CAREER & TECHNOLOGY STUDIES

FORESTRY

GUIDE TO STANDARDS AND IMPLEMENTATION

INTERIM 1994
(SEPTEMBER 1994 – SEPTEMBER 1997)
INCLUDES 1996 UPDATES

SD
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1996
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CURRGDHT

996

Alberta
EDUCATION

CURRICULUM STANDARDS BRANCH

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This document was prepared for:

Administrators	✓
Counsellors	✓
General Audience	
Parents	
Students	
Teachers	✓

Program/Level: Career and Technology Studies/Secondary

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Every effort has been made to acknowledge original sources and comply with copyright regulations. Please notify Alberta Education if there are cases where this has not been done. Shaded areas within this document have been approved for optional implementation. Assessment conditions and criteria are in draft form and will be validated 1994-97.

SUMMARY OF CHANGES

This June 1996 version of the *Guide to Standards and Implementation* differs from the June 1995 version as follows:

Section A	No change
Section B	Updated Scope & Sequence
Section C	Minor edits to Planning for Instruction
Sections D, E, F	All conditions and criteria have been revised to include references to assessment tools and standards <i>with some modifications to specific learner expectations</i>
Section G	Assessment tools have been revised and expanded
Section H	Information on linkages and transitions have been updated and reorganized
Section I	Resource lists have been updated to include new resource approvals
Section J	Sample student learner guides have minor revisions, particularly to "HOW will your mark be determined?" and "WHICH resources may you use?"
Section K	Acknowledgments are not included in this version

In May 1997, the Guides to Standards and Implementation will be revised again in preparation for provincial implementation in September 1997.

Questions or comments about this Guide to Standards and Implementation are welcome and should be directed to:

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CAREER AND TECHNOLOGY STUDIES

PROGRAM PHILOSOPHY/RATIONALE

Through Career and Technology Studies (CTS), secondary education in Alberta is responding to the many challenges of modern society, helping young people develop daily living skills, and nurturing a flexible, well-qualified work force.

In Canada's information society, characterized by rapid change in the social and economic environment, students must be confident in their ability to respond to change and successfully meet the challenges they face in their own personal and work lives. In particular, they must make decisions about what they will do when they finish high school. Many students will enter the work force, others will continue their education. All students face the challenges of growing independence and responsibility, and of entering the highly competitive workplace and/or post-secondary programs.

Secondary schools also face challenges. They must deliver, on a consistent basis, high quality, cost-effective programs that students, parents and community find credible and relevant.

CTS helps schools and students meet these challenges. Schools can respond more efficiently and effectively to student and community needs and expectations by using the opportunities in the CTS curriculum to design courses and access school, community and distance learning resources. Students can develop the confidence they need as they move into adult roles by assuming increased

responsibility for their learning; cultivating their individual talents, interests and abilities; and defining and acting on their goals.

As an important component of basic education in Alberta secondary schools, CTS promotes students' achievement by setting clear expectations and recognizing students' success. Students in CTS develop competencies—that is, the knowledge, skills and attitudes students must demonstrate, or what they know and can do.

These competencies can be applied now and in the future as students make a smooth transition into adult roles in the family, community, workplace and/or further education. To help ensure this transition for students, clearly stated expectations and standards have been defined with the assistance of teachers, business and industry representatives and post-secondary educators.

CTS offers *all* students important learning opportunities. Regardless of the particular area of study chosen, students in CTS will:

- develop skills that they can apply in their daily lives now and in the future
- refine career-planning skills
- develop technology-related skills
- enhance employability skills
- apply and reinforce learnings developed in other subject areas.

In CTS, students build skills they can apply in their everyday lives. For example, in the CTS program, particularly at the introductory levels, students have the opportunity to improve their ability to make sound consumer decisions, and to appreciate environmental and safety precautions.

A career encompasses more than activities related to a person's job or occupation; it involves one's personal life in both local and global contexts; e.g., as a family member, a friend, a community volunteer, a citizen.

The integration of careers throughout the CTS program helps students make effective career decisions and target their efforts. Students in CTS will have the opportunity to expand their knowledge about careers, occupations and job opportunities and the education and/or training requirements involved. As well, they will recognize the need for lifelong learning.

Students in CTS will have the opportunity to use and apply technology and systems effectively and efficiently, which involves:

- a decision regarding which processes and procedures best suit the task at hand
- the appropriate selection and skilled use of the tools or resources that are available
- an assessment of and management of the impact the use of the technology may have on themselves, on others and on the environment.

Integrated throughout CTS are employability skills, those basic competencies that help students develop their personal management and social skills. Personal management skills are improved as students take increased responsibility for their learning, design innovative solutions to problems or challenges, and manage resources effectively and efficiently. Students' social skills improve through learning experiences that require them to work effectively with others, demonstrate teamwork and leadership, and maintain high standards in safety and accountability.

Further enhancing the employability skills, CTS reinforces and enhances learnings developed in core and other complementary courses. The curriculum emphasizes, as appropriate, the effective application of communication and numeracy skills.

Finally, in addition to the common outcomes described above, those students who focus on a particular area of study will develop career-specific competencies that support entry into the workplace and/or related post-secondary programs. Career-specific competencies can involve understanding and applying appropriate terminology, processes and technologies related to a specific career, occupation or job.

GENERAL LEARNER EXPECTATIONS

General learner expectations describe the basic competencies that are integrated throughout the CTS program.

Within an applied context that is relevant to personal goals, aptitudes and abilities, the student in Career and Technology Studies will:

- demonstrate the basic knowledge, skills and attitudes necessary for achievement and fulfillment in personal life
- develop an action plan that relates personal interests, abilities and aptitudes to career opportunities and requirements
- use technology effectively, linking and applying available tools, management and processes to produce a desired outcome
- develop personal management skills by:
 - linking theory and practice, using resources, tools, technology and processes responsibly and efficiently (managing learning)
 - applying effective and innovative decision-making and problem-solving strategies in the design, production, marketing and consumption of goods and services (being innovative)
 - selecting relevant, goal-related activities, ranking them in order of importance, allocating necessary time, and preparing and following schedules (managing resources)
- improve social interaction skills by:
 - demonstrating flexibility and cooperative work and communication behaviors (working with others)
 - participating as a team member by working cooperatively with others and contributing to the group with ideas, suggestions and effort (teamwork and leadership)
 - demonstrating high standards of diligence, attendance and punctuality, following safe procedures consistently, and recognizing and eliminating potential hazards (demonstrating responsibility)
- demonstrate appropriate verbal, written, composition, summarization and presentation skills
- use basic computation and measurement principles accurately and efficiently.

PROGRAM ORGANIZATION

CURRICULUM STRUCTURE

Career and Technology Studies is organized into *strands* and *modules*.

Strands in CTS define competencies that help students:

- build daily living skills
- investigate career options
- use technology (managing, processes, tools) effectively and efficiently
- prepare for entry into the workplace and/or related post-secondary programs.

In general, strands relate to selected industry sectors that offer positive occupational opportunities for students. Some occupational opportunities require further education after high school, and some allow direct entry into the workplace. The industry sectors encompass both goods-producing industries, such as agriculture, manufacturing and construction, and service-producing industries, such as business services, health services, and finance and insurance services.

Modules are the building blocks for each strand. They define what a student is expected to know and be able to do (exit-level *competencies*). Modules also specify prerequisites and facility and instructional parameters, where necessary.

The competencies a student must demonstrate to achieve success in a module are defined through the *module learner expectations*. Senior high school students who can demonstrate the module learner expectations (i.e., have the designated competencies) will qualify for one credit towards their high school diploma.

Module learner expectations are a culmination of the *specific learner expectations*, which provide a more detailed framework for instruction. They define the scope and depth of knowledge, skills and attitudes the student should acquire.

The following chart shows the 22 strands that comprise the CTS program and the number of modules available in each strand.

Strand	No. of Modules
1. Agriculture	31
2. Career Transitions	23
3. Communication Technology	32
4. Community Health	31
5. Construction Technologies	46
6. Cosmetology	58
7. Design Studies	31
8. Electro-Technologies	37
9. Energy and Mines	27
10. Enterprise and Innovation	8
11. Fabrication Studies	41
12. Fashion Studies	29
13. Financial Management	15
14. Foods	37
15. Forestry	21
16. Information Processing	43
17. Legal Studies	13
18. Logistics	12
19. Management and Marketing	21
20. Mechanics	53
21. Tourism Studies	24
22. Wildlife	17

Note: *As of September 1996, all 22 strands are available for optional implementation in Alberta junior and high schools. Provincial implementation of all strands is scheduled for September 1997.*

LEVELS OF ACHIEVEMENT

Modules are organized into three levels of achievement: introductory, intermediate and advanced. As students progress through the levels, they will be expected to meet higher standards and demonstrate increased degree of competence, both in the general learner expectations and the module learner expectations.

Introductory level modules help students build daily living skills and form the basis for further learning. Introductory modules are developed for students who have no previous experience in the strand.

Intermediate level modules build on the competencies developed at the introductory level. They provide a broader perspective, helping students recognize the wide range of related career opportunities available within the strand.

Advanced level modules demand a higher level of expertise and help prepare students for entry into the workplace or a related post-secondary program.

The following illustrates the relative emphasis on the aspects of career planning at each of the levels.

TYPES OF COMPETENCE

Two types of competence are defined within the CTS program: basic and career-specific.

Basic Competencies are generic to any career area and are developed within each module. Basic competencies include:

- personal management; e.g., managing learning, being innovative, ethics, managing resources
- social; e.g., communication, teamwork, leadership and service, and demonstrating responsibility (safety and accountability).

Career-specific Competencies relate to a particular strand. These competencies build daily living skills at the introductory levels and support the smooth transition to the workplace and/or post-secondary programs at the intermediate and advanced levels.

The following model shows the relationship of these two types of competencies within the 22 strands of CTS (numbers refer to the chart on page A.5):

CURRICULUM AND ASSESSMENT STANDARDS

CURRICULUM STANDARDS

Curriculum standards in CTS define what students must know and be able to do. Curriculum standards are expressed through general learner expectations for CTS, and through module and specific learner expectations for each strand.

ASSESSMENT STANDARDS

Assessment standards define how the student's performance will be judged. In CTS, each assessment standard defines the conditions and criteria to be used for assessing the competencies defined in each module learner expectation. Students must fully meet each assessment standard, including all of the criteria and conditions defined for the module. Assessment standards are in draft form, as are tools and weightings, and will be validated 1994–97.

Teachers throughout the province will be able to ensure students receive a fair and reliable assessment. Students will use the assessment standards to guide their efforts, ensuring they participate more effectively and successfully in the learning and assessment process. Standards at advanced levels are as much as possible linked to workplace and post-secondary entry-level requirements.

The following pages describe the Forestry strand in the Career and Technology Studies program.

FORESTRY

STRAND RATIONALE

Forests are a valuable source of natural wealth and cover almost two-thirds of Alberta. The resources found on or beneath these public lands are important to our economic strength and quality of life. Forested lands in Alberta and Canada provide wildlife habitat, vital watersheds, grazing lands, non-renewable resource development sites, outdoor recreation and tourism opportunities, and at the same time support the development of the forest products industry.

Achieving harmony among these diverse and sometimes competing needs associated with forested lands is a vital and continuous task. Integrated resource management ensures a balanced use of forest resources through public involvement and a team approach.

Recently, public concern for forests at global levels has expanded to embrace practices that ensure sustainable use of forest ecosystems. Sustainable use of resources and the environment today will not damage prospects for their use by future generations.★

Forestry, a strand in Career and Technology Studies, will provide opportunities for students to learn about the dynamics of a forest ecosystem, as well as the many benefits and opportunities associated with forests. Conservation is viewed throughout the strand as a process for managing human use of the forest environment to ensure such use is sustainable. Students will develop practical knowledge of industry practices that support the integrated and sustainable development of forest resources.

Within the philosophy of Career and Technology Studies, students in Forestry will develop the knowledge, skills, attitudes, motivation and commitment to work individually and collectively, as private citizens and members of the work force, toward the conservation and responsible use of water, land, air, forests and wildlife. In order to achieve these competencies, *the student will:*

- develop greater awareness of the economic, environmental and social significance of the forest resource in Alberta and the rest of the world, and the benefits and costs of resource development

★ Parks Canada and the Canadian Wildlife Service. *The Nature of Canada: A Primer on Spaces and Species*. Ottawa, ON: Environment Canada, 1993.

- describe relationships among production, processing and marketing systems within the forests products industry
- describe technologies and research programs designed to develop, conserve, protect, enhance and sustain the productivity of forested lands
- translate sustainable development and conservation goals into viable plans for managing use of the forest resource
- develop competencies and behaviours that have broad application to environmental career paths, and specific application to careers within Alberta's forest industries.

Although students are at various stages of cognitive development, many will continue to use concrete operational thinking. Each module in Forestry provides opportunities for students to link concrete and psychomotor learning experiences to more abstract thought processes and levels of thinking. Students will be encouraged to transfer the competencies they have developed in other core and complementary school courses as well as through hobbies, interests and past experiences. As students learn to relate theory and practice in participatory situations, confidence will further their ability to meet personal and professional challenges.

STRAND ORGANIZATION

DEVELOPMENT MODEL

The development model depicts major emphases within the Forestry strand. Three dimensions that provide a basis for selecting and organizing content are represented in the model.

- The KNOWLEDGE, SKILLS AND ATTITUDES, represented on the upper face of the model, provide structure for the course and focus attention on learning goals common to all CTS courses.
- The LEARNING CONTEXTS, represented on the right face of the model, foster the development of knowledge and behaviours that will enable students to meet the demands of daily living, further training and the workplace.
-

The THEMES provide situational and concrete learning experiences that support the development of knowledge, skills and attitudes relevant to each of the learning contexts. Each theme focuses attention on the sustainable use of species and ecosystems. Blended together, the themes enable students to understand how it is possible to fulfill social, cultural, aesthetic and economic goals through resource development, while embracing a conservation ethic so as to maintain essential ecological process, genetic diversity and an adequate resource base for future generations.

LEVELS

Forestry, like other Career and Technology Studies curricula, is organized into three levels of learning: introductory, intermediate and advanced.

Introductory modules enable students to develop basic knowledge of forest regions and ecosystems, and skills necessary for functioning in a forest environment. Intermediate and advanced level modules develop more specialized knowledge of silviculture practices, and the harvest, processing and marketing of forest products. Students examine forest management policies and programs, and develop plans for the sustainable development of forested lands.

(Interim Status, 1994)

SCOPE AND SEQUENCE

FORESTRY

— Prerequisite

---- Recommended sequence

★ This module provides a strong foundation for further learning in this strand.

MODULE DESCRIPTIONS

Module FOR101: Why Forestry?

Students explain the social and environmental significance of forests, describe the impact of individuals on forests, and investigate career paths in forestry.

Module FOR102: Forest Regions of Canada

Students identify factors that determine the distribution of forests, and research forest regions of Canada (with emphasis on specific species and forest associations found in Alberta).

Module FOR104: Woods Survival I

Students demonstrate basic skills required for responsible participation in a range of outdoor activities in the forest.

Module FOR105: Mapping and Aerial Photography

Students interpret information conveyed through different types of maps and aerial photographs.

Module FOR106: Measuring the Forest I

Students demonstrate basic forest measurement skills and apply these skills in sampling fibre values in a forested region.

Module FOR109: Basic Forest Ecology

Students investigate forest ecosystems and explain the structure and functioning of trees.

Module FOR110: Forests Forever I

Students describe past and present uses of Canada's forests, and explain how research and technology assist in forest management.

Module FOR201: Making a Difference in Forestry

Students analyze the impact of lifestyle on forests, and propose individual and shared actions that foster environmental stewardship.

Module FOR203: Managing Alberta's Forested Lands

Students research agencies and frameworks used to manage forested lands in Alberta.

Module FOR204: Woods Survival II

Students plan, prepare for and conduct an extended outdoor wilderness trip in the forest.

Module FOR206: Measuring the Forest II

Students research current forest inventory practices and demonstrate appropriate strategies for sampling the fibre and non-fibre value of forests.

Module FOR207: Harvesting and Forest Products

Students research the steps involved in harvesting and processing the fibre resource.

Module FOR210: Forests Forever II

Students explain forest management goals in Alberta, and describe current management practices used to address these goals.

Module FOR212: Users in the Forest

Students identify different users in the forest and explain the planning principles that are used in developing an integrated resource management plan.

Module FOR301: Issues in Forestry

Students analyze local and global issues in forest management, and demonstrate individual and shared actions that foster environmental stewardship.

Module FOR306: Measuring the Forest III

Students explain management applications of data collected from a forest survey, and examine the role of technology in current forest inventory practices.

Module FOR307: The Forest Marketplace

Students describe the range of consumer products and services derived from Canada's forests, and research the production and marketing of forest products.

Module FOR308: Forest Technology Applications

Students examine applications of research and technology in the forest industry, and changing career opportunities in the forestry sector.

Module FOR309: Advanced Forest Ecology

Students investigate interrelationships among soil, water, air, trees and the environment, and explain how forests change.

Module FOR311: Silviculture: Growing the Forest

Students demonstrate knowledge of the techniques used in establishing, growing and harvesting tree crops.

Module FOR312: Stewardship: Balancing Needs

Students develop and present an integrated plan for sustainable development of the forest resource.

SECTION C: PLANNING FOR INSTRUCTION

CTS provides increased opportunity for junior and senior high schools to design courses based on the needs and interests of their students and the circumstances within the school and community. Some strands may be appropriately introduced at the junior high school level. Other strands are more appropriately introduced at the senior high school level or to Grade 9 students. Refer to this section for recommendations regarding the Forestry strand, or the *CTS Manual for Administrators, Counsellors and Teachers* for a summary of the recommended grade levels for each strand.

PLANNING FOR CTS

Defining Courses

Schools determine which strands and modules will be offered in a particular school, and will combine modules into courses.

Each module was designed for approximately 25 hours of instruction. However, this time frame is only a guideline to facilitate planning. The CTS curricula are competency based, and the student may take more or less time to gain the designated competencies within each module.

A course will usually consist of modules primarily from the same strand but, where appropriate, may include modules from two or more strands. Refer to the *CTS Manual for Administrators, Counsellors and Teachers* for more information on course names and course codes.

Module selection and sequencing must consider the module parameters, which define:

- prerequisite and corequisites (entry-level competencies)
- instructional qualifications, if specialized
- equipment and facility requirements, if specialized.

The module parameters are defined for each module in Sections D, E and F of this Guide.

Degree of Flexibility

The CTS program, while designed using the modular structure to facilitate flexible time-tabling and instructional delivery, does not mandate the degree of flexibility a school or teacher will offer. The teacher and school will determine the degree of flexibility available to the student. Within the instructional plan established by the school, the student may:

- be given the opportunity to progress at a rate that is personally challenging
- have increased opportunity to select modules that develop competencies he or she finds most relevant.

Integrating Basic Competencies

Basic competencies are also developed throughout the CTS program and within each module. Selected basic competencies will be emphasized within a module, depending on the nature of the career-specific competencies defined for the module.

Refer to Section G (Assessment Tools) of this Guide for the description of student behaviours expected at each of the four developmental stages defined for the basic competencies.

Assessment of basic competencies could include input and reflection involving the student, teacher(s), peers and others. Description of the observed behaviour could be provided through a competency profile for the module. Positive, ongoing interaction between the student and teacher will support motivation for student growth and improvement.

Assessment of student achievement on the basic competencies is integrated throughout the other module learner expectations.

Assessing Student Achievement

Assessing the student's competency is a process of gathering information by way of observations of process, product and student interaction.

Where appropriate, assessment tools have been defined to assist the teacher and student in the assessment. Refer to Section G (Assessment Tools) of this Guide to Standards and Implementation for copies of the various tools (worksheets, checklists, sample questions, etc.).

A suggested emphasis for each module learner expectation has also been established. The suggested emphasis provides a guideline to help teachers determine time allocation and/or a percentage grade for students.

Recognizing Student Achievement

At the high school level, successful demonstration of the exit-level competencies in a module qualifies the student for one credit. Refer to Section A of this Guide for more detailed information about how curriculum and assessment standards are defined in CTS. Refer to the *CTS Manual for Administrators, Counsellors and Teachers* for more information on how student achievement can be recognized and reported at the school and provincial levels.

Resources

A comprehensive resource base, including print, software and audio-visual, has been identified to support the Forestry strand. It is intended that these resources will form the basis of a resource centre, encouraging teachers and students to access a wide selection of resources and other information sources throughout the learning process. Unless otherwise noted, these resources are considered to be suitable for both junior and senior high school students.

Authorized resources may be obtained from the Learning Resources Distributing Centre or directly from the publisher or distributor. Refer to Section I (Learning Resource Guide) for the complete resource list including curriculum correlations and resource annotations. Additional sources refer to non-commercial or government agencies that offer resources that may be of assistance in this strand.

In addition to the resources, sample Student Learning Guides are available. These samples, designed for individual student or small group use, provide an instructional plan for selected modules and include the following components:

- Why take this module?
- What are the entry-level competencies?
- What are the exit-level competencies?
- What resources may be accessed?
- What assignments/activities must be completed?
- What are the time lines?
- How will the final mark be calculated?

Sample Student Learning Guides have been developed for the following modules in Forestry:

- Forest Regions of Canada
- Woods Survival I
- Woods Survival II
- Basic Forest Ecology
- Advanced Forest Ecology.

Copies of these sample learning guides can be obtained, by request, from the CTS Unit in print and/or disk format (Microsoft Word).

PLANNING FOR FORESTRY

The following suggestions are provided to assist teachers and school and school system administrators as they plan to deliver modules from the Forestry strand.

Selecting Modules

The scope and sequence chart in Section B provides an overview of the Forestry modules, indicating prerequisites and theme areas. Brief descriptions of the modules follow the scope and sequence chart in Section B.

Course planning should take into consideration module sequences that link with both physical and human resources present in the school and community. Although not required, it is recommended that FOR101: Why Forestry? be a prerequisite/corequisite to all modules in the Forestry strand.

Forestry in Junior High

The introductory level modules may be offered at the junior high level. As each school and community will vary in terms of available resources, it is important to consider potential education partners prior to selecting module sequences.

The number of modules will vary according to time available throughout Grades 7, 8 and 9. Two sample courses based on introductory level modules are outlined below.

Sample A: 50 hours of instruction

COURSE EMPHASIS
Introduction to Forestry
MODULES
Why Forestry? (FOR101) Forest Regions of Canada (FOR102)
RATIONALE/KEY LEARNINGS
Students examine the economic, environmental and social significance of forests, describe the impact of individuals on forests, and conduct research on forest regions of Canada.
The course complements the junior high science and social studies programs, and can be linked with other CTS strands including Tourism and Wildlife.

Sample B: 75 hours of instruction

COURSE EMPHASIS
Personal/Recreational Use of Forests
MODULES
Basic Forest Ecology (FOR109) Woods Survival I (FOR104) Making a Difference in Forestry (FOR201)
RATIONALE/KEY LEARNINGS
Students investigate the structure and functioning of forest ecosystems, develop basic skills required for responsible participation in a range of outdoor forest activities, and propose individual and shared actions that foster environmental stewardship.
The course complements the junior high core science program and complementary Environmental and Outdoor Education program, and can be linked with other CTS strands including Tourism and Wildlife.

Where appropriate, junior high school students may also take intermediate level modules, particularly in the Technology and Applications theme.

Modules may be combined into courses and offered within a school year or over a span of a few years.

Forestry in Senior High

Three sample courses, based on intermediate and advanced level modules and designed to be delivered to senior high school students, are as outlined below:

Sample C: 75 hours of instruction

COURSE EMPHASIS
Forest Inventory (assuming junior high background)
MODULES
Measuring the Forest II (FOR206) Measuring the Forest III (FOR306) Forest Technology Applications (FOR308)
RATIONALE/KEY LEARNINGS
Students demonstrate appropriate strategies for sampling fibre and non-fibre values of the forest, explain management applications of data collected from a forest survey, and research applications of technology in forest inventory practices. This course can be linked with other CTS strands including Agriculture, Career Transitions, Information Processing, Tourism and Wildlife.

Sample D: 100 hours of instruction

COURSE EMPHASIS
Silviculture and Forest Harvest (assuming junior high background)
MODULES
Advanced Forest Ecology (FOR309) Silviculture: Growing the Forest (FOR311) Harvesting and Forest Products (FOR207) The Forest Marketplace (FOR307)
RATIONALE/KEY LEARNINGS
Students investigate relationships among soil, water, air, trees and the environment, demonstrate techniques in establishing, growing, harvesting and processing tree crops, and research the production and marketing of forest products in Canada. The course can be linked with other CTS strands including Career Transitions, Management and Marketing, Mechanics and Wildlife.

Sample E: 125 hours of instruction

COURSE EMPHASIS
Forest Management (assuming junior high background)
MODULES
Managing Alberta's Forested Lands (FOR203) Forests Forever II (FOR210) Users in the Forest (FOR 212) Issues in Forestry (FOR301) Stewardship: Balancing Needs (FOR312)
RATIONALE/KEY LEARNINGS
Students research the goals of forest management, and agencies/frameworks used to manage forested lands in Alberta. The module focuses attention on different users in the forest, the planning principles involved in integrated resource management, and individual/shared actions that foster environmental stewardship. This course can be linked with other CTS strands including Agriculture, Career Transitions, Energy and Mines, Legal Studies, Tourism and Wildlife.

Modules could also be grouped into comprehensive courses that develop competencies relevant to career paths within a specific industry.

Organizing for Learning

A "learn by doing" approach is recommended for the Forestry strand. Essentially, the teacher's role will become that of guide and partner in the learning process. The "learn by doing" approach requires the teacher to be facilitator and coach, rather than subject-based expert, as students actively participate in learning by doing and discovering.

Small group instruction is a good way to foster learning by doing and discovering. Small groups enable students to be active participants in learning, and develop independent and responsible learning habits. As students work in small group situations they will share information, solve problems, develop consensus, and help each other learn content and processes.

The community has a key role in education and can be an effective partner in the learning process. The use of community members and resources should be integrated into course planning. Business, industry, post-secondary and government agencies offer a wide range of services and resources, as do local clubs, service groups and institutions. When planning for the use of community resources, teachers should ensure that related presentations and/or activities:

- are consistent with student knowledge and skill levels
- demonstrate sound pedagogy
- are exemplary of approved health and safety standards
- provide a balanced approach to curriculum topics and related issues.

Before selecting modules, teachers should check the module parameters outlined in each module (see Sections D, E and F of the Guide). These module parameters describe:

- prerequisite or corequisite modules,
- facility and equipment requirements, if required, and
- instructional qualifications, if required.

Modules can be delivered sequentially, concurrently or combined. For example, although the modules from the Technology and Applications theme are sequential, they can be combined with modules from the Social and Cultural Perspectives theme or the Management and Conservation theme.

Scenario A

Scenario B

Teachers can also allow students to progress at a rate that is personally challenging; e.g.:

Scenario C

Scenario D

Plans for learning must address social, economic and environmental perspectives related to sustainable forest use and provide opportunities for students to become involved in learning experiences that reflect a broad understanding of issues related to forest use. Presentations of course content that reflect a singular or narrow view of social, economic or environmental concerns are not consistent with learner expectations and must be avoided. For clarification of policy in this regard, refer to Alberta Education's Policy on Controversial Issues located in the *Alberta Education Policy Manual* (1989).

As in all CTS strands, students will identify, explore and prepare for future career opportunities. It is recommended that course planning include the integration of relevant career investigations throughout each module, rather than as a singular or isolated study. Career profiles, interviews and job-shadowing will acquaint students with the many technical and professional careers associated with the forest industry.

Addressing Safety in Off-Campus Excursions

Outdoor trips and field-based investigations are recommended and should be an important part of teaching and learning throughout the Forestry strand. Safety must be a prime consideration in planning off-campus learning experiences. Both teachers and students should engage in activities at their level of training and ability. Adequate instructional support, guidance and supervision must be provided at all times. Local jurisdiction and school policies must be understood by principals, teachers, parents, supervisors and students.

Preparation and Risk Anticipation

The preparation stage is an important part of any off-campus learning experience. At this stage of planning, potential risks can be anticipated and either avoided or moderated. The preparation stage should focus attention on:

- trip administration, including the use of parental permission forms, health information forms, school/system authorization forms and accident report forms as required
- a review of laws and regulations relevant to the learning site and activities that will be undertaken
- assessment of the learning site in terms of potential hazards and risks that may be present
- group size and the level of supervision that will be required (i.e., supervisor/student ratio)
- a briefing of parents, school administrators, government/industry authorities or others who should be informed regarding itineraries, participants and emergency response plans
- pre-trip logistics, including transportation, equipment, facility and departure date/time considerations
- student preparation, including the development of background knowledge/experience and training in specific skill areas.

On-Site Risk Management

Safety and risk management involves exercising situation-specific judgement throughout the course of off-campus learning. Judgement is the product of experience, and may include recognizing factors such as dangers imposed by equipment or animals, deteriorating weather, a decline in physical strength, or a more challenging task. Many of the hazard recognition skills can be taught in the classroom in the preparation stage.

A significant aspect of on-site risk management is group management. Teachers can exercise appropriate group management strategies by focusing attention on:

- pacing, including speed of travel, rest stops, distance travelled, and fitness level of students
- maintaining a safe distance for observations
- group control, including position of leader, signal systems and buddy systems
- the establishment of group rules and norms
- clearly defined task allocations for each student
- objective hazard recognition in the field, including machinery and equipment, weather, terrain, flora and fauna

- subjective hazard recognition in the field, including level of group energy and level of cooperation.

Emergency Response

If students have been well prepared for field-based learning experiences and appropriate group management strategies exercised, the teacher will have maximized opportunities for effective response to an emergency situation. An effective emergency response action plan should include consideration of:

- a suitable approach to the accident site
- first-aid supplies and techniques
- a strategy for signalling assistance
- an evacuation plan
- group management throughout the emergency situation.

Identifying Linkages

Section H of this Guide describes linkages within CTS and with core and complementary programs.

Note that project and practicum modules from the Career Transitions strand may be combined with modules from Forestry to provide increased opportunity for students to develop expertise, refine their competencies and/or obtain credentials.

Project and practicum modules are **not** designed to be offered as distinct courses and should **not** be used to extend Work Experience 15, 25, and 35 courses.

Improving Smooth Transitions to the Workplace and/or Post-secondary Programs

Refer to Section H of this Guide for potential transitions students may make into:

- the workplace
- related post-secondary programs or other avenues for further learning.

MODULE CURRICULUM AND ASSESSMENT STANDARDS:

SECTION D: INTRODUCTORY LEVEL

The following pages define the curriculum and assessment standards for the introductory level of Forestry.

Introductory level modules help students build daily living skills and form the basis for further learning. Introductory modules are developed for students who have no previous experience in the strand.

Module learner expectations define the competencies a student must demonstrate to achieve success in a module. Assessment standards define the conditions and criteria to be used for assessing the competencies defined in the module learner expectations. These assessment standards and the accompanying assessment tools are in draft form and will be validated from 1994 to 1996.

Specific learner expectations provide a detailed framework for instruction to help students build the competencies defined in the module learner expectations. Additional information and suggestions for instruction are provided in the Notes column; teachers may wish to use this space to record their ideas for instruction or student projects.

Module FOR101:	Why Forestry?.....	D.3
Module FOR102:	Forest Regions of Canada	D.7
Module FOR104:	Woods Survival I	D.11
Module FOR105:	Mapping and Aerial Photography	D.17
Module FOR106:	Measuring the Forest I	D.21
Module FOR109:	Basic Forest Ecology	D.25
Module FOR110:	Forests Forever I	D.29

MODULE FOR101: WHY FORESTRY?

Level: Introductory

Theme: Social and Cultural Perspectives

Prerequisite: None

Module Parameters: Access to government, industry and community resources

Students explain the social and environmental significance of forests, describe the impact of individuals on forests, and investigate career paths in forestry.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none">describe the social, cultural, economic and environmental significance of forests	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none">identifying and explaining six or more ways in which local forests (regional or provincial) have:<ul style="list-style-type: none">social and cultural significance (e.g., recreational, spiritual, aesthetic, medicinal)economic significance (e.g., employment, product export, tourism, subsistence, tax base)environmental significance (e.g., air, water and soil cycles) <p><i>Assessment Tools</i> <i>Knowledge/Application Assessment: Significance of Forests, FOR101-1</i> <i>Sample Timeline: Forestry in North America, FOR101-2</i></p> <p><i>Standard</i> <i>Respond to a standard of 1 on the rating scale</i></p> <ul style="list-style-type: none">a comprehensive list of forest products and services <p><i>Standard</i> <i>Identify and describe 20 products and 10 services derived from Canadian forests</i></p>	40

MODULE FOR101: WHY FORESTRY? (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> explain how personal needs, wants, beliefs and actions may influence the forest resource 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> completing a research project that examines influences of personal needs, wants, beliefs and actions on the forest resource. Research to address the influences of: <ul style="list-style-type: none"> – consumer choices – recreational patterns – product marketing and promotion – environmentally friendly products – conservation and preservation ethics <p><i>Assessment Tool</i> <i>Research Process: Impacts on the Forest Resource, FOR101–3</i></p> <p><i>Standard</i> <i>Complete all components of research to a standard of 1 on the rating scale</i></p> <ul style="list-style-type: none"> maintaining a log/journal of reflections and thoughts regarding the impact of personal attitudes, actions and lifestyle on the forest resource, and ideas for environmental citizenship <p><i>Assessment Tool</i> <i>Reflection Guide for Environmental Responsibility/Citizenship, FORREF–ENV</i></p> <p><i>Standard</i> <i>Complete 5 journal/log entries; address criteria for reflection to a standard of 1 on the rating scale</i></p>	<p>30</p>
<ul style="list-style-type: none"> research potential careers in forestry 	<ul style="list-style-type: none"> given current information on career opportunities in forestry, completing a research project on one or more career clusters in the forestry sector <p><i>Assessment Tool</i> <i>Career Search: Introductory Level, FORCAR–1</i></p> <p><i>Standard</i> <i>Conduct research to a standard of 1 on the rating scale</i></p>	<p>30</p>
<ul style="list-style-type: none"> demonstrate basic competencies. 	<ul style="list-style-type: none"> observations of individual effort and interpersonal interaction during the learning process <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>Integrated throughout</p>

MODULE FOR101: WHY FORESTRY? (Continued)

Concept	Specific Learner Expectations	Notes
Forest Role	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • present a historical perspective on the social and cultural significance of forests; e.g., <ul style="list-style-type: none"> – recreational – spiritual/aesthetic – medicinal – community dependence • describe the economic significance of forests at local, national and global levels; e.g., <ul style="list-style-type: none"> – direct and indirect employment – forest products and export values – tourism – subsistence – tax base • describe the environmental significance of forests at local, national and global levels; e.g., <ul style="list-style-type: none"> – wildlife and fisheries habitat – watershed protection and maintenance – water, air and soil quality – maintenance of ecosystems – climate change. 	<p>Interview people for whom the forest has a historical significance (e.g., seniors within the community, aboriginal peoples).</p> <p>Monitor the performance of forest industry in the stock market.</p> <p>Interview local industry representatives</p> <p>Contact Forestry Canada for current resource materials (ph. 435–7210).</p> <p>See <i>Alberta's Focus on Forests</i> (Activity 4.2–Products From Canadian Forests).</p>
Personal Impact	<ul style="list-style-type: none"> • describe the impact of individual attitudes, actions and lifestyle on the forest resource; e.g., <ul style="list-style-type: none"> – conservation ethic – preservation ethic – consumer practices – recreational patterns • describe how consumer and marketing trends in society may affect the forest resource; e.g., <ul style="list-style-type: none"> – needs versus wants – media exaggeration – use of environmental friendly products 	<p>Prepare an inventory of household materials used each day. How many of these materials are derived from the forest resource?</p> <p>Distinguish between wants and needs. Analyze the impact of advertisements on television.</p>

MODULE FOR101: WHY FORESTRY? (Continued)

Concept	Specific Learner Expectations	Notes
Personal Impact (continued)	<p><i>The student should:</i></p> <ul style="list-style-type: none"> propose personal strategies for using forests wisely that foster the attainment of social, cultural, economic and environmental goals; e.g., <ul style="list-style-type: none"> personal actions leadership roles. 	<p>Analyze and debate a controversial issue.</p> <p>Reference activities outlined in <i>Decisions, Decisions: The Environment</i> (software and print material available from Tom Snyder Productions, Inc.)</p> <p>Contact the Environmental Law Centre for resources that support issue analysis and conflict resolution.</p>
Career Paths	<ul style="list-style-type: none"> research career clusters and the range of occupational opportunities within the forestry sector: <ul style="list-style-type: none"> professional technical labour-based gather employment statistics within one or more career clusters; e.g., <ul style="list-style-type: none"> types of careers number of workers employment trends infer career opportunities and trends from employment statistics infer impacts of the marketplace on employment opportunities consider possible forest industries in the future, and resulting career opportunities. 	<p>Interview people employed in the forestry sector. Identify general areas of specialization; e.g.:</p> <ul style="list-style-type: none"> resource inventory biology/ecology resource protection resource harvest forest products environmental management recreation education. <p>Review National Occupational Profiles (NOC).</p> <p>Contact the "Career Hotline" (telephone 1-800-661-3753).</p> <p>Contact senior management people in the forest industry; also producers of value-added products.</p>

MODULE FOR102: FOREST REGIONS OF CANADA

Level: Introductory

Theme: Social and Cultural Perspectives

Prerequisite: Knowledge of geographic regions of Canada (Recommended)

Module Parameters: Access to government and library resources

Students identify factors that determine the distribution of forests, and research forest regions of Canada (with emphasis on specific species and forest associations found in Alberta).

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<i>The student will:</i> <ul style="list-style-type: none">identify factors that determine the type and distribution of forests	<i>Assessment of student assessment will be based on:</i> <ul style="list-style-type: none">conducting laboratory and/or field investigations to determine the effect of temperature, moisture or soil on plant growth <i>Assessment Tool</i> <i>Lab Investigations: Factors Affecting Plant Growth, FOR102-1</i> <i>Standard</i> <i>Complete lab and/or field investigations to a standard of 1 on the rating scale</i>	20
	<ul style="list-style-type: none">explaining ways in which climate and land form affect the growth and distribution of forests <i>Assessment Tool</i> <i>Knowledge/Application Assessment: Growth and Distribution of Forests, FOR102-2</i> <i>Standard</i> <i>Respond to a standard of 1 on the rating scale</i>	10
	<ul style="list-style-type: none">given outline maps of Canada and Alberta, locating and describing:<ul style="list-style-type: none">the eight forest regions of Canada and major tree species within each regionthe three forest regions present in Alberta and major tree species within each region<i>Assessment Tool</i> <i>Task Checklist for Mapping, FORMAP</i> <i>Standard</i> <i>Complete applicable mapping tasks to a standard of 1 on the rating scale</i>	30

MODULE FOR102: FOREST REGIONS OF CANADA (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> identify and describe trees that grow in specific regions of Canada and Alberta 	<p><i>Assessment of student assessment will be based on:</i></p> <ul style="list-style-type: none"> given access to actual (or photographed) tree, shrub and/or plant species within a forest region of Canada, preparing (following museum conservation rules) a leaf or twig collection including at least 20 native species. Each species to be identified using common and scientific names. (At least 50% of the species identified and collected to be trees. If photographs are used in place of actual specimens, collection to include both closeup and full-view photos of each species.) <p><i>Assessment Tool</i> <i>Museum Conservation Rules for Leaf/Twig Collection, FOR102-3</i></p> <p><i>Standard</i> <i>Prepare each specimen in the collection to a standard of 2 on the rating scale</i></p> <ul style="list-style-type: none"> observations of individual effort and interpersonal interaction during the learning process <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above.</i></p>	<p>40</p> <p>Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
Determining Factors	<p><i>The student should:</i></p> <ul style="list-style-type: none"> identify factors that enhance the development of forests and determine the distribution of living organisms within forest regions; e.g., <ul style="list-style-type: none"> land form climate describe relationships between climatic factors and the growth of trees; e.g., <ul style="list-style-type: none"> temperature moisture 	<p>Suggested resource: <i>Forest Regions of Canada</i> (Rowe, 1972).</p> <p>Perform a lab that demonstrates the effect of moisture on tree growth.</p>

MODULE FOR102: FOREST REGIONS OF CANADA (continued)

Concept	Specific Learner Expectations	Notes
Determining Factors (continued)	<p><i>The student should:</i></p> <ul style="list-style-type: none"> describe relationships between land forms and the distribution of forests; e.g., <ul style="list-style-type: none"> topography soil conditions suggest reasons for the distribution of trees in natural regions in Canada and Alberta. 	Using a local map, indicate heavy concentrations of particular tree species. Suggest reasons for the distributions noted.
Forest Regions	<ul style="list-style-type: none"> locate and describe the eight forest regions of Canada; e.g., <ul style="list-style-type: none"> Boreal Subalpine Montane Coast Columbia Deciduous Great Lakes/St. Lawrence Acadian read, interpret and create visual representations of species distribution in Canada and Alberta. 	<p>See <i>Alberta's Focus on Forests</i> (Activity 4.1– Trees of Alberta and Canada).</p> <p>Resources available from Canada Forestry Service include:</p> <ul style="list-style-type: none"> Forest Regions of Canada Native Trees of Canada. <p>Match common trees with their respective locations.</p> <p>Mapping exercises.</p>
Tree Identification	<ul style="list-style-type: none"> identify common trees and other plants that grow in specific regions of Canada and Alberta; e.g., <ul style="list-style-type: none"> tree and shrub identification non-woody plant identification prepare a display of details that help to identify local trees, shrubs and non-woody plants; e.g., <ul style="list-style-type: none"> leaves flowers/cones twigs bark. 	<p>Conduct field trips to locate and identify trees on-site.</p> <p>Use a key to assist in the identification of tree species.</p> <p>Leaf and twig collections.</p>

MODULE FOR104: WOODS SURVIVAL I

Level: Introductory

Theme: Social and Cultural Perspectives

Prerequisite/

Corequisite: Current certification in Emergency First Aid

Module Parameters: Access to an outdoor forest environment and gear for outdoor expeditions; instructor must have current personal certification in Standard First Aid (St. John Ambulance)
Information regarding student safety and instructor certification is provided in Sections C and H of this Guide to Standards and Implementation.

Students demonstrate basic skills required for responsible participation in a range of outdoor activities in the forest.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<i>The student will:</i> <ul style="list-style-type: none">demonstrate knowledge, skills and attitudes that are necessary for safe and comfortable outdoor experiences in the forest	<i>Assessment of student achievement will be based on:</i> <ul style="list-style-type: none">identifying five or more physical hazards that may be imposed by a forest environment, and explaining appropriate steps to take in avoiding/preventing and responding/dealing with each hazard <i>Assessment Tool</i> <i>Knowledge/Application Assessment: Hazards in the Forest Environment, FOR104-1</i> <i>Standard</i> <i>Respond to a standard of 2 on the rating scale</i> <ul style="list-style-type: none">a teacher-prepared assessment in which the student demonstrates knowledge of strategies for dealing with hypothermia, frostbite, fatigue, dehydration and fear in the outdoors <i>Assessment Tool</i> <i>Sample Assessment Items: Woods Survival I, FOR104-2</i> <i>Standard</i> <i>Response indicating 80% mastery</i>	20

MODULE FOR104: WOODS SURVIVAL (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> participate in a range of outdoor forest activities that have minimal impact on the forest environment 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> planning and assembling gear for a three-day trip in the outdoors <p><i>Assessment Tool</i> <i>Task Checklist: Woods Survival I, FOR104-3</i></p> <p><i>Standard</i> <i>Achieve a performance rating of 2 in applicable areas of task assessment</i></p> <ul style="list-style-type: none"> within a continuous timeframe of 20 or more hours, and through access to an outdoor forest environment, conducting safe outdoor activities that have minimal impact on the forest environment. Outdoor activities to demonstrate knowledge of safe techniques for: <ul style="list-style-type: none"> packing and transporting gear required for a three-day trip in the outdoors. Transportation to be by human conveyance (e.g., backpack, sled) using and maintaining outdoor tools and equipment, including knives, axes, saws, shovels, stoves and lanterns building and using outdoor fires constructing a fallen tree shelter, lean-to shelter, snow cave shelter or other type of shelter maintaining hygiene and sanitation while in the outdoors <p><i>Assessment Tools</i> <i>Task Checklist: Woods Survival I, FOR104-3</i> <i>Lab Assessment: Outdoor Forest Experiences, FORLAB</i></p> <p><i>Standard</i> <i>Achieve a performance rating of 2 in task assessment <u>and</u> lab assessment</i></p>	80

MODULE FOR104: WOODS SURVIVAL (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> demonstrate basic competencies. 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> maintaining a log/journal of outdoor experiences that provides summative reflection on individual and group preparedness, cooperation, responsibility and environmental ethics <p><i>Assessment Tool</i> <i>Reflection Guide for Outdoor Experiences, FORREF-OUT</i></p> <p><i>Standard</i> <i>Complete 5 log/journal entries; address criteria for reflection to a standard of 1 on the rating scale</i></p> <ul style="list-style-type: none"> observations of individual effort and interpersonal interaction during the learning process <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above.</i></p>	<p>Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
Outdoor Survival Skills	<p><i>The student should:</i></p> <ul style="list-style-type: none"> identify, assess, avoid and/or respond to physical hazards that may be imposed by the forest environment; e.g., <ul style="list-style-type: none"> particular terrain and conditions, including avalanche, lake and river ice, and bush travel wildlife that may be encountered, including bears, bees, ticks, non-edible plants changes in weather conditions that may affect personal and group safety identify, assess, avoid and/or respond to physiological and psychological factors often associated with outdoor experiences in the forest; e.g., <ul style="list-style-type: none"> dealing with hypothermia, frostbite and dehydration. understanding fatigue and when not to move coping with adversities, such as getting lost or hurt 	<p>Forest hazards to be aware of:</p> <ul style="list-style-type: none"> dead-topped trees bees poisonous plants other wildlife unfamiliar waters forest fires. <p>View films and slide shows of forest expeditions that involve physical hazards.</p> <p>Invite guest speakers/ community resource persons to present information and advice on expeditions in the forest.</p> <p>Potential linkages with "Wilderness First Aid" certification course (Canadian Red Cross).</p>

MODULE FOR104: WOODS SURVIVAL (continued)

Concept	Specific Learner Expectations	Notes
Outdoor Survival Skills (continued)	<p><i>The student should:</i></p> <ul style="list-style-type: none"> list and explain necessary steps to take in emergency and survival situations in the forest; e.g., <ul style="list-style-type: none"> what to do if lost or separated from the group first aid and emergency response to injury construction of emergency shelters how to gather food from edible plants en route organizational strategies, including lead and sweep, regrouping procedures, pacing select appropriate personal and group gear for outdoor forest activities; e.g., <ul style="list-style-type: none"> personal gear, with consideration to maintaining body temperature and protection from injury group gear, to meet requirements for food, shelter, travel and emergencies demonstrate safe use and appropriate care of outdoor hand tools, including knives, axes and saws demonstrate safe procedures for building and using outdoor fires; e.g., <ul style="list-style-type: none"> signalling warming cooking explain techniques used to plan, pack, carry and prepare foods during outdoor forest expeditions; e.g., <ul style="list-style-type: none"> nutritional requirements portability and preservation factors food preparation techniques safe use of campfires explain techniques required for maintaining hygiene during outdoor forest expeditions; e.g., <ul style="list-style-type: none"> water purification personal cleanliness group hygiene. 	<p>Determine appropriate first-aid supplies.</p> <p>Engage students in simulation activities, role-playing and case studies.</p> <p>Review basic first aid and involve students in emergency response situations.</p> <p>Have students present a "fashion show" or produce a video that demonstrates appropriate equipment and its use.</p> <p>Conduct an equipment maintenance clinic.</p> <p>Practise fire building techniques—then plan and carry out a school yard "cookout".</p> <p>Involve students in menu planning for a hypothetical or proposed field trip.</p> <p>Invite guest speakers from a health department or from national/provincial parks.</p>

MODULE FOR104: WOODS SURVIVAL (continued)

Concept	Specific Learner Expectations	Notes
Forest Expeditions	<p><i>The student should:</i></p> <ul style="list-style-type: none"> plan and conduct safe outdoor expeditions in the forest; e.g., <ul style="list-style-type: none"> research information from a variety of sources, including maps, aerial photographs, guidebooks, journals and local experts interpret route information by selecting reasonable destinations, estimating travel time and anticipating obstacles apply knowledge and skills while en route, including map reading and compass skills, knowledge of terrain and route selection, and mapping of key landmarks and directions use different modes of travel to confidently participate in a variety of forest activities; e.g., <ul style="list-style-type: none"> snowshoes, skis, walking staff and canoe hiking, backpacking, cross-country skiing, canoeing and bird-watching acquire and apply minimal impact skills while participating in outdoor forest expeditions; e.g., <ul style="list-style-type: none"> proper trail use, including the avoidance of trail widening campsite care, including the use of fires and stoves, tent site selection, and firewood selection waste disposal techniques, including latrines, waste water disposal and garbage. 	<p>Examine maps, research books, reference materials, etc., on particular field sites to be visited.</p> <p>Access alternative routes with regard to time and preparation required for each.</p> <p>Conduct map reading and basic orienteering exercises in school yard.</p> <p>Plan and implement a sequence of skill development activities with a follow-up excursion.</p> <p>Discuss principles of "ecotourism". Consider carrying capacity of a forested area in relation to minimum environmental impact.</p> <p>Set up a model campsite in the school yard or a local park.</p>

MODULE FOR105: MAPPING AND AERIAL PHOTOGRAPHY

Level: Introductory

Theme: Technology and Applications

Prerequisite: None

Module Parameters: Access to forest maps and aerial photographs

Students interpret information conveyed through different types of maps and aerial photographs.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none">describe different types of maps and aerial photographs used in forestry	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none">preparing and presenting a portfolio that includes:<ul style="list-style-type: none">four or more different types of maps used in forestry, and explanations of the characteristics and applications of eacha one-page report on the National Topographic Grid System and its application in providing legal land descriptionsthe results of research conducted on the goals and techniques of aerial photography <p><i>Assessment Tool</i> <i>Portfolio Assessment: Maps Used in Forestry, FOR105-1</i></p> <p><i>Standard</i> <i>Complete all portfolio components to a standard of 1 on the rating scale</i></p>	20
<ul style="list-style-type: none">interpret and apply information conveyed through maps and aerial photographs	<ul style="list-style-type: none">performing practical orienteering tasks that involve the use of information conveyed through maps. Tasks to include:<ul style="list-style-type: none">orienting a map through inspection of surroundings and use of a compassobtaining bearings from a map using a compassmeasuring direction using a Douglas protractorgiven a legal land description, locating the parcel of land on a map <p><i>Assessment Tool</i> <i>Task Checklist: Orienteering, FOR105-2</i> <i>Lab Assessment: Outdoor Forest Experiences, FORLAB</i></p> <p><i>Standard</i> <i>Achieve a performance rating of 1 in task assessment <u>and</u> lab assessment</i></p>	60

MODULE FOR105: MAPPING AND AERIAL PHOTOGRAPHY (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> demonstrate procedures used to create maps demonstrate basic competencies. 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> describing topography and forest cover for a given area based on information gathered from: <ul style="list-style-type: none"> an aerial photograph and corresponding parts of a forest type map two or more different types of aerial photographs (e.g., black and white, colour, infrared, satellite imagery) <p><i>Assessment Tool</i> <i>Knowledge/Application Assessment: Reading and Interpreting Forest Maps, FOR105-3</i></p> <p><i>Standard</i> <i>Respond to a standard of 1 on the rating scale</i></p> <ul style="list-style-type: none"> constructing a simple map that represents a local forested area. Map to display scale, legend, major land and forest features and topography <p><i>Assessment Tool</i> <i>Task Checklist for Mapping, FORMAP</i></p> <p><i>Standard</i> <i>Complete applicable mapping tasks to a standard of 1 on the rating scale</i></p> <ul style="list-style-type: none"> observations of individual effort and interpersonal interaction during the learning process <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>20</p> <p>Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
Applications of Maps and Aerial Photographs	<p><i>The student should:</i></p> <ul style="list-style-type: none"> describe different types of maps used in forestry; e.g., <ul style="list-style-type: none"> base maps topographic/contour maps soil type maps forest stand or type maps 	<p>Contact the Canadian Forest Services or local forest industries and request different types of maps.</p> <p>Request class sets of maps and photos of locally known areas from Alberta Environmental Protection.</p>

MODULE FOR105: MAPPING AND AERIAL PHOTOGRAPHY (continued)

Concept	Specific Learner Expectations	Notes
Applications of Maps and Aerial Photographs (continued)	<p><i>The student should:</i></p> <ul style="list-style-type: none"> describe components and applications of the National Topographic Grid System and the Western Grid Survey System explain the purpose and techniques of aerial photography describe applications of different types of film used in aerial photography; e.g., <ul style="list-style-type: none"> black and white black and white infrared colour colour infrared research information-gathering technologies and their applications in mapping; e.g., <ul style="list-style-type: none"> satellite imagery Global Positioning Systems (GPS). 	<p>See related topics and resources in the Agriculture strand (AGR312: Soils Management II).</p> <p>Contact industry and/or government resource persons.</p> <p>See "JFW Green Tree Trailblazer Leader Manual", <i>Woods-travel</i>, pp. 117–216).</p> <p>Contact RADARSAT International (3851 Shell Road, Suite 200, Richmond, British Columbia) for up-to-date information regarding applications of satellite remote sensing in mapping Canada's forest resources.</p>
Interpreting Maps and Aerial Photographs	<ul style="list-style-type: none"> orient forestry maps through: <ul style="list-style-type: none"> inspection use of a compass obtain bearings from a map using a forestry compass measure direction using a Douglas protractor read and interpret maps and aerial photographs, explaining information conveyed through: <ul style="list-style-type: none"> legend and symbols scale colours contour lines locate a specific parcel of land on a map by using its legal survey description 	<p>Read and interpret maps/photos of locally known areas.</p> <p>See basic map interpretation activities provided in:</p> <ul style="list-style-type: none"> <i>Orienteering, Level I</i> <i>Orienteering, Level II</i> <p>Progress through a series of mapping activities—start with locating dots in the classroom, then markers around the school, and finally markers around a park or wooded area.</p> <p>See related topics and resources in the Agriculture strand (AGR312: Soils Management II).</p>

MODULE FOR105: MAPPING AND AERIAL PHOTOGRAPHY (continued)

Concept	Specific Learner Expectations	Notes
Interpreting Maps and Aerial Photographs (continued)	<p><i>The student should:</i></p> <ul style="list-style-type: none"> construct a mental image of land terrain from information conveyed through maps estimate and calculate distance and area on maps demonstrate applications of aerial photographs in the stereoscopic viewing of topographic features compare details of forest type maps and aerial photographs with existing ground conditions. 	<p>Consider links with the mathematics program:</p> <ul style="list-style-type: none"> scale diagrams ratio and proportion estimation. <p>Discuss theory behind stereoscopic vision and techniques to train the eye.</p>
Making Maps	<ul style="list-style-type: none"> construct a map that provides information about a forested area; e.g., <ul style="list-style-type: none"> pace/measure area to be mapped gather information regarding land/forest features determine map scale prepare a legend plot major land/forest features. explain how information from aerial photographs is used to construct two-dimensional maps compare details of an aerial photograph with corresponding parts of a forest type map. 	<p>Create a simple topographical map of a local area.</p> <p>Use aerial photographs to create a simple map.</p> <p>If time permits, create a photo mosaic by arranging consecutive aerial photographs along a flight path.</p>

MODULE FOR106: MEASURING THE FOREST I

Level: Introductory

Theme: Technology and Applications

Prerequisite

Corequisite: Mapping and Aerial Photography (FOR105; Recommended)

Module Parameters: Demonstration forest and measurement tools

Students demonstrate basic forest measurement skills and apply these skills in sampling fibre values in a forested region.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<i>The student will:</i> <ul style="list-style-type: none">explain the general goals and techniques of conducting forest surveys	<i>Assessment of student achievement will be based on:</i> <ul style="list-style-type: none">completing a research project on the goals and techniques of conducting a forest survey. Research to address:<ul style="list-style-type: none">reasons for conducting forest surveystechniques used to sample a forested areahow sample data is used to estimate forest populations.<i>Assessment Tool</i> <i>Research Process: Forest Surveys, FOR106–1</i> <i>Standard</i> <i>Conduct research to a standard of 1 on the rating scale</i>	10
<ul style="list-style-type: none">demonstrate basic compass and measurement skills used in forest inventory practices	<ul style="list-style-type: none">using a compass in the outdoors to orient a map, obtain a bearing, and perform a closed traverse (error in closure no greater than 5% of perimeter distance) <i>Assessment Tool</i> <i>Task Checklist: Orienteering, FOR106–2</i> <i>Lab Assessment: Outdoor Forest Experiences, FORLAB</i> <i>Standard</i> <i>Achieve a performance rating of 1 in task assessment <u>and</u> lab assessment</i>	70

MODULE FOR106: MEASURING THE FOREST I (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> sample fibre volumes in a forested region demonstrate basic competencies. 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> given access to a plot of forested land, measuring chain, diameter tape, clinometer and increment borer, measuring (accurate to within 5%): <ul style="list-style-type: none"> horizontal distances up to 25 metres the diameter of 10 trees the height of 10 trees the age of 10 trees. <p><i>Assessment Tool</i> <i>Task Checklist: Forest Measurement, FOR106-3</i> <i>Lab Assessment: Outdoor Forest Experiences, FOR-LAB</i></p> <p><i>Standard</i> <i>Achieve a performance rating of 1 in task assessment <u>and</u> lab assessment</i></p> <ul style="list-style-type: none"> given access to a plot of forested land and suitable measurement tools, conducting (with assistance) a survey of fibre values in the region by: <ul style="list-style-type: none"> establishing boundaries for a sample plot measuring tree diameter, height and age within the plot estimating fibre volumes from sample data <p><i>Assessment Tool</i> <i>Task Checklist: Forest Survey, FOR106-4</i> <i>Lab Assessment: Outdoor Forest Experiences, FORLAB</i></p> <p><i>Standard</i> <i>Achieve a performance rating of 1 in task assessment <u>and</u> lab assessment</i></p> <ul style="list-style-type: none"> observations of individual effort and interpersonal interaction during the learning process <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above.</i></p>	<p>20</p> <p>Integrated throughout</p>

MODULE FOR106: MEASURING THE FOREST I (continued)

Concept	Specific Learner Expectations	Notes
Forest Surveys	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • suggest reasons for conducting a forest survey; e.g., <ul style="list-style-type: none"> – types of information gathered – questions that are answered • distinguish between forest samples and forest populations • describe basic techniques used to sample a forested area; e.g., <ul style="list-style-type: none"> – layout of sample plots – data collection techniques • explain how sample data may be used to estimate fibre volumes and other non-fibre forest resources. 	<p>Obtain assistance from government, industry or private forestry personnel.</p> <p>See <i>Alberta's Focus on Forests</i> (Activity 4.3—Surveying the Forest Resource).</p>
Compass and Measurement Skills	<ul style="list-style-type: none"> • apply basic compass skills to establish direction in the forest; e.g., <ul style="list-style-type: none"> – orient a map – establish and follow a bearing • measure horizontal distance in the forest using pacing and chaining skills • perform open and closed traverses in the forest using compass and chaining skills • measure the diameter of trees using a diameter tape or other suitable equipment • measure the height of trees using a clinometre and measuring tape or other suitable equipment • demonstrate techniques used to determine the age of trees. 	<p>Develop basic skills in measuring direction and distance in the forest.</p> <p>Invite resource person from local government/industry to demonstrate:</p> <ul style="list-style-type: none"> • compass and chain skills • techniques in measuring the forest. <p>Borrow necessary equipment from local government/industry.</p> <p>Use short pieces of logs.</p>
Sampling Technique	<ul style="list-style-type: none"> • apply compass and chaining skills to establish boundaries for a sample forest plot • identify safety practices and policies relevant to gathering sample data in the forest • gather data regarding one or more aspects of the fibre resource within the sample forest plot; e.g., <ul style="list-style-type: none"> – tree height/diameter – number and distribution of species – age of trees 	

MODULE FOR106: MEASURING THE FOREST I (continued)

Concept	Specific Learner Expectations	Notes
Sampling Technique (continued)	<i>The student should:</i> <ul style="list-style-type: none">• record sample data in appropriate tables and/or charts• interpret sample data to make inferences regarding tree populations and fibre values in the forest region• manipulate sample data as required to estimate fibre volumes.	Contact local government/industry to obtain existing sample data.

MODULE FOR109: BASIC FOREST ECOLOGY

Level: Introductory

Content Focus: Management and Conservation

Prerequisite: Science 7 (Recommended)

Module Parameters: Science laboratory and forest environment

Students investigate forest ecosystems and explain the structure and functioning of trees.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<i>The student will:</i> <ul style="list-style-type: none">describe the interrelatedness of elements in the forest ecosystem	<i>Assessment of student achievement will be based on:</i> <ul style="list-style-type: none">given access to information on forest ecology, completing a research project that examines:<ul style="list-style-type: none">interrelationships among at least three living and three nonliving elementspredator–prey–decomposer relationshipsdistribution of species on the basis of habitat requirements <i>Assessment Tool</i> <i>Research Process: Forest Ecosystems, FOR109-1</i> <i>Standard</i> <i>Complete all components of research to a standard of 1 on the rating scale</i>	50
<ul style="list-style-type: none">describe structural units of the tree and their function in performing life processes	<ul style="list-style-type: none">identifying and describing major tree parts (including roots, trunk, branches, leaves, flowers), their function and relationship to one another <i>Assessment Tool</i> <i>Knowledge/Application Assessment: Structural Units of the Tree, FOR109-2</i> <i>Assessment Criteria: Diagrams and Technical Drawings, FORDRA</i> <i>Standard</i> <i>Respond to a standard of 1 on the rating scale</i>	50

MODULE FOR109: BASIC FOREST ECOLOGY (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> demonstrate basic competencies. 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> conducting directed laboratory and/or field investigations that demonstrate three or more vital life processes performed by trees (e.g., nutrient uptake, photosynthesis, respiration, transpiration, reproduction) <p><i>Assessment Tool</i> <i>Lab Investigations: Tree Biology, FOR109-3</i></p> <p><i>Standard</i> <i>Complete lab and/or field investigations to a standard of 1 on the rating scale</i></p> <ul style="list-style-type: none"> observations of individual effort and interpersonal interaction during the learning process <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above.</i></p>	<p>Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
Forest Ecosystems	<p><i>The student should:</i></p> <ul style="list-style-type: none"> identify living and nonliving elements within a local forest ecosystem; e.g., <ul style="list-style-type: none"> soil characteristics land form climate flora and fauna soil organisms describe the interrelatedness of elements within a local forest environment; e.g., <ul style="list-style-type: none"> relationship of soil, air and water characteristics to plant growth interactions and dependencies among living organisms explain the role of trees within a local forest ecosystem; e.g., <ul style="list-style-type: none"> exchange of gases water cycle nutrient cycling wildlife habitat soil conservation 	<p>Involves application of science concepts in a forest environment.</p> <p>Use field trips to identify ecosystem components based on first-hand observations.</p> <p>Conduct experiments to demonstrate the interrelatedness of air, water, soil and plant growth.</p> <p>Observe evidence of plant growth being affected by particular environmental conditions (e.g., light, soil, moisture, crowding).</p> <p>Draw food webs/energy chains based on observations.</p>

MODULE FOR109: BASIC FOREST ECOLOGY (continued)

Concept	Specific Learner Expectations	Notes
Forest Ecosystems (continued)	<p><i>The student should:</i></p> <ul style="list-style-type: none"> analyze food relationships among living organisms within a local forest environment; e.g., <ul style="list-style-type: none"> role of producers, consumers and decomposers food chains and webs compare the ecological niches of selected plant and animal species native to Alberta. 	<p>Draw food webs/energy chains based on observations.</p> <p>Observe evidence of insect or other animal life living on a tree or shrub. Collect and observe samples of insects by placing a sheet of plastic under the plant and tapping branches with a stick.</p>
Tree Biology	<ul style="list-style-type: none"> explain the vital life processes performed by trees and other forest plants; e.g., <ul style="list-style-type: none"> nutrient intake and transportation photosynthesis respiration and transpiration reproduction phenology (leaf flushings, leaf fall, flowering and cone production) describe structural units and component parts of the tree, and their function in performing vital life processes; e.g., <ul style="list-style-type: none"> root trunk/stem leaf flower infer interrelationships among tree structures, their functions, and vital life processes that are performed illustrate the approximate range of one or more tree species throughout North America. 	<p>Laboratory experiments and demonstrations.</p> <p>Perform laboratory experiments to demonstrate life functions.</p> <p>Draw and label a cross-section of a tree (top to bottom) that illustrates all components.</p> <p>Use a small tree to prepare a model that has the parts of the tree labeled.</p> <p>Consider relationships among roots, trunk, branches, leaves and flowers.</p>

MODULE FOR110: FORESTS FOREVER I

Level: Introductory

Theme: Management and Conservation

Prerequisite: None

Module Parameters: Access to resources available from government and industry organizations responsible for forest management and protection (e.g., Alberta Environmental Protection, Canadian Forestry Service)

Students describe past and present uses of Canada's forests, and explain how research and technology assist in forest management.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<i>The student will:</i> <ul style="list-style-type: none">describe past and present uses of forests in Alberta and Canadaexplain how increased demands on the forest have created a need for conservation and management of forested regions	<i>Assessment of student achievement will be based on:</i> <ul style="list-style-type: none">identifying and explaining:<ul style="list-style-type: none">past and present uses of forests in Alberta and Canadaways in which changes in forest use (and management) have affected the economy and the environment <i>Assessment Tool</i> <i>Knowledge/Application Assessment: Forest Use, FOR110-1</i> <i>Standard</i> <i>Respond to a standard of 1 on the rating scale</i>	20
	<ul style="list-style-type: none">definitions and examples of sustainable yield and sustainable development within the context of Alberta's forested regions <i>Assessment Tool</i> <i>Knowledge/Application Assessment: Sustainability, FOR110-2</i> <i>Standard</i> <i>Respond to a standard of 1 on the rating scale</i> <ul style="list-style-type: none">given a current issue regarding the management of a forested region:<ul style="list-style-type: none">negotiating and debating the issue while assuming the role of one or more stakeholder groupspreparing and presenting a position paper that outlines a responsible course of action <i>Assessment Tool</i> <i>Negotiation and Debate, FORNEG-1</i> <i>Position Paper: Forest Management, FOR110-3</i> <i>Standard</i> <i>Address criteria in negotiation/debate and the position paper to a standard of 1 on the rating scale</i>	30

MODULE FOR110: FORESTS FOREVER I (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> research the role of technology in forest protection 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> completing a research project on major components of forest protection <p><i>Assessment Tool</i> <i>Research Process: Components of Forest Protection, FOR110-4</i></p> <p><i>Standard</i> <i>Complete all components of research to a standard of 1 on the rating scale</i></p> <ul style="list-style-type: none"> given access to a forest environment, identifying instances of pest and/or fire damage. Identification will involve: <ul style="list-style-type: none"> collecting and/or photographing pest problems correctly identifying 4 or more forest pests recommending appropriate prevention/control strategies for each pest identified <p><i>Assessment Tool</i> <i>Task Checklist: Identifying Forest Pests, FOR110-5</i> <i>Identification Key for Forest Pests, FOR110-6</i> <i>Lab Assessment: Outdoor Forest Experiences, FORLAB</i></p> <p><i>Standard</i> <i>Achieve a performance rating of 1 in task assessment <u>and</u> lab assessment</i></p>	50
<ul style="list-style-type: none"> demonstrate basic competencies. 	<ul style="list-style-type: none"> observations of individual effort and interpersonal interaction during the learning process <p><i>Assessment Tools</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	Integrated throughout

MODULE FOR110: FORESTS FOREVER I (continued)

Concept	Specific Learner Expectations	Notes
Forest History	<p><i>The student should:</i></p> <ul style="list-style-type: none"> describe changing patterns of forest use in Canada and Alberta from past to present describe the history of the management of forested lands in Canada and Alberta infer the impact of historical trends in forest use and ownership on people, the economy and the environment make predictions about the use of Canada's forest resources in the future. 	<p>Trace the development of Alberta's forest land acts, policies, agencies and resource allocation.</p> <p>Supplementary reference materials include:</p> <ul style="list-style-type: none"> <i>A Forest Journey - The Role of Wood in the Development of Civilization</i> (Harvard University Press) <i>Canadian Forestry - The View Beyond the Trees</i> (Macmillan of Canada).
Conservation and Management	<ul style="list-style-type: none"> compare different uses of forested regions in terms of their advantages and disadvantages; e.g., <ul style="list-style-type: none"> environmental economic social research the roles of different interest groups in managing the forest resource; e.g., <ul style="list-style-type: none"> government forest industry general public other stakeholder groups relate concepts of sustainable development and sustained yield to practical strategies for managing the forest resource; e.g., <ul style="list-style-type: none"> reforestation stand improvement debate an issue regarding sustainable development and/or sustained yield; e.g., <ul style="list-style-type: none"> conduct research develop a position participate in debate examine demands that are placed on forested regions of Canada and Alberta; e.g., <ul style="list-style-type: none"> industry recreation wildlife environment 	<p>Invite resource persons from relevant government agencies and local forest industry.</p> <p>Prepare a poster/collage/display that depicts different aspects of forest use.</p> <p>Visit local sites.</p> <p>Debate and consensus building.</p> <p>Invite resource people to critique debates.</p>

MODULE FOR110: FORESTS FOREVER I (continued)

Concept	Specific Learner Expectations	Notes
Conservation and Management (continued)	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • develop consensus regarding a plan for the integrated use of a local forested area; e.g., <ul style="list-style-type: none"> – conduct research – generate alternatives – agree to a workable solution. 	Examine existing management plans.
Forest Protection	<ul style="list-style-type: none"> • cite reasons for protecting the forest resource; e.g., <ul style="list-style-type: none"> – material and non-material benefits – environmental impact • identify and describe major components of forest protection; e.g., <ul style="list-style-type: none"> – forest fire management – soil conservation and land reclamation – pest and disease control • explain basic goals and techniques of forest fire management, soil conservation and land reclamation • identify and describe symptoms of common forest pests and diseases • compare different methods of pest and disease control; e.g., <ul style="list-style-type: none"> – biological methods – forest management – chemical methods. 	<p>Prepare a display of technologies used in forest protection.</p> <p>Invite a local forest ranger to explain components/ techniques of forest protection.</p> <p>Explain the fire triangle and how to control a fire by removing one or more legs of the triangle.</p>

MODULE CURRICULUM AND ASSESSMENT STANDARDS:

SECTION E: INTERMEDIATE LEVEL

The following pages define the curriculum and assessment standards for the intermediate level of Forestry.

Intermediate level modules help students build on the competencies developed at the introductory level and focus on developing more complex competencies. They provide a broader perspective, helping students recognize the wide range of related career opportunities available within the strand.

Module FOR201:	Making a Difference in Forestry	E.3
Module FOR203:	Managing Alberta's Forested Lands	E.9
Module FOR204:	Woods Survival II	E.15
Module FOR206:	Measuring the Forest II	E.21
Module FOR207:	Harvesting and Forest Products	E.25
Module FOR210:	Forests Forever II	E.31
Module FOR212:	Users in the Forest	E.35

MODULE FOR201: MAKING A DIFFERENCE IN FORESTRY

Level: Intermediate

Theme: Social and Cultural Perspectives

Prerequisite: None

Module Parameters: Access to resources available from government and industry organizations regarding sustainable forest development and environmental stewardship

Students analyze the impact of lifestyle on forests, and propose individual and shared actions that foster environmental stewardship.

Note: Although this module will involve some analysis of background data regarding the impact of lifestyle on forests, the major emphasis is on ‘the doing’ (i.e., commitment/empowerment through personal and shared actions).

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<i>The student will:</i> <ul style="list-style-type: none">• assess the impact of personal attitudes, actions and lifestyle on the forest resource	<i>Assessment of student achievement will be based on:</i> <ul style="list-style-type: none">• maintaining a log/journal of reflections and inferences regarding the impact of daily living activities on the forest environment <i>Assessment Tool</i> <i>Reflection Guide for Environmental Responsibility/Citizenship, FORREF-ENV</i> <i>Guide to Inferences: Personal Impact on Forests, FOR201-1</i> <i>Standard</i> <i>Complete 5 log/journal entries; address criteria for reflection and inferences to a standard of 2 on the rating scale</i>	10
<ul style="list-style-type: none">• describe strategies for reducing, reusing and recycling	<ul style="list-style-type: none">• completing all components of a research project on four or more products recently developed through recycling techniques <i>Assessment Tool</i> <i>Research Process: Recycling Techniques, FOR201-2</i> <i>Standard</i> <i>Complete research to a standard of 2 on the rating scale</i>	30

MODULE FOR201: MAKING A DIFFERENCE IN FORESTRY (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> demonstrate commitment to environmental responsibility/citizenship through personal and shared actions 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> identifying economic and environmental trade-offs that occur through reducing, reusing and recycling <p><i>Assessment Tool</i> <i>Issue Analysis: Reducing, Reusing and Recycling, FOR201-3</i></p> <p><i>Standard</i> <i>Address criteria in issue analysis to a standard of 2 on the rating scale</i></p> negotiating and debating an issue regarding the impact of lifestyle on forest environments <p><i>Assessment Tool</i> <i>Negotiation and Debate, FORNEG-2</i></p> <p><i>Standard</i> <i>Address criteria in negotiation/debate to a standard of 2 on the rating scale</i></p> a proposal and rationale (oral, written or visual) for: <ul style="list-style-type: none"> one personal action that will affect forest ecosystems in positive ways one leadership role/community program in support of environmental stewardship <p><i>Assessment Tool</i> <i>Assessment Criteria: Proposal for Environmental Action, FORPRO</i></p> <p><i>Standard</i> <i>Complete each proposal to a standard of 2 on the rating scale</i></p> volunteering five hours of time working with an environmental, forest industry or professional organization whose major goal is sustainable forest development <p><i>Assessment Tool</i> <i>Log/Verification for Volunteer Work, FORLOG-VOL(a) or FORLOG-VOL(b)</i></p> <p><i>Standard</i> <i>Complete all sections of the log/verification for 5 hours of volunteer work</i></p> 	60

MODULE FOR201: MAKING A DIFFERENCE IN FORESTRY (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> demonstrate basic competencies. 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> a letter written to a government official, industry representative or environmental organization expressing support or concern regarding action taken on a forestry issue, and a critique of the response received <p><i>Assessment Tool</i> <i>Assessment Criteria: Letters of Support or Concern, FORLET</i></p> <p><i>Standard</i> <i>Complete the letter and critique to a standard of 2 on the rating scale</i></p> <ul style="list-style-type: none"> observations of individual effort and interpersonal interaction during the learning process <p><i>Assessment Tools</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
Attitudes, Actions and Lifestyle	<p><i>The student should:</i></p> <ul style="list-style-type: none"> explain how societal attitudes, actions and lifestyle may affect the forest resource; e.g., <ul style="list-style-type: none"> conservation ethic consumer practices recreational patterns describe factors that influence consumer and marketing trends, and how these trends may affect the forest resources; e.g., <ul style="list-style-type: none"> social economic environmental compile a personal inventory of possessions and material purchases made over the last year distinguish among personal needs and wants, as reflected through personal inventory assess the impacts of personal actions and lifestyle on the forest resource. 	<p>Plan for student-directed projects. Encourage students to express personal views and values.</p> <p>Consider 10 personal actions and their consequences on the forest.</p> <p>See <i>Alberta's Focus on Forests</i> (Activity 5.6—What's in the Waste-basket—Reassessing Our Needs).</p> <p>Student debates.</p>

MODULE FOR201: MAKING A DIFFERENCE IN FORESTRY (continued)

Concept	Specific Learner Expectations	Notes
Reduce, Reuse and Recycle	<p><i>The student should:</i></p> <ul style="list-style-type: none"> describe and assess societal trends in the consumption of material goods identify common refuse that can be reused in practical and economical ways conduct research on materials that are being recycled and the products that are produced analyze trade-offs that occur through reducing, reusing and recycling; e.g., <ul style="list-style-type: none"> economic environmental. 	<p>Consider linkages with Energy and Mines (ENM109: Fundamentals of Recycling).</p> <p>Examples:</p> <ul style="list-style-type: none"> fence posts jewelry paper synthetic fibres. <p>Consider the advantages and disadvantages of</p> <ul style="list-style-type: none"> disposable cups versus reusable cups disposable diapers versus cloth diapers.
Environmental Responsibility/ Citizenship	<ul style="list-style-type: none"> propose personal strategies for using the forest resource that foster the attainment of social, cultural, economic and environmental goals; e.g., <ul style="list-style-type: none"> personal actions leadership roles plan, conduct and assess a school-wide campaign to increase awareness of lifestyle, conservation and the environment; e.g., <ul style="list-style-type: none"> establish goals plan and conduct assess results debate an issue regarding the impacts of lifestyle on the forest resource; e.g., <ul style="list-style-type: none"> conduct research develop a position participate in debate 	<p>Develop consensus on a relevant issue.</p> <p>Ask students to prepare a contract expressing personal commitment to environmental stewardship. Review the contract after a period of time to ascertain if contract obligations are being met.</p> <p>Consider case studies and simulations provided in <i>A Forest For All</i>, a multi-media kit developed by the Canadian Forest Products Association and distributed by Marwil Communications.</p>

MODULE FOR201: MAKING A DIFFERENCE IN FORESTRY (continued)

Concept	Specific Learner Expectations	Notes
Environmental Responsibility/ Citizenship (continued)	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • identify constructive ways in which individuals can influence public decisions that affect the forest and all its resources; e.g., <ul style="list-style-type: none"> – voting – lobbying – seeking office – supporting compatible interest groups • assess the goals and objectives of one or more conservation groups. 	Write letters to government agencies, industry and/or environmental groups. Critique response received.

MODULE FOR203: MANAGING ALBERTA'S FORESTED LANDS

Level: Intermediate

Theme: Social and Cultural Perspectives

Prerequisite/

Corequisite: Forest Regions of Canada (FOR102; Recommended)

Module Parameters: Access to government agencies responsible for forest management (e.g., Alberta Environmental Protection, Parks Canada)

Students research agencies and frameworks used to manage forested lands in Alberta.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none">explain how Alberta's forested lands are administered	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none">preparing and presenting a report (written, oral or multi-media) that explains how Alberta's forested lands are administered. Report to include:<ul style="list-style-type: none">a timeline of changes that have occurred in the ownership and administration of forested landsa map and explanation of different land tenures (public and private)a list of five or more agencies responsible for managing forested lands within Alberta's boundaries, and the mandates of each agency <p><i>Assessment Tools</i> <i>Presentations/Reports: Managing Alberta's Forested Lands, FOR203-1</i> <i>Sample Timeline: Management History of Alberta's Forested Lands, FOR203-2</i> <i>Task Checklist for Mapping, FORMAP</i></p> <p><i>Standard</i> <i>Complete all components of the report to a standard of 2 on the rating scale</i></p>	<p>20</p>

MODULE FOR203: MANAGING ALBERTA'S FORESTED LANDS (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> research government legislation and policies affecting the forest resource 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> summarizing the general intent and major roles of: <ul style="list-style-type: none"> important government acts in managing the forest regulations and/or guidelines established in association with government acts for managing the forest <p><i>Assessment Tool</i> <i>Sample Acts and Regulations for Managing Alberta's Forests, FOR203-3</i></p> <p><i>Standard</i> <i>Summarize 4 important government acts <u>and</u> 4 regulations and/or guidelines</i></p>	40
<ul style="list-style-type: none"> describe different ways of allocating land and timber in forest management 	<ul style="list-style-type: none"> given access to current resources on forest management in Alberta, completing a research project that examines the intent of five or more: <ul style="list-style-type: none"> timber dispositions issued by Alberta Land and Forest Services other types of dispositions used to manage non-fibre aspects of forest use <p><i>Assessment Tool</i> <i>Research Process: Allocation Procedures for Land and Timber, FOR203-4</i></p> <p><i>Standard</i> <i>Complete all components of research to a standard of 2 on the rating scale</i></p>	40
<ul style="list-style-type: none"> demonstrate basic competencies. 	<ul style="list-style-type: none"> observations of individual effort and interpersonal interaction during the learning process <p><i>Assessment Tools</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	Integrated throughout

MODULE FOR203: MANAGING ALBERTA'S FORESTED LANDS (continued)

Concept	Specific Learner Expectations	Notes
Administration of Forested Lands	<p><i>The student should:</i></p> <ul style="list-style-type: none"> describe major changes that have occurred from past to present in the ownership and administration of forested lands in Alberta: <ul style="list-style-type: none"> Federal jurisdiction Provincial status <i>Natural Resource Transfer Act</i> describe different land tenures in Alberta today: <ul style="list-style-type: none"> public (provincial and federal crown lands) private identify, locate and compare different land management areas in Alberta: <ul style="list-style-type: none"> white area green area describe the mandates of agencies or groups responsible for managing forested lands within Alberta's boundaries, and the proportion of land under their jurisdiction 	<p>Use archives, films and library resources to research the history of forestry in Alberta.</p> <p>Research how the management of Alberta's forested lands became a responsibility of the provincial government.</p> <p>Contact Alberta Environmental Protection to request maps of land management areas in Alberta.</p> <p>Construct a circle graph depicting land ownership distribution in Alberta (e.g., provincial public, provincial private, federal public, aboriginal lands).</p> <p>For example,</p> <ul style="list-style-type: none"> Alberta Environmental Protection (Land and Forest Services, Parks Services, Fish and Wildlife Services) Parks Canada private ownership Metis or Native Indian Forestry Canada.

MODULE FOR203: MANAGING ALBERTA'S FORESTED LANDS (continued)

Concept	Specific Learner Expectations	Notes
Government Legislation and Policies	<p><i>The student should:</i></p> <ul style="list-style-type: none"> explain how activities in Alberta's forests are subject to a variety of government acts and regulations research the role of important government acts in managing the forest research the role of regulations and guidelines established in association with government acts in further managing the forest assess the short- and long-term effects of selected government acts and regulations on forested land. 	<p>Contact Alberta Environmental Protection (or Queen's Printer, Province of Alberta) to request various acts, regulations and guidelines used in managing forested lands.</p> <p>For example,</p> <ul style="list-style-type: none"> • <i>Forest Act</i> • <i>Forest Reserves Act</i> • <i>Forest and Prairie Protection Act</i> • <i>Provincial Parks Act</i> • <i>Wilderness Areas, Ecological Reserves and Natural Areas Act.</i> <p>For example,</p> <ul style="list-style-type: none"> • <i>Timber Management Regulation</i> • <i>Timber Operating Groundrules</i> • <i>Reforestation Standards</i> • <i>Forest and Prairie Protection Regulation (Part I and II)</i> • <i>Forest Land Use Regulation (Recreation, Mineral, Pipeline, Grazing)</i> <p>Avoid detailed analysis of acts and regulations—<u>OVERVIEW ONLY.</u></p>
Allocation Procedures	<ul style="list-style-type: none"> explain the use of dispositions in managing commercial activities on forested lands identify criteria used to establish forest land and timber dispositions 	<p>For example, authorizations in the form of permits, licences or other legal agreements.</p> <p>Consider different public land users/uses. For example,</p> <ul style="list-style-type: none"> • fibre production • recreation • agriculture • wildlife habitat • integrated use.

MODULE FOR203: MANAGING ALBERTA'S FORESTED LANDS (continued)

Concept	Specific Learner Expectations	Notes
Allocation Procedures (continued)	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • explain the intent of different timber dispositions issued by the Alberta Forest Service, and the responsibilities of holders of these dispositions • describe other types of dispositions that are used to manage non-fibre aspects of forest use • research the role of consultation (with other resource users) and public involvement in establishing land and timber dispositions. 	<p>For example,</p> <ul style="list-style-type: none"> • Forest Management Agreements (FMAs) • Quota Certificates • Timber Licences • Commercial Timber Permits Local • Timber Permits. <p>For example,</p> <ul style="list-style-type: none"> • grazing • hunting, fishing and trapping • energy and mineral development • commercial trail riding. <p>Role-playing.</p>

MODULE FOR204: WOODS SURVIVAL II

Level: Intermediate

Theme: Social and Cultural Perspectives

Prerequisite: Woods Survival I (FOR104); current certification in Emergency First Aid

**Prerequisite/
Corequisite:** Mapping and Aerial Photography (FOR105; Recommended)

Module Parameters: Access to an outdoor forest environment and gear for outdoor expeditions; instructor must have current personal certification in Standard First Aid (St. John Ambulance)
Information regarding student safety and instructor certification is provided in Sections C and H of this Guide to Standards and Implementation.

Students plan, prepare for and conduct an extended outdoor wilderness trip in the forest.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<i>The student will:</i> <ul style="list-style-type: none">plan and prepare for an extended outdoor wilderness trip in the forest	<i>Assessment of student achievement will be based on:</i> <ul style="list-style-type: none">developing and presenting collaborative group plans for an extended outdoor wilderness trip in the forest <i>Assessment Tools</i> <i>Task Checklist: Woods Survival II, FOR204–1</i> <i>Trip Planning, LRDC</i> <i>Standard</i> <i>Complete each component of trip planning to a standard of 2 on the rating scale</i>	20
<ul style="list-style-type: none">safely conduct and conclude an extended outdoor wilderness trip in the forest with minimal environmental impact	<ul style="list-style-type: none">within a continuous timeframe of at least 72-hours, and through access to an outdoor forest environment, demonstrating procedures for setting up camp, preparing meals, complying with pertinent legislation, breaking camp, and ensuring least possible environmental impact <i>Assessment Tools</i> <i>Task Checklist: Woods Survival II, FOR204–1</i> <i>Lab Assessment: Outdoor Forest Experiences, FORLAB</i> <i>National Occupational Standards for Outdoor Guide, LRDC</i> <i>Standard</i> <i>Conduct and conclude the trip to a standard of 2 on the rating scale</i>	80

MODULE FOR204: WOODS SURVIVAL II (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> demonstrate basic competencies. 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> successfully participating in four or more activities while en route that involve personal interaction with the wilderness environment <p><i>Assessment Tool</i> <i>Task Checklist: Woods Survival II, FOR204-1</i> <i>Lab Assessment: Outdoor Forest Experiences, FORLAB</i></p> <p><i>Standard</i> <i>Complete 4 of the activities (as outlined in the task checklist) that involve personal interaction with the wilderness environment to a standard of 2 on the rating scale</i></p> <ul style="list-style-type: none"> a post-trip assessment that provides observations and personal impressions, and summarizes: <ul style="list-style-type: none"> activities well done problems encountered and suggested solutions recommendations regarding future trips <p><i>Assessment Tool</i> <i>Post-Trip Assessment for Woods Survival II, FOR204-2</i></p> <p><i>Standard</i> <i>Achieve a performance rating of 2 in applicable areas of post-trip assessment</i></p> <ul style="list-style-type: none"> observations of individual effort and interpersonal interaction during the learning process <p><i>Assessment Tools</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>Integrated throughout</p>

MODULE FOR204: WOODS SURVIVAL II (continued)

Concept	Specific Learner Expectations	Notes
Trip Planning and Preparation	<p><i>The student should:</i></p> <ul style="list-style-type: none"> establish specific objectives for an outdoor wilderness trip; e.g., <ul style="list-style-type: none"> goals and expectations length of trip destination general schedule and agenda incorporate guidelines for environmental awareness into trip planning and preparations; e.g., <ul style="list-style-type: none"> principles of ecotourism consideration for carrying capacity strategies for minimum impact land use identify and obtain appropriate supplies, equipment and personal gear for the trip; e.g., <ul style="list-style-type: none"> water, food and grub box tents, stoves, ax first aid and survival kits clothing and foot wear toiletries plan for weather and seasonal conditions; e.g., <ul style="list-style-type: none"> identify hazards particular to the area listen to weather and news reports and forecasts conduct a pre-trip assessment of supplies, equipment and personal gear; e.g., <ul style="list-style-type: none"> compare to trip checklist assess quality, quantity and condition assess relative to weather and seasonal conditions obtain missing and/or specialty items prepare supplies, equipment and personal gear for transportation 	<p>Hold pre-trip meeting to confirm trip details. Obtain information regarding special needs (e.g., physical limitations, special dietary requirements). Discuss trip expectations.</p> <p>List potential environmental impacts of the trip. Write before-and-after journal entries to document affect on a campsite.</p> <p>Contact local outdoor gear supplier for information and instruction on supplies and equipment. List all supplies/equipment to be taken on trip. Identify items that may have significant environmental impact—consider alternatives that would lessen impact.</p> <p>Establish methods of regular and emergency communication, and a contingency plan to be used if regular communication is interrupted.</p> <p>Compare supplies and checklist. Ensure all equipment is in satisfactory working condition. Pack supplies/equipment in waterproof containers.</p>

MODULE FOR204: WOODS SURVIVAL II (continued)

Concept	Specific Learner Expectations	Notes
Trip Planning and Preparation (continued)	<p><i>The student should:</i></p> <ul style="list-style-type: none"> plan courses of action to cope with potential emergency situations in the wilderness; e.g., <ul style="list-style-type: none"> extreme weather conditions fire or flood injury and illness avalanche. 	<p>Potential linkages with "Wilderness First Aid" certification course (Canadian Red Cross).</p> <p>Outline requirements for survival and first-aid kits.</p>
Conducting and Concluding the Trip	<ul style="list-style-type: none"> follow guidelines for safe travel in the forest; e.g., <ul style="list-style-type: none"> inform responsible person of travel plans follow travel schedule as planned use orientation and navigational skills identify potential hazards and take necessary precautions dress according to mode of travel, weather and season watch for changes in current weather conditions set up a wilderness camp site, following guidelines for comfort, safety and least possible environmental impact; e.g., <ul style="list-style-type: none"> select camp site considering <ul style="list-style-type: none"> site exposure and drainage access to water and firewood impact on flora and fauna proximity to potential dangers erect tent or lean-to assemble other amenities protect food from wildlife and spoilage protect equipment from the elements follow minimal impact guidelines in establishing: <ul style="list-style-type: none"> latrine location and toilet procedures wash area and procedures fire site and use methods of garbage and waste water disposal 	<p>Students need a written plan so everyone knows who is responsible for each function. Become familiar with hazards particular to the area. Listen to news and weather reports. Carry survival equipment. Reroute, postpone or cancel trip if conditions threaten safety.</p> <p>Select dry, level ground. Consider potential hazards including fire, rock slides, avalanches, dead materials close to shelter, etc.</p> <p>Use biodegradable soap. Be aware of local fire restrictions. Use driftwood or deadfall whenever possible.</p>

MODULE FOR204: WOODS SURVIVAL II (continued)

Concept	Specific Learner Expectations	Notes
Conducting and Concluding the Trip (continued)	<p><i>The student should:</i></p> <ul style="list-style-type: none"> comply with local, provincial and federal legislation relevant to activities that are undertaken assume outdoor camp duties on a rotational basis; e.g., <ul style="list-style-type: none"> meal preparation camp maintenance and hygiene demonstrate practical knowledge and skills in at least three areas relevant to wilderness travel; e.g., <ul style="list-style-type: none"> closed compass traverse tree/shrub/vegetation/twig identification animal track and scat identification use of equipment survival skills monitor the activities of wildlife in the area and take precautions to avoid dangerous situations follow appropriate procedures to break camp; e.g., <ul style="list-style-type: none"> pack supplies, equipment and personal gear take down shelter clean site do circle tour of site 	<p>Consider land use, permits, seasonal restrictions, quotas, etc. Seek clarification if necessary. Report violations.</p> <p>Students should practise food preparation at home first. Have students participate in all areas of preparation, operation and clean-up. Alternate chores during trip.</p> <p>Dispose of garbage properly. Store food safely. Maintain safe distance.</p> <p>Bury waste and remove all signs of toilet pit.</p> <p>Do circle tour of campsite—look for garbage and misplaced equipment.</p>

MODULE FOR204: WOODS SURVIVAL II (continued)

Concept	Specific Learner Expectations	Notes
Conducting and Concluding the Trip (continued)	<p><i>The student should:</i></p> <ul style="list-style-type: none"> conclude the wilderness trip and conduct a post-trip assessment; e.g., <ul style="list-style-type: none"> observations and personal impressions problems encountered recommendations regarding future trips. 	<p>Have students "bring back in image" of a favourite spot or something they considered special about the trip. Develop images through drawings or descriptive writings.</p> <p>Develop a slide/tape presentation based on the outdoor wilderness trip.</p> <p>Consider:</p> <ul style="list-style-type: none"> satisfaction with equipment and supplies suitability of environment or route inconsistencies between trip and expectations.

MODULE FOR206: MEASURING THE FOREST II

Level: Intermediate

Theme: Technology and Applications

Prerequisite: Measuring the Forest I (FOR106)

Module Parameters: Access to a demonstration forest and tools used in forest measurement

Students research current forest inventory practices and demonstrate appropriate strategies for sampling the fibre and non-fibre value of forests.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<i>The student will:</i> <ul style="list-style-type: none">research specific sampling techniques used to gather information about the forest resource	<i>Assessment of student achievement will be based on:</i> <ul style="list-style-type: none">completing a research project on random and systematic sampling techniques and their application in gathering data about fibre and non-fibre forest values. Research to address problems related to bias, error, and the use of sample data in estimating forest populations <i>Assessment Tool</i> <i>Research Process: Random and Systematic Sampling Techniques, FOR206-1</i> <i>Standard</i> <i>Complete all components of research to a standard of 2 on the rating scale</i>	20
<ul style="list-style-type: none">sample fibre and non-fibre values in a forest region	<ul style="list-style-type: none">designing a sampling technique (transect and plot) for gathering information about a specific fibre <u>and</u> non-fibre resource (e.g., trees, rabbits, soil, grass, insects). Design to address:<ul style="list-style-type: none">goals/outcomes for the forest surveytype and amount of data to be collectedsuitable sampling techniquesboundary for sample areaa data collection sheet <i>Assessment Tool</i> <i>Task Checklist: Sampling Fibre and Non-Fibre Forest Values, FOR206-2</i> <i>Standard</i> <i>Design the sampling technique(as outlined in the task checklist) to a standard of 2 on the rating scale</i>	30

MODULE FOR206: MEASURING THE FOREST II (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> demonstrate basic competencies. 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> collecting and recording sample data on 0.01% of a representative forested area, and compiling sample data in order to estimate the fibre <u>and</u> non-fibre resource within the forested area. Fibre data sampling to involve transects and plots, and to be accurate within 10% <p><i>Assessment Tool</i> <i>Task Checklist: Sampling Fibre and Non-Fibre Forest Values, FOR206-2</i> <i>Sample Data Sheet: Fibre and Non-Fibre Forest Values, FOR206-3</i> <i>Lab Assessment: Outdoor Forest Experiences, FORLAB</i></p> <p><i>Standard</i> <i>Collect, record and compile sample data (as outlined in the task checklist <u>and</u> lab assessment) to a standard of 2 on the rating scale</i></p>	<p>40</p> <p>10</p>
	<ul style="list-style-type: none"> summarizing and assessing the strengths and weaknesses of the sample data and statements made about the forest resource <p><i>Assessment Tool</i> <i>Task Checklist: Sampling Fibre and Non-Fibre Forest Values, FOR206-2</i></p> <p><i>Standard</i> <i>Summarize and assess survey results (as outlined in the task checklist) to a standard of 2 on the rating scale</i></p>	
	<ul style="list-style-type: none"> observations of individual effort and interpersonal interaction during the learning process <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>Integrated throughout</p>

MODULE FOR206: MEASURING THE FOREST II (continued)

Concept	Specific Learner Expectations	Notes
Sample Designs	<p><i>The student should:</i></p> <ul style="list-style-type: none"> research different sampling designs and techniques: <ul style="list-style-type: none"> random systematic describe sample designs and techniques most suited to gathering data about specific forest components identify bias and error in sampling design, and problems related to the use of sample data in estimating forest populations. 	<p>Investigate applications of</p> <ul style="list-style-type: none"> transects plots/nested plots surveys and questionnaires. <p>For example:</p> <ul style="list-style-type: none"> distribution of tree species growth, age and/or volume of trees soil, water and/or wildlife characteristics potential for recreation and/or agriculture.
Fibre and Non-fibre Values	<ul style="list-style-type: none"> establish goals/outcomes for a forest survey identify the type and amount of information regarding the forest resource that is required design techniques for sampling the forest region that are most suited to gathering the type of information required measure and locate the boundary of the sample area within the forest region identify safety practices and policies relevant to gathering sample data in the forest gather data regarding the volume and/or condition of timber resources within the sample plots 	<p>PLAN AND SHARE - LEARN FROM OTHERS.</p> <p>Develop, as a class project, a sampling design appropriate to surveying a specific forest resource. Use the sampling design to collect data.</p> <p>For example,</p> <ul style="list-style-type: none"> tree height/diameter age of trees number and distribution of species

MODULE FOR206: MEASURING THE FOREST II (continued)

Concept	Specific Learner Expectations	Notes
Fibre and Non-Fibre Values (continued)	<p><i>The student should:</i></p> <ul style="list-style-type: none"> gather data regarding the nature of other non-fibre resources present within the sample plots record sample data regarding fibre and non-fibre resources in appropriate tables and charts compile sample data as required to estimate fibre volumes and other non-fibre values within the forest region assess the strengths and weaknesses of the sample data and statements made about the forest resource. 	<p>For example,</p> <ul style="list-style-type: none"> soil and water quality distribution of wildlife potential for recreation/agriculture. <p>Make estimates regarding forest population based on data collected.</p> <p>Discuss validity/ reliability of results.</p>

MODULE FOR207: HARVESTING AND FOREST PRODUCTS

Level: Intermediate

Theme: Technology and Applications

Prerequisite: None

Module Parameters: Access to forest harvest areas and forest products industries

Students research the steps involved in harvesting and processing the fibre resource.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none">• identify major components of a plan for forest harvest	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none">• identifying major components of a plan for forest harvest, including:<ul style="list-style-type: none">– when and how much to cut– methods of harvest (e.g., clear cutting, shelter wood method) and logging (e.g., hand, mechanical)– regeneration and environmental protection <p><i>Assessment Tool</i> <i>Knowledge/Application Assessment: Forest Harvest, FOR207-1</i> <i>Sample Checklist: Forest Harvest Plans, FOR207-2</i></p> <p><i>Standard</i> <i>Respond to a standard of 2 on the rating scale</i></p> <ul style="list-style-type: none">• a teacher-prepared assessment in which the student demonstrates knowledge of major components and considerations relevant to harvest planning <p><i>Assessment Tool</i> <i>Sample Assessment Items: Forest Harvest, FOR207-3</i></p> <p><i>Standard</i> <i>Response indicating 65% mastery</i></p>	20

MODULE FOR207: HARVESTING AND FOREST PRODUCTS (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> describe the mechanics of harvesting trees 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> a presentation or report that describes major stages in the harvesting procedure from stump to mill. Presentation/report to address: <ul style="list-style-type: none"> methods of falling, bucking, delimbing, skidding, loading, hauling, slash disposal and site rehabilitation technologies (e.g., machines, processes) used in the harvesting procedure safety considerations (e.g., legislation, equipment, procedures) relevant to the harvesting operation <p><i>Assessment Tool</i> <i>Presentations/Reports, FORPRE-2</i></p> <p><i>Standard</i> <i>Achieve a minimum rating of 2 on the rating scale for Presentations/Reports</i></p>	50
<ul style="list-style-type: none"> research techniques used in fibre utilization and product formation 	<ul style="list-style-type: none"> completing a research project on fibre utilization and product formation. Research to address: <ul style="list-style-type: none"> major categories/types of forest products steps involved in converting a log into lumber, pulp and one other forest product new developments in milling and pulping technology <p><i>Assessment Tool</i> <i>Research Process: Fibre Utilization and Product Formation, FOR207-4</i></p> <p><i>Standard</i> <i>Complete all components of research to a standard of 2 on the rating scale</i></p>	30
<ul style="list-style-type: none"> demonstrate basic competencies 	<ul style="list-style-type: none"> observations of individual effort and interpersonal interaction during the learning process <p><i>Assessment Tools</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	Integrated throughout

MODULE FOR207: HARVESTING AND FOREST PRODUCTS (continued)

Concept	Specific Learner Expectations	Notes
Harvest Plan	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • identify major components of a plan for harvesting the forest: <ul style="list-style-type: none"> – when and how much to cut – method of harvest (e.g., clear cutting, shelter wood method) and logging (e.g., hand, mechanical) – regeneration and environmental protection • relate the concepts of allowable cut, sustained yield and multiple use to forest harvest practices • explain applications of forest inventory information in establishing a plan for harvest: <ul style="list-style-type: none"> – identification of tree species – determining timber quality, volume and age – layout of cutting area and landing sites – planning for forest access • describe applications of different methods of forest harvest: <ul style="list-style-type: none"> – clearcutting – selective cutting – shelter wood cutting • describe applications of different methods of forest regeneration: <ul style="list-style-type: none"> – natural – artificial • identify environmental concerns to be addressed through harvest plans: <ul style="list-style-type: none"> – protection of sensitive areas – impact on downstream values – landslide and erosion hazards. 	<p>Investigation of a harvest plan establishes background knowledge for FOR212 (Users in the Forest) and FOR312 (Stewardship: Balancing Needs).</p> <p>Discuss essential components of a forest harvest plan—<u>DO NOT</u> make a plan. Use resource persons from government and industry if possible.</p> <p>The following videos, relevant to harvest planning, are available from Alberta Pacific Forest Industries (phone: 1-800-661-5210):</p> <ul style="list-style-type: none"> • <i>A Pledge to the Future: The Alberta Pacific Story</i> (23 minutes) • <i>With Eyes on Tomorrow</i> (38 minutes). <p>Discuss considerations in determining size and location of harvesting tracts.</p> <p>Consider plans for establishing roads and landings needed for a local harvest operation.</p> <p>Discuss the scheduling of equipment and estimated completion date for harvest operations.</p>

MODULE FOR207: HARVESTING AND FOREST PRODUCTS (continued)

Concept	Specific Learner Expectations	Notes
Harvest Techniques	<p><i>The student should:</i></p> <ul style="list-style-type: none"> identify stages in the harvesting procedure from stump to mill: <ul style="list-style-type: none"> – falling, bucking and delimbing – skidding – loading and hauling research techniques and equipment used to fell, buck and delimb trees in a forest harvest operation research techniques and equipment used to transport logs from stump to landing site in a forest harvest operation research techniques and equipment used to transport logs from landing site to mill in a forest harvest operation research techniques used in slash disposal and site rehabilitation following logging operations in a forest area identify safety legislation and requirements relevant to visiting a forest harvest site. 	<p>Plan for field-based instruction that will enable students to follow the tree from harvest to finished product.</p> <p>Have students orally describe the processes to follow in felling, bucking and delimbing a tree.</p> <p>For example,</p> <ul style="list-style-type: none"> • horses • mechanical skidders. <p>Use print material and guest speakers from forest industry and forest industry suppliers.</p> <p>Have students work with a local landowner in reclaiming an eroded forest area.</p> <p>Discuss safety measures used in felling and transporting trees. Contact Occupational Health and Safety for:</p> <ul style="list-style-type: none"> • <i>Logging Safety Manual</i> • <i>Chain Saw Safety Manual</i> • <i>Safety Log Transport Manual.</i>
Fibre Products	<ul style="list-style-type: none"> identify major categories of forest products and give examples of each: <ul style="list-style-type: none"> – pulp and paper – lumber – veneer and plywood – board products – chemical and medicinal products 	<p>Prepare reports based on information gathered through visits to a sawmill and pulpmill.</p> <p>Make a list of general duties performed at a sawmill.</p>

MODULE FOR207: HARVESTING AND FOREST PRODUCTS (continued)

Concept	Specific Learner Expectations	Notes
Fibre Products (continued)	<p><i>The student should:</i></p> <ul style="list-style-type: none"> research the steps and processes involved in log utilization at a sawmill research the steps and processes involved in fibre utilization at a pulp mill: <ul style="list-style-type: none"> mechanical chemical. 	<p>Demonstrate techniques and processes involved in producing a fibre product (e.g., paper).</p> <p>View <i>Weyerhaeuser - OSB Production</i>, a 30-minute video distributed by Ranson Productions, Edmonton (phone: 437-3400).</p> <p>Prepare a list of safety regulations pertinent to sawmills and pulp mills.</p>

MODULE FOR210: FORESTS FOREVER II

Level: Intermediate

Theme: Management and Conservation

Prerequisite: Forests Forever I (FOR110)

Module Parameters: Access to resources available from government and industry organizations responsible for forest management and protection (e.g., Alberta Environmental Protection, Canadian Forestry Service)

Students explain forest management goals in Alberta, and describe current management practices used to address these goals.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<i>The student will:</i> <ul style="list-style-type: none">explain the goals of forest management in Alberta	<i>Assessment of student achievement will be based on:</i> <ul style="list-style-type: none">developing a rationale for forest management in Alberta that involves:<ul style="list-style-type: none">identifying economic, environmental and social needs addressed through forest managementdefinitions and examples of sustainable development, sustained yield and allowable cut <i>Assessment Tool</i> <i>Knowledge/Application Assessment: Forest Management Goals, FOR210-1</i>	30
<ul style="list-style-type: none">identify different types of forest use and the views of different users in the forest	<i>Standard</i> <i>Respond to a standard of 2 on the rating scale</i> <ul style="list-style-type: none">analyzing current issues related to different types of forest use. Analysis to include:<ul style="list-style-type: none">a list of current uses/values of Alberta's forestsa summary of the views of different forest stakeholder groupsan explanation of potential conflicts among stakeholder groupsstrategies for compromise and/or conflict resolution <i>Assessment Tool</i> <i>Issue Analysis: Forest Use, FOR210-2</i> <i>Standard</i> <i>Address criteria in issue analysis to a standard of 2 on the rating scale</i>	30

MODULE FOR210: FORESTS FOREVER II (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> describe current practices used to manage and protect Alberta's forested lands 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> completing a research project on forest management practices in Alberta. Research to address: <ul style="list-style-type: none"> definitions and examples of conservation and preservation different philosophies regarding forest management and protection the mandates of agencies responsible for managing Alberta's forested lands the intent of different agreements, permits and/or licences that make Alberta's forests available for commercial or private use factors likely to influence future forest management in Alberta <p><i>Assessment Tool</i> <i>Research Process: Forest Management Practices, FOR210-3</i></p> <p><i>Standard</i> <i>Complete all components of research to a standard of 2 on the rating scale</i></p>	40
<ul style="list-style-type: none"> demonstrate basic competencies. 	<ul style="list-style-type: none"> observations of individual effort and interpersonal interaction during the learning process <p><i>Assessment Tools</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	Integrated throughout

Concept	Specific Learner Expectations	Notes
Forest Management Goals	<p><i>The student should:</i></p> <ul style="list-style-type: none"> explain the goals of sustainable development within the context of Alberta's forests relate the concept of sustained yield to a system of harvesting and reforestation explain applications of "annual allowable cut" in forest management practices 	Refer to <i>Our Growing Resource: Alberta's Forest Industry... Meeting "Global Challenges</i> (Alberta Forest Products Association).

MODULE FOR210: FORESTS FOREVER II (continued)

Concept	Specific Learner Expectations	Notes
Forest Management Goals (continued)	<p><i>The student should:</i></p> <ul style="list-style-type: none"> identify scientific, economic and social factors addressed through the management of forested lands in Alberta 	<p>Possible factors to consider:</p> <ul style="list-style-type: none"> the silvics of trees growing in the area a cycle for utilization and replacement the goals of different stakeholder groups.
Forest Uses and Users	<ul style="list-style-type: none"> compare current uses and values of Alberta's forests: <ul style="list-style-type: none"> recreation and aesthetics wildlife habitat fibre production range lands coal and petroleum projects hunting and trapping water, air and soil quality ecosystem maintenance job creation describe the views of different forest stakeholder groups and potential conflicts that may arise: <ul style="list-style-type: none"> recreational environmental industrial explain the need for consultation with other resource users and public involvement in forest management. 	<p>See <i>Alberta's Focus on Forests</i> (Activity 4.3–Forest Perspectives; Activity 5.1–Forest Values).</p> <p>Supplementary reference materials include:</p> <ul style="list-style-type: none"> <i>A Forest Journey – The Role of Wood in the Development of Civilization</i> (Harvard University Press) <i>Canadian Forestry – The View Beyond the Trees</i> (Macmillan of Canada). <p>Role-playing. Discussion. Interviewing.</p>
Forest Management Practices	<ul style="list-style-type: none"> identify components of conservation and utilization in current forest management practices describe the mandates of agencies responsible for managing Alberta's forested lands 	<p>Contact resource persons from relevant agencies</p> <p>For example:</p> <ul style="list-style-type: none"> Alberta Forest Service Fish and Wildlife Public Lands Land Information Services.

MODULE FOR210: FORESTS FOREVER II (continued)

Concept	Specific Learner Expectations	Notes
Forest Management Practices (continued)	<p><i>The student should:</i></p> <ul style="list-style-type: none"> describe current management practices that make Alberta's productive forests available to industry for commercial harvest: <ul style="list-style-type: none"> forest management agreements quota certificates commercial timber permits local timber permits consider factors likely to influence future forest management practices 	<p>Group research and presentations.</p> <p>Possible factors to consider include:</p> <ul style="list-style-type: none"> new knowledge and technology increased public participation in decision making population trends recreation and tourism natural resource extraction.

MODULE FOR212: USERS IN THE FOREST

Level: Intermediate

Theme: Management and Conservation

Prerequisite: None

Module Parameters: Access to forest management plans available from government and industry organizations (e.g., Alberta Environmental Protection, Alberta Forest Products Association)

Students identify different users in the forest and explain the planning principles that are used in developing an integrated resource management plan.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<i>The student will:</i> <ul style="list-style-type: none">identify different uses of the forest and the needs of each forest user	<i>Assessment of student achievement will be based on:</i> <ul style="list-style-type: none">identifying four or more major categories of forest use (e.g., industry, recreation, tourism, environmental) and examples of forest users within each category <i>Assessment Tool</i> <i>Knowledge/Application Assessment: Users in the Forest, FOR212-1</i>	10
<ul style="list-style-type: none">explain principles of multiple and integrated land use	<i>Standard</i> <i>Respond to a standard of 2 on the rating scale</i> <ul style="list-style-type: none">completing a research project on the principles of multiple and integrated land use. Research to address:<ul style="list-style-type: none">definitions and Alberta examples of multiple and integrated land usea comparison of multiple land use and integrated land use principles <i>Assessment Tool</i> <i>Research Process: Multiple and Integrated Land Use, FOR21-2</i> <i>Standard</i> <i>Complete all components of research to a standard of 2 on the rating scale</i>	30

MODULE FOR212: USERS IN THE FOREST (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> research the development of a plan for integrated resource management 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> a flowchart that outlines basic components of integrated resource management. Flowchart to provide an overview of processes used to: <ul style="list-style-type: none"> establish planning teams determine management goals and objectives ensure public involvement in planning obtain approval for the management plan <p><i>Assessment Tool</i> <i>Assessment Criteria: Flow Charts, FORFLO</i></p> <p><i>Standard</i> <i>Complete flow chart to a standard of 2 on the rating scale</i></p> <ul style="list-style-type: none"> negotiating and presenting a plan for the integrated use of a local forested area. Plan to address: <ul style="list-style-type: none"> the needs of at least four different users strategies for compromise among users <p><i>Assessment Tools</i> <i>Alberta's Focus on Forests (Section 5.5: Integrated Resource Management), LRDC</i> <i>Negotiation and Debate, FORNEG-2</i></p> <p><i>Standard</i> <i>Negotiate and present the plan to a standard of 2 on the rating scale</i></p>	60
<ul style="list-style-type: none"> demonstrate basic competencies. 	<ul style="list-style-type: none"> observations of individual effort and interpersonal interaction during the learning process <p><i>Assessment Tools</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	Integrated throughout

MODULE FOR212: USERS IN THE FOREST (continued)

Concept	Specific Learner Expectations	Notes
Forest Uses	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • identify and describe major types of forest use; e.g., <ul style="list-style-type: none"> – industrial – recreational – wildlife habitat – water, air and soil quality • research specific uses and multiple demands placed upon forested land; e.g., <ul style="list-style-type: none"> – wood fibre production – wildlife management – grazing and range management – watershed – oil, gas and mining – recreation – protected areas • explain why forests can and should serve many purposes • cite examples of the multiple use of Alberta's forests; e.g., <ul style="list-style-type: none"> – using different parts of the forest for different purposes – using the same area of the forest to obtain more than one benefit. 	<p>This module lends itself to group study rather than independent study. Prior credit in at least three other modules in Forestry will establish sufficient background knowledge.</p>
Multiple and Integrated Land Use	<ul style="list-style-type: none"> • demonstrate how integrated land use involves using a common area of forested land for two or more purposes; e.g., <ul style="list-style-type: none"> – wood fibre – range – wildlife – recreation – mining • cite examples of the integrated use of local forested lands • compare principles of integrated land use with principles of multiple use management • explain the goals of Integrated Resource Planning (IRP) in establishing policy and guidelines for managing forested land. 	<p>Contact a Land Use Officer (Alberta Land and Forest Services) for research materials.</p> <p>Role-playing.</p>

MODULE FOR212: USERS IN THE FOREST (continued)

Concept	Specific Learner Expectations	Notes
Integrated Resource Management	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • identify and describe the basic components of Integrated Resource Planning (IRP); e.g., <ul style="list-style-type: none"> – establishing a planning team – setting goals and objectives – soliciting public involvement – obtaining approval for the plan • prepare a flow chart that outlines relationships among the components of Integrated Resource Planning (IRP) • research two or more forest management plans having different goals, and identify components of Integrated Resource Planning (IRP) that are present in each; e.g., <ul style="list-style-type: none"> – forest protection – access management – harvest planning – range management – wildlife management • develop a plan for the integrated use of a local forested area; e.g., <ul style="list-style-type: none"> – conduct research – generate alternatives – agree to a workable solution. 	<p>See <i>Alberta's Focus on Forests</i>:</p> <ul style="list-style-type: none"> • Activity 5.1–Forest Perspectives • Activity 5.2–Decisions for Change • Activity 5.5–Integrated Resource Management

MODULE CURRICULUM AND ASSESSMENT STANDARDS:

SECTION F: ADVANCED LEVEL

The following pages define the curriculum and assessment standards for the advanced level of Forestry.

Advanced level modules demand a higher level of expertise and help prepare students for entry into the workplace or a related post-secondary program.

Module FOR301:	Issues in Forestry	F.3
Module FOR306:	Measuring the Forest III.....	F.7
Module FOR307:	The Forest Marketplace	F.11
Module FOR308:	Forest Technology Applications	F.15
Module FOR309:	Advanced Forest Ecology	F.19
Module FOR311:	Silviculture: Growing the Forest.....	F.25
Module FOR312:	Stewardship: Balancing Needs	F.29

MODULE FOR301: ISSUES IN FORESTRY

Level: Advanced

Theme: Social and Cultural Perspectives

Prerequisite: None

Module Parameters: Access to resources available from government, industry and community organizations (e.g., special-interest groups) regarding local and/or global issues in forestry

Students analyze local and global issues in forest management, and demonstrate individual and shared actions that foster environmental stewardship.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none">• identify social, economic and environmental perspectives associated with current issues in forest management	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none">• for each of <u>five</u> current issues in forest management, identifying and explaining three or more:<ul style="list-style-type: none">– immediate and/or long-term consequences– possible alternatives for dealing with the issue.Consequences and alternatives to address social, economic and environmental perspectives <p><i>Assessment Tool</i> <i>Issues in Forestry: Analyzing Issues, FOR301-1</i> <i>Assessment Framework: Issue Analysis, CTSISS</i></p> <p><i>Standard</i> <i>Analyze 5 issues to a standard of 3 on the rating scale</i></p> <ul style="list-style-type: none">• a critique of one newspaper/magazine article or video documentary regarding an issue in forest management. Critique to address:<ul style="list-style-type: none">– range of viewpoints/biases evident– validity/reliability of information presented– recommended course of action <p><i>Assessment Tool</i> <i>Issues in Forestry: Analyzing Issues, FOR301-1</i> <i>Guide to Critiquing Media Information, FORMED</i></p> <p><i>Standard</i> <i>Critique one piece of media information to a standard of 3 on the rating scale</i></p>	30

MODULE FOR301: ISSUES IN FORESTRY (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> explain how issues and trends involving Canada's forests may be similar to those in other parts of the world 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> completing a research project on an international forest issue. Research to provide: <ul style="list-style-type: none"> an explanation of the issue, including the stakeholders involved and their respective points of view positive and negative consequences for the forest resource and society a comparison of the issue with a similar forest issue in Canada suggested strategies/actions for dealing with the issue at local and global levels <p><i>Assessment Tool</i> <i>Issues in Forestry: Comparing Local and Global Issues, FOR301-1</i> <i>Assessment Framework: Research Process, CTSRES</i></p> <p><i>Standard</i> <i>Complete all components of research to a standard of 3 on the rating scale</i></p>	30
<ul style="list-style-type: none"> demonstrate individual and shared actions that foster the conservation and management of forested regions 	<ul style="list-style-type: none"> providing a summary of the goals and accomplishments of one environmental conservation group <p><i>Assessment Tool</i> <i>Issues in Forestry: Citizenship—Goals and Actions, FOR301-1</i></p> <p><i>Standard</i> <i>Summarize goals/accomplishments to a standard of 3 on the rating scale</i></p> <ul style="list-style-type: none"> given a current issue in forest management: <ul style="list-style-type: none"> negotiating and debating the issue while assuming the role of one or more stakeholder groups through group consensus building, developing and presenting a shared agreement on a preferred course of action for dealing with the issue <p><i>Assessment Tool</i> <i>Issues in Forestry: Citizenship—Goals and Actions, FOR301-1</i> <i>Negotiation and Debate, FORNEG-3</i></p> <p><i>Standard</i> <i>Negotiate and present and shared agreement to a standard of 3 on the rating scale</i></p>	40

MODULE FOR301: ISSUES IN FORESTRY (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> demonstrate basic competencies. 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> observations of individual effort and interpersonal interaction during the learning process <p><i>Assessment Tools</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
Issues Involve Alternatives	<p><i>The student should:</i></p> <ul style="list-style-type: none"> describe past and present trends in the consumptive and non-consumptive use of forests analyze differing points of view regarding how and to what degree Canada's forests should be used identify positive and negative effects of forest industry development on people, industry and the environment assess the pros and cons of different forest harvesting practices; e.g., <ul style="list-style-type: none"> clearcutting selective harvesting research issues related to the expansion and management of Alberta's forest industry; e.g., <ul style="list-style-type: none"> access management herbicide use in timber management old growth management maintenance of biodiversity describe ways in which different forest stakeholders make use of the judicial, legislative and regulatory systems in working toward their objectives. 	<p>Gather appropriate resource materials prior to beginning the module</p> <p>Discuss issues from a variety of perspectives (e.g., social, economic, environmental).</p> <p>Discuss different perspectives regarding how and to what degree Canada's forests should be used.</p> <p>Analyze the pros and cons regarding three different forest harvest practices.</p> <p>Identify issues related to the expansion of forest management in Alberta.</p>

MODULE FOR301: ISSUES IN FORESTRY (continued)

Concept	Specific Learner Expectations	Notes
Global Issues and Trends	<p><i>The student should:</i></p> <ul style="list-style-type: none"> compare issues involving Canada's forests with similar issues in other parts of the world; e.g., <ul style="list-style-type: none"> land use expansion of the forest industry forest renewal processes management of old growth forests climate change and forest ecosystems extensive versus intensive management assess global impacts of the recreational and commercial use of forests; e.g., <ul style="list-style-type: none"> social and cultural economic environmental infer the long-range effects of the sustainable use of forests in Canada and other parts of the world. 	Research a forest issue in another country. Compare to the Canadian situation.
Individual and Shared Actions	<ul style="list-style-type: none"> compare and contrast different philosophies, ethics and alternatives regarding the forest resource and how best to ensure its health and sustainability assess the goals and objectives of one or more forest conservation or preservation groups debate a global issue regarding the consumptive and/or non-consumptive use of forests; e.g., <ul style="list-style-type: none"> conduct research develop a position participate in debate develop a plan for the use of a forested region; e.g., <ul style="list-style-type: none"> conduct research generate alternatives agree to a plan that meets an acceptable level of needs initiate responsible and ethical actions in relation to the forest and its many resources; e.g., <ul style="list-style-type: none"> individual actions shared actions leadership roles. 	<p>See <i>Alberta's Focus on Forests</i>:</p> <ul style="list-style-type: none"> Activity 3.6—An Urban Wilderness at School Activity 5.1—Forest Values Activity 5.3—Forest Perspectives. <p>Emphasis on empowerment.</p>

MODULE FOR306: MEASURING THE FOREST III

Level: Advanced

Theme: Technology and Applications

Prerequisite: Measuring the Forest II (FOR206)

Module Parameters: Access to forest inventory technology and forest survey data used by public and private organizations in the forestry sector (e.g., Alberta Environmental Protection, Canadian Forestry Service, Canadian Centre for Remote Sensing); access to forestry maps available from private vendors; background knowledge and/or resources in population sampling and design will be an asset

Students explain management applications of data collected from a forest survey, and examine the role of technology in current forest inventory practices.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none">explain the applications of forest survey data in resource management	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none">identifying and explaining applications of timber cruise data and non-fibre data in resource management <p><i>Assessment Tool</i> <i>Knowledge/Application Assessment: Forest Survey Data, FOR306-1</i></p> <p><i>Standard</i> <i>Respond to a standard of 3 on the rating scale</i></p> <ul style="list-style-type: none">demonstrating applications of a sample set of forest survey data by:<ul style="list-style-type: none">identifying bias, error and other limitations in the sample dataextrapolating the data to estimate forest populationsusing the survey data to establish effective forest management practicesmodifying the sample design to increase accuracy of the survey <p><i>Assessment Tool</i> <i>Knowledge/Application Assessment: Forest Survey Data, FOR306-1</i></p> <p><i>Standard</i> <i>Respond to a standard of 3 on the rating scale</i></p>	60

MODULE FOR306: MEASURING THE FOREST III (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> research the role of technology in current forest inventory practices 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> completing a research project on applications of technology in data collection, manipulation and/or storage. Research to address: <ul style="list-style-type: none"> aerial photography satellite imagery computer-based mapping systems applications of ground truthing in verifying data gathered through remote sensing <p><i>Assessment Tool</i> <i>Research Process: Role of Technology in Forest Inventory, FOR306-2</i></p> <p><i>Standard</i> <i>Complete all components of research to a standard of 3 on the rating scale</i></p> <ul style="list-style-type: none"> given information regarding a current forest inventory research project (e.g., an Alberta Research Council project, an initiative of the Canadian Forestry Service), a presentation or report that summarizes: <ul style="list-style-type: none"> the research problem/question research design and expected results accomplishments and challenges encountered to date immediate and long-range implications of the research project <p><i>Assessment Tool</i> <i>Presentations/Reports, FORPRE-3</i></p> <p><i>Standard</i> <i>Complete the presentation or report to a standard of 3 on the rating scale</i></p>	<p>30</p>
<ul style="list-style-type: none"> examine career opportunities in forest measurement 	<ul style="list-style-type: none"> given current information on career opportunities in forest management (e.g., labourer, technician, professional worker), completing a research project on one or more careers in forest management <p><i>Assessment Tool</i> <i>Career Search: Advanced Level, FORCAR-3</i></p> <p><i>Standard</i> <i>Conduct research to a standard of 3 on the rating scale</i></p>	<p>10</p>

MODULE FOR306: MEASURING THE FOREST III (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> demonstrate basic competencies. 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> observations of individual effort and interpersonal interaction during the learning process <p><i>Assessment Tools</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
Data Interpretation	<p><i>The student should:</i></p> <ul style="list-style-type: none"> explain applications of timber cruise data in resource management; e.g., <ul style="list-style-type: none"> estimating total fibre volume projecting future forest growth planning harvest operations explain applications of non-fibre data in resource management; e.g., <ul style="list-style-type: none"> monitoring water and soil quality determining potential for agriculture/recreation monitoring wildlife population densities and trends planning conservation practices interpret a set of sample forest survey data; e.g., <ul style="list-style-type: none"> consider bias, error and other limitations in the sample data extrapolate the data to estimate forest populations suggest applications of data in resource management consider modification to sample design that may increase accuracy of the survey. 	<p>Contact resource persons from:</p> <ul style="list-style-type: none"> Canadian Forestry Service Alberta Land and Forest Services. <p>Perform mathematical calculations to determine timber volumes.</p> <p>Obtain sample data from local government/industry.</p> <p>Use paper and pencil <u>OR</u> computer programs to interpret data.</p> <p>Background information in forest measurement applications is provided in:</p> <ul style="list-style-type: none"> <i>Natural Resources Measurements</i> by Thomas Avery (McGraw Hill Book Co., 1975) <i>Forest Mensuration</i> (3rd Edition) by Bertram Husch, Charles Miller and Thomas Beers (John Wiley and Sons Inc., 1982).

MODULE FOR306: MEASURING THE FOREST III (continued)

Concept	Specific Learner Expectations	Notes
Role of Technology	<p><i>The student should:</i></p> <ul style="list-style-type: none"> research applications of technology in gathering and storing data about the forest resource; e.g., <ul style="list-style-type: none"> aerial photography satellite imagery computer-based mapping systems explain the importance of ground truthing in verifying data gathered through remote sensing make predictions regarding forest inventory technologies and practices in the future outline the objectives of a current forest inventory research project; e.g., <ul style="list-style-type: none"> an initiative of the Canadian Forestry Service an Alberta Research Council project. 	<p>Expose students to various technologies through field studies.</p> <p>Contact the following agencies for information on current data-gathering technologies:</p> <ul style="list-style-type: none"> <i>Canadian Centre for Remote Sensing</i> (Ottawa, Ontario) <i>RADARSAT International</i> (Richmond, B.C.). <p>Consider future uses of computers and advances in GIS.</p> <p>Investigate potential applications of Global Positioning Systems (GPS).</p>
Career Paths	<ul style="list-style-type: none"> outline career paths and the range of occupational opportunities in forest measurement present the results of research on one or more career paths in forest measurement; e.g., <ul style="list-style-type: none"> nature of the work number of workers/employment trends entry requirements/competencies education/training opportunities opportunity for advancement. 	<p>Review National Occupational Profiles (NOC).</p> <p>Interview persons involved in conducting forest inventories.</p> <p>Work experience.</p> <p>Job shadowing.</p>

MODULE FOR307: THE FOREST MARKETPLACE

Level: Advanced

Theme: Technology and Applications

Prerequisite/
Corequisite: Harvesting and Forest Products (FOR207; Recommended)

Module Parameters: Access to resources available from the forest products industry and forest service industry

Students describe the range of consumer products and services derived from Canada's forests, and research the production and marketing of forest products.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<i>The student will:</i> <ul style="list-style-type: none">describe fibre and non-fibre products and services derived from Canada's forests	<i>Assessment of student achievement will be based on:</i> <ul style="list-style-type: none">given a range of relevant in-school/community resources, identifying and describing:<ul style="list-style-type: none">fibre and non-fibre products and services derived from Alberta's forestsforecasts regarding the future use of forests in Alberta and Canada <i>Assessment Tool</i> <i>Knowledge/Application Assessment: Forest Products and Services, FOR307-1</i> <i>Standard</i> <i>Respond to a standard of 3 on the rating scale</i>	10
<ul style="list-style-type: none">research the development of fibre and non-fibre forest products and services in Canada and Alberta	<ul style="list-style-type: none">preparing flowcharts that depict the sequence of steps involved in developing three forest products and/or services <i>Assessment Tool</i> <i>Assessment Criteria: Flow Charts, FORFLO</i> <i>Standard</i> <i>Complete flow charts to a standard of 3 on the rating scale</i> <ul style="list-style-type: none">completing a research project on recent applications of milling and/or pulping technology in the development of one or more forest products/services <i>Assessment Tool</i> <i>Research Process: Milling and/or Pulping Technology, FOR307-2</i> <i>Standard</i> <i>Complete all components of research to a standard of 3 on the rating scale</i>	30

MODULE FOR307: THE FOREST MARKETPLACE (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> research marketing systems and trends, and develop a marketing plan for a forest product or service 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> developing and presenting a multi-media marketing plan for a new forest product or service. Plan to involve consideration of: <ul style="list-style-type: none"> factors that influence market trends product diversification and/or specialization potential markets in North America, the Pacific Rim, Europe and two other selected regions materials and processes involved in product/service development effective marketing strategies and systems <p><i>Assessment Tool</i> <i>Assessment Criteria: A Marketing Plan, FOR307-3</i></p> <p><i>Standard</i> <i>Develop and present the marketing plan to a standard of 3 on the rating scale</i></p>	60
<ul style="list-style-type: none"> demonstrate basic competencies. 	<ul style="list-style-type: none"> observations of individual effort and interpersonal interaction during the learning process <p><i>Assessment Tools</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	Integrated throughout

Concept	Specific Learner Expectations	Notes
Products and Services	<p><i>The student should:</i></p> <ul style="list-style-type: none"> identify market-based products and services derived from Alberta's forests; e.g., <ul style="list-style-type: none"> primary wood products wood-fabricated materials wood pulp and paper products chemical products trapping, fishing and hunting guiding and outfitting tourism and recreational pursuits 	<p>Contact the Alberta Forest Products Association for current resources and information.</p> <p>See <i>Alberta's Focus on Forests</i> (Activity 4.2- Products From Canada's Forests).</p> <p>Identify major industries that require wood.</p> <p>Identify common products derived from a particular tree species.</p>

MODULE FOR307: THE FOREST MARKETPLACE (continued)

Concept	Specific Learner Expectations	Notes
Products and Services (continued)	<p><i>The student should:</i></p> <ul style="list-style-type: none"> identify psychological benefits and extra-market values derived from Alberta's forests; e.g., <ul style="list-style-type: none"> ecological values aesthetic and spiritual values bequest value for future generations analyze trends in the consumptive and non-consumptive use of forests in Canada and Alberta; e.g., <ul style="list-style-type: none"> recreation trapping logging oil and gas development. 	<p>Identify a range of forest products and services that could be derived from a selected site.</p> <p>Supplementary reference materials include:</p> <ul style="list-style-type: none"> <i>A Forest Journey - The Role of Wood in the Development of Civilization</i> (Harvard University Press) <i>Canadian Forestry - The View Beyond the Trees</i> (Macmillan of Canada).
Processing	<ul style="list-style-type: none"> classify and sequence the steps that are involved in producing a fibre commodity; e.g., <ul style="list-style-type: none"> harvest and transportation processing techniques grading, packing and storage identify materials and services that are required at each stage in the production of a fibre commodity; e.g., <ul style="list-style-type: none"> human and natural resources energy and technologies inspection and regulation describe recent developments in milling and pulping technology and their impact on the forest industry; e.g., <ul style="list-style-type: none"> fibre utilization environmental stewardship identify new and emerging products and services derived from Alberta's forests; e.g., <ul style="list-style-type: none"> cattle food methane gas 	<p>See <i>Alberta's Focus on Forests</i>:</p> <ul style="list-style-type: none"> Activity 4.4—From Pulp to Paper and Back Again Activity 4.5—Pulp and Paper: The Technology—Environment Connection. <p>Draw posters that depict what happens to a tree from stump to consumer.</p>
Marketing Systems and Trends	<ul style="list-style-type: none"> determine the nature and extent of Canada's market share in North America, the Pacific Rim, Europe and other locations describe systems used to market Canada's forest products and services at local, national and international levels 	<p>Marketing modules in the Agriculture strand and Management and Marketing strand offer additional instructional strategies.</p>

MODULE FOR307: THE FOREST MARKETPLACE (continued)

Concept	Specific Learner Expectations	Notes
Marketing Systems and Trends (continued)	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • identify social, economic and environmental factors that influence consumer trends and market demands for forest products and services • assess the impact of developing technologies on Canada's fibre and non-fibre forest products; e.g., <ul style="list-style-type: none"> – efficiency of production processes – improved utilization – focus on value-added and knowledge intensive commodities • identify market opportunities that arise from product diversification and specialization, international trade and participation in a global economy • formulate a plan for identifying new market opportunities, developing a forest product, and managing the venture. 	<p>Obtain Dr. Sues: The Lorax (a video that addresses environmental issues in marketing) from the National Film Board or your local Urban/Regional Resource Centre.</p> <p>Visit a sawmill and wood-product distributor to discover traditional and new uses of wood.</p> <p>Prepare plans for Christmas tree production and marketing.</p>

MODULE FOR308: FOREST TECHNOLOGY APPLICATIONS

Level: Advanced

Theme: Technology and Applications

Prerequisite: None

Module Parameters: Access to resources available from the forest products industry and relevant government organizations (e.g., Alberta Environmental Protection, Canadian Forestry Service, Alberta Research Council)

Students examine applications of research and technology in the forest industry, and changing career opportunities in the forestry sector.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none">describe different areas of forest research being conducted in Canada and Alberta	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none">identifying major areas of forest research being conducted in Canada and, where possible, Alberta <p><i>Assessment Tool</i> <i>Forest Technology Applications: Industry Research, FOR308-1</i></p> <p><i>Standard</i> <i>Identify six major areas of forest research to a standard of 3 on the rating scale</i></p> <ul style="list-style-type: none">given information regarding a current forest research project in Canada (e.g., enhanced utilization, forest management), summarizing:<ul style="list-style-type: none">research objectives and participating agenciesinformation-gathering strategiesproject status and implications for forest industry <p><i>Assessment Tool</i> <i>Forest Technology Applications: Industry Research, FOR308-1</i> <i>Presentations/Reports, FORPRE-3</i></p> <p><i>Standard</i> <i>Summarize <u>one</u> current forest research project to a standard of 3 on the rating scale</i></p>	30

MODULE FOR308: FOREST TECHNOLOGY APPLICATIONS (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> give examples of current and emerging technologies used in the forest industry 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> completing a research project on applications of three technologies in different sectors of the forest industry (e.g., greenhouse/nursery operations, silviculture, forest harvest, wood production/utilization, forest inventory/protection). For each technology, research to address: <ul style="list-style-type: none"> specific problems/needs being addressed basic components and principles of operation advantages/disadvantages with respect to social, economic and environmental factors <p><i>Assessment Tool</i> <i>Forest Technology Applications: Technology Application, FOR308-1</i> <i>Sample Research Topics: Technology Application, FOR308-2</i> <i>Research Process, CTSRES</i></p> <p><i>Standard</i> <i>Complete research on <u>three</u> technologies to a standard of 3 on the rating scale</i></p>	50
<ul style="list-style-type: none"> research career opportunities and trends within the forestry sector 	<ul style="list-style-type: none"> given current information on career opportunities and trends in the forestry sector, completing a research project on one or more related career clusters <p><i>Assessment Tool</i> <i>Forest Technology Applications: Technology Careers, FOR30-1</i> <i>Career Search: Advanced Level, FORCAR-3</i></p> <p><i>Standard</i> <i>Complete research to a standard of 3 on the rating scale</i></p>	20
<ul style="list-style-type: none"> demonstrate basic competencies. 	<ul style="list-style-type: none"> observations of individual effort and interpersonal interaction during the learning process <p><i>Assessment Tools</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	Integrated throughout

MODULE FOR308: FOREST TECHNOLOGY APPLICATIONS (continued)

Concept	Specific Learner Expectations	Notes
Research	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • identify and describe different areas of forest research being conducted in Canada and Alberta; e.g., <ul style="list-style-type: none"> – silviculture – harvesting systems – forest products – forest protection – wildlife inventories – ecological studies – integrated resource management • compare the goals and priorities of local agencies whose mandate is to conduct research related to forestry and forest ecosystems; e.g., <ul style="list-style-type: none"> – individuals – corporations – colleges and universities – government agencies • explain the role of the Alberta Forest Research Advisory Council in coordinating forest research activities in Alberta • describe applications of data banks and information systems in making forest management decisions • identify major components of a research plan for the enhanced utilization and/or management of forests; e.g., <ul style="list-style-type: none"> – goals and objectives of the plan – economic, political, scientific and related factors – methodologies and strategies – outcomes and types/kinds of data obtained – limitations of the plan, or information that may be lacking or incomplete. 	Contact Northern Forestry Centre (Canadian Forestry Services) for current resource materials and information.
Technologies	<ul style="list-style-type: none"> • describe past and present applications of technology in the forest industry; e.g., <ul style="list-style-type: none"> – greenhouse and nursery operations – silviculture – harvesting technologies – wood production and utilization – biotechnology 	

MODULE FOR308: FOREST TECHNOLOGY APPLICATIONS (continued)

Concept	Specific Learner Expectations	Notes
Technologies (continued)	<p><i>The student should:</i></p> <ul style="list-style-type: none"> describe emerging applications of technology in the forest industry; e.g., <ul style="list-style-type: none"> pulping procedures effluent treatment and pollution control assess the advantages and disadvantages of a recent technology designed to enhance our utilization and/or management of forests; e.g., <ul style="list-style-type: none"> social economic environmental. 	
Career Trends	<ul style="list-style-type: none"> predict ways in which research, technology, social values and land use priorities may affect forest industries in the future predict future career clusters and occupational opportunities within the forestry sector, and the education/training that may be required to gain employment and advance in related fields research career clusters and the range of occupational opportunities available within the forestry sector; e.g., <ul style="list-style-type: none"> forest inventory forest biology/ecology forest protection forest harvest forest products industry forest management research one or more career paths in forestry; e.g., <ul style="list-style-type: none"> job description/working conditions entry requirements/competencies educational/training opportunities opportunity for advancement opportunity for self-employment and entrepreneurship. 	<p>Review National Occupational Profiles (NOC).</p> <p>Contact the "Career Hotline" (telephone 1-800-661-3753).</p> <p>Interview persons employed in the forestry sector.</p>

MODULE FOR309: ADVANCED FOREST ECOLOGY

Level: Advanced

Theme: Management and Conservation

Prerequisite: Basic Forest Ecology (FOR109) and/or Biology 20; Soils Management I and Soils Management II (AGR212 and AGR312) recommended

Module Parameters: Access to a forest environment

Students investigate interrelationships among soil, water, air, trees and the environment, and explain how forests change.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none">analyze the effects of soil, air and water characteristics on forest ecosystems	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none">identifying and describing:<ul style="list-style-type: none">organic and inorganic components of forest soils and their function in forest ecosystemsmajor types of air pollutants and their affect on forest ecosystems <p><i>Assessment Tool</i> <i>Knowledge/Application Assessment: Soil, Air and Water Characteristics, FOR309-1</i></p> <p><i>Standard</i> <i>Respond to a standard of 3 on the rating scale</i></p> <ul style="list-style-type: none">conducting field investigations on the effects of soil pH, temperature and water quantity on plant growth <p><i>Assessment Tool</i> <i>Field Investigations: Soil, Air and Water Characteristics, FOR309-2</i></p> <p><i>Standard</i> <i>Conduct field investigation to a standard of 3 on the rating scale</i></p> <ul style="list-style-type: none">describing causal relationships and making inferences regarding the effects of:<ul style="list-style-type: none">local forests on soil, water, weather and biotic factorsglobal forests on global climate <p><i>Assessment Tool</i> <i>Guide to Inferences: Forest Ecosystems, FOR309-3</i></p> <p><i>Standard</i> <i>Make <u>ten</u> inferences (as outlined in FOR309-3) to a standard of 3 on the rating scale</i></p>	40

MODULE FOR309: ADVANCED FOREST ECOLOGY (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> research factors that determine the ability of tree species and forest ecosystems to occur in particular environments 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> completing a field-based research project on forest associations. Research to include: <ul style="list-style-type: none"> the silvics of five common Alberta tree species, including climatic, soil and moisture requirements the structural characteristics and environments of three common Alberta forest associations, and factors that have determined their existence <p><i>Assessment Tools</i> <i>Research Process: Forest Associations, FOR309-4</i> <i>Alberta's Focus on Forests (Section 3.1: A Lot Depends on Location), LRDC</i> <i>Common Forest Associations in Alberta, FOR309-5</i></p> <p><i>Standard</i> <i>Complete all components of research to a standard of 3 on the rating scale</i></p>	30
<ul style="list-style-type: none"> explain the process of change in a forest environment 	<ul style="list-style-type: none"> given access to a local forest environment, identifying on-site: <ul style="list-style-type: none"> four living agents of change four non-living agents of change two examples of succession <p><i>Assessment Tool</i> <i>Alberta's Focus on Forests (Section 1.6: Change in Forest Ecosystems), LRDC</i> <i>Identification Guide: Agents of Change, FOR309-6</i></p> <p><i>Standard</i> <i>Address all criteria in the identification guide to a standard of 3 on the rating scale</i></p> <ul style="list-style-type: none"> making inferences regarding structural and/or behavioural adaptations of living organisms to particular changes in a forest environment <p><i>Assessment Tool</i> <i>Guide to Inferences: Forest Ecosystems, FOR309-3</i></p> <p><i>Standard</i> <i>Make <u>four</u> inferences (as outlined in FOR309-3) to a standard of 3 on the rating scale</i></p>	30

MODULE FOR309: ADVANCED FOREST ECOLOGY (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> demonstrate basic competencies. 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> observations of individual effort and interpersonal interaction during the learning process <p><i>Assessment Tools</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
Forest Ecosystems	<p><i>The student should:</i></p> <ul style="list-style-type: none"> describe physical characteristics used to classify forest soils, and the effect of different soils on plant growth; e.g., <ul style="list-style-type: none"> texture porosity explain the function of organic and inorganic components of forest soils; e.g., <ul style="list-style-type: none"> micro- and macro-organisms gases and minerals organic matter water analyze the effects of soil acidity, alkalinity and temperature on the growth of trees and other forest plants describe indicators of water quantity in the forest, and its effects on trees and other plants; e.g., <ul style="list-style-type: none"> surface water ground water describe the effects of known air pollutants on forest ecosystems; e.g., <ul style="list-style-type: none"> ozone particulate matter oxides and nitrogen sulphur dioxide 	<p>See Alberta's Focus on Forests:</p> <ul style="list-style-type: none"> Activity 1.4-How Forests Affect the Environment Activity 1.5-Biosphere. <p>Dig a soil pit.</p> <p>Use a soil test kit.</p> <p>Design and perform experiments that monitor the effects of soil composition, air quality and water quality on tree growth.</p>

MODULE FOR309: ADVANCED FOREST ECOLOGY (continued)

Concept	Specific Learner Expectations	Notes
Forest Ecosystems (continued)	<p><i>The student should:</i></p> <ul style="list-style-type: none"> analyze the effects of a forest on the local environment; e.g., <ul style="list-style-type: none"> soil and water weather other wildlife infer the effects of forests worldwide on global climates. 	Measure/infer rates of transpiration and infer effects on weather and wildlife.
Forest Associations	<ul style="list-style-type: none"> explain that each tree species has unique site and climatic requirements that determine its ability to grow in particular environments research the general characteristics, life history, site and climatic requirements of several Alberta tree species; e.g., <ul style="list-style-type: none"> tree form growth patterns and life cycle soil moisture aspect and elevation describe the general structural characteristics and environments of some common forest associations in Alberta; e.g., <ul style="list-style-type: none"> soil moisture position on slope. 	<p>Field trip to classify growth sites.</p> <p>See <i>Alberta's Focus on Forests</i>:</p> <ul style="list-style-type: none"> Activity 2.4–Differences in Design Activity 3.1–A Lot Depends on Location. <p>Determine “most-likely site” to find particular tree species.</p>
Forest Change	<ul style="list-style-type: none"> identify living and non-living agents of change in a local forest environment infer structural and/or behavioural adaptations of living organisms to particular changes in the forest environment; e.g., <ul style="list-style-type: none"> adaptations to site conditions reproductive adaptations consider the impacts of specific environmental changes on a forest community; e.g., <ul style="list-style-type: none"> short-term consequences long-term consequences give examples of primary and secondary successional stages in a local forest environment 	<p>See <i>Alberta's Focus on Forests</i>:</p> <ul style="list-style-type: none"> Activity 1.6–Change in Forest Ecosystems Activity 3.5–Controlling Fire <p>Relate to forest associations.</p> <p>Example: aspen/spruce understory.</p>

MODULE FOR309: ADVANCED FOREST ECOLOGY (continued)

Concept	Specific Learner Expectations	Notes
Forest Change (continued)	<i>The student should:</i> <ul style="list-style-type: none">• describe Alberta's natural forest history; e.g.,<ul style="list-style-type: none">– role of fire– role of other agents.	Visit a mature forest and clear cut area. Differentiate between the two areas and make predictions regarding the areas in five years.

MODULE FOR311: SILVICULTURE: GROWING THE FOREST

Level: Advanced

Theme: Management and Conservation

Prerequisite: Basic Forest Ecology (FOR109; Recommended)

Module Parameters: Demonstration forest

Students demonstrate knowledge of the techniques used in establishing, growing and harvesting tree crops.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<i>The student will:</i> <ul style="list-style-type: none">describe silviculture and the silvics of Alberta tree species	<i>Assessment of student achievement will be based on:</i> <ul style="list-style-type: none">identifying and describing:<ul style="list-style-type: none">major components of silviculture, including stand establishment, stand management and harvestthe silvics of five Alberta tree species <i>Assessment Tool</i> <i>Knowledge/Application Assessment: Silviculture, FOR311-1</i> <i>Sample Format: Silvics of a Tree Species, FOR311-2</i> <i>Standard</i> <i>Respond to a standard of 3 on the rating scale</i>	25
<ul style="list-style-type: none">demonstrate practices used to establish a stand of trees and manipulate growing conditions to favour particular species	<ul style="list-style-type: none">conducting laboratory and/or field-based investigations that demonstrate regeneration by:<ul style="list-style-type: none">natural methods, including natural seed supply and vegetative reproductionartificial methods, including direct seeding, bare-root and container seedlings <i>Assessment Tool</i> <i>Lab Investigations: Natural and Artificial Regeneration, FOR311-3</i> <i>Observation Checklist for Field-Based Investigations, FOROBS</i> <i>Standard</i> <i>Conduct lab investigations to a standard of 3 on the rating scale <u>and/or</u> complete all sections of the observation checklist for field-based investigations</i>	65

MODULE FOR311: SILVICULTURE: GROWING THE FOREST (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> research growth/harvest relationships and appropriate methods of harvesting tree species 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> a teacher-prepared assessment in which the student demonstrates knowledge of practices used to establish and manage a stand of trees <p><i>Assessment Tool</i> <i>Sample Assessment Items: Stand Establishment and Management, FOR311-4</i></p> <p><i>Standard</i> <i>Response indicating 80% mastery</i></p> <ul style="list-style-type: none"> demonstrating (or explaining) practical field techniques used to establish and tend a stand of trees. <p>Tasks to include:</p> <ul style="list-style-type: none"> – site preparation – cone collection and seed extraction – planting stock – spacing, thinning, pruning, fertilizer use. <p><i>Assessment Tool</i> <i>Task Checklist: Stand Establishment and Tending, FOR311-5</i> <i>Lab Assessment: Outdoor Forest Experiences, LABFOR</i> <i>Observation Checklist for Field-Based Investigations, FOROBS</i></p> <p><i>Standard</i> <i>Achieve a performance rating of :</i></p> <ul style="list-style-type: none"> – 2 in areas identified on the task checklist – 3 in applicable areas of lab assessment. <p><i>Complete all sections of the observation checklist for field-based investigations</i></p> <ul style="list-style-type: none"> given access to current publications on harvest methods (e.g., clearcutting, seed tree, shelterwood, selection), completing a research project on: <ul style="list-style-type: none"> – the benefits and costs of different methods of harvest – appropriate methods of harvest (as determined by silvics) for each of seven Alberta tree species <p><i>Assessment Tool</i> <i>Research Process: Forest Harvest Methods, FOR311-6</i></p> <p><i>Standard</i> <i>Complete all components of research to a standard of 3 on the rating scale</i></p>	<p>10</p>

MODULE FOR311: SILVICULTURE: GROWING THE FOREST (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> demonstrate basic competencies. 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> observations of individual effort and interpersonal interaction during the learning process <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above.</i></p>	<p>Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
Regeneration and Stand Treatment	<p><i>The student should:</i></p> <ul style="list-style-type: none"> demonstrate methods of regeneration where seedlings are established by natural methods; e.g., <ul style="list-style-type: none"> naturally supplied seeds vegetative reproduction demonstrate methods of regeneration where seedlings are established by artificial methods; e.g., <ul style="list-style-type: none"> planting bare-root and container seedlings broadcasting seeds assess the pros and cons of natural and artificial methods of regeneration demonstrate techniques for site preparation and the care and planting of seeds and seedlings demonstrate intermediate stand tending techniques; e.g., <ul style="list-style-type: none"> cleaning thinning pruning fertilizing protecting identify safety practices and policies relevant to site preparation, tree planting and stand tending distinguish between intensive and extensive stand management practices. 	<p>Contact Alberta Land and Forest Services prior to module delivery for information regarding seedling availability, sites for tour and equipment availability.</p> <p><i>See Alberta's Focus on Forests (Activity 5.4—Reforestation: Forests or Tree Farms).</i></p> <p>Practical experiences in establishing a stand of trees and manipulating growing conditions to favour particular species.</p> <p>Potential exists for additional projects in seed collection and tree planting. May also be used as a school fundraiser.</p> <p>Grow container plants and apply different levels of fertilization</p> <p>Compare nutrient requirements of young and mature stands.</p>

MODULE FOR311: SILVICULTURE: GROWING THE FOREST (continued)

Concept	Specific Learner Expectations	Notes
Cutting Methods	<p><i>The student should:</i></p> <ul style="list-style-type: none"> identify factors important in choosing a suitable method of harvest; e.g., <ul style="list-style-type: none"> growth characteristics intended utilization regeneration of species describe current applications of different methods of harvesting trees; e.g., <ul style="list-style-type: none"> clearcutting method seed tree method shelterwood method selection method assess the advantages and disadvantages of different methods of harvesting trees relate appropriate harvest methods to individual tree species. 	<p>See <i>Alberta's Focus on Forests</i> (Activity 4.6–Cutting Styles).</p> <p>Teacher Reference: <i>Timber Harvesting Guidelines</i> (Alberta Forest Service).</p> <p>Select three sites that possess different timber characteristics. Have students physically examine the sites to determine timber condition and harvesting considerations.</p>
Silviculture and Silvics	<ul style="list-style-type: none"> define silviculture as the science and art of growing and tending forest crops to obtain more and better benefits from forests including wood identify major components of silvicultural systems; e.g., <ul style="list-style-type: none"> stand establishment stand management harvest and re-establishment explain that individual tree species have unique ecological requirements that determine suitable silvicultural practices compare and contrast the ecological requirements and silvics for two or more Alberta tree species describe one or more research programs designed to improve silvicultural practices; e.g., <ul style="list-style-type: none"> genetic selection geographic information systems harvesting operations. 	<p>Invite a professional forester to explain components of silviculture.</p>

MODULE FOR312: STEWARDSHIP: BALANCING NEEDS

Level: Advanced

Theme: Management and Conservation

Prerequisite: Users in the Forest (FOR212)

Module Parameters: Access to resources available from government, industry and community organizations regarding forest management and environmental stewardship (e.g., Alberta Environmental Protection, Alberta Forest Products Association, special-interest groups)

Students develop and present an integrated plan for sustainable development of the forest resource.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<i>The student will:</i> <ul style="list-style-type: none">describe basic forest management principles	<i>Assessment of student achievement will be based on:</i> <ul style="list-style-type: none">definitions and Alberta examples of sustainable development, sustained yield, integrated land use and multiple use management <i>Assessment Tool</i> <i>Knowledge/Application Assessment: Forest Management Principles, FOR312-1</i> <i>Standard</i> <i>Respond to a standard of 3 on the rating scale</i>	10
<ul style="list-style-type: none">develop a plan for the sustainable development and integrated use of forested land	<ul style="list-style-type: none">developing and presenting a plan for the sustainable development and integrated use of a forested region. Plan to address:<ul style="list-style-type: none">short- and long-term goals and objectivesthe views of relevant stakeholder groupsa process for public involvementproposed management standards and guidelinesa schedule of development activitiesforest boundaries, access, physical features, cover and other resourcespermits, licences and/or other legal agreements that may be requireda strategy for monitoring use and resolving potential conflicts <i>Assessment Tools</i> <i>Assessment Criteria: Developing A Forest Management Plan, FOR312-2</i> <i>Presentations/Reports, FORPRE-3</i> <i>Standard</i> <i>Achieve a minimum performance rating of:</i> <ul style="list-style-type: none">2 in developing the management plan3 in presenting the management plan	90

MODULE FOR312: STEWARDSHIP: BALANCING NEEDS (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> demonstrate basic competencies. 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> observations of individual effort and interpersonal interaction during the learning process <p><i>Assessment Tools</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
Basic Principles	<p><i>The student should:</i></p> <ul style="list-style-type: none"> explain sustainable development and sustained yield within the context of Canada's forests compare principles of integrated land use with principles of multiple use management by citing examples of each within Alberta research local opportunities for consultation and public involvement in forest management decisions. 	<p>A summative module requiring background knowledge of forestry—should be the last module studied in a sequence of Forestry modules.</p>
Planning Process	<ul style="list-style-type: none"> establish short- and long-term goals for the management of forested land on an integrated basis; e.g., <ul style="list-style-type: none"> recreation forage wildlife habitat wood fibre oil and gas identify scientific, economic and social factors to be addressed through the management plan; e.g., <ul style="list-style-type: none"> the objectives of different stakeholders relevant government acts and regulations forest inventory requirements the silvics of tree species and appropriate harvest methods consumer trends and markets for forest products potential applications of research and technology 	<p><i>See Alberta's Focus on Forests:</i></p> <ul style="list-style-type: none"> 4.3–Forest Perspectives Activity 5.5–Integrated Resource Management <p>Have students interview a local land-owner to determine long-range desires and plans for a forested region. Prepare written management plans consistent with the landowner's long-range goals. Compare with recommendations of a professional forester.</p>

MODULE FOR312: STEWARDSHIP: BALANCING NEEDS (continued)

Concept	Specific Learner Expectations	Notes
Planning Process (continued)	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • survey the views of different stakeholders in the forest and resolve conflicts that may arise; e.g., <ul style="list-style-type: none"> – recreational – environmental – aboriginal – industrial – agricultural • incorporate consultation with other resource users and public involvement into the planning process • identify alternative means of achieving the management goals, and select the preferred alternatives • elaborate upon permits, licences or other legal agreements that may be required • develop a set of actions and present the management plan; e.g., <ul style="list-style-type: none"> – a general description of the forested area – long-term management objectives – short-term management objectives – proposed management standards and guidelines – a schedule of short-term development activities • prepare a map to accompany and elaborate upon the management plan; e.g., <ul style="list-style-type: none"> – boundaries of the forested area – forest cover and other resources within the area – physical features – history of past development – road access – proposed development activities • describe techniques for monitoring the management plan to ensure that goals are being achieved. 	<p>Specific management plans will vary, but need to address some common actions</p>

FORESTRY

SECTION G: ASSESSMENT TOOLS

(DRAFT)

TABLE OF CONTENTS

The following pages include background information and strategies for assessing student achievement and the assessment tools that are listed in Sections D, E and F of this Guide.

This section of the Guide to Standards and Implementation has been designed to provide a common base of understanding about the level of competencies students are expected to demonstrate to successfully complete a module. The goal is to establish assessment standards for junior and senior high school students that are fair, credible, and challenging.

These tools will assist teachers throughout the province to more consistently assess student achievement. The purpose of expanding on the assessment standards is to:

- increase confidence among students, parents, business/industry and post-secondary that students can demonstrate the competencies specified in the modules they have completed
- encourage fairness and equity in how students' efforts are judged
- enable learners to focus effort on key learnings
- support teachers and community partners in planning and implementing CTS.

These tools are in draft form and are being validated between now and 1997 during the optional stage of CTS implementation.

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ASSESSING STUDENT ACHIEVEMENT IN CTS

The CTS assessment standards assess two basic forms of competency:

- What a student **can do**?
 - **make** a product (e.g., wood bowl, report, garment)
 - **demonstrate** a process
 - strand-related competencies (e.g., keyboarding, hair cutting, sewing techniques, lab procedures)
 - basic competencies (e.g., resource use, safety procedures, teamwork).
- What a student **knows**?
 - knowledge base needed to demonstrate a competency (link theory and practice).

CTS Defines *Summative* Assessment Standards

The assessment standards and tools defined for the CTS modules, referenced in Sections D, E and F of this Guide, focus on the final (or summative) assessment of student achievement.

Assessment throughout the learning period (or formative assessment) will continue to assess how students are progressing. Teachers direct and respond to students' efforts to learn—setting and marking tasks and assignments, indicating where improvement is needed, sending out interim reports, congratulating excellence, etc.

Teachers will decide which instructional and assessment strategies to apply during the formative learning period. As formative and summative assessment are closely linked, some teachers may wish to modify the tools included in this section to use during the instructional process. Teachers may also develop their own summative assessment tools as long as the standards are consistent with the minimum expectations outlined by Alberta Education.

Grading and Reporting Student Achievement

When a student can demonstrate ALL of the exit-level competencies defined for the module (Module Learner Expectations), the teacher will designate the module as “successfully completed.” The teacher will then use accepted grading practices to determine the percentage grade to be given for the module—a mark not less than 50%.

The time frame a teacher allows a student to develop the exit-level competency is a local decision. NOTE: The Senior High School Handbook specifies that students must have access to 25 hours of instruction for each credit. Students may, however, attain the required competencies in less time and may proceed to other modules.

Teachers are encouraged to consult their colleagues to ensure grading practices are as consistent as possible.

High school teachers may wish to refer to “Directions for Reporting Student Achievement in CTS” for information on how to use the CTS course codes to report credits students have earned to Alberta Education. (Copies of this document have been forwarded to superintendents and senior high school principals.)

Components of Assessment Standards in CTS

The following components are included in each module:

- **module learner expectations** (shaded left column of the module) define the exit-level competencies students are expected to achieve to complete a module. Each MLE defines and describes critical behaviours that can be measured and observed. The student must meet the standard specified for ALL MLEs within a module to be successful. (*MLEs will not change until 1997 when minor adjustments may be made to update and clarify wording.*)

- **suggested emphasis** (right column of the module) provides a guideline for the relative significance of each MLE and can be used to organize for instruction. (*In draft until early 1997, revisions to selected modules will be distributed in June 1995 and 1996 with final revisions in June 1997.*)
- **conditions and criteria** (middle column of the module) set the framework for the assessment of student competency, specifying the minimum standard for performance and including a reference to assessment tools, where appropriate. (*In draft until early 1997, revisions to selected modules will be distributed in June 1995 and 1996 with final revisions in June 1997.*)

Conditions outline the specifications under which a student's competency can be judged. For example, the conditions could specify whether the assessment should be timed or not, or if the student should be allowed to access to support resources or references.

Criteria define the behaviours that a student must demonstrate to meet the designated standard. For example, the criteria could describe the various techniques that must be demonstrated when using a tool, and/or describe the minimum components of a project the student must complete.

Standard may be defined by (1) assessment tools, which are referenced in this section (or sometimes in approved learning resources) and/or (2) "illustrative examples" of student work (to be developed and distributed in June 1997).

Assessment Tools included in this section of the Guide tend to be of two types:

- tools generic to a strand or to the entire CTS program; e.g., a standard 5-point rating scale is used in all strands. Other generic tools include assessing reports and presentations and lab safety checklists. (*Names of these tools*

include the strand code (e.g., "INF" for Information Processing) and a code for the type of tool (e.g., "TDENT" for Text-Data Entry).)

- tools specific to a module; e.g., assessment checklist for assessing a venture plan in Enterprise and Innovation or a checklist for sketching, drawing and modelling in Design Studies. (*Names of these tools include the module code; e.g., "INF101-1" indicating that it is the first module-specific tool used in Information Processing Module 101.*)
- Illustrative Examples: Selected examples of student work in print, audio, video and/or CD-ROM formats are scheduled to be available by June 1997. These examples will supplement the assessment tools and help teachers decide if a student's work is at standard, above standard, or not yet at standard.

Development and Validation Processes

The "Conditions and Criteria" and "Suggested Emphasis" columns are being validated 1994-97, with extensive input from teachers, professional associations/contacts and post-secondary institutions. The goal is to prepare well-structured assessment standards and related assessment tools that:

- establish an appropriate level of challenge and rigour
- relate directly to the type of learning described in the curriculum standard
- are easy to understand
- are efficient to implement
- can provide a consistent measure of what was expected to be measured.

ASSESSING STUDENT ACHIEVEMENT IN FORESTRY

Assessing student achievement in Forestry involves gathering information about what a student knows and is able to do, and comparing this information with learning outcomes defined by the curriculum (i.e., module learner expectations, assessment conditions and criteria, illustrative examples/reference sets).

Summative assessment for each module in Forestry will focus attention on process (e.g., how the student approaches/performs particular tasks) and product (e.g., quality characteristics of the task performed, item produced or service rendered). While there are also knowledge-based components of learning within each module, a greater emphasis has been suggested for learning that involves the transfer/application of knowledge in task- or service-oriented situations.

Assessment Strategies and Tools

A variety of assessment tools are provided for assessing student performance within each module. Each tool communicates, through a 5-point rating scale, a minimum standard for the completion of a learning task. Criteria for assessing the “basic competencies” students are expected to demonstrate throughout the learning process have been integrated with other performance criteria in each tool.

The assessment tools, when used collectively for a particular module, will assist teachers to assess successful module completion in an equitable and consistent manner. Depending on the way the classroom is organized, assessment tools may be used with individual students upon completion of specific learning tasks, or with the entire class at the end of a learning period.

Tools Generic to Forestry

Assessment tools generic to Forestry have been developed to assist in assessing student performance in key areas of learning across the scope and sequence. The generic tools

communicate minimum performance standards for:

- conducting research, preparing reports and making presentations
- performing practical tasks in stand establishment, tending and maintenance
- conducting laboratory and field-based investigations
- analyzing, negotiating and debating forestry- and environment-related issues
- proposing personal/shared actions that foster environmental citizenship
- exploring career trends and conducting searches of employment opportunities.

The generic tools, referenced as applicable throughout each module in the conditions and criteria column, are identified with a six- or nine-letter code (e.g., FOROBS, FORLOG-VOL). Generic tools developed for use in modules at a specific level are further identified by a number (e.g., FORPRE-1 for introductory, FORPRE-2 for intermediate, FORPRE-3 for advanced).

Tools Specific to Forestry Modules

Other assessment tools have been developed to assess competencies that are unique to specific modules within the Forestry strand. These “module-specific” tools, also referenced in the conditions and criteria column for each module, are identified by the module number followed by a tool number (e.g., FOR107-1 for the first module-specific tool in module FOR107).

In some instances, authorized learning resources have been identified as assessment tools for specific modules. These learning resources usually contain test banks and other assessment strategies considered effective in establishing minimum standards for achievement.

Where appropriate, “Illustrative Examples” or “Sample Assignments/Projects” have been provided in a further attempt to communicate realistic expectations and acceptable standards of achievement.

BASIC COMPETENCIES REFERENCE GUIDE

(This checklist is still being validated)

The following chart outlines basic competencies which students will endeavor to develop and enhance in each of the CTS strands and modules. Students' basic competencies should be assessed through observations involving the student, teacher(s), peers and others as they complete the requirements for each module. In general, there is a progression of task complexity and student initiative as outlined in the Development Framework*. As students progress through the Stages 1, 2, 3 and 4 of this reference guide, they build on the competencies gained in earlier stages. Students leaving high school should set themselves a goal of being able to demonstrate Stage 3 performance.

Suggested strategies for classroom use include:

- having students rate themselves and each other
- using for a reflective conversation between teacher and student
- highlighting areas of strength
- tracking growth in various CTS strands
- highlighting areas upon which to focus
- including in student's portfolio

Stage 1— The student:	Stage 2— The student:	Stage 3— The student:	Stage 4— The student:
Managing Learning <ul style="list-style-type: none"> ☐ comes to class prepared for learning ☐ follows basic instructions as directed ☐ acquires specialized knowledge, skills and attitudes ☐ identifies criteria for evaluating choices and making decisions ☐ uses a variety of learning strategies	<ul style="list-style-type: none"> ☐ follows instructions with limited direction ☐ sets goals and establishes steps to achieve them with direction ☐ applies specialized knowledge, skills and attitudes in practical situations ☐ identifies and applies a range of effective strategies for solving problems and making decisions ☐ explores and uses a variety of learning strategies with limited direction	<ul style="list-style-type: none"> ☐ follows detailed instructions on an independent basis ☐ sets clear goals and establish steps to achieve them ☐ transfers and applies specialized knowledge, skills and attitudes in a variety of situations ☐ uses a range of critical thinking skills to evaluate situations, solve problems and make decisions ☐ selects and uses effective learning strategies ☐ cooperates with others in the effective use of learning strategies	<ul style="list-style-type: none"> ☐ demonstrates self-direction in learning, goal setting and goal achievement ☐ transfers and applies learning in new situations; demonstrates commitment to life-long learning ☐ thinks critically and acts logically to evaluate situations, solve problems and make decisions ☐ provides leadership in the effective use of learning strategies
Managing Resources <ul style="list-style-type: none"> ☐ adheres to established timelines; uses time/schedules/planners effectively ☐ uses information (material and human resources) as directed ☐ uses technology (facilities, equipment, supplies) as directed to perform a task or provide a service ☐ maintains, stores, and/or disposes of equipment and materials as directed 	<ul style="list-style-type: none"> ☐ creates and adheres to timelines with limited direction; uses time/schedules/planners effectively ☐ accesses and uses a range of relevant information (material and human resources) with limited direction ☐ uses technology (facilities, equipment, supplies) as appropriate to perform a task or provide a service with minimal assistance and supervision ☐ maintains, stores and/or disposes of equipment and materials with limited assistance 	<ul style="list-style-type: none"> ☐ creates and adheres to detailed timelines on an independent basis; prioritize task; use time/schedules/planners effectively ☐ accesses a range of information (material and human resources) and recognizes when additional resources are required ☐ selects and uses appropriate technology (facilities, equipment, supplies) to perform a task or provide a service on an independent basis ☐ maintains, stores and/or disposes of equipment and materials on an independent basis 	<ul style="list-style-type: none"> ☐ creates and adheres to detailed timelines; use time/schedules/planners effectively, prioritizing tasks on a consistent basis ☐ uses a wide range of information (material and human resources) in order to support and enhance the basic requirement ☐ recognizes the monetary and intrinsic value of managing technology (facilities, equipment, supplies) ☐ demonstrates effective techniques for managing facilities, equipment and supplies
Problem Solving and Innovation <ul style="list-style-type: none"> ☐ participates in problem solving as a process ☐ learns a range of problem-solving skills and approaches ☐ practices problem-solving skills by responding appropriately to a clearly defined problem, specified goals and constraints by: <ul style="list-style-type: none"> - generating alternatives - evaluating alternatives - selecting appropriate alternative(s) - taking action 	<ul style="list-style-type: none"> ☐ identifies the problem and selects an appropriate problem-solving approach responding appropriately to specified goals and constraints ☐ applies problem-solving skills to a directed or a self-directed activity by: <ul style="list-style-type: none"> - generating alternatives - evaluating alternatives - selecting appropriate alternative(s) - taking action 	<ul style="list-style-type: none"> ☐ thinks critically and acts logically in the context of problem solving ☐ transfers problem-solving skills to real-life situations by generating new possibilities ☐ prepares implementation plans ☐ recognizes risks 	<ul style="list-style-type: none"> ☐ identifies and resolves problems efficiently and effectively ☐ identifies and suggest new ideas to get the job done creatively by: <ul style="list-style-type: none"> - combining ideas or information new ways - making connections between seemingly unrelated ideas - actively seeking out opportunities

Stage 1— The student:	Stage 2— The student:	Stage 3— The student:	Stage 4— The student:
Communicating Effectively <ul style="list-style-type: none"> ☐ uses communication skills; e.g., reading, writing, illustrating, speaking ☐ uses language in appropriate context ☐ listens to understand and learn ☐ demonstrates positive interpersonal skills in selected contexts 	<ul style="list-style-type: none"> ☐ communicates thoughts, feelings, and ideas to justify or challenges a position using written, oral and visual means ☐ uses technical language appropriately ☐ listens and responds to understand and learn ☐ demonstrates positive interpersonal skills in many contexts 	<ul style="list-style-type: none"> ☐ prepares and effectively presents accurate, concise, written, visual and/or oral reports providing reasoned argument ☐ encourages, persuades, convinces or otherwise motivates individuals ☐ listens and responds to understand, learn and teach ☐ demonstrates positive interpersonal skills in most contexts 	<ul style="list-style-type: none"> ☐ negotiates effectively by working towards an agreement that may involve exchanging specific resources or resolving divergent interests ☐ negotiates and works towards a consensus ☐ listens and responds to understand, learn, teach and evaluate ☐ promotes positive interpersonal skills among others .
Working with Others <ul style="list-style-type: none"> ☐ fulfills responsibility in a group project ☐ works collaboratively in structured situations with peer members ☐ acknowledges the opinions and contributions of others in the group 	<ul style="list-style-type: none"> ☐ ☐ cooperates to achieve group results ☐ maintains a balance between speaking, listening and responding in group discussion ☐ respects the feelings and views of others 	<ul style="list-style-type: none"> ☐ seeks a team approach as appropriate based on group needs and benefits e.g. idea potential, variety of strengths, sharing of work load ☐ works in a team or group: <ul style="list-style-type: none"> – encourages and supports team members – helps others in a positive manner – provides leadership/ followership as required – negotiates and works toward consensus as required 	<ul style="list-style-type: none"> ☐ leads, where appropriate, mobilizing the group for high performance ☐ understands and works within the context of the group ☐ prepares, validates and implements plans that reveal new possibilities
Demonstrating Responsibility <p>Attendance</p> <ul style="list-style-type: none"> ☐ demonstrates responsibility in attendance, punctuality and task completion <p>Safety</p> <ul style="list-style-type: none"> ☐ follows personal and environmental health and safety procedures ☐ identifies immediate hazards and their impact on self, others and the environment ☐ follows appropriate/emergency response procedures <p>Ethics</p> <ul style="list-style-type: none"> ☐ makes personal judgements about whether certain behaviour/ action is right or wrong 	<ul style="list-style-type: none"> ☐ ☐ recognizes and follows personal and environmental health and safety procedures ☐ identifies immediate and potential hazards and their impact on self , others and the environment ☐ ☐ assesses how personal judgements affect other peer members and/or family; e.g., home and school 	<ul style="list-style-type: none"> ☐ ☐ establishes and follows personal and environmental health and safety procedures ☐ ☐ ☐ assesses the implications of personal/group actions within the broader community; e.g., workplace 	<ul style="list-style-type: none"> ☐ ☐ transfers and applies personal and environmental health and safety procedures to a variety of environments and situations ☐ ☐ ☐ demonstrates accountability for actions taken to address immediate and potential hazards ☐ analyses the implications of personal/group actions within the global context ☐ states and defends a personal code of ethics as required

Developmental Framework★ <ul style="list-style-type: none"> • Simple task • Structured environment • Directed learning 	<ul style="list-style-type: none"> • Task with limited variable • Less structured environment • Limited direction 	<ul style="list-style-type: none"> • Task with multiple variables • Flexible environment • Self-directed learning, seeking assistance as required 	<ul style="list-style-type: none"> • Complex task • Open environment • Self-directed/self-motivated
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GENERIC RATING SCALE

S C A L E	RUBRIC STATEMENT (included in assessment tool/statements in <i>italics</i> are optional)	IS TASK/ PROJECT COMPLETED?	PROBLEM SOLVING: STUDENT INITIATIVE VS TEACHER DIRECTION/ SUPPORT	USE OF TOOLS, MATERIALS, PROCESSES	STANDARDS OF QUALITY/ PRODUCTIVITY	TEAMWORK LEADERSHIP	SERVICE CLIENT/ CUSTOMER
0	<i>The student:</i> has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.	Has not completed defined outcomes.		Tools, materials and/or processes are used inappropriately.			
1	meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately. <i>Quality and productivity are reasonably consistent. Works cooperatively. Provides a limited range of customer/client services.</i>	Meets defined outcomes.	Follows a guided plan of action.	A limited range of tools, materials and/or processes are used appropriately.	<i>Quality and productivity are reasonably consistent.</i>	<i>Works cooperatively.</i>	<i>Provides a limited range of customer/client services.</i>
2	meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately. <i>Quality and productivity are reasonably consistent. Works cooperatively to achieve team goals. Identifies and provides customer/client services.</i>	Meets defined outcomes.	Plans and solves problems with limited assistance.	Tools, materials and/or processes are selected and used appropriately.	<i>Quality and productivity are reasonably consistent.</i>	<i>Works cooperatively to achieve team goals.</i>	<i>Identifies and provides customer/client services.</i>
3	meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively. <i>Quality and productivity are consistent. Works cooperatively and contributes ideas and suggestions that enhance team effort. Analyzes and provides effective client/customer services.</i>	Meets defined outcomes.	Plans and solves problems in a self- directed manner.	Tools, materials and/or processes are selected and used efficiently and effectively.	<i>Quality and productivity are consistent.</i>	<i>Works cooperatively and contributes ideas and suggestions that enhance team effort.</i>	<i>Analyzes and provides effective client/customer services.</i>
4	exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence. <i>Quality, particularly details and finishes and productivity are consistent and exceed standards. Leads others to contribute team goals. Analyzes and provides effective client/customer services beyond expectations.</i>	Exceeds defined outcomes.	Plans and solves problems effectively and creatively in a self- directed manner.	Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.	<i>Quality, particularly details and finishes and productivity are consistent and exceed standards.</i>	<i>Leads others to contribute team goals.</i>	<i>Analyzes and provides effective client/customer services beyond expectations.</i>

INTRODUCTORY	INTERMEDIATE	ADVANCED
<p><i>The student:</i></p> <p>Preparation and Planning</p> <ul style="list-style-type: none"> • accurately describes an issue on which people disagree • poses an important question regarding the issue • accesses basic in-school/community information sources regarding the issue • uses one or more information-gathering techniques <p>Analyzing Perspectives</p> <ul style="list-style-type: none"> • clarifies different points of view regarding the issue; <i>e.g., social, economic, environmental</i> • states a position on the issue and logical reasons for adopting that position • states an opposing position on the issue and logical reasons for adopting that position • identifies sources of conflict among different positions • distinguishes between fact and fiction/opinion/theory <p>Collaboration and Teamwork</p> <ul style="list-style-type: none"> • shares work appropriately among group members • respects the views of others <p>Evaluating Choices/Making Decisions</p> <ul style="list-style-type: none"> • identifies useful alternatives regarding the issue • establishes criteria for assessing each alternative; <i>e.g., social, economic, environmental</i> • selects an appropriate alternative based on established criteria • reflects on strengths/weaknesses of decisions by considering consequences • communicates information in a logical sequence to justify choices/decisions made 	<p><i>The student:</i></p> <p>Preparation and Planning</p> <ul style="list-style-type: none"> • accurately describes an issue on which people disagree, explaining areas of disagreement • poses one or more thoughtful questions regarding the issue • accesses a range of relevant in-school/community resources • uses a range of information-gathering techniques <p>Analyzing Perspectives</p> <ul style="list-style-type: none"> • categorizes different points of view regarding the issue; <i>e.g., cultural, ethical, economic, environmental, health-related</i> • states a position on the issue and logical reasons for adopting that position • states two or more opposing positions on the issue and logical reasons for adopting each position • describes interrelationships among different perspectives/points of view • determines accuracy/currency/reliability of information and ideas <p>Collaboration and Teamwork</p> <ul style="list-style-type: none"> • shares work appropriately among group members • respects and considers the views of others • negotiates solutions to problems <p>Evaluating Choices/Making Decisions</p> <ul style="list-style-type: none"> • identifies important and appropriate alternatives regarding the issue • establishes knowledge- and value-based criteria for assessing each alternative; <i>e.g., social, economic, environmental</i> • selects an appropriate alternative by showing differences among choices • assesses strengths/weaknesses of decisions by considering consequences • communicates ideas in a logical sequence with supporting detail to justify choices/decisions made 	<p><i>The student:</i></p> <p>Preparation and Planning</p> <ul style="list-style-type: none"> • accurately describes an issue on which people disagree, explaining specific causes of disagreement • poses thoughtful questions regarding the issue • accesses a range of relevant information sources and recognizes when additional information is required • demonstrates resourcefulness in collecting data <p>Analyzing Perspectives</p> <ul style="list-style-type: none"> • categorizes different points of view regarding the issue; <i>e.g., cultural, ethical, economic, environmental, health-related, scientific, political</i> • states a position on the issue and insightful reasons for adopting that position • states three or more opposing positions on the issue and thoughtful reasons for adopting each position • analyzes interrelationships among different perspectives/points of view • recognizes underlying bias/assumptions/values in information and ideas <p>Collaboration and Teamwork</p> <ul style="list-style-type: none"> • shares work appropriately among group members • respects and considers the views of others • negotiates with sensitivity solutions to problems <p>Evaluating Choices/Making Decisions</p> <ul style="list-style-type: none"> • describes in detail important and appropriate alternatives regarding the issue • establishes knowledge- and value-based criteria for assessing each alternative; <i>e.g., social, economic, environmental</i> • selects an appropriate and useful alternative by showing differences among choices • assesses strengths/weaknesses of decisions by considering consequences and implications • communicates thoughts/feelings/ideas clearly to justify choices/decisions made

INTRODUCTORY	INTERMEDIATE	ADVANCED
<p><i>The student:</i></p> <p>Management</p> <ul style="list-style-type: none"> • prepares self for task • organizes and works in an orderly manner • carries out instructions accurately • uses time effectively <p>Teamwork</p> <ul style="list-style-type: none"> • cooperates with group members • shares work appropriately among group members <p>Use of Equipment and Materials</p> <ul style="list-style-type: none"> • selects and uses appropriate equipment/materials • follows safe procedures/techniques • weighs and measures accurately • returns clean equipment/materials to storage areas <p>Investigative Techniques</p> <ul style="list-style-type: none"> • gathers and applies information from at least one source • makes predictions that can be tested • sets up and conducts experiments to test a prediction • distinguishes between manipulated/responding variables • obtains results that can be used to determine if some aspect of the prediction is accurate • summarizes important experimental outcomes 	<p><i>The student:</i></p> <p>Management</p> <ul style="list-style-type: none"> • prepares self for task • organizes and works in an orderly manner • interprets and carries out instructions accurately • plans and uses time effectively • adheres to routine procedures <p>Teamwork</p> <ul style="list-style-type: none"> • cooperates with group members • shares work appropriately among group members • negotiates solutions to problems <p>Use of Equipment and Materials</p> <ul style="list-style-type: none"> • selects and uses appropriate equipment/materials • models safe procedures/techniques • weighs and measures accurately • practises proper sanitation procedures • minimizes waste of materials • advises of potential hazards and necessary repairs <p>Investigative Techniques</p> <ul style="list-style-type: none"> • gathers and applies information from a variety of sources • makes predictions that can be tested • plans, sets up and conducts experiments to test a prediction • identifies and explains manipulated/responding variables • obtains accurate results that confirm/reject the prediction • summarizes and applies experimental outcomes 	<p><i>The student:</i></p> <p>Management</p> <ul style="list-style-type: none"> • prepares self for task • organizes and works in an orderly manner • interprets and carries out instructions accurately • plans and uses time effectively in a logical sequence • displays leadership in adhering to routine procedures • attempts to solve problems prior to requesting help <p>Teamwork</p> <ul style="list-style-type: none"> • cooperates with group members • shares work appropriately among group members • negotiates with sensitivity solutions to problems • displays effective communication skills <p>Use of Equipment and Materials</p> <ul style="list-style-type: none"> • selects and uses equipment/materials independently • demonstrates concern for safe procedures/techniques • weighs and measures accurately and efficiently • practises proper sanitation procedures • minimizes waste of materials • anticipates potential hazards and emergency response <p>Investigative Techniques</p> <ul style="list-style-type: none"> • uses relevant information to explain observations • makes predictions that can be tested • plans, sets up and conducts experiments to test a prediction • analyzes relationships among manipulated/responding variables • obtains accurate results that confirm/reject prediction and answer related questions • summarizes, applies and evaluates experimental outcomes

ASSESSMENT FRAMEWORK: NEGOTIATION AND DEBATE

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INTRODUCTORY	INTERMEDIATE	ADVANCED
<p><i>The student:</i></p> <p>Preparation and Planning</p> <ul style="list-style-type: none"> • accurately describes an issue on which people disagree • poses an important question regarding the issue • accesses basic in-school/community information sources regarding the issue • uses one or more information-gathering techniques <p>Analyzing Perspectives</p> <ul style="list-style-type: none"> • states a position on the issue and logical reasons for adopting that position • explains why the issue is important by presenting examples of possible consequences • clarifies different points of view regarding the issue; e.g., <i>social, economic, environmental</i> • distinguishes between fact and fiction/opinion/theory <p>Collaboration and Teamwork</p> <ul style="list-style-type: none"> • works with a range of peer members • shares information/opinions/suggestions through group discussion • listens to and respects the views of others <p>Negotiating and Debating</p> <ul style="list-style-type: none"> • presents a convincing argument in logical sequence supporting a position adopted on the issue • provides a relevant response to opposing arguments • speaks clearly so the argument can be understood • establishes a shared understanding of key alternatives and consequences relevant to the issue 	<p><i>The student:</i></p> <p>Preparation and Planning</p> <ul style="list-style-type: none"> • accurately describes an issue on which people disagree, explaining areas of disagreement • poses one or more thoughtful questions regarding the issue • accesses a range of relevant in-school/community resources • uses a range of information-gathering techniques <p>Analyzing Perspectives</p> <ul style="list-style-type: none"> • states a position on the issue and logical reasons for adopting that position • explains why the issue is important by presenting examples of possible consequences • categorizes different points of view regarding the issue; e.g., <i>cultural, ethical, economic, environmental, health-related</i> • determines accuracy/currency/reliability of information and ideas <p>Collaboration and Teamwork</p> <ul style="list-style-type: none"> • works with a range of peer members • shares information/opinions/suggestions, maintaining a balance between speaking and listening • listens to and respects the views of others, requesting clarification as necessary from other group members <p>Negotiating and Debating</p> <ul style="list-style-type: none"> • presents a convincing argument in logical sequence supporting a position adopted, conveying points in order of importance • provides a relevant and convincing response to opposing arguments • speaks clearly without hesitation so the argument can be understood • negotiates a shared agreement on preferred alternatives relevant to the issue 	<p><i>The student:</i></p> <p>Preparation and Planning</p> <ul style="list-style-type: none"> • accurately describes an issue on which people disagree, explaining specific causes of disagreement • poses thoughtful questions regarding the issue • accesses a range of relevant information sources and recognizes when additional information is required • demonstrates resourcefulness in collecting data <p>Analyzing Perspectives</p> <ul style="list-style-type: none"> • states a position on the issue and insightful reasons for adopting that position • explains why the issue is important by presenting examples of possible consequences and implications • categorizes different points of view regarding the issue; e.g., <i>cultural, ethical, economic, environmental, health-related, scientific, political</i> • recognizes underlying bias/assumptions/values in information and ideas <p>Collaboration and Teamwork</p> <ul style="list-style-type: none"> • works with a wide range of peer members • shares information/opinions/suggestions, maintaining a balance between speaking and listening • listens to and respects the views of others, requesting clarification as necessary from other group members <p>Negotiating and Debating</p> <ul style="list-style-type: none"> • presents a convincing argument in logical sequence supporting a position adopted, conveying points in order of importance and backing each with sound evidence • provides a relevant and convincing rebuttal to opposing arguments • speaks clearly without hesitation so the argument can be understood by all listeners • negotiates a shared agreement on preferred alternatives by resolving divergent points of view

INTRODUCTORY	INTERMEDIATE	ADVANCED
<p><i>The student:</i></p> <p>Preparation and Planning</p> <ul style="list-style-type: none"> • sets goals and follows instructions accurately • responds to directed questions and follows necessary steps to find answers • accesses basic in-school/community information sources • interprets and organizes information into a logical sequence • records information accurately, using correct technical terms • uses time effectively <p>Presentation</p> <ul style="list-style-type: none"> • demonstrates effective use of at least one medium of communication: <i>e.g., Written: spelling, punctuation, grammar, basic format</i> <i>Oral: voice projection, body language</i> <i>Audio-Visual: techniques, tools</i> • uses correct grammatical convention and technical terms through proofreading/editing • provides an introduction that describes the purpose of the project • communicates information in a logical sequence • states a conclusion based on a summary of facts • provides a reference list of three or more basic information sources 	<p><i>The student:</i></p> <p>Preparation and Planning</p> <ul style="list-style-type: none"> • sets goals and describes steps to achieve them • uses personal initiative to formulate questions and find answers • accesses a range of relevant in-school/community resources • interprets, organizes and combines information into a logical sequence • records information accurately with appropriate supporting detail and using correct technical terms • plans and uses time effectively • gathers and responds to feedback regarding approach to task and project status <p>Presentation</p> <ul style="list-style-type: none"> • demonstrates effective use of at least two communication media: <i>e.g., Written: spelling, punctuation, grammar, format (formal/informal)</i> <i>Oral: voice projection, body language, appearance</i> <i>Audio-Visual: techniques, tools, clarity</i> • maintains acceptable grammatical and technical standards through proofreading and editing • provides an introduction that describes the purpose and scope of the project • communicates ideas into a logical sequence with sufficient supporting detail • states a conclusion by synthesizing the information gathered • provides a reference list that includes five or more relevant information sources 	<p><i>The student:</i></p> <p>Preparation and Planning</p> <ul style="list-style-type: none"> • sets goals and describes steps to achieve them • uses personal initiative to formulate questions and find answers • accesses a range of relevant information sources and recognizes when additional information is required • interprets, organizes and combines information in creative and thoughtful ways • records information accurately, using appropriate technical terms and supporting detail • plans and uses time effectively, prioritizing tasks on a consistent basis • assesses and refines approach to task and project status based on feedback and reflection <p>Presentation</p> <ul style="list-style-type: none"> • demonstrates effective use of a variety of communication media: <i>e.g., Written: spelling, punctuation, grammar, format (formal/informal, technical/literary)</i> <i>Oral: voice projection, body language, appearance, enthusiasm, evidence of prior practice</i> <i>Audio-Visual: techniques, tools, clarity, speed and pacing</i> • maintains acceptable grammatical and technical standards through proofreading and editing • provides an introduction that describes the purpose and scope of the project • communicates thoughts/feelings/ideas clearly to justify or challenge a position • states a conclusion by analyzing and synthesizing the information gathered • gives evidence of adequate research through a reference list including seven or more relevant information sources

INTRODUCTORY	INTERMEDIATE	ADVANCED
<p><i>The student:</i></p> <p>Preparation and Planning</p> <ul style="list-style-type: none"> • sets goals and follows instructions accurately • adheres to established timelines • responds to directed questions and follows necessary steps to find answers • uses time effectively <p>Information Gathering and Processing</p> <ul style="list-style-type: none"> • accesses basic in-school/community information sources • uses one or more information-gathering techniques • interprets and organizes information in a logical sequence • records information accurately, using correct technical terms • distinguishes between fact and fiction/opinion/theory • responds to feedback when current approach is not working <p>Collaboration and Teamwork</p> <ul style="list-style-type: none"> • cooperates with group members • shares work appropriately among group members <p>Information Sharing</p> <ul style="list-style-type: none"> • demonstrates effective use of one or more communication media; <i>e.g., written, oral, audio-visual</i> • communicates information in a logical sequence • uses correct grammatical convention and technical terms • cites three or more basic information sources 	<p><i>The student:</i></p> <p>Preparation and Planning</p> <ul style="list-style-type: none"> • sets goals and establishes steps to achieve them • creates and adheres to useful timelines • uses personal initiative to formulate questions and find answers • plans and uses time effectively <p>Information Gathering and Processing</p> <ul style="list-style-type: none"> • accesses a range of relevant in-school/community resources • uses a range of information-gathering techniques • interprets, organizes and combines information into a logical sequence • records information accurately with appropriate supporting detail and using correct technical terms • determines accuracy/currency/reliability of information sources • gathers and responds to feedback regarding approach to the task <p>Collaboration and Teamwork</p> <ul style="list-style-type: none"> • cooperates with group members • shares work appropriately among group members • negotiates solutions to problems <p>Information Sharing</p> <ul style="list-style-type: none"> • demonstrates effective use of two or more communication media; <i>e.g., written, oral, audio-visual</i> • communicates ideas in a logical sequence with sufficient supporting detail • maintains acceptable grammatical and technical standards • cites five or more relevant information sources 	<p><i>The student:</i></p> <p>Preparation and Planning</p> <ul style="list-style-type: none"> • sets clear goals and establishes steps to achieve them • creates and adheres to detailed timelines • uses personal initiative to formulate questions and find answers • plans and uses time effectively, prioritizing tasks on a consistent basis <p>Information Gathering and Processing</p> <ul style="list-style-type: none"> • accesses a range of relevant information sources and recognizes when additional information is required • demonstrates resourcefulness in collecting data • interprets, organizes and combines information in creative and thoughtful ways • records information accurately with appropriate supporting detail and using correct technical terms • recognizes underlying bias/assumptions/values in information sources • assesses and refines approach to the task and project status based on feedback and reflection <p>Collaboration and Teamwork</p> <ul style="list-style-type: none"> • cooperates with group members • shares work appropriately among group members • negotiates with sensitivity solutions to problems • displays effective communication and leadership skills <p>Information Sharing</p> <ul style="list-style-type: none"> • demonstrates effective use of a variety of communication media; <i>e.g., written, oral, audio-visual</i> • communicates thoughts/feelings/ideas clearly to justify or challenge a position • maintains acceptable grammatical and technical standards • gives evidence of adequate information gathering by citing seven or more relevant information sources

TASK	OBSERVATION/RATING			
Preparation and Planning	4	3	2	1 0 N/A
Content	4	3	2	1 0 N/A
Presenting/Reporting	4	3	2	1 0 N/A

STANDARD IS 1 IN EACH APPLICABLE TASK

Rating Scale

The student:

- 4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.
- 3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.
- 2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.
- 1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.
- 0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

TASK CHECKLIST

The student:

Preparation and Planning

- ☐ sets goals and follows instruction accurately
- ☐ responds to directed questions and follows necessary steps to find answers
- ☐ accesses basic in-school/community information sources
- ☐ interprets and organizes information into a logical sequence
- ☐ records information accurately, using correct technical terms
- ☐ uses time effectively

Content

Presenting/Reporting

- ☐ demonstrates effective use of at least one medium of communication:
e.g., Written: *spelling, punctuation, grammar, basic format*
Oral: *voice projection, body language*
Audio-Visual: *techniques, tools*
- ☐ uses correct grammatical convention and technical terms through proofreading/editing
- ☐ provides an introduction that describes the purpose of the project
- ☐ communicates information in a logical sequence
- ☐ states a conclusion based on a summary of facts
- ☐ provides a reference list of three or more basic information sources

REFLECTIONS/COMMENTS:

TASK	OBSERVATION/RATING			
Preparation and Planning	4	3	2	1 0 N/A
Content	4	3	2	1 0 N/A
Presenting/Reporting	4	3	2	1 0 N/A

STANDARD IS 2 IN EACH APPLICABLE TASK

Rating Scale

The student:

- 4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.
- 3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.
- 2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.
- 1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.
- 0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

TASK CHECKLIST

The student:

Preparation and Planning

- ☐ sets goals and describes steps to achieve them
- ☐ uses personal initiative to formulate questions and find answers
- ☐ accesses a range of relevant in-school/community resources
- ☐ interprets, organizes and combines information into a logical sequence
- ☐ records information accurately with appropriate supporting detail and using correct technical terms
- ☐ plans and uses time effectively
- ☐ gathers and responds to feedback regarding approach to task and project status

Content

Content (continued)

Presenting/Reporting

- ☐ demonstrates effective use of at least two communication media:
e.g., Written: *spelling, punctuation, grammar, format (formal/informal)*
Oral: *voice projection, body language, appearance*
Audio-Visual: *techniques, tools, clarity*
- ☐ maintains acceptable grammatical and technical standards through proofreading and editing
- ☐ provides an introduction that describes the purpose and scope of the project
- ☐ communicates ideas into a logical sequence with sufficient supporting detail
- ☐ states a conclusion by synthesizing the information gathered
- ☐ provides a reference list that includes five or more relevant information sources

REFLECTIONS/COMMENTS:

TASK	OBSERVATION/RATING				
Preparation and Planning	4	3	2	1	0
Content	4	3	2	1	0
Presenting/Reporting	4	3	2	1	0
					N/A

STANDARD IS 3 IN EACH APPLICABLE TASK**Rating Scale***The student:*

- 4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.
- 3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.
- 2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.
- 1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.
- 0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

TASK CHECKLIST*The student:***Preparation and Planning**

- ☐ sets goals and describes steps to achieve them
- ☐ uses personal initiative to formulate questions and find answers
- ☐ accesses a range of relevant information sources and recognizes when additional information is required
- ☐ interprets, organizes and combines information in creative and thoughtful ways
- ☐ records information accurately, using appropriate technical terms and supporting detail
- ☐ plans and uses time effectively, prioritizing tasks on a consistent basis
- ☐ accesses and refines approach to task and project status based on feedback and reflection

Content**Content (continued)****Presenting/Reporting**

- ☐ demonstrates effective use of at least one medium of communication:
e.g., Written: spelling, punctuation, grammar, format (formal/informal, technical/literary) voice projection, body language, appearance, enthusiasm, evidence of prior practice
- ☐ Oral:
techniques, tools, clarity, speed and pacing
- ☐ maintains acceptable grammatical and technical standards through proofreading and editing
- ☐ provides an introduction that describes the purpose and scope of the project
- ☐ communicates thoughts/feelings/ideas clearly to justify or challenge a position
- ☐ states a conclusion by analyzing and synthesizing the information gathered
- ☐ gives evidence of adequate research through a reference list including seven or more relevant information sources

REFLECTIONS/COMMENTS:

TASK	OBSERVATION/RATING				
Preparation and Planning	4	3	2	1	0 N/A
Information Gathering and Processing	4	3	2	1	0 N/A
Content	4	3	2	1	0 N/A
Collaboration and Teamwork	4	3	2	1	0 N/A
Information Sharing	4	3	2	1	0 N/A

STANDARD IS 1 IN EACH APPLICABLE TASK**Rating Scale***The student:*

- 4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.
- 3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.
- 2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.
- 1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.
- 0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

CSB: 96 06 07
(Interim 1994)**TASK CHECKLIST***The student:***Preparation and Planning**

- ☐ sets goals and follows instructions accurately
- ☐ adheres to established timelines
- ☐ responds to directed questions and follows necessary steps to find answers
- ☐ uses time effectively

Information Gathering and Processing

- ☐ accesses basic in-school/community information sources
- ☐ uses one or more information-gathering techniques
- ☐ interprets and organizes information into a logical sequence
- ☐ records information accurately, using correct technical terms
- ☐ distinguishes between fact and fiction/opinion/theory
- ☐ responds to feedback when current approach is not working

Content

- ☐ describes one or more career clusters within the field; e.g.:
 - labour-based
 - technical
 - professional

Content (continued)

- ☐ identifies and describes occupations relevant to one or more career clusters; e.g.:
 - nature of the occupation
 - duties of the employee
- ☐ provides a survey of current employment statistics relevant to one or more career clusters; e.g.:
 - types of occupations
 - number of employees
- ☐ identifies entry requirements and training programs relevant to one or more career clusters; e.g.:
 - entrance requirements and competencies
 - type of training programs
- ☐ assesses current and future employment opportunities and trends; e.g.:
 - local and national needs
 - opportunities for advancement

Collaboration and Teamwork

- ☐ cooperates with group members
- ☐ shares work appropriately among group members

Information Sharing

- ☐ demonstrates effective use of one or more communication media:
e.g., written, oral, audio-visual
- ☐ communicates information in a logical sequence
- ☐ uses correct grammatical conventions and technical terms
- ☐ cites three or more basic information sources

REFLECTIONS/COMMENTS:

TASK	OBSERVATION/RATING				
Preparation and Planning	4	3	2	1	0
Information Gathering and Processing	4	3	2	1	0
Content	4	3	2	1	0
Collaboration and Teamwork	4	3	2	1	0
Information Sharing	4	3	2	1	0

STANDARD IS 2 IN EACH APPLICABLE TASK**Rating Scale**

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

Forestry /G.20
(Interim '994)

TASK CHECKLIST

The student:

Preparation and Planning

- ☐ sets goals and establishes steps to achieve them
- ☐ creates and adheres to useful timelines
- ☐ uses personal initiative to formulate questions and find answers
- ☐ plans and uses time effectively

Information Gathering and Processing

- ☐ accesses a range of relevant in-school/community resources
- ☐ uses a range of information-gathering techniques
- ☐ interprets, organizes and combines information into a logical sequence
- ☐ records information accurately with appropriate supporting detail and using correct technical terms
- ☐ determines accuracy/currency/reliability of information sources
- ☐ gathers and responds to feedback regarding approach to the task

Content

- ☐ describes one or more career clusters within the field; e.g.:
 - labour-based
 - technical
 - professional
- ☐ identifies and describes occupations relevant to one or more career clusters; e.g.:
 - nature of the occupation
 - duties of the employee
 - workplace conditions

Content (continued)

- ☐ provides a survey of current employment statistics relevant to one or more career clusters; e.g.:
 - types of occupations
 - number of employees
 - employment trends
- ☐ identifies entry requirements and training programs relevant to one or more career clusters; e.g.:
 - entrance requirements and competencies
 - type and extent of training programs
- ☐ assesses current and future employment opportunities and trends; e.g.:
 - local, national and international needs
 - opportunities for advancement and/or career change

Collaboration and Teamwork

- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates solutions to problems

Information Sharing

- ☐ demonstrates effective use of two or more communication media:
 - e.g., written, oral, audio-visual*
- ☐ communicates ideas in a logical sequence with sufficient supporting detail
- ☐ maintains acceptable grammatical and technical standards
- ☐ cites five or more relevant information sources

REFLECTIONS/COMMENTS:

TASK	OBSERVATION/RATING				
Preparation and Planning	4	3	2	1	0
Information Gathering and Processing	4	3	2	1	0
Content	4	3	2	1	0
Collaboration and Teamwork	4	3	2	1	0
Information Sharing	4	3	2	1	0

STANDARD IS 3 IN EACH APPLICABLE TASK

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

CSB: 96 06 07
(Interim 1994)

TASK CHECKLIST

The student:

Preparation and Planning

- ☐ sets clear goals and establishes steps to achieve them
- ☐ creates and adheres to detailed timelines
- ☐ uses personal initiative to formulate questions and find answers
- ☐ plans and uses time effectively, prioritizing tasks on a consistent basis

Information Gathering and Processing

- ☐ accesses a range of relevant information sources and recognizes when additional information is required
- ☐ demonstrates resourcefulness in collecting data interprets, organizes and combines information in creative and thoughtful ways
- ☐ records information accurately with appropriate supporting detail and using correct technical terms
- ☐ recognizes underlying bias/assumptions/values in information sources
- ☐ assesses and refines approach to the task and project status based on feedback and reflection

Content

- ☐ describes one or more career clusters within the field; e.g.:
 - labour-based
 - technical
 - professional
- ☐ identifies and describes occupations relevant to one or more career clusters; e.g.:
 - nature of the occupation
 - duties of the employee
 - workplace conditions
 - salary/wages and employee benefits

Content (continued)

- ☐ provides a survey of current employment statistics relevant to one or more career clusters; e.g.:
 - types of occupations
 - number of employees
 - employment trends
- ☐ identifies entry requirements and training programs relevant to one or more career clusters; e.g.:
 - entrance requirements and competencies
 - type and extent of training programs
 - post-secondary institutions
- ☐ assesses current and future employment opportunities and trends; e.g.:
 - local, national and international needs
 - opportunities for advancement and/or career change
 - opportunities for self-employment and entrepreneurship

Collaboration and Teamwork

- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates with sensitivity solutions to problems
- ☐ displays effective communication and leadership skills

Information Sharing

- ☐ demonstrates effective use of a variety of communication media:
 - e.g., written, oral, audio-visual
- ☐ communicates thoughts/feelings/ideas clearly to justify or challenge a position
- ☐ maintains acceptable grammatical and technical standards
- ☐ gives evidence of adequate information gathering by citing seven or more relevant information sources.

REFLECTIONS/COMMENTS:

TASK	OBSERVATION/RATING				
Preparation and Planning	4	3	2	1	0
Analyzing Perspectives	4	3	2	1	0
Collaboration and Teamwork	4	3	2	1	0
Negotiating and Debating	4	3	2	1	0

STANDARD IS 1 IN EACH APPLICABLE TASK

Rating Scale

The student:

- 4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.
- 3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.
- 2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.
- 1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.
- 0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

Forestry /G.22
(Interiv '994)

TASK CHECKLIST

The student:

Preparation and Planning

- ☐ accurately describes an issue on which people disagree
- ☐ poses an important question regarding the issue
- ☐ accesses basic in-school/community information sources regarding the issue
- ☐ uses one or more information-gathering techniques

Collaboration and Teamwork

- ☐ works with a range of peer members
- ☐ shares information/opinions/suggestions through group discussion
- ☐ listens to and respects the views of others

Negotiating and Debating

- ☐ presents a convincing argument in logical sequence supporting a position adopted on the issue

Analyzing Perspectives

- ☐ states a position on the issue and logical reasons for adopting that position
- ☐ explains why the issue is important by presenting examples of possible consequences
- ☐ clarifies different points of view regarding the issue; *e.g., social, economic, environmental*
- ☐ distinguishes between fact and fiction/opinion/theory

- ☐ provides a relevant response to opposing arguments

- ☐ speaks clearly so the argument can be understood

- ☐ establishes a shared understanding of key alternatives and consequences relevant to the issue

REFLECTIONS/COMMENTS:

TASK	OBSERVATION/RATING				
Preparation and Planning	4	3	2	1	0
Analyzing Perspectives	4	3	2	1	0
Collaboration and Teamwork	4	3	2	1	0
Negotiating and Debating	4	3	2	1	0

STANDARD IS 2 IN EACH APPLICABLE TASK**Rating Scale***The student:*

- 4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.
- 3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.
- 2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.
- 1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.
- 0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

TASK CHECKLIST*The student:***Preparation and Planning**

- ☐ accurately describes an issue on which people disagree, explaining areas of disagreement
- ☐ poses one or more thoughtful questions regarding the issue
- ☐ accesses a range of relevant in-school/community resources
- ☐ uses a range of information-gathering techniques

Collaboration and Teamwork

- ☐ works with a range of peer members
- ☐ shares information/opinions/suggestions, maintaining a balance between speaking and listening
- ☐ listens to and respects the views of others, requesting clarification as necessary from other group members

Analyzing Perspectives

- ☐ states a position on the issue and logical reasons for adopting that position
- ☐ explains why the issue is important by presenting examples of possible consequences
- ☐ categorizes different points of view regarding the issue; e.g., *cultural, ethical, economic, environmental, health-related*
- ☐ determines accuracy/currency/reliability of information and ideas

Negotiating and Debating

- ☐ presents a convincing argument in logical sequence supporting a position adopted, conveying points in order of importance
- ☐ provides a relevant and convincing response to opposing arguments
- ☐ speaks clearly without hesitation so the argument can be understood
- ☐ negotiates a shared agreement on preferred alternatives relevant to the issue

REFLECTIONS/COMMENTS:

TASK	OBSERVATION/RATING				
Preparation and Planning	4	3	2	1	0
Analyzing Perspectives	4	3	2	1	0
Collaboration and Teamwork	4	3	2	1	0
Negotiating and Debating	4	3	2	1	0

STANDARD IS 3 IN EACH APPLICABLE TASK

Rating Scale

The student:

- 4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.
- 3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.
- 2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.
- 1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.
- 0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

Forestry /G.24
(Interj' '994)

TASK CHECKLIST

The student:

Preparation and Planning

- ☐ accurately describes an issue on which people disagree, explaining specific causes of disagreement
- ☐ poses thoughtful questions regarding the issue
- ☐ accesses a range of relevant information sources and recognizes when additional information is required
- ☐ demonstrates resourcefulness in collecting data

Analyzing Perspectives

- ☐ states a position on the issue and insightful reasons for adopting that position
- ☐ explains why the issue is important by presenting examples of possible consequences and implications
- ☐ categorizes different points of view regarding the issue;
e.g., cultural, ethical, economic, environmental, health-related, scientific, political
- ☐ recognizes underlying bias/assumptions/values in information and ideas

Collaboration and Teamwork

- ☐ works with a wide range of peer members
- ☐ shares information/opinions/suggestions, maintaining a balance between speaking and listening
- ☐ listens to and respects the views of others, requesting clarification as necessary from other group members

Negotiating and Debating

- ☐ presents a convincing argument in logical sequence supporting a position adopted, conveying points in order of importance and backing each with sound evidence
- ☐ provides a relevant and convincing rebuttal to opposing arguments
- ☐ speaks clearly without hesitation so the argument can be understood by all listeners
- ☐ negotiates a shared agreement on preferred alternatives by resolving divergent points of view

REFLECTIONS/COMMENTS:

Student Name: _____

Module(s): FOR104 FOR105 FOR106 FOR204 FOR206 FOR311

ACTIVITY/ TASK:									
DATE:									
Management	4	4	4	4	4	4	4	4	4
	3	3	3	3	3	3	3	3	3
	2	2	2	2	2	2	2	2	2
	1	1	1	1	1	1	1	1	1
Teamwork	0	0	0	0	0	0	0	0	0
	4	4	4	4	4	4	4	4	4
	3	3	3	3	3	3	3	3	3
	2	2	2	2	2	2	2	2	2
Use of Equipment and Materials	1	1	1	1	1	1	1	1	1
	0	0	0	0	0	0	0	0	0
	4	4	4	4	4	4	4	4	4
	3	3	3	3	3	3	3	3	3
Environmental Ethics	2	2	2	2	2	2	2	2	2
	1	1	1	1	1	1	1	1	1
	0	0	0	0	0	0	0	0	0
	4	4	4	4	4	4	4	4	4

Rating Scale*The student:*

- 4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.
- 3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.
- 2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.
- 1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.
- 0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

ASSESSMENT CRITERIA*The student:***Management**

- ☐ prepares self for task
- ☐ organizes and works in an orderly manner
- ☐ interprets and carries out instructions accurately
- ☐ plans and uses time in a logical sequence
- ☐ attempts to solve problems prior to requesting help
- ☐ _____
- ☐ _____

Teamwork

- ☐ cooperates with group members
- ☐ shares tasks/tools appropriately among peers
- ☐ negotiates solutions to problems
- ☐ displays effective communication skills
- ☐ _____
- ☐ _____

Use of Equipment and Materials

- ☐ selects appropriate equipment and materials
- ☐ handle/uses equipment and materials safely
- ☐ demonstrates concern for safe procedures/techniques
- ☐ cleans/maintains/stores equipment in a safe manner
- ☐ keeps work/study environment clean and organized
- ☐ advises of immediate hazards and necessary repairs
- ☐ _____
- ☐ _____

Environmental Ethics

- ☐ protects flora and fauna
- ☐ chooses environmentally friendly materials
- ☐ minimizes generation of waste materials
- ☐ follows accepted practices for disposing of wastes
- ☐ protects/manages water supply
- ☐ _____
- ☐ _____

CSB: 96 06 07

Forestry /G.25
(Interim 1994)

RATING	ASSESSMENT CRITERIA
4 3 2 1 0	<p><i>The student:</i></p> <p>Preparation and Planning</p> <p>☐ identifies a specific issue regarding the forest environment</p> <p>☐ talks to others in order to clarify ideas</p> <p>☐ accesses basic in-school/community resources regarding the issue</p> <p>☐ identifies appropriate individuals/agencies to contact</p> <p>☐ establishes a position on the issue</p> <p>☐</p> <p>Writing the Letter</p> <p>☐ clearly states a position on the issue and a rationale for adopting that position</p> <p>☐ considers the implications of various approaches for dealing with the issue</p> <p>☐ cites references to support information/views</p> <p>☐ maintains an appropriate tone of communication</p> <p>☐ requests a response to the letter</p> <p>☐ uses correct grammatical and technical conventions</p> <p>☐ demonstrates proof-reading and editing skills</p> <p>☐</p> <p>Critiquing the Response</p> <p>☐ identifies important elements of the response:</p> <p>– acknowledgement of support or concern</p> <p>– statement of position and rationale</p> <p>– reference to supporting information/views</p> <p>– comments regarding future options/alternatives</p> <p>☐ assesses quality of the response based on:</p> <p>– logical development of ideas</p> <p>– quality/quantity of supporting information and views</p> <p>– tone of communication</p> <p>☐ suggests possible improvements to the response and original letter</p> <p>☐</p>

Rating Scale

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- 2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.
- 1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.
- 0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

REFLECTIONS/COMMENTS

TASK CHECKLIST FOR MAPPING

FORMAP

TASK	OBSERVATION/RATING				
Preparation and Planning	4	3	2	1	0
Technical Components	4	3	2	1	0
Information Sharing	4	3	2	1	0
Collaboration and Teamwork	4	3	2	1	0

STANDARD IS 1 FOR INTRODUCTORY LEVEL MODULES, 2 FOR INTERMEDIATE LEVEL MODULES, AND 3 FOR ADVANCED LEVEL MODULES

Rating Scale

The student:

- 4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.
- 3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.
- 2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.
- 1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.
- 0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

TASK CHECKLIST

The student:

Preparation and Planning

- ☐ sets goals and follows instructions
- ☐ responds to directed questions and/or follows necessary steps to find answers
- ☐ uses time effectively
- ☐ accesses basic in-school/community information sources
- ☐ interprets and organizes information logically
- ☐ transfers and/or extrapolates data from print and visual sources to create maps
- ☐

Technical Components

- ☐ prepares an outline of the mapped area to scale
- ☐ provides an appropriate map title
- ☐ records relevant location data
- ☐ provides a map legend that explains:
 - map symbols
 - map scale
- ☐ organizes use of space; e.g.:
 - map size in relationship to paper size
 - use of borders
 - position of legend

Technical Components (continued)

- ☐ demonstrates appropriate use of colour, shading and/or patterns
- ☐ produces a document free of wrinkles and smudges
- ☐ maintains appropriate technical standards through proof-reading and editing; e.g.:
 - spelling
 - legibility
- ☐

Information Sharing

- ☐ communicates map content through oral presentation
- ☐ demonstrates ability to use map overlays in presentation
- ☐ poses questions based on information provided in map
- ☐

Collaboration and Teamwork

- ☐ shares work appropriately among group members
- ☐ respects the views of others
- ☐ negotiates solutions to problems
- ☐

REFLECTIONS/COMMENTS

GUIDE TO CRITIQUING MEDIA INFORMATION

FORMED

Student Name:	Date:
Media Source:	
Method of Presentation:	
Issue/Topic:	

GOALS/OBJECTIVES OF THE MEDIA PRESENTATION

SUMMARY OF INFORMATION PRESENTED (e.g., topic/issue, position taken, supporting detail, implications/consequences)

QUALITY/OBJECTIVITY OF INFORMATION PRESENTED (e.g., bias-balance, currency/reliability, logic/reasoning)

PERSONAL IMPACT OF MEDIA PRESENTATION

Yes	No	ASSESSING QUALITY/OBJECTIVITY
☐	☐	<i>The media presentation:</i> clearly describes a topic/issue/position taken with sufficient supporting detail
☐	☐	demonstrates bias-balance in the manner of presentation
☐	☐	makes reference to different points of view (e.g., social, economic, environmental)
☐	☐	distinguishes between fact and fiction/opinion/theory
☐	☐	references current and reliable sources for information and ideas
☐	☐	draws valid conclusions based on analysis/synthesis of information
☐	☐	

Rating Scale

The student:

- 4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.
- 3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.
- 2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.
- 1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.
- 0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

LOG/VERIFICATION OF VOLUNTEER WORK**FORLOG-VOL(a)**

Student Name: _____ Module: _____ Supervisor: _____

<p>Volunteer Service Provided: _____ Date: _____</p> <p>Volunteer Site/Location: _____</p> <p>Time Volunteered: _____</p> <p>Description of Volunteer Service: _____</p> <p>(a) goals/tasks established by supervisor _____</p> <p>_____</p> <p>_____</p> <p>(b) tasks completed by volunteer: _____</p> <p>_____</p> <p>_____</p> <p>Observations/Insights Gained From Volunteer Work: _____</p> <p>_____</p> <p>_____</p> <p>Comments: _____</p> <p>_____</p> <p>_____</p> <p>(Student's Signature) _____</p> <p>(Supervisor's Signature) _____ (Supervisor/s Phone Number) _____</p>	<p>Volunteer Service Provided: _____ Date: _____</p> <p>Volunteer Site/Location: _____</p> <p>Time Volunteered: _____</p> <p>Description of Volunteer Service: _____</p> <p>(a) goals/tasks established by supervisor _____</p> <p>_____</p> <p>_____</p> <p>(b) tasks completed by volunteer: _____</p> <p>_____</p> <p>_____</p> <p>Observations/Insights Gained From Volunteer Work: _____</p> <p>_____</p> <p>_____</p> <p>Comments: _____</p> <p>_____</p> <p>_____</p> <p>(Student's Signature) _____</p> <p>(Supervisor's Signature) _____ (Supervisor/s Phone Number) _____</p>
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STANDARD: The student completes all sections of the log/verification for 5 hours of volunteer work.

PREPARATION AND PLANNING	YES	NO	N/A
<i>The student:</i>			
• identifies personal and environmental goals for volunteer work	☐	☐	
• prepares a list of potential environmental, forest industry and/or professional organizations to contact regarding volunteer work	☐	☐	☐
• contacts an organization regarding desire to volunteer, sharing personal information through interview and/or resume	☐	☐	☐
• obtains satisfactory placement for volunteer work	☐	☐	
• establishes a schedule of dates and times for volunteer work	☐	☐	
• identifies and adheres to school policies/procedures regarding off-campus activities	☐	☐	

STANDARD IS 2 IN EACH APPLICABLE TASK AREA

Rating Scale

The student:

- 4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.
- 3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.
- 2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.
- 1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.
- 0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.
- N/A Not Applicable

REFLECTIONS / COMMENTS

VERIFYING AND REFLECTING	YES	NO	N/A
<i>The student:</i>			
• submits a log of tasks undertaken for each volunteer site and/or work experience (see Part II)	☐	☐	
• performs volunteer tasks in a satisfactory manner (see Part II)	☐	☐	
• provides a brief written summary of personal observations/impressions regarding the volunteer experience: <ul style="list-style-type: none"> – contribution of tasks undertaken to environmental stewardship – problems encountered and suggested solutions – recommendations regarding future volunteer experiences 	☐	☐	

STUDENT LOG OF ACTIVITIES	VERIFICATION BY SUPERVISOR
<p>Student's Name: _____</p> <p>Sponsoring Organization: _____</p> <p>Supervisor's Name/Position: _____</p> <p>Date(s) of Volunteer Work: _____</p> <p>Time(s)/Duration of Volunteer Work: _____</p> <p>_____</p> <p>Volunteer Tasks Undertaken:</p>	<p><i>The student:</i></p> <ul style="list-style-type: none"> ☐ follows instructions and adheres to guidelines ☐ uses time effectively ☐ demonstrates concern for safe procedures and techniques ☐ anticipates and advises of potential hazards ☐ works cooperatively with other group members. <p>Supervisor's Comments:</p>
<p>_____</p> <p>Student's Signature</p>	<p>_____</p> <p>Supervisor's Signature</p>
<p>_____</p> <p>Date</p>	<p>_____</p> <p>Date</p>

REFLECTION GUIDE FOR OUTDOOR EXPERIENCES

FORREF-OUT

JOURNAL ENTRY;	#1	#2	#3	#4	#5
DATE:					
Individual/Group Preparedness	4 3 2 1 0 N/A	4 3 2 1 0 N/A	4 3 2 1 0 N/A	4 3 2 1 0 N/A	4 3 2 1 0 N/A
Cooperation and Teamwork	4 3 2 1 0 N/A	4 3 2 1 0 N/A	4 3 2 1 0 N/A	4 3 2 1 0 N/A	4 3 2 1 0 N/A
Responsibility and Safety	4 3 2 1 0 N/A	4 3 2 1 0 N/A	4 3 2 1 0 N/A	4 3 2 1 0 N/A	4 3 2 1 0 N/A
Environmental Ethics	4 3 2 1 0 N/A	4 3 2 1 0 N/A	4 3 2 1 0 N/A	4 3 2 1 0 N/A	4 3 2 1 0 N/A
TOTAL:					

Rating Scale

The student:

- 4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.
- 3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.
- 2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.
- 1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.
- 0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

CRITERIA FOR REFLECTION

The student:

Individual/Group Preparedness

- ☐ sets goals and follows instructions accurately
- ☐ adheres to established timelines
- ☐ identifies/assembles outdoor gear appropriate to the task
- ☐ uses time effectively

Cooperation and Teamwork

- ☐ works with a range of peer members
- ☐ shares work appropriately among group members
- ☐ considers the ideas/suggestions of others

Responsibility and Safety

- ☐ selects and uses appropriate equipment/materials
- ☐ follows safe procedures/techniques
- ☐ anticipates and advises of potential hazards
- ☐ practices proper sanitation procedures

Environmental Ethics

- ☐ uses environmentally-friendly materials
- ☐ picks up garbage and carries everything out that is carried in
- ☐ avoids ecologically sensitive areas
- ☐ demonstrates techniques for protecting water supply

JOURNAL ENTRY:	#1	#2	#3	#4	#5
DATE:					
Preparation and Planning	4 3 2 1 0 N/A	4 3 2 1 0 N/A	4 3 2 1 0 N/A	4 3 2 1 0 N/A	4 3 2 1 0 N/A
Comprehension and Analysis	4 3 2 1 0 N/A	4 3 2 1 0 N/A	4 3 2 1 0 N/A	4 3 2 1 0 N/A	4 3 2 1 0 N/A
Evaluation and Decision-Making	4 3 2 1 0 N/A	4 3 2 1 0 N/A	4 3 2 1 0 N/A	4 3 2 1 0 N/A	4 3 2 1 0 N/A
Presenting and Reporting	4 3 2 1 0 N/A	4 3 2 1 0 N/A	4 3 2 1 0 N/A	4 3 2 1 0 N/A	4 3 2 1 0 N/A
TOTAL:					

STANDARD IS 1 IN EACH APPLICABLE TASK AREA

Rating Scale

The student:

- 4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.
- 3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.
- 2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.
- 1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.
- 0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

<p>REFLECTION CRITERIA</p> <p><i>The student:</i></p> <p>Preparation and Planning</p> <ul style="list-style-type: none"> ☐ sets goals and follow instructions accurately ☐ establishes a schedule of activities for completing each journal entry ☐ accesses in-school/community sources of information ☐ plans and uses time effectively <p>Comprehension and Analysis</p> <ul style="list-style-type: none"> ☐ considers the impact of one or more personal attitudes, actions and/or lifestyles on the forest environment ☐ identifies relevant social, economic and/or environmental perspectives ☐ explains potential sources of conflict regarding personal attitudes, actions and/or lifestyle <i>e.g., Who? What? Where? Why?</i> <p>Evaluation and Decision Making</p> <ul style="list-style-type: none"> ☐ balances information and values ☐ demonstrates respect for and consider the views of others ☐ consider alternatives for environmental citizenship on the basis of their consequences and implications for the forest environment ☐ reflects on strengths of personal actions and lifestyle within the context of environmental responsibility, and suggest areas that need improvement <p>Presenting and Reporting</p> <ul style="list-style-type: none"> ☐ uses correct grammatical convention and technical terms through proof-reading/editing ☐ communicates information and ideas clearly in a logical sequence ☐ provides an introduction that describes the purpose of the journal entry ☐ states a conclusion based on a summary of information and ideas

PROPOSAL	RATIONALE	INTENDED OUTCOMES
1. Personal Action		
2. Leadership Role		

RATING SCALE

- 4 Demonstrates a thorough understanding of the need for action. Problems are solved independently in effective and creative ways. The rationale and outcomes are based on analysis of data and supported with sufficient detail.
- 3 Demonstrates an understanding of the need for action. Issues are effectively addressed in a self-directed manner. The rationale and outcomes are based on analysis of data and supported with some detail.
- 2 Demonstrates a general understanding of the need for action. Issues are addressed with guidance. The rationale and outcomes are based on limited data and detail.
- 1 Demonstrates partial understanding of the need for action. Attempts a proposal but the rationale and/or outcomes are general or unsupported.
- 0 Fails to understand the need for action or does not attempt a proposal.

DIRECTIONS

THE STUDENT PROVIDES TWO PROPOSALS FOR ENVIRONMENTAL ACTION - ONE BASED ON PERSONAL/INDIVIDUAL ACTION, THE OTHER INVOLVING A LEADERSHIP ROLE. EACH PROPOSAL TO BE SUPPORTED WITH A RATIONALE AND INTENDED OUTCOMES.

STANDARD

EACH PROPOSAL TO BE COMPLETED TO A STANDARD OF 1 IN INTRODUCTORY MODULES, 2 IN INTERMEDIATE MODULES, AND 3 IN ADVANCED MODULES.

TASK	OBSERVATION/RATING				
Preparation and Planning	4	3	2	1	0
Technical Components	4	3	2	1	0
Information Sharing	4	3	2	1	0
Collaboration and Teamwork	4	3	2	1	0
					N/A

STANDARD IS 1 FOR INTRODUCTORY LEVEL MODULES, 2 FOR INTERMEDIATE LEVEL MODULES, AND 3 FOR ADVANCED LEVEL MODULES

Rating Scale

The student:

- 4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.
- 3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.
- 2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.
- 1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.
- 0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

CSB: 96 06 07

Forestry /G.35
(Interim 1994)

TASK CHECKLIST	
<i>The student:</i>	
Preparation and Planning ☐ sets goals and follows instructions ☐ responds to directed questions and/or follows necessary steps to find answers ☐ uses time effectively ☐ accesses basic in-school/community information sources ☐ interprets and organizes information logically ☐ transfers and/or extrapolates data from print and visual sources to create a diagram/technical drawing	Technical Components (continued) ☐ accurately labels diagram/technical drawing components ☐ provides an appropriate title for the diagram/technical drawing ☐ demonstrates appropriate use of colour, shading and/or patterns ☐ produces a document free of wrinkles and smudges ☐ maintains appropriate technical standards through proof-reading and editing; e.g.: – spelling – readability
Technical Components ☐ selects and uses appropriate drawing instruments and tools ☐ prepares an accurate outline of the theme to scale ☐ adds detail to the theme as required to ensure recognition and realism ☐ organizes use of space; e.g.: – diagram/technical drawing in relation to paper size – use of borders – position of labels	Information Sharing ☐ communicates content of diagram/technical drawing through oral presentation ☐ demonstrates ability to use overlays in presentation ☐ poses questions based on information provided in the diagram/technical drawing
	Collaboration and Teamwork ☐ shares work appropriately among group members ☐ respects the views of others ☐ negotiates solutions to problems
REFLECTIONS/COMMENTS	

TASK	OBSERVATION/RATING				
Preparation and Planning	4	3	2	1	0
Technical Components	4	3	2	1	0
Information Sharing	4	3	2	1	0
Collaboration and Teamwork	4	3	2	1	0
					N/A

STANDARD IS 1 FOR INTRODUCTORY LEVEL MODULES, 2 FOR INTERMEDIATE LEVEL MODULES, AND 3 FOR ADVANCED LEVEL MODULES

Rating Scale

The student:

- 4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.
- 3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.
- 2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.
- 1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.
- 0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

TASK CHECKLIST

The student:

Preparation and Planning

- ☐ sets goals and follows instructions
- ☐ responds to directed questions and/or follows necessary steps to find answers
- ☐ uses time effectively
- ☐ accesses basic in-school/community information sources
- ☐ interprets and organizes information logically
- ☐ transfers and/or extrapolates data from print and visual sources to create a flow chart

Technical Components

- ☐ prepares an outline of steps/processes in proper sequence and order
- ☐ organizes use of space in relation to paper size
- ☐ selects and uses appropriate drawing instruments and tools
- ☐ creates a flow chart that:
 - has a definite beginning and end
 - clearly indicates the sequencing of steps/processes
- ☐ provides arrows to indicate correct sequence of steps/processes

Technical Components (continued)

- ☐ labels flow chart components as required
- ☐ provides an appropriate title for the flow chart
- ☐ demonstrated appropriate use of colour, shading and/or patterns
- ☐ produces a document free of wrinkles and smudges
- ☐ maintains appropriate technical standards through proof-reading and editing; e.g.:
 - spelling
 - legibility

Information Sharing

- ☐ communicates content of flow chart through oral presentation
- ☐ demonstrates ability to use flow chart overlays in presentation
- ☐ poses questions based on information provided in the flow chart

Collaboration and Teamwork

- ☐ shares work appropriately among group members
- ☐ respects the views of others
- ☐ negotiates solutions to problems

REFLECTIONS/COMMENTS

Student Name:	Module:	Date:
Destination:		
Contact Person:		
Title/Position of Contact Person:		

PURPOSE OF TRIP (Teacher Defined)

STUDENT EXPECTATIONS (What do you expect to observe/learn?)

ACTUAL OBSERVATIONS (What did you actually observe/learn?)

APPLICATIONS OF SILVICULTURE PRACTICES

REFLECTION ON FIELD INVESTIGATION (What did you find most interesting? least interesting?)

OBSERVED CAREERS	
Career #1: Title: Education Requirements: Salary Range: Pros: Cons:	
Career #2: Title: Education Requirements: Salary Range: Pros: Cons:	
Career #3: Title: Education Requirements: Salary Range: Pros: Cons:	
Would any of the observed careers appeal to you? Why or why not? 	

SUMMATIVE CHECKLIST (to be completed by teacher/supervisor)	
<i>The student:</i>	
☐ identifies trip goals and follows instructions accurately	
☐ adheres to established itinerary/timelines	
☐ demonstrates appropriate use of equipment, supplies and/or clothing	
☐ adheres to acceptable safety standards and behavioural expectations as established by school policy	
☐ accesses resources available on site	
☐ uses effective questioning techniques to gather information	
☐ interprets and records information accurately	
☐ follows directions/procedures indicated by tour guide and/or as established by industry policy while on site	
☐ completes all sections of the observation checklist for each field-based investigation.	
☐	
☐	

Assessment Criteria and Conditions:

- identify and explain six or more ways in which local forests (regional or provincial) have:
 - social and cultural significance
 - economic significance
 - environmental significance.

Suggested Reference(s):

- *Alberta's Focus on Forests*
- *Woodlot Management Guide for the Prairie Provinces*
- *Our Growing Resource.*

STANDARD: Respond to a standard of 1 on the rating scale.

Rating Scale

The student:

- 4 meets project/task objectives in a self-directed manner. Provides explanations and critical judgements based on a superior knowledge base. Demonstrates an understanding of relevant concepts and related issues.
- 3 meets project/task objectives in a self-directed manner. Provides explanations and comparisons of relevant concepts using more precise terminology. Requires little or no prompting.
- 2 meets project/task objectives with limited assistance in planning and in selecting and using resources. Applies knowledge of concepts in different situations using correct terminology. Requires occasional prompting.
- 1 completes task as directed, demonstrating basic skills/completeness by following a guided course of action. Uses simple recall to demonstrate basic knowledge of concepts. Requires prompting.
- 0 does not complete the task, or is unable to provide a suitable response

N/A Not Applicable

CSB: 96 06 07

Forestry /G.39
(Interim 1994)

Background Information	Sample Questions/Activities
<p>See <i>Alberta's Focus on Forests</i>:</p> <ul style="list-style-type: none"> • Activity 1.4: How Forests Affect the Environment • Activity 4.2: Products from Canada's Forests • Activity 5.1: Forest Values. <p>See <i>Woodlot Management Guide for the Prairie Provinces</i>, page i-6: Potential Benefits from Woodlots:</p> <ul style="list-style-type: none"> • Cash Returns • Personal Use • Insurance • Erosion Control • Windbreaks and Crop Enhancement • Winter Shelter • Landscape Aesthetics • Wildlife Habitat • Moisture Management and Snow Catching • Environmental Aspect. 	<p>1. Describe six or more ways in which local forests have social and cultural significance; e.g.:</p> <ul style="list-style-type: none"> – recreational – spiritual – aesthetic – medicinal – community dependence. <p>2. Describe six or more ways in which local forests have economic significance; e.g.:</p> <ul style="list-style-type: none"> – employment – product export – tourism – subsistence – tax base <p>3. Describe six or more ways in which local forests have environmental significance; e.g.:</p> <ul style="list-style-type: none"> – wildlife and fisheries habitat – watershed protection and maintenance – water, air and soil quality – maintenance of ecosystems

DATE	EVENT	DATE	EVENT
6000 BC	Forest cover gradually regenerates over most of Canada following the ice age. Trees are used by native people as a source of food, heat, boat and home building material.	1817	First of many paper mills in Quebec, built by Artemus Jackson.
3600 BC	Earliest use of paper, a papyrus document.	1819	First paper mill in the Maritimes built by Anthony Holland to supply his newspaper with paper.
105	T'sai Lun invents paper using silk, bark and hemp.	1843	Paper is still manufactured largely from linen and cotton rags. But interest in wood as a possible raw material is increasing.
1150	Moors introduce paper to Europe.		Friedrich Keller invents the process for manufacturing groundwood pulp.
1604	Samuel de Champlain establishes one of the earliest European settlements in Canada, on an island in the Saint Croix river.	1848	U.S. timber merchants and lumbermen begin setting up business in Canada, building mills and importing American workers. By the end of the century, the value of American lumber trade equals that of Britain.
1607	European settlers begin to arrive, forests are cleared for agriculture, lumber and fuel.		First sawmills appear on Vancouver Island, just outside of Victoria.
1650	First sawmills appear along the St. Lawrence River and in Atlantic Canada.	1849	
1719	A French physicist, Reaumur, states that paper can be made from the fibres of plants, including trees.	1850	Pine and oak timber is in great demand for export.
1763	American Revolution restricts British access to New England timber supply. Britain begins to exploit Atlantic Canada forests for masts and spars.	1851	The Englishmen, Hugh Burgess and Charles Watt, invent a process for manufacturing pulp by cooking wood chips in chemicals. It is called the soda process and uses caustic soda and lye.
1793	Napoleonic Wars restrict British access to Baltic timber. This initiates Canada's timber trade with Britain, an industry that continues to grow throughout the 19th century.	1860	Lumber exports begin from western Canada, mainly to South America, Australia and San Francisco.
1799	Nicolas Robert of France patents the first papermaking machine. Until this time, paper has been made entirely by hand, sheet by sheet.	1869	First groundwood pulp produced commercially in Canada at Valleyfield, Quebec by Alexander Buntin.
		1890	First tissue machine in Canada installed by E. B. Eddy at Hull, Quebec.
1803	First Canadian paper mill built at St. Andrews, Quebec, by Walter Ware and Benjamin Wales, two New Englanders. They manufacture writing, printing and wrapping papers.	1891	British Columbia prohibits exports of pulpwood from Crown lands.
		1899	Elihu Stewart, the first Dominion Forester, is hired.

DATE	EVENT	DATE	EVENT
1900	As the 20th Century begins, papermaking in Canada is still a small industry serving domestic needs.	1950	The gas powered chain saw comes into wide use in Canadian forests. The wheeled skidder called the Bonnard prehauler is introduced
1907	First forestry school in Canada opens at the University of Toronto.	1960	Government and industry increase conservation efforts; the amount of trees cut now equal the amount grown.
1912	The first forest fire protection association is formed in St. Maurice, Quebec.	1964	A large expansion of the Canadian forest industry occurs. New mills are built in every region of Canada, particularly British Columbia.
1914	The east coast lumber industry begins to decline. The best timber is depleted and Britain reestablishes links with Baltic lumber merchants.	1966	The timber quota system is introduced in Alberta to provide the forest industry with long term timber inventories.
1916	Demands on forests during World War I reduce available timber to low levels.	1975	The Forest Engineering Research Institute of Canada is established.
1918	Canada becomes the world's largest exporter of pulp and paper.	1979	The Canadian pulp and paper industry produces 20 million tonnes of pulp, paper and paperboard valued at \$8 billion.
1919	For the first time in Canada, aircraft are used for fire patrol and photographic mapping.	1987	More than 800 million seedlings are planted in an effort to make Canada's forest resource healthier and more productive.
1924	Protectionism in the U.S. closes the American market to Canadian timber.	1988	Valued at \$14 billion, pulp and paper remains Canada's most important manufacturing sector.
1926	Canada's newsprint production exceeds that of the U.S.	1990	Biodiversity in the forest becomes a major issue in Canada and the world.
1930	The Great Depression reduces pulp and paper production by one third.	19__	Canadian society insists on environmental auditing of forestry operations.
1935	West coast forest industry gradually expands to comprise half of the total Canadian lumber production.		
1939	World War II stimulates a substantial increase in the production of forest products.		
1945	Post war exports of lumber, pulp and paper rise sharply.		
1946	The first bleach kraft pulp mill designed by Howard Rapson and Morris Wayman is built and Temiscaming, Quebec.		
1949	Ontario Department of Lands and Forests uses water bombers to fight forest fires.		

TASK	OBSERVATION/RATING			
Preparation and Planning	4	3	2	1 0 N/A
Information Gathering and Processing	4	3	2	1 0 N/A
Content	4	3	2	1 0 N/A
Collaboration and Teamwork	4	3	2	1 0 N/A
Information Sharing	4	3	2	1 0 N/A

STANDARD IS 1 IN EACH APPLICABLE TASK**Rating Scale***The student:*

- 4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.
- 3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.
- 2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.
- 1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.
- 0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

TASK CHECKLIST*The student:***Preparation and Planning**

- ☐ sets goals and follows instructions accurately
- ☐ adheres to established timelines
- ☐ responds to directed questions and follows necessary steps to find answers
- ☐ uses time effectively

Information Gathering and Processing

- ☐ accesses basic in-school/community information sources
- ☐ uses one or more information-gathering techniques
- ☐ interprets and organizes information into a logical sequence
- ☐ records information accurately, using correct technical terms

- ☐ distinguishes between fact and fiction/opinion/theory
- ☐ responds to feedback when current approach is not working

Content

- ☐ describes the impact of personal actions and lifestyle on the forest resource; e.g.:
- consumer choices
 - recreational patterns
- ☐ prepares an inventory of household materials used on a daily basis that are derived from the forest resource

Content (continued)

- ☐ distinguishes between “wants” and “needs” as they relate to consumptive practices
- ☐ explains how product marketing and promotion may affect the forest resource; e.g.:
- media exaggeration
 - use of environmentally friendly products
- ☐ compares and contrasts the “conservation ethic” and “preservation ethic” with reference to the impact of each on the forest resource

Collaboration and Teamwork

- ☐ cooperates with group members
- ☐ shares work appropriately among group members

Information Sharing

- ☐ demonstrates effective use of one or more communication media:
e.g., written, oral, audio-visual
- ☐ communicates information in a logical sequence
- ☐ uses correct grammatical conventions and technical terms
- ☐ cites three or more basic information sources

REFLECTIONS/COMMENTS:

TASK	OBSERVATION/RATING				
Management	4	3	2	1	0
Teamwork	4	3	2	1	0
Use of Equipment and Materials	4	3	2	1	0
Investigative Techniques	4	3	2	1	0

STANDARD IS 1 IN EACH APPLICABLE TASK**Rating Scale***The student:*

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

CSB: 96 06 07

Forestry /G.43
(Interim 1994)**TASK CHECKLIST***The student:***Management**

- ☐ prepares self for task
- ☐ organizes and work in an orderly manner
- ☐ carries out instructions accurately
- ☐ uses time effectively

Teamwork

- ☐ cooperates with group members
- ☐ shares work appropriately among group members

Use of Equipment and Materials

- ☐ selects and uses appropriate equipment/materials
- ☐ follows safe procedures/techniques
- ☐ weighs and measures accurately
- ☐ returns clean equipment/materials to storage areas

Investigative Techniques

- ☐ gathers and applies information from at least one source
- ☐ makes predictions that can be tested regarding factors affecting plant growth; e.g.:
 - temperature
 - moisture
 - soil characteristics
- ☐ sets up and conducts experiments to test predictions
- ☐ distinguishes between manipulated/responding variables
- ☐ obtains results that can be used to determine if some aspect of the prediction is accurate
- ☐ summarizes important experimental outcomes regarding factors affecting plant growth
- ☐ applies experimental results in explaining the distribution of forests in Alberta

REFLECTIONS/COMMENTS:

Assessment Criteria and Conditions:

- explain ways in which climate and land form affect the growth and distribution of forests.

Suggested Reference(s):

- *Alberta's Focus on Forests*
- *Investigating Terrestrial Ecosystems*
- *Native Trees of Canada.*

STANDARD: Respond to a standard of 1 on the rating scale.

Rating Scale

The student:

- 4 meets project/task objectives in a self-directed manner. Provides explanations and critical judgements based on a superior knowledge base. Demonstrates an understanding of relevant concepts and related issues.
 - 3 meets project/task objectives in a self-directed manner. Provides explanations and comparisons of relevant concepts using more precise terminology. Requires little or no prompting.
 - 2 meets project/task objectives with limited assistance in planning and in selecting and using resources. Applies knowledge of concepts in different situations using correct terminology. Requires occasional prompting.
 - 1 completes task as directed, demonstrating basic skills/completeness by following a guided course of action. Uses simple recall to demonstrate basic knowledge of concepts. Requires prompting.
 - 0 does not complete the task, or is unable to provide a suitable response
- N/A Not Applicable

Background Information	Sample Questions / Activities
<p>See <i>Alberta's Focus on Forests</i>:</p> <ul style="list-style-type: none"> • Activity 3.1: A Lot Depends on Location • Activity 3.4: Forests: Thriving or Declining <p>See <i>Investigating Terrestrial Ecosystems</i>:</p> <ul style="list-style-type: none"> • Chapter 6: Adaptations of Organisms to Light and Soil • Chapter 7: Weather, Climate and Biomes. 	<ol style="list-style-type: none"> 1. Explain ways in which climatic factors affect the growth of trees; e.g.: <ul style="list-style-type: none"> – temperature – moisture 2. Explain ways in which land form factors affect the growth of trees; e.g.: <ul style="list-style-type: none"> – topography – soil characteristics 3. Integrate information about climatic and land form factors to explain species distribution within forest regions. 4. Given a natural region of Alberta or Canada, suggest five or more reasons for the distribution of trees within that region.

ASSESSMENT CRITERIA	RATING SCALE			
	0	1	2	3
Each specimen in the collection to be assessed according to the following criteria:				
1. Completeness <ul style="list-style-type: none"> specimen must include typical <u>needles/leaves, twig and terminal bud</u> cone, fruit or seed to be included where feasible minimum size of specimen is 15 cm in length 	Atypical foliage No twig or bud No cone or fruit	No twig or bud Sample too small No cone or fruit	All components present Size at minimum No cone or fruit	All components present Size above minimum Cone/fruit included
2. Pressing: <ul style="list-style-type: none"> specimen to be flattened so that the undersides of some needles/leaves face upward no folding or bending of tissue to be evident. 	Foliage not flat Underside of foliage not visible Substantial folding of tissue	Foliage flat Underside of foliage not visible Significant folding of tissue	Foliage flat Underside of some foliage faces upward Minor folding of tissue	Foliage Flat Underside of some foliage faces upward All tissue laying flat
3. Mounting: <ul style="list-style-type: none"> dried specimens are attached to Bristol board with white glue or Gum Arabic conifers may be placed in Ryker mounts specimen must occupy central position on mounting sheet (or in Ryker mount) orientation vertical or at 45° to vertical (terminal bud to top). 	Scotch tape Horizontal or downward orientation Smears evident	White glue Horizontal or downward orientation Minor smears or excess glue	White glue Vertical or upward orientation Excess/insufficient glue used	White glue Vertical or upward orientation Sheet clear of smears, excess glue
4. Labelling: <ul style="list-style-type: none"> family name scientific name common name geographic location where collected habitat name of collector date of collection 	Incomplete information Incorrect sequence for more than 2 items	Habitat or location missing 1-2 items out of sequence	Complete information 1-2 items out of sequence	Complete information Correct sequence
5. Identification: <ul style="list-style-type: none"> must include common name, as well as species, genus and family names. 	More than 2 categories incorrect (family, genus, species, common name)	2 of 4 categories wrong	Correct to genus only	Correct to species

STANDARD IS 2 FOR EACH SPECIMEN IN THE COLLECTION

Assessment Criteria and Conditions:

- identify five or more physical hazards that may be imposed by a forest environment, and explain appropriate steps to take in avoiding/preventing and responding/dealing with each hazard

Suggested Reference(s):

- *National Occupational Standards for Outdoor Guide*
- *JFW Green Tree Trailblazer Leader Manual*.

STANDARD: Respond to a standard of 1 on the rating scale.

Rating Scale

The student:

- 4 meets project/task objectives in a self-directed manner. Provides explanations and critical judgements based on a superior knowledge base. Demonstrates an understanding of relevant concepts and related issues.
 - 3 meets project/task objectives in a self-directed manner. Provides explanations and comparisons of relevant concepts using more precise terminology. Requires little or no prompting.
 - 2 meets project/task objectives with limited assistance in planning and in selecting and using resources. Applies knowledge of concepts in different situations using correct terminology. Requires occasional prompting.
 - 1 completes task as directed, demonstrating basic skills/completeness by following a guided course of action. Uses simple recall to demonstrate basic knowledge of concepts. Requires prompting.
 - 0 does not complete the task, or is unable to provide a suitable response
- N/A Not Applicable

Background Information	Sample Questions / Activities
<p>See <i>National Occupational Standards for Outdoor Guide</i>:</p> <p><u>Section F - Safety</u></p> <ul style="list-style-type: none"> • 1.1: avoid dangerous situations with wildlife • 1.2: prepare for weather and seasonal conditions • 1.5: follow guidelines for travel safety <p><u>Section G - Survival</u></p> <ul style="list-style-type: none"> • 1.1: outline requirements for survival and first-aid kits • 1.2: follow emergency plan • 1.3: set up emergency shelter • 2.1: signal for help • 2.2: use two-way radio • 3.1: identify water and food needs for survival • 3.2: ensure safe supply of water and food 	<p>1. Explain steps to take in identifying, assessing, avoiding and/or responding to physical hazards imposed by the forest environment; e.g.:</p> <ul style="list-style-type: none"> – particular terrain and conditions, including avalanche, lake and river ice, and bush travel – wildlife that may be encountered, including bears, bees, ticks, non-edible plants – changes in weather conditions that may affect personal and group safety. <p>2. Explain steps to take in identifying, assessing, avoiding and/or responding to physiological and psychological factors often associated with outdoor experiences in the forest; e.g.:</p> <ul style="list-style-type: none"> – dealing with hypothermia, frostbite and dehydration – understanding fatigue and when not to move – coping with adversities, such as getting lost or hurt. <p>3. List/explain/demonstrate necessary steps to take in emergency and survival situations in the forest; e.g.:</p> <ul style="list-style-type: none"> – what to do if lost or separated from the group – first aid and emergency response to injury – construction of emergency shelters – how to gather food from edible plants – enroute organizational strategies, including lead and sweep, regrouping procedures, pacing.

SAMPLE ASSESSMENT ITEMS: WOODS SURVIVAL I

FOR104-2

MULTIPLE CHOICE:

1. Bob's toes are numb after spending all day outdoors at -25°C. He gets in his truck and takes off his boots. All his toes are white and hard. Bob should:
 - a) turn the heater on high and stick his toes in the hot air
 - ☒ b) let his feet warm up slowly
 - c) rub snow on the affected area
 - d) pour the hot coffee from his thermos over his toes to warm them up quickly.
2. To avoid frostbite one should:
 - a) always wear a face mask
 - b) don't go out when colder than -26°C
 - ☒ c) evaluate the weather and dress accordingly
 - d) always dress for -40°C weather.
3. If you were wet and started to panic in the woods, the best way to deal with the fear is:
 - a) run very fast for 10 minutes because physical activity removes fear
 - ☒ b) force yourself to sit down and think about the situation calmly
 - c) let the panic happen and deal with the situation after
 - d) none of the other choices
4. If you were planting trees in a hot open eutovar with no shade, you should:
 - a) drink a litre of water once every 3 hours and wear a hat
 - b) drink a little water every 20 minutes or so and not wear a hat
 - c) drink a litre of water once every 3 hours and not wear a hat
 - ☒ d) drink a little water every 20 minutes or so and wear a hat.
5. On a cold late fall day with a stiff wind blowing, your partner falls into a river. He goes through some rapids and is in the river for 5 minutes before you drag him out. You should:
 - a) tell him to walk with you and let the wind dry him off
 - ☒ b) build a fire to dry him off
 - c) make him take off his clothes, build a fire and warm him up
 - d) continue working, it will take his mind off his wet clothes.

WRITTEN RESPONSE:

1. Describe "hypothermia" and list three factors that cause it.
 Descriptive Criteria: *shivering, loss of coordination, loss of awareness, slowing down, withdrawal (personality change), speech difficulty*
 Causes: *fatigue, exhaustion, hypohydration, inappropriate dress, injury*
2. Survival may depend on the person as well as the situation. List eight personality requirements of survival.
 Survival may depend on *personality as well as the nature of the danger, weather, terrain, or emergency. Whether fear will lead to panic or act as a spur to greater sharpness, whether fatigue will overcome or leave a person able to take the necessary action to survive, are, dependent on the person as well as the situation. Qualities in people that are important to survival are:*
 - *can make up one's mind*
 - *can improvise*
 - *can live in solitude*
 - *can adapt to new situations*
 - *can remain calm and collected*
 - *can hope for the best but prepare for the worst*
 - *has patience*
 - *can accept hardship*
 - *can understand the other person.*
3. You are in an outdoor survival situation with no contact for outside assistance. What procedure would you use to obtain your food and water requirements in a:
 - a. mid-winter forested area
 - b. summer forested area
 - c. summer area above the timberline.

WRITTEN RESPONSE (continued):

4. Describe strategies that may be effective in coping with pain in survival situations.

Pain is Nature's way of making you pay attention to something that is wrong with you. But Nature also has ways of holding off pain if you are too busy doing something else to pay attention to the injury right then. Pain may go unnoticed if your mind is occupied with plans for survival. On the other hand, once given in to, pain will weaken the drive to survive. Pain can get the best of you if you let it, even if it isn't serious or prolonged. A special effort must be made to keep hopes up and to keep working

5. How does fatigue work to lessen a person's chances of survival? Describe strategies for minimizing fatigue in outdoor situations.

Even a very moderate amount of fatigue can materially reduce mental ability. Fatigue can make you careless - it becomes increasingly easy to adopt the feeling of just not caring. This is one of the biggest dangers in survival. The confused notion that fatigue and energy expenditure are directly related may be responsible for many deaths in survival situations. Certainly there is a real danger of over-exertion, but fatigue may actually be due to hopelessness, lack of a goal, dissatisfaction, frustration or boredom. Fatigue may represent an escape from a situation which has become too difficult. If you recognize the dangers of a situation, you can often summon the strength to go on.

Standard: Response indicating 80% mastery

6. Boredom and loneliness are two often unexpected challenges in survival situations. Describe strategies for coping with these challenges.

Boredom and loneliness are two of the toughest enemies of survival. they are dangerous mainly because they are unexpected. When nothing happens, when something is expected and doesn't come off, when you must stay still, quiet and alone, these feelings creep up on you.

7. Describe strategies for coping with cold, thirst and hunger in survival situations.

PLANNING, ASSEMBLING AND TRANSPORTING GEAR	<p><i>The student:</i></p> <p>☐ prepares a 3-day camping menu for self that addresses:</p> <ul style="list-style-type: none"> ☐ expected caloric output ☐ all food groups included in the Canada Food Guide ☐ concerns related to food spoilage ☐ provisions for emergency <p>☐ assembles and packs gear for a trip in an appropriate manner:</p> <ul style="list-style-type: none"> ☐ addresses weight restrictions ☐ makes efficient use of space ☐ packs food to prevent spoilage and minimize odour <p>☐ safely transports gear by human conveyance (e.g., backpack, sled) a minimum distance of 3 kilometres</p> <p>☐</p> <p>☐</p> <p>☐</p> <p>☐</p>
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OUTDOOR TOOLS AND EQUIPMENT	<p><i>The student:</i></p> <p>☐ follows safe procedures for the use of knives:</p> <ul style="list-style-type: none"> ☐ ensures good condition prior to use ☐ demonstrates safe use/appropriate care ☐ follows safe procedures for storing and carrying ☐ uses correct sharpening techniques <p>☐ follows safe procedures for the use of axes:</p> <ul style="list-style-type: none"> ☐ ensures good condition prior to use ☐ demonstrates safe use/appropriate care ☐ follows safe procedures for storing and carrying ☐ uses correct sharpening techniques <p>☐ follows safe procedures for the use of saws:</p> <ul style="list-style-type: none"> ☐ ensures good condition prior to use ☐ demonstrates safe use/appropriate care ☐ follows safe procedures for storing and carrying ☐ uses correct sharpening techniques <p>☐ follows safe procedures for the use of shovels:</p> <ul style="list-style-type: none"> ☐ ensures good condition prior to use ☐ demonstrates safe use/appropriate care ☐ follows safe procedures for storing and carrying ☐ uses correct sharpening techniques
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OUTDOOR TOOLS AND EQUIPMENT (continued)	<p><i>The student:</i></p> <p>☐ follows safe procedures for the use of lanterns:</p> <ul style="list-style-type: none"> ☐ ensures sufficient fuel/air intake ☐ removes extra fuel from area before lighting ☐ allows spilled fuel to evaporate prior to lighting ☐ follows correct lighting procedures ☐ places lit lantern in safe location <p>☐ follows safe procedures for the use of stoves:</p> <ul style="list-style-type: none"> ☐ ensures sufficient fuel/air intake and adequate ventilation ☐ removes extra fuel from area prior to lighting ☐ allows any spilled fuel to evaporate prior to lighting ☐ follows correct lighting procedures ☐ follows correct shut-down/post-use procedures <p>☐</p> <p>☐</p>
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OUTDOOR FIRES	
<i>The student:</i>	
☐ checks the location and supply of extinguishing materials	
☐ uses natural materials (e.g., rocks) to control fire spread	
☐ removes vegetation matter from base of fire	
☐ takes wind into consideration when choosing fire location	
☐ establishes a structure/method for supporting cooking utensils	
☐ starts the fire using fine fuels (e.g., grass, twigs) rather than gas	
☐ constructs a fire of appropriate size, using only drift wood or dead fall for fuel	
☐ ensures fire is completely extinguished when finished	
☐	

CONSTRUCTING OUTDOOR SHELTERS	
<i>The student:</i>	
☐ identifies type of shelter that will best protect from the elements	

CONSTRUCTING OUTDOOR SHELTERS (continued)	
☐ selects an appropriate location for shelter, considering water, fire and signaling needs	
☐ selects a location protected from wind, and away from dead or single trees	
☐ demonstrates two or more basic shelter-building techniques that involve the use of materials and/or natural structures available in the outdoors; e.g.:	☐ fallen tree shelter ☐ lean-to shelter ☐ snow cave shelter
☐ constructs shelter demonstrating least possible impact on the environment	
☐ demonstrates appropriate use of tools, equipment and safety devices	
☐	

HYGIENE AND SANITATION	
<i>The student:</i>	
☐ plans for potable water supply	
☐ demonstrates appropriate water purification techniques	
☐ explains appropriate location and construction of latrines	

HYGIENE AND SANITATION (continued)	
☐ establishes methods of disposing of waste water and garbage	
☐	
☐	

STANDARD IS 2 IN EACH APPLICABLE TASK**Rating Scale***The student:*

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

TASK	OBSERVATION/RATING				
Allocating Time and Materials	4	3	2	1	0
Building the Portfolio	4	3	2	1	0
Presenting and Critiquing	4	3	2	1	0
	N/A				

STANDARD IS 1 IN EACH APPLICABLE TASK

Rating Scale

The student:

- 4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.
- 3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.
- 2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.
- 1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.
- 0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

TASK CHECKLIST

The student:

Allocating Time and Materials

- ☐ develops and follows a schedule of activities for preparing a portfolio of maps and aerial photographs used in forestry
- ☐ uses personal initiative to formulate questions and find answers; identifies parameters within which problems must be solved
- ☐ accesses a range of relevant in-school and community resources
- ☐ shares information with others for feedback and collaboration
- ☐ plans and uses time effectively
- ☐ assesses and refines approach to task and project status based on feedback and reflection

Building the Portfolio

- ☐ constructs four or more different types of maps used in forestry; e.g.:
 - base map
 - topographic/contour map
 - soil type map
 - forest stand map
- ☐ identifies characteristics and applications of each type of map included in the portfolio
- ☐ develops a one-page report on the National Topographic Grid System and its application in providing legal land descriptions
- ☐ displays one or more examples of aerial photographs

Building the Portfolio (continued)

- ☐ explains the purpose and techniques of aerial photography, and applications of different types of film used
- ☐ provides a summary of current information-gathering technologies and their applications in mapping; e.g.:
 - satellite imagery
 - Global Positioning Systems (GPS)

Presenting and Critiquing

- ☐ demonstrates effective use of two or more communication media in presenting the portfolio: e.g., written, oral, audio-visual
- ☐ communicates ideas in a logical sequence with sufficient supporting detail
- ☐ maintains acceptable grammatical and technical standards
- ☐ provides an introduction that describes the purpose and scope of the portfolio
- ☐ relates final outcomes and products to original purpose, and identifies strengths and areas for improvement
- ☐ cites five or more relevant information sources
- ☐ conducts collaborative assessment of processes used and outcomes achieved

REFLECTIONS/COMMENTS:

ALLOCATING TIME AND MATERIALS	
<i>The student:</i>	develops and follows a schedule of activities for each orienteering task
☐	
☐	selects and uses appropriate equipment and materials
☐	uses appropriate safety devices; e.g.: ☐ protective clothing ☐ protective eye wear ☐ hard hats
☐	recognizes potential hazards and takes steps to eliminate/avoid them
☐	critically examines task performance, identifying strengths and areas that need improvement

BASIC COMPASS AND MEASUREMENT SKILLS	
<i>The student:</i>	reads and interprets maps and aerial photographs used in forestry; e.g.: ☐ legend and symbols ☐ scale ☐ colours ☐ contour lines
☐	constructs a mental image of a forested area from information conveyed through maps and aerial photographs
☐	orients a forestry map through inspection of surroundings

BASIC COMPASS AND MEASUREMENT SKILLS (continued)	
<i>The student:</i>	orients a forestry map using a compass: ☐ places compass on map with edge along desired line of travel ☐ rotates the capsule until the "N" on the compass dial points to true north on the map ☐ checks to ensure that north-south lines are parallel with the map's meridians ☐ reads the bearing at the top of the compass
☐	obtains a bearing from a map using a forestry compass: ☐ sets the compass for the desired bearing of travel ☐ holds the compass level and turns body until north end of the needle aligns with 0 degrees (compass north) ☐ walks in direction of bearing, citing landmarks and checking course
☐	measures direction using a Douglas protractor
☐	applies knowledge of the National Topographic Grid System in locating a parcel of forested land; e.g.: ☐ given its legal land description, locates a specific parcel of land on a map ☐ given a specific parcel of land on a map, identifies its legal land description
☐	estimates/calculates distance and area on a forestry map
☐	

STANDARD IS 1 IN EACH APPLICABLE TASK

Rating Scale

The student:

- 4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.
- 3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.
- 2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.
- 1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.
- 0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.
- N/A Not Applicable

REFLECTIONS/COMMENTS

Assessment Criteria and Conditions:

- describe topography and forest cover for a given area based on information gathered from:
 - an aerial photograph and corresponding parts of a forest type map
 - two or more different types of aerial photographs (e.g., black and white, colour, infrared, satellite imagery)

Suggested Reference(s):

- *Managing the Forest*

STANDARD: Respond to a standard of 1 on the rating scale.

Rating Scale

The student:

- 4 meets project/task objectives in a self-directed manner. Provides explanations and critical judgements based on a superior knowledge base. Demonstrates an understanding of relevant concepts and related issues.
- 3 meets project/task objectives in a self-directed manner. Provides explanations and comparisons of relevant concepts using more precise terminology. Requires little or no prompting.
- 2 meets project/task objectives with limited assistance in planning and in selecting and using resources. Applies knowledge of concepts in different situations using correct terminology. Requires occasional prompting.
- 1 completes task as directed, demonstrating basic skills/competence by following a guided course of action. Uses simple recall to demonstrate basic knowledge of concepts. Requires prompting.
- 0 does not complete the task, or is unable to provide a suitable response
N/A Not Applicable

Background Information	Sample Questions / Activities
<p>See <i>Managing the Forest</i>:</p> <p><u>Maps</u></p> <ul style="list-style-type: none"> • Topographic Map Interpretation • Contour Mapping <p><u>Air Photographs</u></p> <ul style="list-style-type: none"> • Photo Mosaic • Drainage Patterns • Stereogram 	<ol style="list-style-type: none"> 1. Read and interpret maps and aerial photographs, explaining information conveyed through: <ul style="list-style-type: none"> – legend and symbols – scale – colours – contour lines. 2. Construct a “mental image” of land terrain as conveyed through a map. 3. Use maps to estimate and calculate: <ul style="list-style-type: none"> – distance – area. 4. Demonstrate applications of aerial photographs in the stereoscopic viewing of topographic features. 5. Compare details of forest type maps and aerial photographs with existing ground conditions.

TASK	OBSERVATION/RATING			
Preparation and Planning	4	3	2	1 0 N/A
Information Gathering and Processing	4	3	2	1 0 N/A
Content	4	3	2	1 0 N/A
Collaboration and Teamwork	4	3	2	1 0 N/A
Information Sharing	4	3	2	1 0 N/A

STANDARD IS 1 IN EACH APPLICABLE TASK**Rating Scale***The student:*

4. exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.
3. meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.
2. meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.
1. meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.
0. has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

Forestry /G.54
(Interim 1994)

CSB: 96 06 07

TASK CHECKLIST*The student:***Preparation and Planning**

- ☐ sets goals and follows instructions accurately
- ☐ adheres to established timelines
- ☐ responds to directed questions and follows necessary steps to find answers
- ☐ uses time effectively

Information Gathering and Processing

- ☐ accesses basic in-school/community information sources
- ☐ uses one or more information-gathering techniques
- ☐ interprets and organizes information into a logical sequence

- ☐ records information accurately, using correct technical terms

- ☐ distinguishes between fact and fiction/opinion/theory

- ☐ responds to feedback when current approach is not working

Content

- ☐ suggests reasons for conducting a forest survey; e.g.:

- types of information gathered
- questions that are answered
- ☐ distinguishes between forest samples and forest populations, and provides examples of each

Content (continued)

- ☐ describes basic techniques used to sample a forested area; e.g.:
 - layout of sample plots
 - data collection techniques
- ☐ explains applications of the clinometer, increment borer and diameter tape in data collection
- ☐ explains how sample data may be used to estimate fibre volumes and other non-fibre forest resources
- ☐ provides a glossary of terms relevant to conducting a forest survey

Collaboration and Teamwork

- ☐ cooperates with group members
- ☐ shares work appropriately among group members

Information Sharing

- ☐ demonstrates effective use of one or more communication media: e.g., *written, oral, audio-visual*
- ☐ communicates information in a logical sequence
- ☐ uses correct grammatical conventions and technical terms
- ☐ cites three or more basic information sources

REFLECTIONS/COMMENTS:

ALLOCATING TIME AND MATERIALS	
<i>The student:</i>	
☐ follows a schedule of activities for each orienteering task	
☐ selects and uses appropriate equipment and materials	
☐ uses appropriate safety devices; e.g.:	
☐ suitable clothing	
☐ protective eye wear	
☐ hard hat	
☐ recognizes potential hazards and takes steps to eliminate/avoid them	
☐ critically examines task performance, identifying strengths and areas that need improvement	

BASIC COMPASS AND MEASUREMENT SKILLS	
<i>The student:</i>	
☐ orients a map using a compass:	
☐ places compass on map with edge along desired line of travel	
☐ rotates the capsule until the "N" on the compass dial points to true north on the map	
☐ checks to ensure that north-south lines are parallel with the map's meridians	
☐ reads the bearing at the top of the compass	

BASIC COMPASS AND MEASUREMENT SKILLS (continued)	
<i>The student:</i>	
☐ establishes and follows a bearing using a compass:	
☐ sets the compass for the desired bearing of travel	
☐ holds the compass level and turns body until north end of the needle aligns with 0 degrees (compass north)	
☐ walks in direction of bearing, citing landmarks and checking course	
☐ performs a closed traverse, error in closure no greater than 5% of perimeter distance:	
☐ starts at 0 degrees and walk 10 metres. Places stick in ground at this point	
☐ adds 90 degrees onto compass, setting it at 90 degrees. Aligns north end of needle with 90 degrees. Walks 10 metres in this direction using a measuring chain as guide. Places stick in ground at this point	
☐ adds 90 degrees onto compass, setting it at 180 degrees. Aligns north end of needle with 180 degrees. Walks 10 metres in this direction. Places stick in ground at this point	
☐ adds 90 degrees onto compass, setting it at 270 degrees. Aligns north end of needle with 270 degrees. Walks 10 metres in this direction. Returns to within one metre of starting point	

STANDARD IS 1 IN EACH APPLICABLE TASK

Rating Scale

The student:

- 4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.
- 3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.
- 2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.
- 1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.
- 0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

REFLECTIONS/COMMENTS

ALLOCATING TIME AND MATERIALS	
<i>The student:</i>	follows a schedule of activities for each orienteering task
☐	
☐	selects and safely uses appropriate equipment and materials
☐	uses appropriate safety devices; e.g.: ☐ suitable clothing ☐ protective eye wear ☐ hard hat
☐	recognize potential hazards and takes steps to eliminate/avoid them.

BASIC FOREST MEASUREMENT (continued)	
☐	measures the height of 10 trees, accurate to within 5% on at least 8 trees, using a clinometer ☐ measures 15 metres from the base of the tree ☐ uses clinometer to determine elevation at this point in relation to base of the tree ☐ aims clinometer at top of tree and reads height in metres ☐ adjusts tree height to compensate for elevation in relation to base of the tree.
☐	measures the age of 10 trees, accurate to within 5% on at least 8 trees, using an increment borer ☐ attaches boring bit to outer casing of increment borer ☐ moves the boring bit into at least the centre of the tree at breast height by turning clockwise ☐ inserts the core sampler into the boring bit and gives the borer one complete counter clockwise turn ☐ slides the extracting tool gently between the core and borer and carefully withdraws both core and tool ☐ determines tree age by counting rings on the core ☐ places core sample back into the tree and seals boring hole ☐ removes accumulations of resin and dirt from increment borer.
☐	

BASIC FOREST MEASUREMENT	
<i>The student:</i>	measures horizontal distances up to 25 metres, accurate to within 5% ☐ using pacing techniques ☐ using a forester's chain
☐	measures the diameter of 10 trees at approximately 1.5 metres above ground level, each accurate to within 5%, using a diameter tape ☐ places sharp end of tape in tree at breast height ☐ wraps tape around tree and determines tree circumference ☐ accurately reads/calculates tree diameter at breast height (DBH)
☐	

TABULATING AND PRESENTING RESULTS	
<i>The student:</i>	makes accurate observations and inferences regarding tree measurements
☐	
☐	records data accurately and systematically (e.g., use a dot-dash tally)
☐	considers limitations and generalizability of the results of measurement
☐	reflects on procedures/outcomes/task performance and suggests refinements.

STANDARD IS 1 IN EACH APPLICABLE TASK**Rating Scale***The student:*

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

ALLOCATING TIME AND MATERIALS	
<i>The student:</i>	
☐ follows a schedule of activities for conducting a forest survey	
☐ selects and safely uses appropriate equipment and materials	
☐ uses appropriate safety devices; e.g.: ☐ suitable clothing ☐ protective eye wear ☐ hard hat	
☐ recognizes potential hazards and takes steps to eliminate/avoid them.	

CONDUCTING THE FOREST SURVEY (continued)	
<i>The student:</i>	
☐ records data regarding tree height and age, by species, using grid system and charts	
☐ calculates fibre volume by species on a per hectare basis using sample plot data	
☐	

CONDUCTING THE FOREST SURVEY	
<i>The student:</i>	
☐ establishes boundaries for a 100 square metre sample forest plot	
☐ subdivides the plot into a number of subplots by extending string lines across the plot between two sides	
☐ measures tree diameter by species, each accurate to within 5%, for all trees in the plot larger than 9.1 cm DBH	
☐ records data regarding tree diameter, by species, using grid system and charts	
☐ measures the height and age of 10 of the tallest trees in the plot, accurate to within 5% on at least 8 trees	

INTERPRETING SURVEY RESULTS	
<i>The student:</i>	
☐ demonstrates an understanding of problems encountered in conducting a forest survey	
☐ records data accurately and systematically	
☐ interprets sample data to make inferences regarding tree populations and fibre volume	
☐ considers limitations of sampling techniques and survey results	
☐ critically examines procedures/outcomes/ task performance and suggests refinements	
☐	

STANDARD IS 1 IN EACH APPLICABLE TASK

Rating Scale

The student:

- 4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.
 - 3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.
 - 2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.
 - 1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.
 - 0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.
- N/A Not Applicable

REFLECTIONS/COMMENTS

TASK	OBSERVATION/RATING				
Preparation and Planning	4	3	2	1	0
Information Gathering and Processing	4	3	2	1	0
Content	4	3	2	1	0
Collaboration and Teamwork	4	3	2	1	0
Information Sharing	4	3	2	1	0

STANDARD IS 1 IN EACH APPLICABLE TASK**Rating Scale**

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

Forestry /G.58
(Interim, 1994)

CSB: 96 06 07

TASK CHECKLIST

The student:

Preparation and Planning

- ☐ sets goals and follows instructions accurately
- ☐ adheres to established timelines
- ☐ responds to directed questions and follows necessary steps to find answers
- ☐ uses time effectively

Information Gathering and Processing

- ☐ accesses basic in-school/community information sources
- ☐ uses one or more information-gathering techniques
- ☐ interprets and organizes information into a logical sequence
- ☐ records information accurately, using correct technical terms
- ☐ distinguishes between fact and fiction/opinion/ theory
- ☐ responds to feedback when current approach is not working

Content

- ☐ identifies living and non-living elements within a local forest ecosystem; e.g.:
 - soil characteristics
 - land form
 - climate
 - flora and fauna
 - soil organisms
- ☐ describes interrelationships among at least three living and three non-living elements within a local forest environment; e.g.:
 - relationship of soil, air, water characteristics to plant growth
 - interactions and dependencies among living organisms

Content (continued)

- ☐ explains the role of trees within a local forest ecosystem; e.g.:
 - exchange of gases
 - water cycle
 - nutrient cycling (macro nutrients)
 - wildlife habitat
 - soil conservation
 - energy flow
- ☐ analyzes food relationships among living organisms within a local forest environment; e.g.:
 - role of producers, consumers and decomposers
 - food chains and webs
- ☐ describes the distribution of dominant species within a local forest environment on the basis of habitat requirements; e.g.:
 - common tree species
 - flowering plants of the understory
 - common mammals and birds.

Collaboration and Teamwork

- ☐ cooperates with group members
- ☐ shares work appropriately among group members

Information Sharing

- ☐ demonstrates effective use of one or more communication media: e.g., *written, oral, audio-visual*
- ☐ communicates information in a logical sequence
- ☐ uses correct grammatical conventions and technical terms
- ☐ cites three or more basic information sources

REFLECTIONS/COMMENTS:

Assessment Criteria and Conditions:

- identify and describe major tree parts (including roots, trunk, branches, leaves, flowers), their function and relationship to one another

Suggested Reference(s):

- *Alberta's Focus on Forests*

STANDARD: Respond to a standard of 1 on the rating scale

Rating Scale

The student:

- 4 meets project/task objectives in a self-directed manner. Provides explanations and critical judgements based on a superior knowledge base. Demonstrates an understanding of relevant concepts and related issues.
- 3 meets project/task objectives in a self-directed manner. Provides explanations and comparisons of relevant concepts using more precise terminology. Requires little or no prompting.
- 2 meets project/task objectives with limited assistance in planning and in selecting and using resources. Applies knowledge of concepts in different situations using correct terminology. Requires occasional prompting.
- 1 completes task as directed, demonstrating basic skills/completeness by following a guided course of action. Uses simple recall to demonstrate basic knowledge of concepts. Requires prompting.
- 0 does not complete the task, or is unable to provide a suitable response

N/A Not Applicable

Background Information	Sample Questions / Activities
<p>See <i>Alberta's Focus on Forests</i>:</p> <ul style="list-style-type: none"> • Activity 2.1: Finding the Light • Activity 2.2: Tree Waterworks I • Activity 2.3: Tree Waterworks II • Activity 2.4: Differences in Design • Activity 2.5: Tree Keys • Activity 2.6: New Trees from Old • Activity 2.7: How Trees Grow 	<ol style="list-style-type: none"> 1. Explain vital life processes performed by trees and other forest plants; e.g.: <ul style="list-style-type: none"> – nutrient uptake and transportation – photosynthesis – respiration and transpiration – reproduction – phenology (leaf flushings, leaf fall, flowering and cone production) 2. Provide labelled diagrams of major tree parts; e.g.: <ul style="list-style-type: none"> – root – trunk/stem – branch/twig – leaf – flower 3. Describe the function of major tree parts in performing vital life processes. 4. Describe interrelationships among tree structures, their functions, and vital life processes that are performed. 5. Describe major stages in the life cycle of a native tree. 6. Describe the role of trees in the water cycle.

TASK	OBSERVATION/RATING				
Management	4	3	2	1	0
Teamwork	4	3	2	1	0
Use of Equipment and Materials	4	3	2	1	0
Investigative Techniques	4	3	2	1	0

STANDARD IS 1 IN EACH APPLICABLE TASK**Rating Scale***The student:*

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

TASK CHECKLIST*The student:***Management**

- ☐ prepares self for task
- ☐ organizes and works in an orderly manner
- ☐ carries out instructions accurately
- ☐ uses time effectively

Teamwork

- ☐ cooperates with group members
- ☐ shares work appropriately among group members

Use of Equipment and Materials

- ☐ selects and uses appropriate equipment/materials
- ☐ follows safe procedures/techniques
- ☐ weighs and measures accurately
- ☐ returns clean equipment/materials to storage areas

Investigative Techniques

- ☐ gathers and applies information from at least one source
- ☐ makes predictions that can be tested regarding at least three vital life processes performed by trees; e.g.:
 - nutrient uptake and transportation
 - photosynthesis
 - respiration
 - transpiration
 - reproduction
 - phenology
- ☐ sets up and conducts experiments to test predictions
- ☐ distinguishes between manipulated/responding variables
- ☐ obtains results that can be used to determine if some aspect of the prediction is accurate
- ☐ summarizes important experimental outcomes, relating structural units of the tree to their function in performing life processes.

REFLECTIONS/COMMENTS:

Assessment Criteria and Conditions:

- identify and explain:
 - past and present uses of forests in Alberta and Canada
 - ways in which changes in forest use (and management) have affected the economy and the environment

Suggested Reference(s):

- *Alberta's Focus on Forests*
- *Our Growing Resource*.

STANDARD: Respond to a standard of 1 on the rating scale.

Rating Scale

The student:

- 4 meets project/task objectives in a self-directed manner. Provides explanations and critical judgements based on a superior knowledge base. Demonstrates an understanding of relevant concepts and related issues.
- 3 meets project/task objectives in a self-directed manner. Provides explanations and comparisons of relevant concepts using more precise terminology. Requires little or no prompting.
- 2 meets project/task objectives with limited assistance in planning and in selecting and using resources. Applies knowledge of concepts in different situations using correct terminology. Requires occasional prompting.
- 1 completes task as directed, demonstrating basic skills/competence by following a guided course of action. Uses simple recall to demonstrate basic knowledge of concepts. Requires prompting.
- 0 does not complete the task, or is unable to provide a suitable response

N/A Not Applicable

<p>Background Information</p> <p>See <i>Alberta's Focus on Forests</i>:</p> <p><u>Unit 4 - Forest Resources and Technologies</u></p> <ul style="list-style-type: none"> • Activity 4.1: Trees of Alberta and Canada • Activity 4.2: Products from Canada's Forests • Activity 4.3: Surveying the Forest Resource • Activity 4.4: From Pulp to Paper <p><u>Unit 5 - Forest Management for All</u></p> <ul style="list-style-type: none"> • Activity 5.1: Forest Values • Activity 5.2: Decision for Change • Activity 5.3: Forest Perspectives 	<p>Sample Questions / Activities</p> <ol style="list-style-type: none"> 1. Provide an overview of changing patterns of forest use in Canada and Alberta from past to present; e.g.: <ul style="list-style-type: none"> – aboriginal use – fur trade – land clearing for agriculture – ship building – urbanization – sawmilling – pulp and paper – value-added products – recreational uses. 2. Describe the history of forest land administration in Canada and Alberta; e.g.: <ul style="list-style-type: none"> – Federal jurisdiction – Provincial status – <i>Natural Resource Transfer Act</i>. 3. Suggest three or more ways in which changes in forest use (and management) have affected: <ul style="list-style-type: none"> – the economy – the environment. 4. Make predictions regarding the future use (and management) of forests in Alberta and Canada.
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Assessment Criteria and Conditions:

- give definitions and examples of sustainable yield and sustainable development within the context of Alberta's forested regions

Suggested Reference(s):

- *Our Growing Resource*
- *Forestline*.

STANDARD: Respond to a standard of 1 on the rating scale.

Rating Scale

The student:

- 4 meets project/task objectives in a self-directed manner. Provides explanations and critical judgements based on a superior knowledge base. Demonstrates an understanding of relevant concepts and related issues.
- 3 meets project/task objectives in a self-directed manner. Provides explanations and comparisons of relevant concepts using more precise terminology. Requires little or no prompting.
- 2 meets project/task objectives with limited assistance in planning and in selecting and using resources. Applies knowledge of concepts in different situations using correct terminology. Requires occasional prompting.
- 1 completes task as directed, demonstrating basic skills/completeness by following a guided course of action. Uses simple recall to demonstrate basic knowledge of concepts. Requires prompting.
- 0 does not complete the task, or is unable to provide a suitable response

N/A Not Applicable

Background Information	Sample Questions / Activities
<p>See <i>Our Growing Resource</i>, Chapter 2 - The Challenge of Sustainable Development:</p> <ul style="list-style-type: none"> • Managing Forest Development • Integrated Resource Management - Accommodating Many Uses • Harvest Planning and Practices • Reforestation • Air and Water Quality • Building Sustainable Businesses. 	<ol style="list-style-type: none"> 1. What does "sustainable yield" and "sustainable development" mean to you? Defend your response with information gathered through research (e.g., Alberta Environmental Protection). 2. Discuss the meaning of the following definition of sustainable forest management: <i>"the development of forests to meet current needs without prejudice to their future productivity, ecological diversity, or capacity for regeneration".</i> 3. Identify and explain major components/ considerations in sustainable forest management; e.g.: <ul style="list-style-type: none"> - timber resources - biodiversity of wildlife - air, land and water quality. 4. Interview representatives of three or more different forest industry organizations regarding their approach to sustainable forest management; e.g.: <ul style="list-style-type: none"> - priorities - actions. 5. Identify current research projects underway that are intended to support sustainable forestry practices.

TASK	OBSERVATION/RATING			
Preparation and Planning	4	3	2	1 0 N/A
Content	4	3	2	1 0 N/A
Presenting/Reporting	4	3	2	1 0 N/A

STANDARD IS 1 IN EACH APPLICABLE TASK

Rating Scale

The student:

- 4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.
 - 3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.
 - 2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.
 - 1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.
 - 0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.
- N/A Not Applicable

TASK CHECKLIST

The student:

Preparation and Planning

- ☐ sets goals and follows instruction accurately
- ☐ responds to directed questions and follows necessary steps to find answers
- ☐ accesses basic in-school/community information sources
- ☐ interprets and organizes information into a logical sequence
- ☐ records information accurately, using correct technical terms
- ☐ uses time effectively

Content

- ☐ provides a clear and concise statement of an issue regarding management of a forested region
- ☐ examines social, political, scientific, ethical, economic and/or environmental perspectives related to the issue
- ☐ explains why the issue is important by providing examples of possible consequences and their impact on sustainable yield and sustainable development
- ☐ states a position regarding the issue, and develops a logical argument and rationale for the position taken

Content (continued)

- ☐ develops a plan of action for dealing with the issue at local and/or global levels
- ☐ provides a glossary of terms relevant to the issue.

Presenting/Reporting

- ☐ demonstrates effective use of at least one medium of communication:
e.g., Written: spelling, punctuation, grammar, basic format
Oral: voice projection, body language
Audio-Visual: techniques, tools
- ☐ uses correct grammatical convention and technical terms through proofreading/editing
- ☐ provides an introduction that describes the purpose of the project
- ☐ communicates information in a logical sequence
- ☐ states a conclusion based on a summary of facts
- ☐ provides a reference list of three or more basic information sources

REFLECTIONS/COMMENTS:

TASK	OBSERVATION/RATING				
Preparation and Planning	4	3	2	1	0
Information Gathering and Processing	4	3	2	1	0
Content	4	3	2	1	0
Collaboration and Teamwork	4	3	2	1	0
Information Sharing	4	3	2	1	0

STANDARD IS 1 IN EACH APPLICABLE TASK

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

Forestry /G.64
(Interim 1994)

TASK CHECKLIST

The student:

Preparation and Planning

- ☐ sets goals and follows instructions accurately
- ☐ adheres to established timelines
- ☐ responds to directed questions and follows necessary steps to find answers
- ☐ uses time effectively

Information Gathering and Processing

- ☐ accesses basic in-school/community information sources
- ☐ uses one or more information-gathering techniques
- ☐ interprets and organizes information into a logical sequence
- ☐ records information accurately, using correct technical terms
- ☐ distinguishes between fact and fiction/opinion/theory
- ☐ responds to feedback when current approach is not working

Content

- ☐ cites reasons for protecting the forest resource; e.g.:
 - material and non-material benefits
 - environmental impact
- ☐ identifies and describes major components of forest protection; e.g.:
 - forest fire management
 - soil conservation and land reclamation
 - pest and disease control

Content (continued)

- ☐ explains basic goals and techniques of forest fire management, soil conservation and land reclamation
- ☐ identifies and describes symptoms of common forest pests and diseases
- ☐ compares different methods of pest and disease control; e.g.:
 - biological methods
 - forest management
 - chemical methods

Collaboration and Teamwork

- ☐ cooperates with group members
- ☐ shares work appropriately among group members

Information Sharing

- ☐ demonstrates effective use of one or more communication media; e.g., written, oral, audio-visual
- ☐ communicates information in a logical sequence
- ☐ uses correct grammatical conventions and technical terms
- ☐ cites three or more basic information sources

REFLECTIONS/COMMENTS:

COLLECTING/PHOTOGRAPHING PEST PROBLEMS	
<i>The student:</i>	
☐ collects, photographs and/or observes six or more instances of pest damage evident in a forest environment	
☐ identifies and describes forest site and/or forest stand factors associated with each instance of pest damage	
☐	

RECOMMENDING PREVENTION/ CONTROL STRATEGIES	
<i>The student:</i>	
☐ uses information provided in the <i>Identification Key for Forest Pests</i> (FOR110-6) to recommend appropriate prevention/control strategies for each of four pests identified	
☐	

STANDARD IS 1 IN EACH APPLICABLE TASK

Rating Scale

The student:

- 4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.
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- 2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.
- 1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.
- 0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

REFLECTIONS / COMMENTS

USING THE IDENTIFICATION KEY TO IDENTIFY FOREST PESTS	
<i>The student:</i>	
☐ explains basic terminology used in the <i>Identification Key for Forest Pests</i> (FOR110-6)	
☐ explains steps in using a dichotomous key to identify pests or pest damage	
☐ uses the identification key to correctly identify four or more forest pests and/or instances of pest damage	
☐	

This identification guide includes only the most common insects and diseases that affect the forests of Alberta. The key is not intended to be exhaustive in terms of pests and pest damages it can be used to identify. The key serves only as a beginner's guide to the identification of some common agents of forest change in Alberta.

Key **Title**

1	General
2	Physical Injuries
3	Disease
4	Animal/Insect Damage

Keys have been modified from the following source:

Finck, Kelly E., P. Humphreys and G. Hawkins. 1989.
Field Guide to Pests of Managed Forests in British
Columbia. Forestry Canada and B.C. Ministry of Forests,
Victoria, B.C. Joint Publ. No. 16. 188p.

Use of the Keys for Pest Identification

There are various factors/agents that cause damage in forest stands and in wood products. These can be grouped into the following categories:

Diseases

Abiotic injuries – primarily due to climatic and soil factors

Animal damage

Insects.

When identifying the cause of damage in a forest stand we usually focus attention on the symptoms because they are visible. The first step is to use General Key #1 to determine which agents of change are responsible.

Notice that each key provides two choices, e.g.:

- a. whole tree affected
- a. part of the tree affects.

Read both choices before selecting the appropriate one.

Good luck with your pest identification!

KEY 1: GENERAL**a. Whole tree affected**

- a. Crown entirely or partially discoloured, bright yellow, brown or red or lacking leaves or needles; trees may be broke, laying on the ground or standing and lower stem buried in sediment; crown, if present, may not be deformed
- b. Widespread area affected, especially in low lying areas or in bands along slopes, near industrial sites, adjacent to streams or on lower slopes in mountainous terrain; trees in small clumps are uniformly affected
Key 2: Physical Injuries
- c. Trees affected randomly and to a varying extent
 - d. Sap present of stem or at root collar
 - e. Sap at root collar
 - f. Sap, mycelia, mushrooms or bracket fungi around root collar
Key 3: Disease 1
 - f. Sap, tunnels, bark and wood fragments around root collar, roots chewed
Key 4: Animal/Insect Damage
- c. Sap, swelling, cankers or bracket fungi on main stem or branches
Key 3: Disease 1

f. Bark removal from stems or roots

- b. Crown thin, yellow, poor growth, crown not generally deformed
 - g. Widespread area affected, impact on trees quite uniform, no evidence of disease. No evidence of industrial site nearby nor are trees on poor sites
Key 2: Physical Injuries
- g. Affected trees in patches or scattered individuals, standing dead and/or windthrown trees; trees affected to varying degrees
Key 3: Disease 1

a. Part of tree affected

- h. Foliage, leaders and/or branch tips affected
Key 1: General 2
- h. Main stem and/or branches affected
 - a. Trees erect or windthrown in random manner, cankers, fungi, sap, brooms or swellings
Key 3: Disease 1
 - i. No cankers, fungi, sap, brooms or swellings
 - j. Splintered or broken main stem, top and/or branches, wind thrown trees lying in all the same direction
Key 2: Physical Injuries
 - j. Pitch, frass or cottony tufts present, branch or main stem gouting and/or breakage which may or may not be present
Key 4: Animal/Insect Damage

a. Foliage affected

- b. Trees affected in widespread area, especially in low lying areas or in bands along slopes
Key 2: Physical Injuries 1
- b. Trees affected in large to small areas, generally to varying extent
 - c. Needles uniformly coloured or mottled, small fruiting bodies or blisters present, main stems or branches may not be affected
Key 3: Disease 1
 - c. Extensive loss of leaves or needles, or needles uniformly discoloured or mottled, generally from the top of crown downward and from the tips inward. Chewed or clipped needles, mined buds, exit holes, silk and/or insects present
Key 4: Animal/Insect Damage

a. Leaders and/or branch tips affected

- d. Bark removed or tips clipped off
Key 4: Animal/Insect Damage
- d. Bark not stripped, tips and/or buds not clipped
 - e. Tips may or may not curl, buds or needles mined, exit holes, frass, silk or cottony tufts present
Key 4: Animal/Insect Damage
- e. Tips discoloured
 - f. Small dark fruiting bodies or white to orange blisters or cankers on bark
Key 3: Disease 1
- f. Buds mushy, in low lying areas or industrial site nearby
Key 2: Physical Injuries

KEY 2: PHYSICAL INJURIES**Physical Injuries 1: Injuries to Crown/Foliage or Tips**

- a. Tree leaning, windthrown or laying on ground

Key 2: Physical Injuries 2

- a. Tree erect
b. Damage to main stem and/or branches

Key 2: Physical Injuries

- b. Damage to crown

Foliage discoloured or leaders and branch tips damaged

- c. Tips of leaders, branches affected (including buds).
Damage most intense in depressions. Buds, new shoots, and needles brown in spring. Shoots and needles brown in fall. Mushy buds, all species in a stand may be affected.

Frost Damage

- c. Foliage discolouration not restricted to the leaders, branches or branch tips. No evidence of insects, animals or disease. No industrial site nearby, generally no noticeable discolouration or death of deciduous and/or shrub layer. Crown in deep red-brown to brown

- d. Damage in a band along al slope

Red Belt Injury

- d. Damage does not extend in a band along a slope;

needles, if any, lacking flecking

- e. Crown is brown from top down and from new to old needles; needles may drop especially in late summer

Drought Damage

- e. Crown devoid of foliage or entire crown reddish brown, scorched appearance, evidence of burned bark

Fire Damage**Physical Injuries 2: Injuries to Main Stem/Branches or Whole Tree**

- a. Tree leaning, windthrown or broken; young to mature trees
b. Trees windthrown or broken

- c. Trees blown over, crown intact, root "mats" present, trees lie in one direction, branches and stem of adjacent trees may be scarred or splintered

Wind Damage

- c. Evidence of numerous broken trees aligned at right angles to the slope on steep middle and lower slopes. Sharp line between old and young trees, damaged area may be occupied by shrubs and forbs

Avalanche Damage

- b. Young trees bent over or deformed, older trees with uneven and splintered breakage of tops and/or upper branches, cankers not evident

Snow or Ice Damage

- a. Tree erect, damage to main stem and/or branches

- d. Bark removal of main stem generally evident

- e. Main stem severely debarked and deeply gouged, exposed wood splintered, evidence of logging or construction activities adjacent, may also be associated with adjacent windfall

Mechanical Damage

- e. Main stem may be debarked but no evidence of gouging, splintering on wood; evidence of burned branch ends and charcoal

Fire Damage

- d. Main stem not severely damaged

- f. Branches and/or tops broken or splintered, cankers not evident

Snow or Ice Damage

- f. Branches and/or top not broken or splintered

- g. Upper surface of branches have wounds or scars associated with green ragged crown, scars may or may not be on main stem

Hail Damage

- g. Scars on main stem, bark removed from scar or lower stem buried

- h. Extended scars at ground level

Fire Scar

- h. Lower section of stem buried by sediment from adjacent stream

Flood Damage

KEY 3: DISEASE**Disease 1: Diseases of roots and those affecting more than one kind of tissue**

- a. **Whole tree affected**
No cankers; scattered pockets of trees with thick chlorotic crown with poor growth or standing dead, wind toppled trees in crisscross pattern, trees of all ages affected.
- Root Rots**
- a. **Part of tree affected**
 - b. Part of crown affected
Crown red, dead top and/or branches, cankers on main stem and/or branches – on pines only
 - b. Either foliage or stem and/or branches affected
 - c. Young to mature stand with conks, flattened areas, swellings or brooms
 - d. No brooms or aerial shoots
 - d. Brooms present, minor needle discolouration, no blisters on needles, aerial shoots or basal cups on swollen areas of branches and brooms.
Branch pattern whorled

Key 3: Disease 2**Key 3: Disease 2****Key 3: Disease 2****Lodgepole Pine dwarf Mistletoe****Disease 2: Cankers, Rusts and Trunk Rots**

- a. Various types of conks visible on tree trunks or bracket fungi on ground near base of tree
- a. **Absence of conks or bracket fungi on stem or near base of tree**
 - b. No noticeable swelling on stem, dead areas consist of flattened or depressed tissue, dead bark may have peeled off stem
 - c. On Aspen, rough, flattened area, black cracked bark
 - c. On Lodgepole Pine, elongated sunken, perennial canker, usually on the lower bole. Sap, branch flagging, blue-black stain in sapwood under the canker
- b. Spindle to oval-shaped swellings present on pines, raised areas on main stem and/or branches. Noticeable blistering of bark, sometimes extended scars. Fruiting structures are white, yellow or orange powdery blisters

Hypoxylon Canker**Atropellis Canker****Pine Stem Rusts**

KEY 4: ANIMAL/INSECT DAMAGE**Animal Damage**

- a. **Bark removed from roots, branches or stem**
 b. Bark removed from buried roots

Vole

- b. Bark removed from branches and/or main stem
 c. Damage below 2.5 m.
 d. Bark stripped from main stem and branches
 e. Bark pulled away in large strips, tooth and claw marks on sapwood

Bear

- e. Shredded bark remaining on tree, long vertical tooth marks

Deer

- d. Bark and sapwood gnawed
 f. Shallow gnaw marks
 g. Exposed sapwood has rough appearance
 g. Exposed sapwood fairly smooth

Tree Squirrel

- f. Deep gnaw marks, distinct tooth marks

Porcupine

- c. Damage above 2.5 m.
 h. Shallow gnaw marks

Tree Squirrel

- h. Deep gnaw marks

Porcupine

- a. **Stems and/or branches cut or damage to foliage**
 i. Stems and/or branches cut, multiple chips to 4 cm long at base of tree or branch

Beaver**Insect Damage**

- a. **Entire crown affected**
 b. Coniferous hosts. Needles chewed to varying degrees, needle stubs may or may not remain on the tree

Defoliators (Sawflies or Budworms)

- b. 'Deciduous hosts

Defoliators (Tent Caterpillars, Leaf-Eating Beetles, Leaf Miners)

- a. **Leaders and branches, stems, roots or cones affected**
 c. Leaders and branches affected

Terminal Weevils

- c. Main stems affected

- d. Entire tree dying. Crown yellow or reddish brown: boring dust around base of tree, tunnels on inside of bark

Bark Beetles

- d. Tree may be alive or dead; may have presence of sap flow form insect entrance holes; insect feeding penetrates deeply into wood

Wood Borers or Carpenter Ants

- c. Roots or root collar area affected. Pitch tubes at root collar. Sap soaked duff near root collar. Trees up to 3 m. tall are most susceptible, entire crown may be reddish

Warren's Root Collar Weevil

- c. Cones and/or seed affected

- g. Pitch and silk webbing present on the exterior of the cone

Coneworms

- h. Absence of pitch and silk. Exit holes on exterior of cone may be visible

Chalcid Wasp

INFERENCE

Definition: to derive a conclusion from facts or premises

Synonyms: infer, deduce, deduct, draw, gather, judge

Criteria for Assessing Inferences

Inferences made in intermediate level modules should communicate the process used to derive conclusions. Inferences should not be considered as right or wrong. Instead, inferences are valid if they are communicated in a logical sequence with sufficient supporting detail. Both the type and amount of information used to derive a conclusion are important in determining the validity of the inference.

Each inference made regarding the impact of daily living activities on forest ecosystems should provide:

- ☐ a clear statement of the situation
- ☐ relevant facts and detail that support more than one point of view e.g., cultural, ethical, economic, environmental, health-related
- ☐ a logical sequence of ideas that lead to a conclusion
- ☐ evidence that different points of view were considered in deriving the conclusion
- ☐ a conclusion that is valid and realistic in light of the information gathered.

RATING SCALE

4	3	2	1	0
Exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.	Meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.	Meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.	Meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.	Has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

Log of Reflections and Inferences

The log will include five or more journal entries that describe daily living activities having impact on forest ecosystems. Activities may be seasonal in nature (e.g., burning wood for heat), yet need to be of sufficient duration to permit reflection on their consequences. Each journal entry should describe:

- ☐ the nature of the activity
- ☐ a rationale for participating in the activity
- ☐ inferences regarding both short- and long-term consequences for forest ecosystems.

Journal entries may reference activities that:

- involve the consumption of fibre-based products; e.g.:
 - wood as a fuel
 - paper and paper products
 - food products/additives
- involve recreational use of the forest; e.g.:
 - personal use of forest environments
 - use of recreational vehicles
 - participation in hunting and/or fishing activities
- influence the forest in indirect ways; e.g.:
 - use of heat in the home
 - turning on an electric light
 - use of an automobile.

TASK	OBSERVATION/RATING				
Preparation and Planning	4	3	2	1	0
Information Gathering and Processing	4	3	2	1	0
Content	4	3	2	1	0
Collaboration and Teamwork	4	3	2	1	0
Information Sharing	4	3	2	1	0

STANDARD IS 2 IN EACH APPLICABLE TASK**Rating Scale***The student:*

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

Forestry /G.72
(Interim 1994)

CSB: 96 06 07

TASK CHECKLIST*The student:***Preparation and Planning**

- ☐ sets goals and establishes steps to achieve them
- ☐ creates and adheres to useful timelines
- ☐ uses personal initiative to formulate questions and find answers
- ☐ plans and uses time effectively

Information Gathering and Processing

- ☐ accesses a range of relevant in-school/community resources
- ☐ uses a range of information-gathering techniques
- ☐ interprets, organizes and combines information into a logical sequence
- ☐ records information accurately with appropriate supporting detail and using correct technical terms
- ☐ determines accuracy/currency/reliability of information sources
- ☐ gathers and responds to feedback regarding approach to the task

Content

- ☐ identifies different types of refuse that can be recycled in practical and economical ways
- ☐ identifies four or more products recently developed through recycling techniques; e.g.:
 - plastic wood
 - paper
 - synthetic fibres
 - clothing

Content (continued)

- ☐ identifies advantages and disadvantages associated with each of four recycled products, and trade-offs that occur through the recycling process; e.g.:
 - social
 - economic
 - environmental

- ☐ explains in detail technologies and processes used to develop one or more recycled products, and prepares flowcharts/diagrams that illustrate major stages/steps in the recycling process

Collaboration and Teamwork

- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates solutions to problems

Information Sharing

- ☐ demonstrates effective use of two or more communication media
e.g., written, oral, audio-visual
- ☐ communicates ideas in a logical sequence with sufficient supporting detail
- ☐ maintains acceptable grammatical and technical standards
- ☐ cites five or more relevant information sources

REFLECTIONS/COMMENTS:

TASK	OBSERVATION/RATING				
Preparation and Planning	4	3	2	1	0
Analyzing Perspectives	4	3	2	1	0
Collaboration and Teamwork	4	3	2	1	0
Evaluating Choices and Making Decisions	4	3	2	1	0

STANDARD IS 2 IN EACH APPLICABLE TASK

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

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1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

TASK CHECKLIST

The student:

Preparation and Planning

- ☐ accurately describes an issue related to reducing, reusing and/or recycling on which people disagree, explaining areas of disagreement
- ☐ poses one or more thoughtful questions regarding the issue
- ☐ accesses a range of relevant in-school/community resources
- ☐ uses a range of information-gathering techniques

Analyzing Perspectives

- ☐ identifies and categorizes trade-offs that occur through reducing, reusing and/or recycling e.g., *cultural, ethical, economic, environmental, health-related*

- ☐ states a position on the issue and reasons for adopting that position
- ☐ states two or more opposing positions on the issue and reasons for adopting each position
- ☐ describes interrelationships among different perspectives/points of view
- ☐ determines accuracy/currency/reliability of information and ideas

Collaboration and Teamwork

- ☐ shares work appropriately among group members
- ☐ respects and considers the views of others
- ☐ negotiates solutions to problems

Evaluating Choices/Making Decisions

- ☐ identifies important and appropriate alternatives regarding reducing, reusing and/or recycling
- ☐ establishes knowledge- and value-based criteria for assessing each alternative e.g., *social, economic, environmental*

- ☐ selects an appropriate alternative by showing differences among choices
- ☐ assesses strengths/weaknesses of decisions made regarding the issue by considering consequences

- ☐ communicates ideas in a logical sequence with sufficient supporting detail to justify choices/decisions made

REFLECTIONS/COMMENTS:

TASK	OBSERVATION/RATING				
Preparation and Planning	4	3	2	1	0
Content	4	3	2	1	0
Presenting/Reporting	4	3	2	1	0

STANDARD IS 2 IN EACH APPLICABLE TASK

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

TASK CHECKLIST

The student:

Preparation and Planning

- ☐ sets goals and describes steps to achieve them
- ☐ uses personal initiative to formulate questions and find answers
- ☐ accesses a range of relevant in-school/ community resources
- ☐ interprets, organizes and combines information into a logical sequence
- ☐ records information accurately with appropriate supporting detail and using correct technical terms
- ☐ plans and uses time effectively
- ☐ gathers and responds to feedback regarding approach to task and project status

Content

- ☐ provides a timeline of major changes that have occurred in the ownership and administration of forested lands in Alberta; e.g.:
 - Federal jurisdiction
 - Provincial status
 - *Natural Resource Transfer Act*
- ☐ describes different land tenures in Alberta today; e.g.:
 - public (provincial and federal crown lands)
 - private
- ☐ prepares a map that outlines different land management areas in Alberta; e.g.:
 - white area
 - green area

Content (continued)

- ☐ explains the mandates of five or more agencies responsible for managing forested lands within Alberta's boundaries; e.g.:
 - Alberta Environmental Protection
 - Parks Canada
 - private ownership
 - Metis or Native Indian
 - Forestry Canada
- ☐ prepares a graph (e.g., circle) that depicts current land ownership distribution in Alberta

Presenting/Reporting

- ☐ demonstrates effective use of at least two communication media:
 - e.g., Written: *spelling, punctuation, grammar, format (formal/informal)*
 - Oral: *voice projection, body language, appearance*
 - Audio-Visual: *techniques, tools, clarity*
- ☐ maintains acceptable grammatical and technical standards through proofreading and editing
- ☐ provides an introduction that describes the purpose and scope of the project
- ☐ communicates ideas into a logical sequence with sufficient supporting detail
- ☐ states a conclusion by synthesizing the information gathered
- ☐ provides a reference list that includes five or more relevant information sources

REFLECTIONS/COMMENTS:

DATE	EVENT
1670-1870	Forests are administered by the Hudson Bay Co.
1870	Government of Canada administers forest lands
1885	Disposition of timber is administered by public competition.
1905	Criteria similar to present LTP's Alberta becomes a province September 1, 1905, but does not have control of resources
1910	Forest Reserves and Parks Act replaces Forest Reserves Act of 1906 Five forests are created
1930	Control of natural resources is transferred to Alberta
1948	Crowsnest, Bow and Clearwater forests are placed under ERCB jurisdiction
1949	Green and Yellow areas are established in Alberta The Department of Lands and Forests is created The first Forests Act is passed
1966	The timber quota system is established.
19--	-----
19--	-----
19--	-----

Reference: *Public hearings on the Environmental Effects of Forestry Operations in Alberta, Perspectives II - The Forest Industry in Alberta*

FORESTS ACT

This act provides overall direction for forest legislation (primarily the allocation of timber harvesting rights) in Alberta. It consists of four parts:

1. Administration - defines forest officers, specifies who can make regulations, prescribes uses and prohibited activities.
2. Crown Timber - specifies the four methods of allocating cutting rights to crown timber. Conditions associated with each tenure are outlined.
3. Forest Land Uses - outlines the means to authorize, prescribe and control recreational activities on forested land.
4. Offences and Penalties - outlines offences under the Forests Act and prescribes penalties.

Timber Management Regulation

This regulation is more specific than the Forests Act. It specifies the conditions associated with Timber Quotas, Commercial Timber Permits (CTP's), Local Timber Permits (LTP's), Forest Products tags, Christmas tree permits, rates of Crown dues, timber appraisal, payments of Crown charges, clearing land for industrial uses and general provisions. The amounts of specific penalties are also indicated.

Typical content provided in a Forest Management Agreement (FMA) would be:

- description of area
- land withdrawals
- rights over the land
- forest management provisions
 - general
 - reforestation
 - forest protection
- records and scaling
- charges and dues
- mill construction and operation
- deposit
- general provisions

Forest Land Use and Management Regulations

These regulations control vehicle access into Willmore Wilderness Park and prescribe penalties for the contravention of regulations.

Forest Recreation Regulation

This regulation establishes Forest Land Use Zones, Forest Recreation Areas and Forest Recreation trails. Activities permitted in a Forest Recreation Area are indicted, along with prescribed user fees.

THE FOREST AND PRAIRIE PROTECTION ACT

This act authorizes legislation that covers all aspects of protecting the forest from fire.

The Forest and Prairie Protection Regulations

Part I

- issuing of fire permits
- fire prevention precautions (industrial, pipe line, campfires, incinerators, power saws)
- travel in a closed area
- conscription exemptions
- required fire fighting equipment
- liability

Part II

- fire hazard reduction
- procedures for debris disposal associated with:
 - logging
 - agriculture
 - geophysical exploration
- conduct of firefighting operations
- pollution and erosion control

FOREST RESERVES ACT

This act provides a means of establishing forest reserves in Alberta. These reserves are generally south of the 12th Base line and include most of the Foothills South Region. Procedures are indicated for:

- acquiring land
- making regulations
- cancelling permits
- posting signs
- identifying offences and issuing penalties

Forest Reserves Regulations

These regulations specify the conditions associated with domestic grazing within Forest Reserves, and include:

- types of permits
- requirements of a range management plan
- conditions associated with grazing.

PROVINCIAL PARKS ACT

This act gives authority to the Government to establish criteria for creating provincial parks. It deals with:

- purpose of parks and recreation areas
- authority to acquire land for parks
- authority to create parks and recreation areas
- authority to make regulations for disposition of land for parks
- authority of the Minister regarding closures, concessions, standards of operations and zoning
- control and protection of roads
- authority of parks officers
- seizures
- offences

WILLMORE WILDERNESS PARK ACT

This act establishes the Willmore Wilderness area. It identifies intended uses (mines and minerals are not subject to this act) and gives Cabinet the authority to make regulations.

WILDERNESS AREAS ACT

This act identifies procedures for establishing a wilderness area. It deals with:

- land acquisition
- programs permitted in a wilderness area
- prohibited activities
- travel restrictions
- provision of adjacent buffer areas
- offences and penalties.

TASK	OBSERVATION/RATING				
Preparation and Planning	4	3	2	1	0
Information Gathering and Processing	4	3	2	1	0
Content	4	3	2	1	0
Collaboration and Teamwork	4	3	2	1	0
Information Sharing	4	3	2	1	0

STANDARD IS 2 IN EACH APPLICABLE TASK**Rating Scale***The student:*

- 4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.
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- 0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

Forestry /G.78
(Interim 1994)

CSB: 96 06 07

TASK CHECKLIST*The student:***Preparation and Planning**

- ☐ sets goals and establishes steps to achieve them
- ☐ creates and adheres to useful timelines
- ☐ uses personal initiative to formulate questions and find answers
- ☐ plans and uses time effectively

Information Gathering and Processing

- ☐ accesses a range of relevant in-school/community resources
- ☐ uses a range of information-gathering techniques
- ☐ interprets, organizes and combines information into a logical sequence
- ☐ records information accurately with appropriate supporting detail and using correct technical terms
- ☐ determines accuracy/currency/reliability of information sources
- ☐ gathers and responds to feedback regarding approach to the task

Content

- ☐ explains the use of dispositions/authorizations in the form of permits, licences and other legal agreements in managing commercial activities on forested lands
- ☐ identifies different public land users/uses, and criteria for establishing forest land and timber dispositions; e.g.:
 - fibre production
 - recreation/agriculture
 - wildlife habitat

Content (continued)

- ☐ describes the intent of three or more different timber dispositions issued by the Alberta Forest Service, and the responsibilities of holders of these dispositions
- ☐ describes the intent of three or more other types of dispositions used to manage non-fibre aspects of forest use; e.g.:
 - grazing
 - hunting, fishing and trapping
 - energy and mineral development
- ☐ explains the role of consultation (with other resource users) and public involvement in establishing land and timber dispositions

Collaboration and Teamwork

- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates solutions to problems

Information Sharing

- ☐ demonstrates effective use of two or more communication media
e.g., written, oral, audio-visual
- ☐ communicates ideas in a logical sequence with sufficient supporting detail
- ☐ maintains acceptable grammatical and technical standards
- ☐ cites five or more relevant information sources

REFLECTIONS/COMMENTS:

TRIP PLANNING AND PREPARATION	
<i>The student:</i>	☐ establishes specific objectives for an outdoor wilderness trip; e.g.: ☐ goals and expectations ☐ length of trip ☐ destination ☐ general itinerary and daily agendas
☐	prepares a camping menu for self that addresses: ☐ expected caloric output ☐ all food groups included in the Canada Food Guide ☐ concerns related to food spoilage ☐ provisions for emergency
☐	plans for weather and seasonal conditions; e.g.: ☐ identify hazards particular to the area ☐ listen to weather and news reports/forecasts
☐	incorporates guidelines for environmental awareness into trip planning; e.g.: ☐ principles of ecotourism ☐ consideration for carrying capacity ☐ strategies for minimum impact land use
☐	identifies and obtains appropriate supplies, equipment and personal gear for the trip; e.g.: ☐ water and food ☐ tent, stove, axe ☐ first aid and survival supplies ☐ clothing and foot wear ☐ toiletries

TRIP PLANNING AND PREPARATION (continued)	
<i>The student:</i>	☐ conducts pre-trip assessment of supplies, equipment and personal gear; e.g.: ☐ compares to trip checklist ☐ assesses quality, quantity and condition ☐ assesses relative to weather and seasonal conditions ☐ obtains missing and/or specialty items
☐	prepares supplies, equipment and personal gear for transportation; e.g.: ☐ addresses weight restrictions ☐ makes efficient use of space ☐ packs food to prevent spoilage and minimize odour
☐	plans course of action to cope with potential emergency situations in the wilderness; e.g.: ☐ extreme weather conditions ☐ fire or flood ☐ injury and illness ☐ avalanche
☐	
☐	

CONDUCTING THE TRIP	
<i>The student:</i>	☐ follows guidelines for safe travel in the forest; e.g.: ☐ follows travel schedule as planned ☐ uses orientation and navigational skills ☐ identifies potential hazards and take necessary precautions ☐ dresses according to mode of travel, weather and season ☐ watches for changes in current weather conditions
☐	sets up camp site following guidelines for comfort, safety and least possible environmental impact; e.g.: ☐ selects appropriate camp site ☐ erects tent or lean-to ☐ assembles other amenities ☐ protects food from wildlife and spoilage ☐ protects equipment from the elements
☐	follows minimal impact guidelines in establishing and using camp site; e.g.: ☐ latrine location and toilet procedures ☐ wash area and procedures ☐ fire site and use ☐ garbage and waste water disposal
☐	complies with local, provincial and federal legislation relevant to activities that are undertaken
☐	assumes camp duties on a rotational basis; e.g.: ☐ meal preparation ☐ camp maintenance and hygiene

CONDUCTING THE TRIP (continued)	
<i>The student:</i>	monitors the activities of wildlife in the area and takes precautions to avoid dangerous situations
☐	
☐	
☐	

WILDERNESS INTERACTION	
<i>The student:</i>	performs a closed traverse (accurate to within 5%) with a minimum of six legs and total perimeter distance between one and three kilometres
☐	
☐	identifies 25 tree, shrub and/or other plant species
☐	identifies, while demonstrating appropriate safety/health precautions five different: <ul style="list-style-type: none"> ☐ animal tracks and scat ☐ hazardous plants ☐ forest insects
☐	identifies five or more uses of forest plants for human survival and comfort in the wilderness environment
☐	spends three hours alone in a designated forest area, and share experiences and coping strategies

WILDERNESS INTERACTION (continued)	
<i>The student:</i>	
☐	
☐	

BREAKING CAMP AND CONCLUDING THE TRIP	
<i>The student:</i>	follows appropriate procedures for breaking camp: <ul style="list-style-type: none"> ☐ packs supplies, equipment and personal gear ☐ takes down shelter ☐ cleans site ☐ does circle tour of site
☐	conducts a post-trip assessment: <ul style="list-style-type: none"> ☐ observations and personal impressions ☐ activities well done ☐ problems encountered ☐ recommendations regarding future trips
☐	
☐	

STANDARD IS 2 IN EACH APPLICABLE TASK

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

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0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

REFLECTIONS/COMMENTS

TASK	OBSERVATION/RATING				
Individual/Group Preparedness	4	3	2	1	0
Cooperation and Teamwork	4	3	2	1	0
Responsibility and Safety	4	3	2	1	0
Environmental Ethics	4	3	2	1	0

STANDARD IS 2 IN EACH APPLICABLE TASK

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N/A Not Applicable

CSB: 96 06 07

Forestry /G.81
(Interim 1994)

TASK CHECKLIST

The student:

Individual/Group Preparedness

- ☐ sets goals and follows instructions accurately
- ☐ adheres to established timelines
- ☐ identifies/assembles outdoor gear appropriate to the task
- ☐ uses time effectively
- ☐ identifies tasks well done
- ☐ identifies problems encountered and suggests solutions
- ☐ makes recommendations regarding future trips

Cooperation and Teamwork

- ☐ works with a range of peer members
- ☐ shares work appropriately among group members
- ☐ considers the ideas/suggestions of others
- ☐ identifies tasks well done
- ☐ identifies problems encountered and suggests solutions
- ☐ makes recommendations regarding future trips

Responsibility and Safety

- ☐ selects and uses appropriate equipment/materials
- ☐ follows safe procedures/techniques
- ☐ anticipates and advises of potential hazards
- ☐ practises proper sanitation procedures
- ☐ identifies tasks well done
- ☐ identifies problems encountered and suggests solutions
- ☐ makes recommendations regarding future trips

Environmental Ethics

- ☐ uses environmentally friendly materials
- ☐ picks up garbage and carries out everything that is carried in
- ☐ avoids ecologically sensitive areas
- ☐ demonstrates techniques for protecting water supply
- ☐ identifies tasks well done
- ☐ identifies problems encountered and suggests solutions
- ☐ makes recommendations regarding future trips

REFLECTIONS/COMMENTS:

TASK	OBSERVATION/RATING				
Preparation and Planning	4	3	2	1	0
Information Gathering and Processing	4	3	2	1	0
Content	4	3	2	1	0
Collaboration and Teamwork	4	3	2	1	0
Information Sharing	4	3	2	1	0

STANDARD IS 2 IN EACH APPLICABLE TASK**Rating Scale***The student:*

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- 0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

Forestry /G.82
(Interim 1994)**TASK CHECKLIST***The student:***Preparation and Planning**

- ☐ sets goals and establishes steps to achieve them
- ☐ creates and adheres to useful timelines
- ☐ uses personal initiative to formulate questions and find answers
- ☐ plans and uses time effectively

Information Gathering and Processing

- ☐ accesses a range of relevant in-school/community resources
- ☐ uses a range of information-gathering techniques
- ☐ interprets, organizes and combines information into a logical sequence
- ☐ records information accurately with appropriate supporting detail and using correct technical terms
- ☐ determines accuracy/currency/reliability of information sources
- ☐ gathers and responds to feedback regarding approach to the task

Content

- ☐ distinguishes between random and systematic sampling techniques
- ☐ defines/illustrates and explains the steps involved in conducting:
 - random plot samples
 - random transect samples
 - systematic plot samples
 - systematic transect samples

Content (continued)

- ☐ identifies sampling designs suited to gathering specific data regarding:
 - distribution of a tree species
 - growth, age and/or volume of trees
 - soil, water and/or wildlife characteristics
 - potential for recreation and/or agriculture
- ☐ explains sources of bias and error in random and systematic sampling designs, and problems related to use of the sample data in estimating forest values or populations

Collaboration and Teamwork

- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates solutions to problems

Information Sharing

- ☐ demonstrates effective use of two or more communication media
e.g., written, oral, audio-visual
- ☐ communicates ideas in a logical sequence with sufficient supporting detail
- ☐ maintains acceptable grammatical and technical standards
- ☐ cites five or more relevant information sources

REFLECTIONS/COMMENTS:

ALLOCATING TIME AND MATERIALS	
<i>The student:</i>	develops and follows a schedule of activities for sampling forest values
☐	
☐	selects and safely uses appropriate equipment and materials
☐	uses appropriate safety devices; e.g.: ☐ protective clothing ☐ protective eye wear ☐ hard hats
☐	recognizes potential hazards and takes steps to eliminate/avoid them.

SAMPLING DESIGN	
<i>The student:</i>	identifies goals/outcomes for a forest survey
☐	
☐	determines the type and amount of data to be collected
☐	selects a sampling technique suited to survey goals/outcomes and type/amount of data to be collected; e.g.: ☐ random ☐ systematic ☐ transect ☐ plot
☐	establishes boundaries for the sample area
☐	designs a data collection sheet appropriate to the information to be collected
☐	takes necessary precautions to address health and safety concerns throughout the planning process (e.g., hantavirus in owl pellets)

COLLECTING, RECORDING AND COMPILING SAMPLE DATA	
<i>The student:</i>	collects sample data regarding a specific fibre and non-fibre value on 0.01% of the forested area
☐	
☐	records data accurately and systematically, using standard data collection techniques
☐	adheres to health and safety practices while collecting and recording data
☐	performs calculations on sample data as required in order to estimate fibre and non-fibre resources
☐	prepares a summary of fibre data accurate to within 10% of existing volume estimates
☐	states conclusions regarding fibre and non-fibre values based on observations and compilations of sample data.
☐	
☐	

SUMMARIZING AND ASSESSING SURVEY RESULTS	
<i>The student:</i>	summarizes the strengths and weaknesses of the sample data
☐	
☐	considers limitations and generalizability of conclusions drawn regarding fibre and non-fibre values in the forested area
☐	critically examines procedures/outcomes/ task performance and suggests refinements.

SUMMARIZING AND ASSESSING SURVEY RESULTS (continued)	
<i>The student:</i>	
☐	
☐	

STANDARD IS 2 IN EACH APPLICABLE TASK**Rating Scale***The student:*

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0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

REFLECTIONS/COMMENTS

ACTIVITY #5

SAMPLE WILDLIFE INVENTORY FORM

Signs of Browing # _____ Evidence (# species) _____

Signs of scat # _____ Distance of nearest water _____m

Distance to nearest permanent housing _____km

Availability of forage: low medium high

Type: _____

Availability of browse species: low medium high

Type: _____

Other signs of wildlife (e.g., nests, burrows): _____

ACTIVITY #6

SAMPLE INSECT AND DISEASE INVENTORY FORM

Evidence of insects:	low	medium	high
Evidence of disease:	low	medium	high
Specimen 1: Attack location	roots	yes	no
	trunk	yes	no
	foliage	yes	no
Specimen 2: Attack location	roots	yes	no
	trunk	yes	no
	foliage	yes	no
Specimen 3: Attack location	roots	yes	no
	trunk	yes	no
	foliage	yes	no

Assessment Criteria and Conditions:

- identify major components of a plan for forest harvest, including:
 - when and how much to cut
 - methods of harvest (e.g., clear cutting, shelter wood method) and logging (e.g., hand, mechanical)
 - regeneration and environmental protection

Suggested Reference(s):

- *Alberta's Focus on Forests*
- *Our Growing Resource*
- *Managing the Forest.*

STANDARD: Respond to a standard of 2 on the rating scale.

Rating Scale

The student:

- 4 meets project/task objectives in a self-directed manner. Provides explanations and critical judgements based on a superior knowledge base. Demonstrates an understanding of relevant concepts and related issues.
- 3 meets project/task objectives in a self-directed manner. Provides explanations and comparisons of relevant concepts using more precise terminology. Requires little or no prompting.
- 2 meets project/task objectives with limited assistance in planning and in selecting and using resources. Applies knowledge of concepts in different situations using correct terminology. Requires occasional prompting.
- 1 completes task as directed, demonstrating basic skills/completeness by following a guided course of action. Uses simple recall to demonstrate basic knowledge of concepts. Requires prompting.
- 0 does not complete the task, or is unable to provide a suitable response

N/A Not Applicable

Forestry /G.86
(Interim 1994)

Background Information	Sample Questions / Activities
<p>See <i>Alberta's Focus on Forests</i>:</p> <ul style="list-style-type: none"> • Activity 4.6: Cutting Styles • Activity 5.3: Forest Perspectives. <p>See <i>Managing the Forest</i>:</p> <p><u>Harvest</u></p> <ul style="list-style-type: none"> • Logging Plans • Forest roads • Harvesting Methods • Hazard Abatement - Slash Burning. 	<ol style="list-style-type: none"> 1. Define and give examples of allowable cut, sustained yield and integrated use within the context of forest harvest planning. 2. Explain applications of forest inventory data in establishing a plan for harvest; e.g.: <ul style="list-style-type: none"> – identification of tree species – determining timber quality, volume and age – layout of cutting area and landing sites – planning for forest access 3. Explain and illustrate the clear cutting, seed tree, shelter wood and selection methods of forest harvest. 4. Give examples of natural and artificial regeneration, and the advantages/ disadvantages of each. 5. Identify environmental concerns to be addressed through harvest planning; e.g.: <ul style="list-style-type: none"> – protection of sensitive areas – impact on downstream values – landslide and erosion hazards.

PLANNING COMPONENTS	YES	NO	N/A
Have block layout requirements been met?	☐	☐	
Has block size met operating ground rule guidelines?	☐	☐	
Have operability factors been considered?	☐	☐	
Has the condition of the timber been accounted for?	☐	☐	
Have deciduous and coniferous operations been integrated?	☐	☐	☐
Have utilization standards been considered?	☐	☐	
Is the method of harvest appropriate to the terrain?	☐	☐	
Do block boundaries follow natural breaks in topography, stand types, watershed divides, etc.?	☐	☐	
Is harvest sequence logical in terms of volume to be removed at any cut, timing of the second cut, etc.?	☐	☐	
Have management objectives of other agencies been considered? <ul style="list-style-type: none"> fisheries and wildlife recreation watershed 	☐ ☐ ☐	☐ ☐ ☐	☐ ☐ ☐
Is the reforestation plan included?	☐	☐	
Is a plan for forest protection included?	☐	☐	
Have forest landscape management principles been applied?	☐	☐	

STANDARD IS 2 IN EACH APPLICABLE TASK

Rating Scale

The student:

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N/A Not Applicable

REFLECTIONS/COMMENTS

CLEARCUTTING

1. Give a definition of clearcutting.
 - *A method of reproducing even aged strands where all of the standing mature trees are cut at one time during a rotation.*
2. Give four examples of situations or conditions where clearcutting is the only feasible reproduction method to use.
 - *even aged, mature to over mature stands*
 - *shade intolerant species*
 - *on sites subject to windthrow*
 - *stand replacement, e.g.:*
 - *good phenotypes to replace poor phenotypes*
 - *change species composition*
 - *change to a regulated forest.*
3. Identify three advantages of using artificial regeneration with clearcutting.
 - *equipment and techniques in logging and site preparation are unrestricted*
 - *close control of composition and arrangement of new stand*
 - *superior genetic strains and species can be introduced*
 - *prompt regeneration.*
4. What are two disadvantages of using artificial regeneration with clearcutting?
 - *slash disposal is required*
 - *existing vegetation must be controlled before planting*
 - *may be a tendency toward a monoculture.*
5. Identify three conditions where it is advantageous to use artificial regeneration with clearcutting.
 - *where seed supply is not dependable*
 - *where it is desirable to change species composition*
 - *dense, mature forests where dominants are not windfirm*
 - *where silvicultural practice is intensive.*
6. What two conditions are essential if natural regeneration is to be used successfully with clearcutting?
 - *distribution of abundant seed supply over entire area*
 - *favourable environmental conditions for seed germination and development.*
7. What are two problems with relying on natural regeneration after clearcutting in a white spruce stand?
 - *delay in regeneration until there is a good seed crop and weather suitable for germination and survival*
 - *the delay in regeneration may result in development of ground vegetation which leads to an irregular aged stand.*

8. Identify the three modifications of the clearcutting method.
 - *patch*
 - *alternate strip*
 - *progressive strip.*
9. What is the minimum number of cutting operations in the progressive strip method?
 - *3.*
10. What are three biological advantages of the clearcutting method?
 - *appropriate for shade intolerant species*
 - *can change species composition*
 - *thorough site preparation is possible*
 - *options for regeneration include seed from standing timber, slash-borne cones and artificial regeneration*
 - *the only method to obtain successful regeneration from some species.*
11. List three considerations which come into play when planning size, form and arrangement of cuts for a clearcutting operation.
 - *ecological characteristics of the species*
 - *topography*
 - *road network*
 - *logging equipment.*
12. What are three advantages of progressive strip clearcutting over other forms of clearcutting?
 - *area to be artificially regenerated is smaller than with other methods*
 - *strip widths can be made narrow enough so natural regeneration takes place*
 - *reduction in potential losses from windthrow (the last strip is the most susceptible)*
 - *aesthetics are improved over other methods since volume harvested at any time is low.*
13. Identify two economic advantages of the clearcutting method.
 - *harvesting costs are low*
 - *simple and efficient administration, logging and silvicultural operations.*
14. What are three biological disadvantages of the clearcutting method?
 - *maximum degree of site exposure*
 - *slash hazard*
 - *require site preparation*
 - *all parts of a stand pass simultaneously through each stage of development.*

CLEARCUTTING (continued)

15. What are two economic disadvantages of the clearcutting method?
 - cost of regeneration may be high
 - may not be a market for small sized wood
 - must wait one full rotation until the next harvest.
16. What are three detrimental effects on fish populations when clearcutting right to the edge of stream banks?
 - water temperatures rise adversely affecting the food supply of fish
 - situation of streams
 - debris can clog streams.
17. Give three specific situations where clearcutting is the most appropriate method of cutting.
 - where there are even aged over mature forests
 - where there are shade intolerant species
 - where sites are subject to windthrow
 - where poor phenotypes are to be replaced by good phenotypes or where species composition is to be changed.
18. Clearcutting results in maximum site exposure. Identify three environmental factors associated with this exposure and indicate how each of these affects the chances for regeneration of tree seedlings.
 - high radiation loads during day - heat injury
 - large diurnal temperature fluctuations - danger of freezing injury
 - high moisture stress - seedling desiccation
 - erosion of soil - seedlings washed out or buried
 - more wind - high evaporative stress.
19. Give three reasons why harvesting costs are lower in clearcutting than with any other reproduction method.
 - operations are concentrated
 - minimal road development
 - few restrictions on equipment
 - no tree marking.

SEED TREE METHOD

20. Define what is meant by the seed tree reproduction method.
 - A method to propagate even aged stands where essentially all mature trees are removed at one time with the retention of scattered trees (singly or in small groups) to serve as a seed source).
21. In what two ways does the seed tree method differ from clearcutting?
 - retention of scattered seed trees
 - seed supply from the scattered seed trees - more uniform seed distribution.

22. Identify two situation or conditions where the seed tree method is appropriate.
 - even aged stands
 - shade intolerant, windfirm trees with light, wind blown seed
 - where there are few restrictions on size and arrangement of cut areas.
23. Identify four desirable characteristics for seed trees.
 - must be windfirm
 - must produce abundant and fertile seed
 - must be a D or a good CD
 - good phenotype
 - desired species
24. What are two silvical advantages of the seed tree method over the clearcutting method?
 - source of seed on very ha
 - good control of species composition and phenotypic characteristics.
25. What are three economic advantages of the seed tree method over the clearcutting method?
 - larger areas can be cut at one time
 - simple to apply since the only marking required is the seed trees
 - seed trees may be cut or left.
26. Identify two disadvantages (economic or biological) of the seed tree method compared to the clearcutting method.
 - seed source is exposed and there is risk of loss
 - some restrictions in logging.
27. Why is the seed tree method not very commonly used now?
 - The method was not properly applied, (e.g., too few seed trees ha left, trees lacked windfirmness, poor quality trees were left).
28. Is the seed tree method desirable for any of the following species in Alberta? For each species answer yes or no and indicate why.

A. White Spruce	B. Lodgepole Pine
13. A: White Spruce	13. B: Lodgepole Pine
- no, lacks windfirmness	- no, not ideal for serotinous coned populations, may be suitable for populations with nonserotinous cones.

SHELTERWOOD METHOD

29. Give a definition of the shelterwood reproduction method. Be sure to indicate how the method differs from other reproduction methods.
- *This is a method to propagate even-aged stands where two or more partial cuts are made in a mature stand over a relatively short period (<20%) of the rotation.*
30. The preparatory cutting is the first cut in a 3-cut shelterwood. What are the two purposes for undertaking this cut?
- *open up the stand to enhance seed production*
 - *allow more radiation to reach the forest floor and decompose thick organic horizons.*
31. What crown classes are removed in a preparatory cutting?
- *I, O poor formed CD.*
32. What is the purpose of the seed cutting?
- *To further open up the stand and allow for establishment of regeneration.*
33. When should the seed cutting in the shelterwood method occur?
- *During a good seed year.*
34. What are two purposes for the removal cuttings in the shelterwood method?
- *uncover the new crop*
 - *to remove overstory which has increased in value.*
35. What is the prime factor that will determine when a removal cut (final cut) should be made?
- *Condition of the regeneration, when regeneration is well established the final cut can be made.*
36. Identify four biological advantages of the shelterwood method.
- *best seed supply of even aged systems*
 - *natural regeneration is more certain and complete*
 - *best method for producing even aged stands of shade tolerant species*
 - *light and heavy seeded species can be regenerated*
 - *suitable for stands consisting of two or more species with different lengths of rotation*
 - *reduced fire hazard*
 - *less susceptible to insects and diseases.*
37. What are two biological disadvantages of the shelterwood method?
- *risk of windfall*
 - *damage to regeneration during harvest*
 - *damage to overstory during harvest.*

38. The shelterwood method has a number of economic advantages. Identify two of them.
- *less waste than clearcutting*
 - *overlap of rotations*
 - *for sawlog material or high value product.*
39. What is one (1) economic disadvantage of the shelterwood method?
- *harvesting is costly*
 - *high cost of harvesting may be essential to obtain cheap natural regeneration.*
40. What is the purpose of the seed cutting in the shelterwood method? What three crown classes are removed in this cut?
- *Open up stand so regeneration can become established, I, O, many CD.*
41. Give three reasons why harvesting is more expensive with the shelterwood method than with clearcutting.
- *more restrictions on logging equipment*
 - *tree marking is required*
 - *more skilled personnel required*
 - *more scattered operations*
 - *same area logged more than once.*
42. Give two economic features (other than harvesting) which apply to the shelterwood method.
- *overlap or rotations*
 - *cheap natural regeneration may be obtained.*
43. Identify five biological features of the shelterwood method.
- *best seed supply of even aged systems*
 - *natural regeneration more certain and complete*
 - *best method for producing even aged stands of shade tolerant species*
 - *can regenerate light and heavy seeded species*
 - *suitable for stands consisting of two or more species with different lengths of rotation*
 - *lowered susceptibility to insects and disease*
 - *fire hazard may be reduced*
 - *risk of windfall*
 - *damage to regeneration during harvest*
 - *damage to overstory during harvest.*

SELECTION METHOD

44. Give a definition of the selection reproduction method.
- *Mature timber in an uneven aged stand is removed as single, scattered trees or in small groups, at short intervals (cutting cycles) repeated indefinitely.*
45. identify three situations where the selection method would be appropriate to use.
- *all aged or uneven aged stands*
 - *high value stands of sawtimber*
 - *areas of high danger for windfall and snow breakage*
 - *protection forests*
 - *parks where aesthetics are important.*
46. What is meant by the cutting cycle in the selection method?
- *The number of years between successive cuts in the same stand.*
47. The selection method can be used in stands which have a J-shaped dbh class distribution. what is meant by a J-Shaped curve?
- *This is a diameter distribution curve in a stand which has a large number of small diameter trees and a small number of large diameter trees.*
48. What is the minimum number of age classes in a stand suitable for the selection method?
- 3
49. Why is it important to maintain a balance between the following components?
- A) growth
 - B) harvested yield
 - C) reproduction.
 - *If any component is reduced too severely, eventually the stand will have insufficient regeneration and sustained yield cannot be attained.*
50. Identify three characteristics that you might use in selecting trees to be harvested.
- *trees larger than a specified dbh*
 - *age or size of trees*
 - *quality of trees*
 - *vigour of trees.*
51. Identify two economic advantages of the selection method.
- *production and financial returns are continuous*
 - *financially attractive for farm woodlots*
 - *merchantable yield may be higher than with even aged methods.*

52. Identify five advantages of the selection reproduction method. Consider only the silvics of the tree species or stands.

- *maximum site protection*
- *continuous seed source*
- *self protected seedlings*
- *reduced windfall hazard*
- *minimized snow damage*
- *minimized insect and disease damage*
- *only method to maintain uneven aged stands*
- *applicable to shade tolerant species*
- *thin and harvest cut simultaneously*
- *minimized fire hazard.*

53. What are two other advantages (exclude economics and silvics) of the selection method?

- *enhanced aesthetics*
- *improved wildlife habitat*
- *fish habitat optimized.*

54. Give three reasons why harvesting costs with the selection method are higher than for any other reproduction method.

- *operations are scattered*
- *restrictions on choice of logging methods and equipment*
- *each area must be logged a number of times*
- *skilled personnel are needed for marking, felling and extraction.*

55. Indicate two other economic disadvantages of the selection method.

- *restricted to situations where there is a market for large size, high value trees*
- *danger of high grading*
- *complicated administration.*
- *danger of high grading*
- *complicated administration.*

56. What is one (1) advantage for stream fish when the selection method of harvesting is used?

- *streams are shaded to water temperature does not rise*
- *no debris in stream to clog channel*
- *bank damage is minimized so siltation is reduced.*

57. Identify two advantages for deer when the selection method of timber harvest is used.

- *edge effect is maximized*
- *feeding areas (open) in proximity to hiding and thermal cover.*

TASK	OBSERVATION/RATING				
Preparation and Planning	4	3	2	1	0 N/A
Information Gathering and Processing	4	3	2	1	0 N/A
Content	4	3	2	1	0 N/A
Collaboration and Teamwork	4	3	2	1	0 N/A
Information Sharing	4	3	2	1	0 N/A

STANDARD IS 2 IN EACH APPLICABLE TASK**Rating Scale***The student:*

- 4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.
- 3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.
- 2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.
- 1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.
- 0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

Forestry /G.92
(Interim 1994)**TASK CHECKLIST***The student:***Preparation and Planning**

- ☐ sets goals and establishes steps to achieve them
- ☐ creates and adheres to useful timelines
- ☐ uses personal initiative to formulate questions and find answers
- ☐ plans and uses time effectively

Information Gathering and Processing

- ☐ accesses a range of relevant in-school/community resources
- ☐ uses a range of information-gathering techniques
- ☐ interprets, organizes and combines information into a logical sequence
- ☐ records information accurately with appropriate supporting detail and using correct technical terms
- ☐ determines accuracy/currency/reliability of information sources
- ☐ gathers and responds to feedback regarding approach to the task

Content

- ☐ outlines major categories/types of forest products, and examples of consumer products within each category; e.g.:
- pulp and paper
 - lumber
 - veneer and plywood
 - board products
 - chemical and medicinal products

Content (continued)

- ☐ explains the steps and processes involved in converting a log into:
- lumber
 - pulp
 - one other forest product
- ☐ provides a summary of new developments in milling and pulping technology
- ☐ provides a list of safety regulations pertinent to a sawmill and/or a pulp mill

Collaboration and Teamwork

- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates solutions to problems

Information Sharing

- ☐ demonstrates effective use of two or more communication media
e.g., written, oral, audio-visual
- ☐ communicates ideas in a logical sequence with sufficient supporting detail
- ☐ maintains acceptable grammatical and technical standards
- ☐ cites five or more relevant information sources

REFLECTIONS/COMMENTS:

Assessment Criteria and Conditions:

- develop a rationale for forest management in Alberta that involves:
 - an analysis of economic, environmental and social needs addressed through forest management
 - definitions and examples of sustainable development, sustained yield and allowable cut

Suggested Reference(s):

- *Our Growing Resource*
- *Alberta's Focus on Forests*
- *Managing the Forest.*

STANDARD: Respond to a standard of 2 on the rating scale.

Rating Scale

The student:

- 4 meets project/task objectives in a self-directed manner. Provides explanations and critical judgements based on a superior knowledge base. Demonstrates an understanding of relevant concepts and related issues.
- 3 meets project/task objectives in a self-directed manner. Provides explanations and comparisons of relevant concepts using more precise terminology. Requires little or no prompting.
- 2 meets project/task objectives with limited assistance in planning and in selecting and using resources. Applies knowledge of concepts in different situations using correct terminology. Requires occasional prompting.
- 1 completes task as directed, demonstrating basic skills/completeness by following a guided course of action. Uses simple recall to demonstrate basic knowledge of concepts. Requires prompting.
- 0 does not complete the task, or is unable to provide a suitable response

N/A Not Applicable

CSB: 96 06 07

Background Information	Sample Questions / Activities
<p>See <i>Our Growing Resource</i>, Chapter 2 – The Challenge of Sustainable Development:</p> <ul style="list-style-type: none"> • Managing Forest Development • Integrated Resource Management - Accommodating Many Uses • Harvest Planning and Practices • Reforestation • Air and Water Quality • Building Sustainable Businesses. <p>See <i>Alberta's Focus on Forests</i>, Unit 5 - Forest Management for All:</p> <ul style="list-style-type: none"> • 5.1: Forest Values • 5.2: Decision for Change • 5.3: Forest Perspectives • 5.4: Reforestation: Forests or Tree Farms? • 5.5: Integrated Resource Management • 5.6: What's in the Wastebasket – Reassessing Our Needs 	<p>1. Explain the goals of “sustainable development”, “sustainable yield” and “allowable cut” within the context of Alberta’s forests.</p> <p>2. Discuss the meaning of the following definition of sustainable forest management: <i>“the development of forests to meet current needs without prejudice to their future productivity, ecological diversity, or capacity for regeneration”.</i></p> <p>3. Identify and explain major components/ considerations in sustainable forest management; e.g.: <ul style="list-style-type: none"> – timber resources – biodiversity of wildlife – air, land and water quality. </p> <p>4. Identify two or more economic, environmental and social needs addressed through the management of forested lands in Alberta.</p> <p>5. Interview representatives of three or more different forest industry organizations regarding their approach to sustainable forest management; e.g.: <ul style="list-style-type: none"> – priorities – actions. </p> <p>6. Identify current research projects underway that are intended to support sustainable forestry practices.</p>

TASK	OBSERVATION/RATING				
Preparation and Planning	4	3	2	1	0
Analyzing Perspectives	4	3	2	1	0
Collaboration and Teamwork	4	3	2	1	0
Evaluating Choices and Making Decisions	4	3	2	1	0

STANDARD IS 2 IN EACH APPLICABLE TASK

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

Forestry /G.94
(Interi- '994)

CSB: 96 06 07

TASK CHECKLIST

The student:

Preparation and Planning

- ☐ accurately describes ten or more current uses/values of Alberta's forests
- ☐ poses thoughtful questions regarding each forest use/value
- ☐ accesses a range of relevant information sources and recognizes when additional information is required
- ☐ demonstrates resourcefulness in collecting data

Analyzing Perspectives

- ☐ categorizes the views of different interest groups regarding three or more types of forest use; *e.g., cultural, ethical, economic, environmental, health-related, scientific, political*
- ☐ states a position on one issue regarding forest use, and insightful reasons for adopting that position
- ☐ states two or more opposing positions on the issue and thoughtful reasons for adopting each position
- ☐ analyzes interrelationships among different perspectives/points of view
- ☐ recognizes underlying bias/assumptions/values in information and ideas

Collaboration and Teamwork

- ☐ shares work appropriately among group members
- ☐ respects and considers the views of others
- ☐ negotiates with sensitivity solutions to problems regarding forest use

Evaluating Choices/Making Decisions

- ☐ describes in detail important and appropriate alternatives regarding one type of forest use
- ☐ establishes knowledge- and value-based criteria for assessing each alternative *e.g., social, economic, environmental*
- ☐ selects an appropriate and useful alternative by showing differences among choices
- ☐ assesses strengths/weaknesses of decisions by considering consequences and implications for:
 - forest users
 - forest ecosystems
- ☐ develops strategies for compromise and/or conflict resolution among different forest users/interest groups
- ☐ communicates thoughts/feelings/ideas clearly to justify choices/decisions made.

REFLECTIONS/COMMENTS:

TASK	OBSERVATION/RATING				
Preparation and Planning	4	3	2	1	0
Information Gathering and Processing	4	3	2	1	0
Content	4	3	2	1	0
Collaboration and Teamwork	4	3	2	1	0
Information Sharing	4	3	2	1	0

STANDARD IS 2 IN EACH APPLICABLE TASK**Rating Scale**

The student:

- 4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.
- 3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.
- 2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.
- 1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.
- 0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

CSB: 96 06 07

Forestry /G.95
(Interim 1994)

TASK CHECKLIST

The student:

Preparation and Planning

- ☐ sets goals and establishes steps to achieve them
- ☐ creates and adheres to useful timelines
- ☐ uses personal initiative to formulate questions and find answers
- ☐ plans and uses time effectively

Information Gathering and Processing

- ☐ accesses a range of relevant in-school/community resources
- ☐ uses a range of information-gathering techniques
- ☐ interprets, organizes and combines information into a logical sequence
- ☐ records information accurately with appropriate supporting detail and using correct technical terms
- ☐ determines accuracy/currency/reliability of information sources
- ☐ gathers and responds to feedback regarding approach to the task

Content

- ☐ defines and gives examples of conservation and preservation within the context of forest management
- ☐ cites instances where differences in philosophy have impacted forest management and protection
- ☐ explains the mandates of five or more agencies responsible for managing Alberta's forested lands; e.g.:
 - Alberta Forest Service
 - Fish and Wildlife Services

Content (continued)

- ☐ explains the intent of four or more different agreements, permits and/or licences that make Alberta's forests available for commercial or private use; e.g.:
 - forest management agreements
 - quota certificates
 - commercial/private timber permits
- ☐ identifies factors likely to influence future forest management practices; e.g.:
 - knowledge/technology
 - recreation and tourism

Collaboration and Teamwork

- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates solutions to problems

Information Sharing

- ☐ demonstrates effective use of two or more communication media
e.g., written, oral, audio-visual
- ☐ communicates ideas in a logical sequence with sufficient supporting detail
- ☐ maintains acceptable grammatical and technical standards
- ☐ cites five or more relevant information sources

REFLECTIONS/COMMENTS:

Assessment Criteria and Conditions:

- identify four or more major categories of forest use (e.g., industry, recreation, tourism, environmental) and examples of forest users within each category

Suggested Reference(s):

- *Alberta's Focus on Forests*
- *Woodlot Management Guide for the Prairie Provinces.*

STANDARD: Respond to a standard of 2 on the rating scale.

Rating Scale

The student:

- 4 meets project/task objectives in a self-directed manner. Provides explanations and critical judgements based on a superior knowledge base. Demonstrates an understanding of relevant concepts and related issues.
 - 3 meets project/task objectives in a self-directed manner. Provides explanations and comparisons of relevant concepts using more precise terminology. Requires little or no prompting.
 - 2 meets project/task objectives with limited assistance in planning and in selecting and using resources. Applies knowledge of concepts in different situations using correct terminology. Requires occasional prompting.
 - 1 completes task as directed, demonstrating basic skills/completeness by following a guided course of action. Uses simple recall to demonstrate basic knowledge of concepts. Requires prompting.
 - 0 does not complete the task, or is unable to provide a suitable response
- N/A Not Applicable

Background Information	Sample Questions / Activities
<p>See <i>Alberta's Focus on Forests</i>, Unit 5 - Forest Management for All:</p> <ul style="list-style-type: none"> • 5.1: Forest Values • 5.2: Decision for Change • 5.3: Forest Perspectives • 5.4: Reforestation: Forests or Tree Farms? • 5.5: Integrated Resource Management • 5.6: What's in the Wastebasket - Reassessing Our Needs <p>See <i>Woodlot Management Guide for the Prairie Provinces</i>:</p> <ul style="list-style-type: none"> • Section G: Wildlife and Woodlots • Section H: Recreation • Section J: Agroforestry 	<ol style="list-style-type: none"> 1. Identify major categories of forest use and different forest users within each category; e.g.: <ul style="list-style-type: none"> - industrial - recreational - tourism - agriculture - environmental 2. Describe a range of specific forest uses and multiple demands placed upon forested lands; e.g.: <ul style="list-style-type: none"> - wood fibre production - wildlife management - grazing and range management - watershed - oil, gas and mining - recreation - protected areas 3. Explain why forests can and should serve many purposes. 4. Cite examples of the multiple use of Alberta's forests; e.g.: <ul style="list-style-type: none"> - using different parts of the forest for different purposes - using the same area of the forest to obtain more than one benefit. 5. Interview representatives of three or more different forest industry organizations regarding their approach to multiple use of forested lands; e.g.: <ul style="list-style-type: none"> - priorities - actions.

TASK	OBSERVATION/RATING				
Preparation and Planning	4	3	2	1	0
Information Gathering and Processing	4	3	2	1	0
Content	4	3	2	1	0
Collaboration and Teamwork	4	3	2	1	0
Information Sharing	4	3	2	1	0

STANDARD IS 2 IN EACH APPLICABLE TASK**Rating Scale***The student:*

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

CSB: 96 06 07

TASK CHECKLIST*The student:***Preparation and Planning**

- ☐ sets goals and establishes steps to achieve them
- ☐ creates and adheres to useful timelines
- ☐ uses personal initiative to formulate questions and find answers
- ☐ plans and uses time effectively

Information Gathering and Processing

- ☐ accesses a range of relevant in-school/community resources
- ☐ uses a range of information-gathering techniques
- ☐ interprets, organizes and combines information into a logical sequence
- ☐ records information accurately with appropriate supporting detail and using correct technical terms
- ☐ determines accuracy/currency/reliability of information sources

- ☐ gathers and responds to feedback regarding approach to the task

Content

- ☐ explains why forests can and should simultaneously serve social, economic and environmental goals
- ☐ provides a definition of multiple land use, and cites examples of the multiple use of Alberta's forests; e.g.:
 - using different parts of the forest for different purposes
 - using the same area of the forest at different times to obtain more than one benefit

Content (continued)

- ☐ provides a definition of integrated land use, and cites examples in Alberta where a common area of forested land serves two or more purposes at the same time; e.g.:
 - wood fibre production and wildlife management
 - grazing, oil production and recreation
- ☐ compares and contrasts principles of multiple land use with principles of integrated land use
- ☐ explains the goals of Integrated Resource Planning (IRP)

- ☐
- ☐
- ☐

Collaboration and Teamwork

- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates solutions to problems

Information Sharing

- ☐ demonstrates effective use of two or more communication media
e.g., written, oral, audio-visual
- ☐ communicates ideas in a logical sequence with sufficient supporting detail
- ☐ maintains acceptable grammatical and technical standards
- ☐ cites five or more relevant information sources

REFLECTIONS/COMMENTS:

<i>Analyzing Issues</i>	Minimum Level of Performance 3	Observed Level of Performance
<p><i>The student:</i></p> <ul style="list-style-type: none"> ☐ analyzes five current issues in forest management: <ul style="list-style-type: none"> – accurately describes each issue – clarifies different points of view regarding each issue <i>e.g., social, economic, environmental</i> – identifies two or more useful alternatives regarding each issue – assesses each alternative on the basis of immediate/long-term consequences ☐ critiques <u>one</u> newspaper/magazine article or video documentary regarding an issue in forest management with respect to: <ul style="list-style-type: none"> – range of viewpoints/biases evident – validity/reliability of information presented – recommended course of action <p><i>See assessment tools generic to CTS:</i> <i>Assessment Framework: Issue Analysis (CTSIS)</i> <i>Guide to Critiquing Media Information (FORMED)</i></p>		
<i>Comparing Local and Global Issues</i>	Minimum Level of Performance 3	Observed Level of Performance
<p><i>The student:</i></p> <ul style="list-style-type: none"> ☐ accurately describes <u>one</u> international forest issue ☐ compares the international issue with a similar forest issue in Canada ☐ suggests <u>two</u> or more strategies/actions for dealing with the issue at local and global levels ☐ assesses each strategy/action on the basis of consequences for society, the economy and the environment <p><i>See assessment tools generic to CTS and Forestry:</i> <i>Assessment Framework: Research Process (CTSRES)</i></p>		

<i>Citizenship: Goals and Actions</i>	Minimum Level of Performance 3	Observed Level of Performance
<p><i>The student:</i></p> <ul style="list-style-type: none"> ☐ explains different philosophies/ethics regarding the use of forests and how best to ensure their sustainability ☐ summarizes the goals and accomplishments of <u>one</u> environmental conservation group ☐ negotiates and debates <u>one</u> current issue in forest management: <ul style="list-style-type: none"> – clearly states a position on the issue – presents a convincing argument in logical sequence supporting the position – provides a relevant and convincing rebuttal to opposing arguments – develops a shared agreement on preferred alternatives ☐ through group consensus building, proposes a plan for the conservation and management of forested regions that includes individual actions, shared actions and leadership roles <p><i>See assessment tools generic to Forestry:</i> <i>Negotiation and Debate (FORNEG-3)</i></p>		
<i>Managing Learning</i>	Minimum Level of Performance 3	Observed Level of Performance
<p><i>The student:</i></p> <ul style="list-style-type: none"> ☐ sets clear goals and establishes steps to achieve them ☐ uses personal initiative to formulate questions and find answers ☐ demonstrates resourcefulness in gathering information ☐ plans and uses time effectively, prioritizing tasks on a consistent basis ☐ assesses and refines approach to task/project based on feedback and reflection 		

Research and Communication	Minimum Level of Performance 3	Observed Level of Performance
<p><i>The student:</i></p> <ul style="list-style-type: none"> ☐ accesses a range of relevant information sources and recognizes when additional information is required ☐ interprets, organizes and combines information in creative and thoughtful ways ☐ recognizes underlying bias/assumptions/values in information and ideas ☐ demonstrates effective use of a variety of communication media <i>e.g., written, oral, multi-media</i> ☐ communicates thoughts/feelings/ideas clearly to justify or challenge a position ☐ maintains acceptable grammatical and technical standards through proof-reading and editing ☐ gives evidence of adequate information gathering by citing relevant information sources 		

Collaboration, Teamwork and Ethics	Minimum Level of Performance 3	Observed Level of Performance
<p><i>The student:</i></p> <ul style="list-style-type: none"> ☐ works with a range of peer members ☐ shares information/opinions/suggestions, maintaining a balance between speaking and listening ☐ listens to and respects the views of others, requesting clarification as necessary from other group members ☐ negotiates with sensitivity solutions to problems ☐ assesses the consequences of personal/group actions on society and the environment 		

RATING SCALE	4	3	2	1	0
	Meets project/task objectives in a self-directed manner, selecting and implementing the most appropriate course of action. Problems are solved in effective and creative ways. Quality and productivity exceed standards.	Meets project/task objectives in a self-directed manner, selecting and using resources/processes efficiently and effectively. No errors or deficiencies are noted. Quality and productivity consistently meet standards.	Meets project/task objectives with limited assistance in planning, solving problems and in selection and use of resources/ processes. Only minor errors/deficiencies are noted. Quality and productivity meet standards, but are occasionally inconsistent.	Completes task as directed, demonstrating basic skills/completeness by following a guided course of action. Quality and productivity meet standard but are inconsistent.	Has not yet completed the task. Major deficiencies and/or errors are evident.

Assessment Criteria and Conditions:

- identify and explain applications of timber cruise data and non-fibre data in resource management
- demonstrate applications of a sample set of forest survey data

Suggested Reference(s):

- *Managing the Forest*
- *Woodlot Management Guide for the Prairie Provinces*
- *Natural Resources Measurements*
- *Forest Mensuration*.

STANDARD: Respond to a standard of 3 on the rating scale.

Rating Scale

The student:

- 4 meets project/task objectives in a self-directed manner. Provides explanations and critical judgements based on a superior knowledge base. Demonstrates an understanding of relevant concepts and related issues.
 - 3 meets project/task objectives in a self-directed manner. Provides explanations and comparisons of relevant concepts using more precise terminology. Requires little or no prompting.
 - 2 meets project/task objectives with limited assistance in planning and in selecting and using resources. Applies knowledge of concepts in different situations using correct terminology. Requires occasional prompting.
 - 1 completes task as directed, demonstrating basic skills/completeness by following a guided course of action. Uses simple recall to demonstrate basic knowledge of concepts. Requires prompting.
 - 0 does not complete the task, or is unable to provide a suitable response
- N/A Not Applicable

Forestry /G.100
(Interi: '994)

CSB: 96 06 07

Background Information	Sample Questions / Activities
<p>See <i>Managing the Forest</i>, Inventory:</p> <ul style="list-style-type: none"> • Timber Inventory • What Tree is That? • Grouping Trees • What is a Tree? • Tree Growth • Measurement Activities • Maps • Air Photographs <p>See <i>Woodlot Management Guide for the Prairie Provinces</i>, Section F - Inventory:</p> <ul style="list-style-type: none"> • Steps to Conduct an Inventory • Maps • Cruising • Designing a Cruise • Measuring Cruise Plots • Plot Sizes • Measuring Tree Diameter • Measuring Tree Age • Measuring Tree Height • Processing Cruise Data • Sample Compilation 	<ol style="list-style-type: none"> 1. Discuss applications of timber cruise data in resource management; e.g.: <ul style="list-style-type: none"> - estimating fibre volumes - projecting forest growth - planning harvest operations. 2. Perform mathematical calculations to determine timber volumes for a sample forested area. 3. Explain applications of non-fibre data in resource management; e.g.: <ul style="list-style-type: none"> - measures of water and soil quality - watershed potential - number and density of wildlife. 4. Discuss potential applications of sample non-fibre data obtained from local government/industry. 5. Interpret a set of sample forest survey data; e.g.: <ul style="list-style-type: none"> - consider bias, error and other limitations in the sample data - extrapolate the data to estimate forest populations - suggest applications of the data in resource management - suggest modifications to sample design that may increase accuracy of the survey. 6. Research applications of computer software in processing forest survey data.

TASK	OBSERVATION/RATING				
Preparation and Planning	4	3	2	1	0
Information Gathering and Processing	4	3	2	1	0
Content	4	3	2	1	0
Collaboration and Teamwork	4	3	2	1	0
Information Sharing	4	3	2	1	0

STANDARD IS 3 IN EACH APPLICABLE TASK**Rating Scale**

The student:

- 4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.
- 3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.
- 2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.
- 1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.
- 0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

CSB: 96 06 07

TASK CHECKLIST

The student:

Preparation and Planning

- ☐ sets clear goals and establishes steps to achieve them
- ☐ creates and adheres to detailed timelines
- ☐ uses personal initiative to formulate questions and find answers
- ☐ plans and uses time effectively, prioritizing tasks on a consistent basis

Information Gathering and Processing

- ☐ accesses a range of relevant information sources and recognizes when additional information is required

- ☐ demonstrates resourcefulness in collecting data
- ☐ interprets, organizes and combines information in creative and thoughtful ways
- ☐ records information accurately with appropriate supporting detail and using correct technical terms
- ☐ recognizes underlying bias/assumptions/values in information sources

- ☐ assesses and refines approach to the task and project status based on feedback and reflection

Content

- ☐ explains applications of aerial photography in current data collection practices
- ☐ interprets information regarding the forest resource in one or more aerial photographs

Content (continued)

- ☐ explains applications of satellite imagery in current data collection practices
- ☐ interprets one or more satellite images used in forest inventory

- ☐ explains applications of one or more computer-based mapping systems in data manipulation and/or data storage

Collaboration and Teamwork

- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates with sensitivity solutions to problems
- ☐ displays effective communication and leadership skills

Information Sharing

- ☐ demonstrates effective use of a variety of communication media; e.g., written, oral, audio-visual
- ☐ communicates thoughts/feelings/ideas clearly to justify or challenge a position
- ☐ maintains acceptable grammatical and technical standards
- ☐ gives evidence of adequate information gathering by citing seven or more relevant information sources

REFLECTIONS/COMMENTS:

Assessment Criteria and Conditions:

- given a range of relevant in-school/community resources, identify and describe:
 - fibre and non-fibre products and services derived from Alberta's forests
 - forecasts regarding the future use of forests in Alberta and Canada

Suggested Reference(s):

- *Alberta's Focus on Forests*
- *Our Growing Resource*
- *Woodlot Management Guide for the Prairie Provinces.*

STANDARD: Respond to a standard of 3 on the rating scale.

Rating Scale

The student:

- 4 meets project/task objectives in a self-directed manner. Provides explanations and critical judgements based on a superior knowledge base. Demonstrates an understanding of relevant concepts and related issues.
- 3 meets project/task objectives in a self-directed manner. Provides explanations and comparisons of relevant concepts using more precise terminology. Requires little or no prompting.
- 2 meets project/task objectives with limited assistance in planning and in selecting and using resources. Applies knowledge of concepts in different situations using correct terminology. Requires occasional prompting.
- 1 completes task as directed, demonstrating basic skills/completeness by following a guided course of action. Uses simple recall to demonstrate basic knowledge of concepts. Requires prompting.
- 0 does not complete the task, or is unable to provide a suitable response

N/A Not Applicable

Forestry /G.102
(Interim 1994)

Background Information	Sample Questions / Activities
<p>See <i>Alberta's Focus on Forests</i>, Unit 4 - Forest Resources and Technologies:</p> <ul style="list-style-type: none"> • 4.2: Products from Canada's Forests • 4.3: Surveying the Forest Resource • 4.4: From Pulp to Paper • 4.5: Pulp and Paper: The Technology-Environment Connection. <p>See <i>Our Growing Resource</i>, Chapter 3: Production and Products - Today's Forest Industry:</p> <ul style="list-style-type: none"> • Lumber • Panelboard • Pulp and Paper. <p>See <i>Woodlot Management Guide for the Prairie Provinces</i>, Section III - Products/Markets:</p> <ul style="list-style-type: none"> • Fibre Markets • Energy • Christmas Trees • Food. 	<p>1. Identify 20 or more fibre-based products and services derived from Alberta's forests; e.g.:</p> <ul style="list-style-type: none"> – primary wood products – wood-fabricated products – pulp and paper products – chemical products – food products. <p>2. Identify 10 or more non-fibre values derived from Alberta's forests; e.g.:</p> <ul style="list-style-type: none"> – trapping, hunting and fishing – guiding and outfitting – tourism and recreational pursuits – ecological values – aesthetic and spiritual values. <p>3. Describe trends in the consumptive and non-consumptive use of forests in Canada and Alberta; e.g.:</p> <ul style="list-style-type: none"> – recreation – trapping – logging – oil and gas development. <p>4. Given a selected forest region, identify a range of forest products and services that could be derived from that site.</p> <p>5. Identify a range of common products derived from a given tree species.</p>

TASK	OBSERVATION/RATING			
Preparation and Planning	4	3	2	1 0 N/A
Information Gathering and Processing	4	3	2	1 0 N/A
Content	4	3	2	1 0 N/A
Collaboration and Teamwork	4	3	2	1 0 N/A
Information Sharing	4	3	2	1 0 N/A

STANDARD IS 3 IN EACH APPLICABLE TASK**Rating Scale***The student:*

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

CSB: 96 06 07

Forestry /G.103
(Interim 1994)

TASK CHECKLIST*The student:***Preparation and Planning**

- ☐ sets clear goals and establishes steps to achieve them
- ☐ creates and adheres to detailed timelines
- ☐ uses personal initiative to formulate questions and find answers
- ☐ plans and uses time effectively, prioritizing tasks on a consistent basis

Information Gathering and Processing

- ☐ accesses a range of relevant information sources and recognizes when additional information is required

- ☐ demonstrates resourcefulness in collecting data
- ☐ interprets, organizes and combines information in creative and thoughtful ways
- ☐ records information accurately with appropriate supporting detail and using correct technical terms
- ☐ recognizes underlying bias/assumptions/values in information sources

- ☐ assesses and refines approach to the task and project status based on feedback and reflection

Content

- ☐ identifies, describes and sequences the steps/processes that are involved in one milling or pulping technology
- ☐ identifies materials and services that are required at each stage of production; e.g.:
 - human and natural resources
 - energy and technologies
 - inspection and regulation

Content (continued)

- ☐ describes products and/or services made available through applications of the milling or pulping technology
- ☐ develops a flow chart of steps and processes involved in the production process
- ☐ identifies potential affects of the milling or pulping process on the environment, and precautions taken by industry to eliminate/minimize environmental impact

Collaboration and Teamwork

- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates with sensitivity solutions to problems
- ☐ displays effective communication and leadership skills

Information Sharing

- ☐ demonstrates effective use of a variety of communication media; e.g., *written, oral, audio-visual*
- ☐ communicates thoughts/feelings/ideas clearly to justify or challenge a position
- ☐ maintains acceptable grammatical and technical standards
- ☐ gives evidence of adequate information gathering by citing seven or more relevant information sources

REFLECTIONS/COMMENTS:

STANDARD IS 3 IN EACH APPLICABLE TASK

RATING	ASSESSMENT CRITERIA
4	<p><i>The student:</i></p> <p>Schedules Tasks</p> <p>☐ defines the task</p> <p>☐ identifies task components and organizes them into a logical sequence</p> <p>☐ uses time effectively</p> <p>☐</p> <p>Gathers Relevant Information</p> <p>☐ poses important questions regarding potential customers/markets</p> <p>☐ accesses basic in-school/community information sources regarding the product/service and potential customers/markets</p> <p>☐ interprets and organizes information into a logical sequence</p> <p>☐</p> <p>Develops the Plan</p> <p>☐ describes the product/service and marketing goals</p> <p>☐ assesses consumer preferences, and how these may be met through product diversification/specialization</p> <p>☐ identifies potential markets in North America, the Pacific Rim, Europe and two other selected regions</p> <p>☐ outlines the sequence of steps, materials, and processes involved in product/service development</p> <p>☐ establishes a pricing strategy based on market analysis and cost factors</p> <p>☐ establishes a packaging/labeling, advertising and promotion strategy consistent with marketing goals and consumer preferences</p> <p>☐ summarizes opportunities and challenges relevant to the marketing plan</p> <p>☐</p> <p>Assesses and Communicates the Plan</p> <p>☐ presents marketing plans in a logical sequence using two or more communication media</p> <p>☐ uses correct grammar and technical terms</p> <p>☐ predicts the likelihood of suggested outcomes/sales being realized</p> <p>☐ makes summative statements regarding strengths/weaknesses and general feasibility of the marketing plan</p> <p>☐</p>
3	
2	
1	
0	

Rating Scale

The student:

- 4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.
- 3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.
- 2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.
- 1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.
- 0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

REFLECTIONS / COMMENTS

<i>Industry Research</i>	Minimum Level of Performance 3	Observed Level of Performance
<p><i>The student:</i></p> <ul style="list-style-type: none"> ☐ identifies <u>six</u> or more types of forest research being conducted in Canada ☐ explains the role of the Alberta Forest Research Advisory Council in coordinating forest research activities in Alberta ☐ explains applications of data banks and information systems in forest research ☐ summarizes <u>one</u> current forest research project in Canada with respect to: <ul style="list-style-type: none"> – research objectives and participating agencies – information-gathering strategies – project status and implications for forest industry <p><i>See assessment tools generic to Forestry: Presentations/Reports (FORPRE-3)</i></p>		
<i>Technology Applications</i>	Minimum Level of Performance 3	Observed Level of Performance
<p><i>The student:</i></p> <ul style="list-style-type: none"> ☐ identifies applications of technology in <u>six</u> or more sectors of the forest industry (e.g., inventory, silviculture, protection, harvest, processing, management) ☐ analyzes <u>three</u> technologies currently used in the forest industry by identifying: <ul style="list-style-type: none"> – specific problems/needs being addressed – basic components and principles of operation – benefits and costs with respect to social/economic/environmental factors ☐ describes <u>one</u> or more emerging technologies in the forest industry and needs being addressed <p><i>See assessment tools generic to CTS: Assessment Framework: Research Process (CTSRES)</i></p>		

<i>Technology Careers</i>	Minimum Level of Performance 3	Observed Level of Performance
<p><i>The student:</i></p> <ul style="list-style-type: none"> ☐ identifies occupational opportunities within <u>six</u> career clusters related to forest technology (e.g., inventory, silviculture, protection, harvest, processing, management) ☐ describes employment conditions and requirements within one career cluster (e.g., job description/working conditions, remuneration, entry requirements, training opportunities, potential for advancement/entrepreneurship) ☐ makes forecasts regarding career trends in forest technology, future occupational opportunities and related employment conditions and requirements <p><i>See assessment tools generic to Forestry: Career Search: Advanced Level (FORCAR-3)</i></p>		
<i>Managing Learning</i>	Minimum Level of Performance 3	Observed Level of Performance
<p><i>The student:</i></p> <ul style="list-style-type: none"> ☐ sets clear goals and establishes steps to achieve them ☐ uses personal initiative to formulate questions and find answers ☐ plans and uses time effectively, prioritizing tasks on a consistent basis ☐ assesses and refines approach to task/project based on feedback and reflection 		

<i>Research and Communication</i>	Minimum Level of Performance 3	Observed Level of Performance
<p><i>The student:</i></p> <ul style="list-style-type: none"> ☐ accesses a range of relevant information sources and recognizes when additional information was required ☐ interprets, organizes and combines information in creative and thoughtful ways ☐ records information accurately with appropriate supporting detail and using correct technical terms ☐ demonstrates effective use of a variety of communication media <i>e.g., written, oral, multi-media</i> ☐ maintains acceptable grammatical and technical standards through proof-reading and editing ☐ gives evidence of adequate information gathering by citing relevant information sources 		

<i>Collaboration and Teamwork</i>	Minimum Level of Performance 3	Observed Level of Performance
<p><i>The student:</i></p> <ul style="list-style-type: none"> ☐ cooperates with group members ☐ shares work appropriately among group members ☐ negotiates solutions to problems ☐ displays effective communication and leadership skills 		

RATING SCALE	4	3	2	1	0
	Exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.	Meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.	Meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.	Meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.	Has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

SILVICULTURE

- biotechnology
- scarification
- vegetation control
-
-
-

FOREST INVENTORY/PROTECTION

- laser disc technology
- Geographic Information Systems (GIS)
- Global Positioning Systems (GPS)
-
-
-

GREEN HOUSE AND NURSERY OPERATIONS

- container systems
- environmental control systems
- packaging and storage systems
-
-
-

FOREST HARVEST

- feller bunchers
- delimbers
- on-site chipping
- on-board computer control systems
-
-

WOOD PRODUCTION AND UTILIZATION

- lasers in sawmills
- pulping technology
- computer process control
-
-
-

FOREST MANAGEMENT

- satellite imagery
- aerial photography
-
-
-
-

Assessment Criteria and Conditions:

- identify and describe:
 - organic and inorganic components of forest soils and their function in forest ecosystems
 - major types of air pollutants and their affect on forest ecosystems

Suggested Reference(s):

- *Alberta's Focus on Forests*
- *Woodlot Management Guide for the Prairie Provinces.*

STANDARD: Respond to a standard of 3 on the rating scale.

Rating Scale

The student:

- 4 meets project/task objectives in a self-directed manner. Provides explanations and critical judgements based on a superior knowledge base. Demonstrates an understanding of relevant concepts and related issues.
- 3 meets project/task objectives in a self-directed manner. Provides explanations and comparisons of relevant concepts using more precise terminology. Requires little or no prompting.
- 2 meets project/task objectives with limited assistance in planning and in selecting and using resources. Applies knowledge of concepts in different situations using correct terminology. Requires occasional prompting.
- 1 completes task as directed, demonstrating basic skills/completeness by following a guided course of action. Uses simple recall to demonstrate basic knowledge of concepts. Requires prompting.
- 0 does not complete the task, or is unable to provide a suitable response

N/A Not Applicable

Background Information

See *Alberta's Focus on Forests*, Unit 3 - Conditions Affecting Growth:

- 3.1: A Lot Depends on Location
- 3.2: Life History of a Tree
- 3.3: Woodland Whodunit
- 3.4: Forests: Thriving or Declining
- 3.5: Controlling Fire
- 3.6: Urban Wilderness at School.

See *Woodlot Management Guide for the Prairie Provinces*, Section I - Woodlot Assessment:

- Forest Ecology
- Ecological Areas
- Soils
- Tree Species.

Sample Questions / Activities

1. Describe physical characteristics used to classify forest soils, and the effect of different soils on plant growth; e.g.:
 - texture
 - porosity.
2. Explain the function of organic and inorganic components of forest soils; e.g.:
 - micro- and macro-organisms
 - gases and minerals
 - organic matter
 - water.
3. Explain the effects of soil acidity, alkalinity and temperature on the growth of trees and other forest plants.
4. Describe indicators of water quality in the forest, and its effects on trees and other plants; e.g.:
 - surface water
 - ground water.
5. Describe the effects of known air pollutants on forest ecosystems; e.g.:
 - ozone
 - particulate matter
 - oxides and nitrogen
 - sulphur dioxide.

TASK	OBSERVATION/RATING				
Management	4	3	2	1	0
Teamwork	4	3	2	1	0
Use of Equipment and Materials	4	3	2	1	0
Investigative Techniques	4	3	2	1	0

STANDARD IS 3 IN EACH APPLICABLE TASK**Rating Scale***The student:*

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

TASK CHECKLIST*The student:***Management**

- ☐ prepares self for task
- ☐ organizes and works in an orderly manner
- ☐ interprets and carries out instructions accurately
- ☐ plans and uses time effectively in a logical sequence
- ☐ displays leadership in adhering to routine procedures
- ☐ attempts to solve problems prior to requesting help

Teamwork

- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates with sensitivity solutions to problems
- ☐ displays effective communication skills

Use of Equipment and Materials

- ☐ independently selects and uses equipment/materials
- ☐ demonstrates concern for safe procedures/techniques
- ☐ measures accurately and efficiently
- ☐ practices proper sanitation procedures
- ☐ minimizes waste of materials
- ☐ anticipates potential hazards and emergency response

Investigative Techniques

- ☐ identifies two or more local soil types using soil triangle and hand texturing techniques
- ☐ makes predictions that can be tested regarding the effects of:
 - soil pH on the growth of trees
 - temperature on the growth of trees
 - water quantity on the growth of trees
- ☐ plans and conducts field investigations to test each predictions
- ☐ uses relevant information to explain observations regarding the effects of soil pH, temperature and water quantity on the growth of trees
- ☐ analyzes relationships among manipulated/responding variables
- ☐ obtains accurate results that confirm/reject each prediction and answer related questions
- ☐ summarizes, applies and evaluates observations and experimental outcomes

REFLECTIONS/COMMENTS:

INFERENCE

Definition: to derive a conclusion from facts or premises

Synonyms: infer, deduce, deduct, draw, gather, judge

Criteria for Assessing Inferences

Inferences made in advanced level modules should:

- communicate the process used to derive conclusions
- be reliable and valid in light of information gathered.

Inferences must be communicated in a logical sequence with sufficient supporting detail. Both the type and amount of information used to derive a conclusion are important in determining the reliability/validity of the inference.

Each inference made regarding interrelationships in forest ecosystems should provide:

- a clear statement of the factors being investigated
- relevant facts and detail that support more than one point of view;
e.g., cultural, ethical, economic, environmental, health-related, scientific, political
- a logical sequence of ideas that lead to a conclusion
- evidence that different points of view were considered in deriving the conclusion
- a valid and realistic conclusion that is based on analysis and synthesis of information

Causal Relationships and Inferences

The student makes two or more inferences regarding:

- ☐ the effects of local forests on soil; e.g.:
- nutrient content
 - hydrologic cycle
 - pH balance
- ☐ the effects of local forests on water; e.g.:
- surface water
 - ground water
- ☐ the effects of local forests on weather
- ☐ the effects of local forests on biotic factors; e.g.:
- plants
 - animals
- ☐ the effects of global forests on climate
- ☐ structural adaptations of living organisms to changes in a forest environment; e.g.:
- adaptation to site conditions
 - reproductive adaptation
- ☐ behavioural adaptations of living organisms to changes in a forest environment
- ☐
- ☐
- ☐

RATING SCALE

4	3	2	1	0
Exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.	Meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.	Meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.	Meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.	Has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

TASK	OBSERVATION/RATING				
Preparation and Planning	4	3	2	1	0 N/A
Information Gathering and Processing	4	3	2	1	0 N/A
Content	4	3	2	1	0 N/A
Collaboration and Teamwork	4	3	2	1	0 N/A
Information Sharing	4	3	2	1	0 N/A

STANDARD IS 3 IN EACH APPLICABLE TASK**Rating Scale***The student:*

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

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1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

CSB: 96 06 07

TASK CHECKLIST*The student:***Preparation and Planning**

- ☐ sets clear goals and establishes steps to achieve them
- ☐ creates and adheres to detailed timelines
- ☐ uses personal initiative to formulate questions and find answers
- ☐ plans and uses time effectively, prioritizing tasks on a consistent basis

Information Gathering and Processing

- ☐ accesses a range of relevant information sources and recognizes when additional information is required
- ☐ demonstrates resourcefulness in collecting data
- ☐ interprets, organizes and combines information in creative and thoughtful ways
- ☐ records information accurately with appropriate supporting detail and using correct technical terms
- ☐ recognizes underlying bias/assumptions/values in information sources
- ☐ assesses and refines approach to the task and project status based on feedback and reflection

Content

- ☐ explains how each tree species has unique site and climatic requirements that determine its ability to grow in particular environments
- ☐ provides descriptive accounts of the silvics of five common Alberta tree species; e.g.:
 - tree form
 - growth patterns and life cycle
 - soil requirements

Content (continued)

- climatic and moisture requirements
- aspect and elevation
- ☐ provides descriptive accounts of the structural characteristics and environments of three common Alberta forest associations, and factors that have determined their existence; e.g.:
 - location on a map
 - soil type
 - position of slope
 - overstory and dominant understory

Collaboration and Teamwork

- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates with sensitivity solutions to problems
- ☐ displays effective communication and leadership skills

Information Sharing

- ☐ demonstrates effective use of a variety of communication media; e.g., *written, oral, audio-visual*
- ☐ communicates thoughts/feelings/ideas clearly to justify or challenge a position
- ☐ maintains acceptable grammatical and technical standards
- ☐ gives evidence of adequate information gathering by citing seven or more relevant information sources

REFLECTIONS/COMMENTS:

Natural Subregion	Forest Association	Structure	Soil Texture	Soil Moisture	Slope Position
Montane	Lodgepole Pine / Bearberry	Tree/shrub	silty loamy	Very dry	Upper
	White Spruce / Horsetail	Tree / Forb	peaty	Wet	Toe
	Aw-Sw-Pl / Hairy Wild Rye	Tree / Grass	fine loamy to clayey	Moist	Upper
	Lodgepole Pine / Lichen	Tree / Lichen	sandy	Very dry	Upper
	Pl-Sb / Labrador Tea	Tree / Shrub	loamy or clayey	Moist	Middle
Lower Foothills	Sb-Pl / Labrador Tea	Tree / Shrub	silt loam to silty clay loam	Wet	Lower
	Treed Bog	Tree / Shrub	organic	Wet	Depression
	Sb-Sw / Labrador Tea / Horsetail	Tree / Shrub / Forb	organic	Wet	Toe
	Aw-Sw-Pl / Low Bush Cranberry	Tree / Shrub	fine loamy clayey	Moist	Middle
	Treed Poor Fen	Tree / Shrub	organic	Wet	Depression
Upper Foothills	Aw-Sw-Pl / Bracted Honeysuckle	Tree / Shrub	fine loamy - clayey	Moist	Lower
	Aw-Sw-Pl / Hairy Wild Rye	Tree / Grass	Fine loamy	Dry	Upper
	Lodgepole Pine / Lichen	Tree / Lichen	fine loamy clayey	Very dry	Upper
	Pl-Sb / Labrador Tea	Tree / Shrub	fine loamy clayey	Moist	Middle
	Sb-Pl / Labrador Tea	Tree / Shrub	silt loam to clay loam	Wet	Lower
	Treed Bog	Tree / Shrub	organic / loam	Wet	Depression
	White Spruce / Horsetail	tree / Forb	silty loam - clay loam	Wet	lower
	Pl / Tall Bilberry	Tree / Shrub	fine loamy - clayey	Moist	Upper
	Pl / Hairy Wild Rye	Tree / grass	Fine loamy	Dry	Upper
	Pl / Bracted Honeysuckle	Tree / Shrub	silt loam to clay loam	Wet	Toe

Natural Subregion	Forest Association	Structure	Soil Texture	Soil Moisture	Slope Position
Boreal	Jack Pine / Lichen	Tree / Lichen	sandy, loamy sandy	Very dry	Upper
	Pj-Sb / Labrador Tea	Tree / Shrub	clayey to loamy	Moist	Middle
	Sb-Pj / Labrador Tea	Tree / Shrub	variable	Moist	Lower
	Treed Bog	Tree / Shrub	organic	Wet	Toe
	Sb / Labrador Tea / Horsetail	Tree / Shrub	variable	Wet	Toe
	Pj-Aw / Blueberry	Tree / Shrub	sandy-loamy sand	Dry	Upper
	Aw-Sw / Low Bush Cranberry	Tree / Shrub	loamy to clayey	Moist	Middle
	Pb-Aw / Dogwood	tree / Shrub	loamy to clayey	Moist	Lower
	Sw / Horsetail	Tree / Forb	peaty	Moist	Toe
	Aw / Saskatoon / Sarsaparilla	Tree / Shrub / Forb	loamy or clayey	Dry to moist	Middle to upper
Foothills Parkland	Aw / Saskatoon / Sarsaparilla	Tree / Shrub / Forb	loamy or clayey	Dry to moist	Middle to upper
	Aw-Pb / High Bush Cranberry	Tree / Shrub	loamy or clayey	Moist	Depressions
Peace River Parkland	Pb / Dogwood / Horsetail	Tree / Shrub / Forb	loamy or clayey	Moist	Flats and Depressions
	Pb / Dogwood / Horsetail	Tree / Shrub / Forb	loamy or clayey	Moist	Flats and Depressions

Tree Species Abbreviations:

Aw – Trembling Aspen
Pb – Balsam Poplar
Pl – Lodgepole Pine
Pj – Jack Pine
Sb – Black Spruce
Sw – White Spruce

Definitions

Forb: any non-woody plant species other than grass or a grass-like plant.

Grass: any member of the grass family.

Shrub: any woody species with relatively low growth habit; often has several basal shoots

Tree: a woody species with a single bole that is normally taller than a shrub.

COMMON FOREST ASSOCIATIONS IN THE CENTRAL PARKLAND SUBREGION

Forest Association	Aw / Saskatoon / Sarsaparilla	Aw-Ph / High Bush Cranberry
Soil Texture	Loamy or clayey	Loamy or clayey
Soil moisture	Dry to Moist	Moist

Pb / Dogwood / Horsetail
Loamy or clayey
Moist

COMMON FOREST ASSOCIATIONS IN THE MONTANE SUBREGION

Forest Association	Pl / Bearberry
Soil Texture	Silty loamy
Soil moisture	Very dry

Sw / Horsetail	Aw-Sw-Pl / Hairy Wild Rye
Peaty	Fine loamy to clayey
Wet	Moist

COMMON FOREST ASSOCIATIONS IN THE LOWER FOOTHILLS SUBREGION

Forest Association	Pl / Lichen	Pl-SB / Labrador Tea	Sb-Pl Labrador Tea	Treed Bog	Sb-Sw / Labrador Tea / Horsetail	Aw-Sw-Pl / Low Bush Cranberry
Soil Texture	Sandy	Loamy or clayey	Silt loam to silty clay loam	Organic	Organic	fine Loamy clayey
Soil moisture	Very dry	Moist	Wet	Wet	Wet	Moist

Forest Association	Treed poor fen
Soil Texture	Organic
Soil moisture	Wet

Aw-Sw-Pl Bracted Honeysuckle
Fine Loamy Clayey
Moist

Aw-Sw-Pl / Low Bush Cranberry
Fine loamy clayey
Moist

Aw-Sw-Pl / Hairy Wild Rye
Fine loamy
Dry

COMMON FOREST ASSOCIATIONS IN THE UPPER FOOTHILLS SUBREGION

Forest Association	Pl / Lichen	Pl-Sb / Labrador Tea	Sb-Pl Labrador Tea	Tree Bog	Sw / Horsetail
Soil Texture	Sandy	Loamy or clayey	Silt loam to silty clay loam	Organic	Peaty
Soil moisture	Very dry	Moist	Wet	Wet	Moist

Forest Association	Pl / Tall Bilberry	Pl / Hairy Wild Rye	Pl / Bracted Honeysuckle
Soil Texture	Fine loamy - clayey	Fine loamy	Silt loam to clay loam
Soil moisture	Moist	Dry	Wet

COMMON FOREST ASSOCIATIONS IN THE BOREAL MIXEDWOOD SUBREGION

Forest Association	Pj / Lichen	Pl-SB / Labrador Tea	Sb-Pl / Labrador Tea	Tree Bog	Sb/Labrador Tea / Horsetail
Soil Texture	Sandy to loamy sand	Clayey to loamy	Variable	Organic	Variable
Soil Moisture	Very dry	Moist	Moist	Wet	Moist

Forest Association	Pl-Aw / Blueberry	Aw-Sw / Low Bush Cranberry	Pb - Aw / Dogwood
Soil Texture	Sandy - loamy sand	Loamy to clayey	Loamy to clayey
Soil Moisture	Dry	Moist	Moist

The identification guide includes only the most common insects and diseases that affect the forests of Alberta. The key is not intended to be exhaustive in terms of pests and pest damages it can be used to identify. The key serves only as a beginner's guide to the identification of some common agents of forest change in Alberta.

Key	Title
1	General 1
2	General 2
3	Abiotic Injuries 1
4	Abiotic Injuries 2
5	Animal Damage
6	Disease 1: Disease of roots and those affecting more than one kind of tissue
7	Disease 2: Cankers, rusts and trunk rots
8	Insect Damage

Keys have been modified from the following source:

Finck, Kelly E., P. Humphreys and G. Hawkins. 1989. Field Guide to Pests of Managed Forests in British Columbia. Forestry Canada and B.C. Ministry of Forests, Victoria, B.C. Joint Publ. No. 16. 188p.

Use of the Keys for Pest Identification

There are various factors/agents that cause damage in forest stands and in wood products. These can be grouped into the following categories:

- Diseases
- Abiotic injuries – primarily due to climatic and soil factors
- Animal damage
- Insects.

When identifying the cause of damage in a forest stand we usually focus attention on the symptoms because they are visible. The first step is to use General Key #1 to determine which agents of change are responsible.

Notice that each of the keys provides two choices, e.g.:

- a. whole tree affected
- a. part of the tree affects.

Read both choices before selecting the appropriate one.

General Key #1 may direct a user to one of the above agents of change (diseases, abiotic injuries, animal damage or insects) or it may direct the user to General Key #2. If directed to general Key #2, you will also be eventually referred to one of the above agents of change.

Some of the groups of change agents have separate keys that provide additional information. For example there are two keys for abiotic injuries: Key #3 covers injuries to crown or foliage, Key #4 covers injuries to main stem/branches or the whole tree. The two disease keys are based on parts of the tree affected and diseases that have features in common, e.g.:

- Key #6 – diseases of roots and those affecting more than one kind of tissue
- Key #7 – cankers, rusts and trunk rots.

You will be asked to use the identification guide to identify:

- 4 living agents of change
- 4 non-living agents of change.

Good luck with your pest identification!

KEY 1 – GENERAL 1

- a. Whole tree affected
- b. Crown entirely or partially discoloured, bright yellow, brown or red or lacking foliage; trees may be broken, laying on ground or erect and lower stem buried in sediment; crown, if present, may not be deformed.
- c. Widespread area affected, especially in low lying areas or in bands along slopes, near industrial sites, adjacent to streams or on lower slopes in mountainous terrain; trees in small clumps are uniformly affected.

Key 4 Abiotic Injuries 2

- c. Trees affected randomly and to a varying extent
- d. Resinosis present on stem or at root collar

e. Resinosis at root collar

f. Resinosis, mycelia, fruiting bodies around root collar

Key 6 Disease 1

f. Resinosis, galls, frass around root collar, roots chewed

Key 8 Insect Damage

e. Resinosis, swelling, cankers or fruiting bodies on main stem or branches

Key 6 Disease 1

d. Bark removal from stems or roots

Key 5 Animal Damage

b. Crown thin, chlorotic, poor growth, crown not generally deformed.

g. Widespread area affected, impact on trees quite uniform, no evidence of disease, no industrial site nearby nor are trees on poor sites

Key 3 Abiotic Injuries 1

g. Affected trees in patches or scattered individuals, standing dead and/or windthrown trees; trees affected to varying degrees

Key 6 Disease 1**a. Part of tree affected**

h. Foliage, leaders and/or branch tips affected

Key 2 General 2

h. Main stem and/or branches affected

a. Trees erect or windthrown in random manner, cankers, fruiting bodies, resinosis, brooms or swellings

Key 6 Disease 1

i. No cankers, fruiting bodies, resinosis, brooms or swellings

j. Splintered breakage of main stem, tops and/or branches, windthrown trees lying all in the same direction

Key 3 Abiotic Injuries 1

j. Pitch, frass or cottony tufts present, branch or main stem gouting and /or breakage which may or may not be present

Key 8 Insect Damage**KEY 2 – GENERAL 2****a. Foliage affected**

a. Trees affected in widespread area, especially in low lying areas or in bands along slopes

Key 3 Abiotic Injuries 1

b. Trees affected in large to small areas, generally to varying extent.

c. Needles uniformly coloured or mottled small fruiting bodies or blisters present, main stems or branches may not be affected

Key 6 Disease 1

c. Extensive defoliation or needles uniformly discoloured or mottled, generally from top of crown downward and from the tips inward, chewed or clipped needles, mined buds, exit holes, webbing, frass and/or insects present

Key 8 Insect Damage**a. Leaders and/or branch tips affected**

d. Bark removed or tips clipped off

Key 5 Animal Damage

d. Bark not stripped, tips and/or buds not clipped

e. Tips may or may not curl, buds or needles mined, exit holes, frass, webbing or cottony tufts present

Key 8 Insect Damage

e. Tips discoloured

f. Small dark fruiting bodies or white to orange blisters or cankers on bark

Key 6 Disease 1

f. Buds mushy, in low lying areas or industrial site nearby

Key 3 Abiotic Injuries 1

KEY 3 – ABIOTIC INJURIES 1

(Injuries to Crown/Foliage or Tips)

- a. Tree leaning, windthrown or laying on ground
- a. Tree erect
 - a. Damage to main stem and/or branches
 - b. Damage to crown
 - Foliage discoloured or leaders and branch tips damaged
 - c. Tips of leaders, branches or branchlets affected (including buds). Damage most intense in depressions. Buds, new shoots, and needles brown in spring. Shoots and needles brown in the fall. Mushy buds, all species in a stand may be affected.
 - c. Foliage discolouration not restricted to the leader, branch or branchlet tips. No evidence of insects, animals or disease. No industrial site nearby, generally no noticeable discolouration/necrosis or deciduous and/or shrub layer. Crown is deep red-brown to brown
 - d. Damage in an elevational band along a slope
 - d. Damage does not extend in a band along a slope; needles, if any, lacking flecking
 - c. Crown is brown from top down and from new to old needles; needles may drop especially in late summer
 - e. Crown devoid of foliage or entire crown reddish brown, scorched appearance, evidence or burned bark.

Fire Damage

KEY 4 – ABIOTIC INJURIES 2

(Injuries to Main Stem/Branches or Whole Tree)

- a. Tree leaning, windthrown or broken; ;young to mature trees
 - b. Trees windthrown or broken
 - c. Trees blown over, crown intact, root “mats” present, trees lie in one direction, branches and stem of adjacent trees may be scarred or splintered)
 - c. Evidence of numerous broken trees aligned at right angles to the slope on steep middle and lower slopes; sharp demarcation between old and young trees, damaged area may be occupied by shrubs and forbs.
- Wind Damage (Windthrow and/or Windsnap)**
- b. Young trees bent over or deformed, older trees with uneven and splintered breakage of tops and/or upper branches, cankers not evident
- Avalanche Damage**
- Snow or Ice Damage**
- a. Tree erect, damage to main stem and/or branches
 - d. Bark removal of main stem generally evident
 - c. Main stem severely debarked and deeply gouged, exposed wood splintered; evidence of logging or construction activities adjacent, may also be associated with adjacent windfall.
 - e. Main stem may be debarked but no evidence of gouging, splintering on wood; evidence or burned branch ends and charcoal.
- Mechanical Damage**
- Fire Damage**
- d. Main stem not severely damaged
 - f. Branches and/or top not broken or splintered, cankers not evident
- Snow and Ice Damage**
- f. Branches and/or top not broken or splintered
 - g. Upper surface of branches have wounds or scars associated with green ragged crown, lesions may or may not be on main stem
- Hail Damage**
- g. Lesions on main stem, bark removed from lesion or lower stem buried
 - h. Elongated basal scars at ground level
 - h. Lower section of stem buried by sediment from adjacent stream. Level topography adjacent to a stream. Evidence of periodic deposition of overburden.
- Fire Scar**
- Flooding Damage**

KEY 5 – ANIMAL DAMAGE

- a. Bark removed from roots, branches or stem

Debarking

- a. Portions of stems, twigs or branches severed, cut or splintered

- b. A relatively clean cut on twig, branch or stem
c. Stems and/or branches severed, multiple tooth marks on wood,, numerous chips on ground below damage

Cutting

- c. Single, smooth, oblique cut, lack of multiple tooth marks

Clipping

- b. Twigs or stem with a ragged, torn appearance

Browsing **KEY 6 – DISEASE 1****Diseases of roots and those affecting more than one kind of tissue**

- a. Whole tree affected

No cankers; scattered pockets of trees with thin chlorotic crowns with poor growth or standing dead, wind toppled trees in criss-cross pattern, trees of all ages affected

Root Rots

- a. Part of tree affected

- b. Part of crown affected

Crown red, dead top and/or branches, cankers on main stem and/or branches on pines only

Key 7 Disease 2

- b. Either foliage or stem and/or branches affected

Main stem and/or branches affected

- c. Mature to overmature stand with conks visible on the main stem or at the base of the tree

Key 7 Disease 2

- c. Young to mature stand, stem lacks conks but may have flattened

areas or swellings; brooms may occur in the crown

- d. no pronounced swelling, necrotic areas consist of flattened or depressed tissue

- d. Spindle to oval-shaped swellings present and/or deformation, necrotic areas raised

- e. No brooms or aerial shoots

Key 7 Disease 2

- e. Brooms present

Minor needle discolouration, no blisters on needles, aerial shoots or basal cups on swollen areas of branches and brooms. Aerial shoots around in cross section, branch pattern whorled.

Lodgepole Pine dwarf Mistletoe

KEY 7 - DISEASE 2

Cankers, Rusts and Trunk Rots

- a. Various types of fungal fruiting bodies (conks) visible on tree trunks or fruiting bodies on ground near base of tree.
 - Trunk Rots**
 - a. Absence of conks or fruiting bodies on stem or near base of tree
 - a. No noticeable swelling on stem, necrotic areas consist of flattened or depressed tissue, dead bark may have sloughed off stem
 - b. On Aspen, rough, flattened area, black cracked bark
 - c. On Lodgepole Pine, elongated sunken, perennial canker, usually on lower bole. Resinosis, branch flagging, blue-black stain in sapwood under the canker
 - Hypoxylon Canker**
 - Atropellis Canker**
 - b. Spindle to oval-shaped swellings present on pines, raised necrotic areas on main stem and/or branches. Noticeable blistering of bark, sometimes elongated scars. Fruiting structures are white, yellow or orange powdery blisters.
- Pine Stem Rusts**

KEY 8 INSECT DAMAGE

- a.. Entire crown affected
 - b. Coniferous hosts. Needles chewed to varying degrees, needle stubs may or may not remain on the tree
- Defoliators (Sawflies or Budworms)**
- b. Deciduous hosts
 - Defoliators (Tent Caterpillars, Leaf-Eating Beetles, Leaf Miners)**
 - a. Leaders and branches, stems or roots affected
 - h. Main stems affected
 - i. Entire tree dying, crown yellow or reddish brown; boring dust around base of tree, tunnels on inside of bark
 - Bark Beetles**
 - i. Tree may be alive or dead; may have presence of sap flow from insect entrance holes; insect feeding penetrates deeply into wood
 - Wood Borers or Carpenter Ants**
 - h. Roots or root collar area affected. Pitch tubes at root collar. Resin-soaked duff near root collar. Trees up to 3 m. tall are most susceptible, entire crown may be reddish.

Warren's Root Collar Weevil

Assessment Criteria and Conditions:

- identify and describe:
 - major components of silviculture, including stand establishment, stand management and harvest
 - the silvics of five Alberta tree species.

Suggested Reference(s):

- *Our Growing Resource*
- *Woodlot Management Guide for the Prairie Provinces*
- *Native Trees of Canada*.

STANDARD: Respond to a standard of 3 on the rating scale.

Rating Scale

The student:

- 4 meets project/task objectives in a self-directed manner. Provides explanations and critical judgements based on a superior knowledge base. Demonstrates an understanding of relevant concepts and related issues.
 - 3 meets project/task objectives in a self-directed manner. Provides explanations and comparisons of relevant concepts using more precise terminology. Requires little or no prompting.
 - 2 meets project/task objectives with limited assistance in planning and in selecting and using resources. Applies knowledge of concepts in different situations using correct terminology. Requires occasional prompting.
 - 1 completes task as directed, demonstrating basic skills/completeness by following a guided course of action. Uses simple recall to demonstrate basic knowledge of concepts. Requires prompting.
 - 0 does not complete the task, or is unable to provide a suitable response
- N/A Not Applicable

Background Information	Sample Questions / Activities
<p>See <i>Our Growing Resource</i>, Chapter 2 - The Challenge of Sustainable Development:</p> <ul style="list-style-type: none"> • Managing Forest Development • Integrated Resource Management - Accommodating Many Uses • Harvest Planning and Practices • Reforestation • Air and Water Quality • Building Sustainable Businesses. <p>See <i>Woodlot Management Guide for the Prairie Provinces</i>, Section IV- Woodlot Management:</p> <ul style="list-style-type: none"> • Management Planning • Reforestation • Stand Tending • Harvest • Fire Protection. 	<ol style="list-style-type: none"> 1. Provide a comprehensive definition of silviculture and its role in forestry. 2. Identify and explain major components of silvicultural systems, including: <ul style="list-style-type: none"> – stand establishment – stand management – harvest and cutting methods. 3. Explain how individual tree species have unique ecological requirements that determine suitable silvicultural practices. 4. Describe and compare the silvics of five or more Alberta tree species with respect to: <ul style="list-style-type: none"> – growth characteristics – reproduction habitat requirements (e.g., soil, water, temperature). 5. Describe one or more research programs designed to improve silvicultural practices; e.g.: <ul style="list-style-type: none"> – biotechnology – application of information technology – cultural/operational applications. 6. Develop a glossary of 20 or more terms relevant to silviculture.

A. TREE NAME

1. Common: _____

2. Botanical: _____

B. GROWTH FORM

C. HABITAT REQUIREMENTS

1. Climate: _____

2. Soils and Topography _____

3. Associated Trees and Shrubs _____

DISTRIBUTION
(as outlined on map of Canada)

D. LIFE HISTORY**1. Reproduction and Early Growth**

(a) Flowering and Fruiting

(b) Seedling Development

(c) Vegetative Reproduction (if applicable)

2. Sapling to Maturity

(a) Growth and Yield

(b) Reaction to Competition

(c) Major Enemies

GROWTH FORM
(as sketched or outlined)

TASK	OBSERVATION/RATING				
Management	4	3	2	1	0
Teamwork	4	3	2	1	0
Use of Equipment and Materials	4	3	2	1	0
Investigative Techniques	4	3	2	1	0

STANDARD IS 3 IN EACH APPLICABLE TASK**Rating Scale***The student:*

- 4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.
- 3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.
- 2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.
- 1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.
- 0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

TASK CHECKLIST*The student:***Management**

- ☐ prepares self for task
- ☐ organizes and works in an orderly manner
- ☐ interprets and carries out instructions accurately
- ☐ plans and uses time effectively in a logical sequence
- ☐ displays leadership in adhering to routine procedures
- ☐ attempts to solve problems prior to requesting help

Teamwork

- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates with sensitivity solutions to problems
- ☐ displays effective communication skills

Use of Equipment and Materials

- ☐ independently selects and uses equipment/materials
- ☐ demonstrates concern for safe procedures/techniques
- ☐ measures accurately and efficiently
- ☐ practices proper sanitation procedures
- ☐ minimizes waste of materials
- ☐ anticipates potential hazards and emergency response

Investigative Techniques

- ☐ uses relevant information to explain observations regarding natural regeneration; e.g.:
 - seed supply
 - vegetative reproduction
- ☐ uses relevant information to explain observations regarding artificial regeneration; e.g.:
 - direct seeding
 - bare-root/container seedlings
- ☐ makes predictions that can be tested regarding one or more methods of regeneration
- ☐ plans, sets up & conducts experiments to test a prediction
- ☐ analyzes relationships among manipulated/responding variables
- ☐ obtains accurate results that confirm/reject prediction and answers related questions
- ☐ summarizes, applies and evaluates observations and experimental outcomes; e.g.:
 - for species with wind disseminated seed, assesses height and/or age of seedlings as a function of distance from edge of cutblock
 - for species with slash borne-cones, assesses whether adequate seed is available per unit area
 - for direct seeding, is sufficient seed being broadcast to insure block stocking?
 - for bare root/container planting, are sufficient seedlings being planted to insure a fully stocked stand?

REFLECTIONS/COMMENTS:

TREE IMPROVEMENT

1. Explain major objectives of a tree improvement program.
2. Identify factors to consider in choosing a natural seed production area.
3. Cite advantages and disadvantages of clonal and seedling seed orchards.
4. Describe methods of increasing seed production in a seed production area.

CONE COLLECTION

1. Identify major factors influencing seed production in conifers.
2. Large cone crops in pine occur if climatic conditions are favourable. What stages of flower and cone development are the most critical? What kind of climatic conditions favour each of these stages?
3. Identify reasons for conducting a cone crop survey.
4. Describe methods of collecting cones from natural forest stands.
5. Seed testing is carried out for a number of parameters. Identify and explain three of them.
6. Identify and explain one physical test conducted to determine the viability of seed.

SITE PREPARATION

1. Provide reasons for ensuring adequate site preparation.
2. Describe mechanical methods of site preparation.
3. Explain advantages of a brush rake over an angled dozer blade in scarification operations.
4. Identify two functions of a drag type scarifier.
5. Identify types of mechanical scarification equipment that are commonly used in addition to those listed above.

SEEDING

1. Identify factors that determine the timing of a successful direct seeding operation.
2. What is the recommended time of year for carrying out a conifer seeding operation in Alberta? Give reasons for conducting conifer seeding operations at this time.
3. Seeding operations in Alberta have at times failed. Identify factors that may influence the success rate of seeding operations.
4. Identify biological advantages of spot seeding over broadcast seeding.

CONTAINER PLANTING

1. Explain requirements of a successful container system.
2. Describe desirable physical characteristics of container seedlings.
3. Explain advantages of growing seedlings in containers rather than as bare root stock in a nursery.
4. One of the critical elements in survival of a tree seedling is to maintain a favourable water balance. What is meant by the water balance? How can a tree seedling maintain a favourable water balance?

INTERMEDIATE STAND TREATMENTS

1. Define and give examples of intermediate stand treatments.
2. What is the major objective of release cutting? Identify the predominant growth stage(s) for trees that are released.
3. Describe methods of undertaking a liberation cut in a stand. Identify advantages and disadvantages of each method.

PRUNING

1. Identify and explain three stages of natural pruning. Briefly describe factors that may affect each stage.
2. Identify and describe three objectives of artificial pruning.
3. Explain potential hazards that may result from the excessive pruning of spruce trees.
4. What minimum live crown ratio should be attained when pruning?
5. Cite reasons for pruning conifers in the late winter or early spring.

PRUNING (continued)

6. Why is it important when pruning large diameter limbs (i.e., over 4 cm in diameter) that the initial cut be made 10 to 15 cm away from the bole of the tree?
7. Explain why hand pruning saws have curved blades and teeth pointing back toward the handle.
8. Why is it important when pruning to make a clean cut that is flush with the bole?

FERTILIZATION

1. Explain the process of organic matter decomposition on the forest floor.
2. Identify and explain important principles of fertilizer application.
3. Explain ways in which wood quality in a forest stand is altered as a result of fertilizer application.
4. Why should fertilizer high in phosphorous be used at the time of planting?
5. One example of a mixed fertilizer is 10-52-10. Explain what these numbers mean. What purpose would this fertilizer be most suited to?
6. Suggest fertilizers appropriate to three different stages of forest growth.
e.g., seedling establishment
after crown closure
10 to 15 years before harvest

SITE PREPARATION	
<i>The student:</i>	☐ lists six or more objectives of site preparation
☐	explains techniques and applications of mechanical site preparation; e.g.: ☐ scalping ☐ trenching ☐ plowing mixing ☐ mounding
☐	identifies and describes common types of equipment used in mechanical site preparation; e.g.: ☐ blade ☐ plow ☐ drag scarifier ☐ disc trencher ☐ spot scarifier ☐ moulder/inverter
☐	demonstrates techniques and applications of manual and motor manual site preparation
☐	explains applications of fire and herbicides in site preparation
☐	identifies geographic areas not suited to site preparation and explains why
☐	assesses three or more site preparation methods relative to site location

CONE COLLECTION AND SEED EXTRACTION	
<i>The student:</i>	☐ identifies and describes common methods of cone collection; e.g.: ☐ squirrel caches ☐ felling and picking ☐ aerial collection
☐	identifies appropriate equipment and safe techniques for one or more methods of cone collection
☐	describes handling, tagging and temporary storage procedures for collected cones
☐	demonstrates seed extraction and seed cleaning techniques
☐	conducts one or more seed tests; e.g.: ☐ purity ☐ weight ☐ germination ☐ moisture content ☐ viability
☐	describes methods of seed storage
☐	

DIRECT SEEDING	
<i>The student:</i>	☐ describes characteristics of a favourable seed bed; e.g.: ☐ physical nature of the forest floor ☐ kind and amount of vegetation
☐	describes techniques and applications of direct seeding; e.g.: ☐ broadcast seeding ☐ spot seeding
☐	identifies and describes common types of equipment used in direct seeding
☐	outlines steps that can be taken to enhance success with direct seeding; e.g.: ☐ timing the seeding operation ☐ preparing the seed bed ☐ managing seed quality and quantity ☐ controlling seed predators
☐	
☐	

PLANTING STOCK	
<i>The student:</i>	☐ demonstrates correct techniques for the care and handling of bare root and container stock; e.g.: ☐ physical handling ☐ temperature control ☐ moisture/humidity control
☐	demonstrates three or more hand planting methods; e.g.: ☐ L-slit method ☐ mattock method ☐ planting bar method ☐ wedge method
☐	identifies and describes common hand planting tools and equipment; e.g.: ☐ planting spade ☐ dibble ☐ planting bar ☐ potputki ☐ mattock
☐	demonstrates correct planting technique; e.g.: ☐ cleans out planting spot before making hole ☐ keeps roots of planting stock moist at all times, taking plants out of planting bag one at a time ☐ makes hole large and deep enough to ensure proper placement of roots ☐ plants firmly in ground to correct depth and within 30% of vertical ☐ closes hole from bottom to top, packing soil firmly against roots to prevent air pockets ☐ performs final check by gently tugging on plant

SPACING AND THINNING	
<i>The student:</i>	☐ identifies optimum spacing and stocking rates for one or more species of seedlings
☐	describes generally accepted "rules of thumb" for scheduling spacing and thinning treatments of crop trees
☐	describes applications of three or more thinning treatments; e.g.: ☐ juvenile spacing ☐ sanitation spacing ☐ conifer release ☐ commercial thinning
☐	establishes criteria for identifying trees to keep and trees to cut in a forest stand
☐	inspects crop trees for damage; e.g.: ☐ broken stems ☐ saw nicks ☐ broken leaders ☐ stripped limbs
☐	selects dominant and codominant trees to be saved as crop trees in a forest stand
☐	describes two or more thinning treatments; e.g.: ☐ cutting with brush saws/chain saws ☐ girdling ☐ hand pulling ☐ use of herbicides
☐	

PRUNING AND SANITATION	
<i>The student:</i>	☐ identifies reasons for artificial pruning
☐	describes factors that determine the timing of pruning operations
☐	identifies criteria for selecting crop trees to be pruned; e.g.: ☐ species characteristics ☐ growth rate ☐ number, size and age of trees
☐	demonstrates correct pruning technique; e.g.: ☐ live crown ratio greater than 40% ☐ proper pruning height ☐ branch cuts flush with bole
☐	identifies and describes common pruning tools and equipment; e.g.: ☐ hand and pole saws ☐ axes, brushhooks and hatchets ☐ chisels and pulling knives ☐ machines
☐	inspects residuals in a forest stand for: ☐ signs of damage ☐ quality of stems
☐	verifies that slash in a forest stand is bucked to lay flat on the ground
☐	
☐	

STANDARD IS 2 IN EACH APPLICABLE TASK

Rating Scale

The student:

- 4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.
- 3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.
- 2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.
- 1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.
- 0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

REFLECTIONS/COMMENTS

TASK	OBSERVATION/RATING				
Preparation and Planning	4	3	2	1	0
Information Gathering and Processing	4	3	2	1	0
Content	4	3	2	1	0
Collaboration and Teamwork	4	3	2	1	0
Information Sharing	4	3	2	1	0

STANDARD IS 3 IN EACH APPLICABLE TASK**Rating Scale***The student:*

- 4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.
- 3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.
- 2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.
- 1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.
- 0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

CSB: 96 06 07

TASK CHECKLIST*The student:***Preparation and Planning**

- ☐ sets clear goals and establishes steps to achieve them
- ☐ creates and adheres to detailed timelines
- ☐ uses personal initiative to formulate questions and find answers
- ☐ plans and uses time effectively, prioritizing tasks on a consistent basis

Information Gathering and Processing

- ☐ accesses a range of relevant information sources and recognizes when additional information is required
- ☐ demonstrates resourcefulness in collecting data
- ☐ interprets, organizes and combines information in creative and thoughtful ways
- ☐ records information accurately with appropriate supporting detail and using correct technical terms
- ☐ recognizes underlying bias/assumptions/values in information sources
- ☐ assesses and refines approach to the task and project status based on feedback and reflection

Content

- ☐ explains factors relevant to choosing a suitable method of harvest:
 - silvics of tree species
 - intended utilization
 - impact on wildlife and watershed
 - impact on other stakeholder groups
- ☐ provides a descriptive account and explains advantages/disadvantages of the:
 - clearcutting system of harvest
 - seed tree system of harvest

Content (continued)

- shelterwood system of harvest
- selection system of harvest
- ☐ makes recommendations (based on silvics) regarding an appropriate harvest method for each of seven Alberta tree species
- ☐ identifies social, economic and environmental factors that may influence harvest methods
- ☐ explains modifications to harvest systems that accommodate local site conditions and management objectives; e.g.:
 - clearcutting with reserves
 - forest ecosystem networks
 - single-tree selection

Collaboration and Teamwork

- ☐ cooperates with group members
- ☐ shares work appropriately among group members
- ☐ negotiates with sensitivity solutions to problems
- ☐ displays effective communication and leadership skills

Information Sharing

- ☐ demonstrates effective use of a variety of communication media;
 - e.g., *written, oral, audio-visual*
- ☐ communicates thoughts/feelings/ideas clearly to justify or challenge a position
- ☐ maintains acceptable grammatical and technical standards
- ☐ gives evidence of adequate information gathering by citing seven or more relevant information sources

REFLECTIONS/COMMENTS:

Assessment Criteria and Conditions:

- definitions and Alberta examples of sustainable development, sustained yield, integrated land use and multiple use management.

Suggested Reference(s):

- *Our Growing Resource*
- *Alberta's Focus on Forests*
- *Managing the Forest.*

STANDARD: Respond to a standard of 3 on the rating scale.

Rating Scale

The student:

- 4 meets project/task objectives in a self-directed manner. Provides explanations and critical judgements based on a superior knowledge base. Demonstrates an understanding of relevant concepts and related issues.
 - 3 meets project/task objectives in a self-directed manner. Provides explanations and comparisons of relevant concepts using more precise terminology. Requires little or no prompting.
 - 2 meets project/task objectives with limited assistance in planning and in selecting and using resources. Applies knowledge of concepts in different situations using correct terminology. Requires occasional prompting.
 - 1 completes task as directed, demonstrating basic skills/completeness by following a guided course of action. Uses simple recall to demonstrate basic knowledge of concepts. Requires prompting.
 - 0 does not complete the task, or is unable to provide a suitable response
- N/A Not Applicable

Background Information	Sample Questions / Activities
<p>See <i>Our Growing Resource</i>, Chapter 2 - The Challenge of Sustainable Development:</p> <ul style="list-style-type: none"> • Managing Forest Development • Integrated Resource Management - Accommodating Many Uses • Harvest Planning and Practices • Reforestation • Air and Water Quality • Building Sustainable Businesses. <p>See <i>Alberta's Focus on Forests</i>, Unit 5 - Forest Management for All:</p> <ul style="list-style-type: none"> • 5.1: Forest Values • 5.2: Decision for Change • 5.3: Forest Perspectives • 5.4: Reforestation: Forests or Tree Farms? • 5.5: Integrated Resource Management. 	<p>1. Explain the goals of "sustainable development" and "sustainable yield" within the context of Alberta's forests.</p> <p>2. Interpret and discuss the meaning of the following definition of sustainable forest management: "the development of forests to meet current needs without prejudice to their future productivity, ecological diversity, or capacity for regeneration"</p> <p>3. Identify and explain major components/considerations relevant to sustainable forest management; e.g.:</p> <ul style="list-style-type: none"> - timber resources - biodiversity of wildlife - air, land and water quality. <p>4. Explain why forests can and should serve many purposes.</p> <p>5. Compare principles of integrated land use with principles of multiple use management by citing examples of each within Alberta.</p> <p>6. Explain strategies for consultation and public involvement in forest management decisions in Alberta.</p>

ASSESSMENT CRITERIA: Developing a Forest Management Plan

FOR312-2

MANAGEMENT OUTCOMES

The student:

- ☐ identifies short- and long-term management goals for the area based on single use of the forest (e.g., recreation)
- ☐ justifies management goals as the preferred alternative for the area
- ☐ proposes a management plan for the area consistent with management goals that includes:
 - a statement of government policies and guidelines
 - a schedule of management activities
 - a process for public involvement
 - a strategy for monitoring use and resolving potential conflicts
- ☐ presents the management plan to class/peers in a logical sequence, supporting points with sound evidence
- ☐ identifies significant features of management plans presented by class/peers for the same area based on other types of forest use (e.g., wildlife habitat, wood fibre)
- ☐ negotiates with class/peers a set of compromised management goals and strategies for the area that support integrated land use (e.g., lumber, recreation, wildlife, gas, grazing) based on social, economic and environmental factors
- ☐ presents an integrated management plan for the forested area consistent with compromised management goals and strategies that attempts to address:
 - the views of relevant stakeholder groups
 - short- and long-term goals and objectives
 - proposed management standards and guidelines
 - a process for public involvement
 - a strategy for monitoring use and resolving potential conflicts.

PLANNING PROCESSES

Planning and Preparation

- ☐ sets goals and establishes steps to achieve them
- ☐ creates and adheres to useful timelines
- ☐ uses personal initiative to formulate questions and find answers
- ☐ plans and uses time effectively

Information Gathering and Processing

- ☐ accesses a range of relevant information sources
- ☐ interprets, organizes and combines information in effective ways
- ☐ uses appropriate methods to calculate data and obtain accurate results

Collaboration and Teamwork

- ☐ cooperates with and shares work appropriately among team members
- ☐ shares information/opinions/suggestions, maintaining a balance between speaking and listening
- ☐ considers the ideas and suggestions of others, and when appropriate integrates new ideas into personal frame of reference

Negotiating and Debating

- ☐ explains positions adopted by presenting examples of possible consequences and implications
- ☐ presents a realistic plan in logical sequence supporting positions adopted
- ☐ provides a relevant and convincing rebuttal to opposing views
- ☐ negotiates solutions to problems and shared agreements by resolving divergent points of view

RATING SCALE

4	3	2	1	0
Exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.	Meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.	Meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.	Meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.	Has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

STANDARD IS 2 IN MANAGEMENT OUTCOMES AND PLANNING PROCESSES

CSB: 96 06 07

Forestry /G.131
(Interim 1994)

FORESTRY

SECTION H: LINKAGES/TRANSITIONS

(INTERIM)

TABLE OF CONTENTS

This section of the GSI has been designed to provide an overview of linkages and transitions of CTS modules with a number of organizations. The charts and information presented in this section will assist CTS students and teachers in understanding the potential application of CTS modules as students move into the workplace.

LINKAGES

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*All practical arts courses will be replaced by Career and Technology Studies in September, 1997.

LINKAGES/TRANSITIONS

LINKAGES

With Other CTS Strands

The Forestry strand provides opportunities for students to develop competencies in one or more forestry-related areas, including:

- personal and/or recreational use
- silviculture
- forest inventory
- forest harvest
- forest products
- forest management.

Each area of forestry links with competencies that are developed in other CTS strands. To facilitate and strengthen these linkages, courses may be designed by combining Forestry modules with modules from other CTS strands (e.g., Agriculture, Community Health, Energy and Mines, Legal Studies, Management and Marketing, Mechanics, Tourism Studies, Wildlife). Potential linkages of Forestry with other CTS strands, determined by the areas of course emphasis and industry specialization, are identified in the chart in this section (see “Connections with Other CTS Strands”, page H.3).

The Career Transitions strand of CTS provides project, practicum, safety and leadership modules that may be combined with modules in Forestry to increase the opportunity for students to develop expertise and refine their competencies. For example, a silviculture or forest inventory project may require more than the 25, 50 or 75 hours available through modules by that name. In these cases project and/or practicum modules from the Career Transitions strand can be accessed so as to provide sufficient time for completion of learning and the task.

Sample courses in Forestry that involve linkages with other CTS strands are provided in the charts in this section (see “Forestry in Junior High”, page H.4 and “Forestry in Senior High”, page H.5).

With Other Secondary Programs

The Forestry strand has many links with other core and complementary subject areas across the curriculum. For example, many of the modules in Forestry link with the junior and senior high Science programs, and provide opportunities for students to extend and apply related knowledge and skills in practical ways.

Potential linkages of Forestry with other core and complementary subject areas across the curriculum are identified in the chart in this section (see “Forestry: Connections Across the Curriculum”, page H.6).

With Practical Arts Courses

Modules in the Forestry strand replace existing content in the junior high Environmental and Outdoor Education 7, 8 and 9 programs. A detailed correlation of the Forestry strand to these practical arts courses can be found in this section (see “Forestry: Correlations with Practical Arts Courses: Environmental and Outdoor Education 7, 8 and 9”, pages H.7-8).

TRANSITIONS

To the Workplace

Intermediate and advanced modules are designed to develop knowledge, skills and attitudes that provide transitions to occupations in forestry-related areas. Some career sectors welcome individuals who have basic skills and are prepared to learn through further training from the employer.

Information from the National Occupational Classification (NOC) regarding occupations in forestry-related areas that can be accessed upon completion of high school is provided in this section (see "Forestry: Related Occupations", pages H.9).

To Related Post-secondary Programs

Advanced level modules will assist students to make plans regarding further studies in forestry at post-secondary levels. The Forestry modules provide desirable background and skills for entry into related programs at public and private colleges, technical institutes, universities and vocational colleges in Alberta.

An outline of post-secondary institutions in Alberta currently offering programs in forestry-related areas is provided in this section (see "Forestry: Summary of Related Post-secondary Programs", page H.10).

CREDENTIALLING

Students may earn partial or complete credentials recognized in the workplace and/or post-secondary institutions by demonstrating specified competencies within the CTS curriculum. The Forestry strand, in conjunction with modules from the Career Transitions strand, may provide opportunities for students to develop competencies that link with:

- First Aid certificate courses
- National Occupational Standards for Outdoor Guide
- Alberta Conservation and Hunter Education Program
- Alberta Fishing Education Program
- Pesticide Applicator certificate courses.

In addition, formal agreements have been established with Olds College for the recognition of CTS competencies developed in soils management (see Agriculture strand).

Teachers may wish to explore opportunities for linking courses in Forestry with these and/or other credentialling programs. Further information regarding credentialling in Forestry is provided in this section (see "Credentialling Opportunities in Forestry", page H.11).

LINKAGES – Forestry: Connections with Other CTS Strands

Forestry Modules	Other CTS Strands																				
	Agriculture	Career Transitions	Communication Technology	Community Health	Construction Technologies	Cosmetology Studies	Design Studies	Energy and Mines	Electro Technologies	Enterprise and Innovation	Fashion Studies	Financial Management	Foods	Fabrication Studies	Information Processing	Legal Studies	Logistics	Management and Marketing	Mechanics	Tourism Studies	Wildlife
Theme: Social & Cultural Perspectives																					
FOR101: Why Forestry?																					
FOR102: Forest Regions of Canada																					
FOR104: Woods Survival I																					
FOR201: Making a Difference in Forestry																					
FOR203: Managing Alberta's Forested Lands																					
FOR204: Woods Survival II																					
FOR301: Issues in Forestry																					
Theme: Technology & Applications																					
FOR105: Mapping & Aerial Photography																					
FOR106: Measuring the Forest I																					
FOR206: Measuring the Forest II																					
FOR207: Harvesting & Forest Products																					
FOR306: Measuring the Forest III																					
FOR307: The Forest Marketplace																					
FOR308: Forest Technology Application																					
Theme: Management & Conservation																					
FOR109: Basic Forest Ecology																					
FOR110: Forests Forever I																					
FOR210: Forests Forever II																					
FOR212: Users in the Forest																					
FOR309: Advanced Forest Ecology																					
FOR311: Silviculture: Growing the Forest																					
FOR312: Stewardship: Balancing Needs																					

Provides many direct links with competencies in this strand. Students will reinforce, extend and apply a substantial number of knowledge and/or skill components in practical situations.

Provides some links with competencies developed in this strand, usually through the application of related technologies and/or processes.

LINKAGES – Forestry in Junior High

Course Emphasis	Forestry Modules	Mechanics Modules	Wildlife Modules	Tourism Studies Modules
Forest Ecology (3 modules)	Why Forestry?		Natural History of Alberta Wildlife	
	Basic Forest Ecology			
Forest Inventory (4 modules)	Why Forestry?		Measuring the Value of Wildlife	
	Mapping & Aerial Photography			
	Measuring the Forest I			
Logging and Timber Utilization (5 modules)	Why Forestry?	Engine Fundamentals		
	Forest Regions of Canada	Mechanical Systems		
	Harvesting & Forest Products			
Personal and Recreational (6 modules)	Why Forestry?		Fishing & the Aquatic Environment	Tourism Attractions Sector
	Mapping & Aerial Photography			
	Woods Survival I			
	Woods Survival II			

LINKAGES – Forestry in Senior High

Area of Course Emphasis	Forestry Modules	Wildlife Modules	Tourism Studies Modules	Career Transitions Modules
Personal and Recreational (3 credits) Prerequisite: Woods Survival I	Making a Difference in Forestry Woods Survival II		Adventure and Ecotourism	
Silviculture (5 credits) Prerequisite: None	Basic Forest Ecology Advanced Forest Ecology Silviculture: Growing the Forest Forest Technology Applications			Project 2A
Harvest and Forest Products (5 credits) Prerequisite: Measuring the Forest I and II	Managing Alberta's Forested Lands Harvesting and Forest Products The Forest Marketplace Measuring the Forest III			Project 2A
Environmental Stewardship (3 credits) Prerequisite: None	Making a Difference in Forestry	Issues in Wildlife I		Project 2A
Forest Management (5 credits) Prerequisite: None	Issues in Forestry Users in the Forest Stewardship: Balancing Needs	Interactions of Wildlife and Society		Project 2A

LINKAGES – Forestry: Connections Across the Curriculum

Forestry Modules	Across the Curriculum															
	Junior High							Senior High								
	Language Arts	Social Studies	Mathematics	Science	Health & PLS	Physical Education	Fine Arts	English	Social Studies	Mathematics	Science (General)	Biology	Chemistry	Physics	CALM	Physical Education
Theme: Social & Cultural Perspectives																
FOR101: Why Forestry?																
FOR102: Forest Regions of Canada																
FOR104: Woods Survival I																
FOR201: Making a Difference in Forestry																
FOR203: Managing Alberta's Forested Lands																
FOR204: Woods Survival II																
FOR301: Issues in Forestry																
Theme: Technology & Applications																
FOR105: Mapping & Aerial Photography																
FOR106: Measuring the Forest I																
FOR206: Measuring the Forest II																
FOR207: Harvesting & Forest Products																
FOR306: Measuring the Forest III																
FOR307: The Forest Marketplace																
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FOR210: Forests Forever II																
FOR212: Users in the Forest																
FOR309: Advanced Forest Ecology																
FOR311: Silviculture: Growing the Forest																
FOR312: Stewardship: Balancing Needs																

Provides many direct links with course content. Students will reinforce, extend and apply a substantial number of knowledge and/or skill components in practical contexts.

Provides some links with course content, usually through the application of related technologies and/or processes.

LINKAGES – Forestry: Correlations with Practical Arts Courses:*
Environmental and Outdoor Education 7, 8 and 9

	Why Forestry?	Forest Regions Of Canada	Woods Survival I	Mapping & Aerial Photography	Measuring The Forest I	Basic Forest Ecology	Forests Forever I	Making A Difference In Forestry	Managing Alberta's Forested Lands	Woods Survival II	Measuring The Forest II	Harvesting & Forest Products	Forests Forever II	Users In The Forest	Issues In Forestry	Measuring the Forest III	The Forest Marketplace	Forest Technology Applications	Advanced Forest Ecology	Silviculture: Growing The Forest	Stewardship: Balancing Needs
OUTDOOR CORE																					
regard for self, others and the environment			X	X	X					X	X					X					
trip preparation and safety			X							X											
safe and comfortable outdoor living skills			X							X											
applying information for safe route planning			X	X						X											
environmentally responsible outdoor activities			X		X					X	X					X				X	
physical fitness for outdoor activities																					
PERSONAL AND GROUP DEVELOPMENT																					
respect and appreciation for self and others	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
setting realistic goals	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
personal communication skills	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
relationship of individuals to groups	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
group process skills	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ENVIRONMENTAL CORE																					
diversity of environments and life forms	X	X				X													X		
interactions within environments	X	X				X													X	X	
natural and human changes to the environment	X					X	X						X		X				X		
air, water and soil cycles	X					X													X	X	
the sun as the primary energy source on Earth						X													X		

*All practical arts courses will be replaced by Career and Technology Studies in September, 1997.

LINKAGES – Forestry: Correlations with Practical Arts Courses:*

Environmental and Outdoor Education 7, 8 and 9 (continued)

	Why Forestry?	Forest Regions Of Canada	Woods Survival I	Mapping & Aerial Photography	Measuring The Forest I	Basic Forest Ecology	Forests Forever I	Making A Difference In Forestry	Managing Alberta's Forested Lands	Woods Survival II	Measuring The Forest II	Harvesting & Forest Products	Forests Forever II	Users In The Forest	Issues In Forestry	Measuring the Forest III	The Forest Marketplace	Forest Technology Applications	Advanced Forest Ecology	Silviculture: Growing The Forest	Stewardship: Balancing Needs
OUTDOOR EXPEDITIONS																					
skill and judgment in outdoor expeditions			X	X	X					X	X					X				X	
positive self-concept and regard for others			X							X											
group problem solving and group living skills			X							X											
regard for environments and responsible outdoor judgment			X	X	X					X	X					X				X	
ENVIRONMENTAL INVESTIGATIONS																					
environmental investigation skills		X				X													X	X	
strategies for responding to environmental concerns							X	X					X		X					X	
COMMITMENT TO ACTION																					
outdoor recreation as part of healthy lifestyle			X							X											
appreciation of environments through respectful use	X		X				X	X		X			X		X					X	
responsible use of local and global environments	X		X				X	X		X			X		X					X	
plans to make personal growth a lifelong process								X							X						

*All practical arts courses will be replaced by Career and Technology Studies in September, 1997.

TRANSITIONS – Forestry: Related Occupations

Information for this chart was obtained from the National Occupations Classification (NOC) descriptions:

Educational Requirements:

D: High School Education

C: Apprenticeship

B: College or Vocational Education

A: University

Occupation Profile	NOC#	D	C	B	A
Arborist	2225			✓	✓
Biochemist	2112				✓
Biologist and Related Scientist	2121				✓
Botanist	2121				✓
Chemist	2112				✓
Chainsaw and Skidder Operators	8421	✓			
Environmental Auditor	2263				✓
Environmental Education Specialist	4161				✓
Environmental Engineer	2131				✓
Forest Technologist	2223			✓	
Forester/Forestry Scientist	2122				✓
Forestry Professionals	2122				✓
Forestry Worker	8422			✓	
Hazardous Waste Management Technician	2263			✓	
Hydrologist	2113				✓
Inspectors in Public and Environmental Health and Occupational Health and Safety	2263			✓	✓
Interpretive Naturalist	2121			✓	✓
Labourers in Wood, Pulp and Paper Processing	9614	✓			
Land Surveyor	2154				✓
Land Use/Community Planner (Urban, Regional, Park)	2153				✓
Logging and Forestry Labourers	8616	✓			
Logging Machinery Operators	8241	✓			
Lumber Graders and Other Wood Processing Inspectors and Graders	9436	✓			
Other Wood Processing Machine Operators	9434	✓			
Paper Converting Machine Operators	9435	✓			
Papermaking and Coating Control Operators	9234	✓			
Papermaking and Finishing Machine Operators	9433	✓			
Pollution Control Technician	2231			✓	
Pulp Mill Machine Operators	9432	✓		✓	
Pulping Control Operators	9233	✓		✓	
Primary Production Managers (except Agriculture)	0911				✓
Sawmill Machine Operators	9431	✓			
Silviculture and Forestry Workers	8422	✓		✓	
Supervisors, Forest Products Processing	9215	✓		✓	
Supervisor, Logging and Forestry	8211	✓		✓	
Utilities Managers	0912			✓	✓

TRANSITIONS – Forestry: Summary of Related Post-secondary Programs

	PUBLIC COLLEGES										TECH. INST.	Banff	UNIVERSITIES			VOCATIONAL COLLEGES								
	Alberta College of Art & Design	Fairview College	Grande Prairie Regional College	Grant MacEwan Community College	Keyano College	Lakeland College	Leibniz Community College	Medicine Hat College	Mount Royal College	Olds College			Red Deer College	APPRENTICESHIP TRADE	Albena College	Augustana University College	Canadian Union College	Concordia College	King's University College, The	North American Baptist College	Southern Alberta Institute of Technology			
Biological Sciences (including degree programs in Biochemistry, Biology, Botany, Entomology, Genetics, Microbiology & Zoology)			1t2t	2t		1t		1t2t	2t		2t		B	B	B	B	BMP hD	BMP hD	BM		AVC - Calgary	AVC - Edmonton	AVC - Lac La Biche	AVC - Lesser Slave Lake
											1t													
Biological Sciences/Biomedical Engineering Technology (certificate & diploma programs with various specializations)																			D					
Environmental Science (various specializations in Conservation & Reclamation, Environmental Monitoring & Conservation Enforcement, Fish & Wildlife, Parks & Recreation, and Renewable Resource/Watershed Management)					1t	D	CD			CD					B2t	B	B	CM	B					C(34 w)
Environmental Technology/Water & Wastewater Technician																			C					C
Forestry, Forest Science/Technology		1t			1t	1t		1t	1t		1t						BMP hD							C
Forestry/Legging Operations																				V	V			C VC
Petroleum/Mineral Resource/Land Management										D														
Leisure, Tourism & Society/ Recreation Administration/Leisure (degree programs with various specializations)					C			1t			2t				1t		BM	B	BM					
Physical Education (degree programs with various specializations)		2t	1t		1t	1t		2t	D1t		2t				B 2t	1t		BMP hD	BM					
Recreation, Leadership & Management/Leisure Services (certificate and diploma programs with various specializations)							CD	D	D										D					C C

CODES:	B	Bachelor's Degree	D	Diploma (2 years)	w	weeks
	M	Master's Degree	V	Varies	m	months
	Ph.D.	Doctoral Degree	1t	One-year transfer	y	years
	C	Certificate (1 year or less)	2t	Two-year transfer		

*Information taken from "It's About Time: To Start Thinking About Your Future", Advanced Education and Career Development, 1995

CREDENTIALLING – *Credentialling Opportunities in Forestry*

Certificate	Agency	Other Strands	Modules	Instructor Qualifications	Comments
Alberta Conservation and Hunter Education Program	Alberta Environmental Protection, Fish and Wildlife Services	WLD	Regulated Hunting and Game Management I (WLD107) Regulated Hunting and Game Management II (WLD207)	Yes with Environmental Protection	Contact Alberta Environmental Protection, Fish and Wildlife Services, at (403) 944-0313 or (403) 297-6423 for information regarding instructor and student certification
Alberta Fishing Education Program	Alberta Environmental Protection, Fish and Wildlife Services	WLD	Fishing and the Aquatic Environment (WLD108)	Yes with Environmental Protection	
Alberta Tourism Industry Standards <ul style="list-style-type: none"> • Outdoor Guide • Freshwater Angling Guide • Hunting Guide 	Alberta Tourism Education Council (ATEC)		Woods Survival I (FOR104) Woods Survival II (FOR204)	No	Industry standards currently available – certification under development. Evaluation by industry peer-based or written exam and demonstration of practical skills. Contact ATEC at 1-800-265-1283
Canadian Firearms Safety Course	Alberta Justice, Chief Provincial Firearms Office	CTR	Project modules (CTR211 - 215) (CTR311 - 315)	Yes with Alberta Justice	Contact Alberta Justice at (403) 427-0437 for information regarding instructor and student certification
Emergency First Aid	St. John Ambulance	CTR	Personal Safety Management (CTR121)	Yes	<i>See Community Health and/or Career Transitions</i>
Standard First Aid	St. John Ambulance	CMH	First Aid/CPR (CMH212)	Yes	
Basic Wilderness First Aid	Canadian Red Cross Society	CTR	Project modules (CTR211 - 215) (CTR311 - 315)	Yes with Canadian Red Cross	Evaluation done by instructor certified with Canadian Red Cross. Contact: Calgary (403) 541-4446 Edmonton (403) 423-2680 Lethbridge (403) 327-7117 Grande Prairie (403) 539-7127 Red Deer (403) 346-1241 Medicine Hat (403) 526-3048

FORESTRY

SECTION I: LEARNING RESOURCE GUIDE

(INTERIM)

TABLE OF CONTENTS

This section of the GSI has been designed to provide a list of resources that support student learning. Three different types of resources are identified:

- **Authorized:** Resources authorized by Alberta Education for CTS curriculum; these resources are categorized as basic, support, or teaching
- **Other:** Titles provided as a service to assist local jurisdictions to identify resources that contain potentially useful ideas for teachers. Alberta Education has done a preliminary review of these resources, but further review will be necessary for use in school jurisdictions
- **Additional:** A list of local and provincial sources of information available to teachers, including the community, government agencies, resource centres and organizations.

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INTRODUCTION

CTS AND THE RESOURCE-BASED CLASSROOM

Career and Technology Studies (CTS) encourages teachers to establish a resource-based classroom, where a variety of appropriate, up-to-date print and non-print resources are available. Learning resources identified for CTS strands include print, software, interactive videos, manipulatives, student learning guides and tutorials.

The resource-based classroom approach accommodates a variety of instructional strategies and teaching styles, and supports individual or small group planning. It provides students with opportunities to interact with a wide range of information sources in a variety of learning situations. Students in CTS are encouraged to take an active role in managing their own learning. Ready access to a strong resource base enables students to learn to screen and use information appropriately, to solve problems, to meet specific classroom and learning needs, and to develop competency in reading, writing, speaking, listening and viewing.

PURPOSE AND ORGANIZATION OF THIS DOCUMENT

The purpose of this document is to help teachers identify a variety of resources to meet their needs and those of the students taking the new Forestry curriculum. It is hoped that this practical guide to resources will help teachers develop a useful, accessible resource centre that will encourage students to become independent, creative thinkers.

This document is organized as follows:

- Authorized Resources:
 - basic learning resources
 - support learning resources
 - teaching resources
- Other Resources
- Additional Sources.

Some resources in the guide have been authorized for use in some or all of the CTS strands, e.g., the 11-video Career and Technology Studies series produced by ACCESS: The Education Station. Full information is provided in the appropriate section of this resource guide.

Each resource in the guide provides bibliographic information, an annotation where appropriate, and a correlation to the Forestry modules. The distributor code for each entry will facilitate ordering resources. It is recommended that teachers preview all resources before purchasing, or purchase one copy for their reference and additional copies as required.

Distributor Code	Resources		Levels/Mod. No.			1 = Introductory 2 = Intermediate 3 = Advanced Indicates module number
			1	2	3	
ATEC	Title	Author	101	201	301	
	Bibliographic Information					
	Annotation					

Distributor Code - see Distributor Directory

HOW TO ORDER

Most authorized resources are available from the Learning Resources Distributing Centre (LRDC) at:

12360 – 142 Street
Edmonton, AB
T5L 4X9
Telephone: (403) 427-2767
Fax: (403) 422-9750

Please check LRDC for availability of videos.

The section on Additional Sources lists a variety of other places to find information related to this strand. In addition, at the back of this document is a Distributor Directory, which contains the name and address of each publisher/distributor referred to in the resource list. Note that in some cases a resource may be published by one company but distributed through another.

The information contained is as complete and accurate as possible.

RESOURCE POLICY

For further information on resource policy and definitions, refer to the *Student Learning Resources Policy* and *Teaching Resources Policy* or contact:

Learning Resources Unit
Curriculum Standards Branch
Alberta Education
5th Floor, Devonian Building, East Tower
11160 Jasper Avenue
Edmonton, AB
T5K 0L2
Telephone: (403) 422-4872
Fax: (403) 422-0576

AUTHORIZED RESOURCES

BASIC LEARNING RESOURCES

The following basic learning resources have been authorized by Alberta Education for use in the Forestry curriculum. These resources address the majority of the learner expectations in one or more modules and/or levels. A curriculum correlation appears in the right-hand column.

Distributor Code	Resources	Level/Module No.		
		1	2	3
LRDC	<p><i>Ecosystems.</i> B. Herridge and B. Chernin. Gage Educational Publishing, 1995.</p> <p>The 72 page student text provides an illustrated introduction to ecosystems and a more in-depth look at living and non-living factors and the roles they play in ecosystems. The text concludes with examples of human impacts on ecosystems and examines current issues from a variety of perspectives. The 500 page teacher's resource book provides teaching ideas correlated to the student text and suggestions regarding evaluation, supplementary resources and integrated projects. Blackline master, reproducible for classroom use, are provided.</p>	101	201	301
		102	209	309
		109		312
		110		
LRDC	<p><i>Global Environment, The.</i> Steven Sterling and Sue Lyle. Mississauga, ON: Copp Clark Pitman, 1991.</p> <p>This text addresses a broad range of environmental issues within a global context. Issues are examined through a variety of stimulating activities, including case studies, discussion and role-playing.</p>	109	203	301
		110	210	
LRDC	<p><i>Investigating Terrestrial Ecosystems.</i> William A. Andrews. Scarborough, ON: Prentice-Hall Canada Inc., 1986.</p> <p>This student textbook focuses attention on the ecology of our planet and more specifically terrestrial ecosystems. The content is intended to assist students to identify and resolve environmental issues. The textbook investigates basic concepts of terrestrial ecosystems and examines specific biomes. Each chapter includes student-centred activities, case studies and suggestions for field studies.</p>	101		309
		102		
		109		
LRDC	<p><i>Native Trees of Canada.</i> (8th edition.) R.C. Hosie. Markham, ON: Fitzhenry and Whiteside Limited, 1990.</p> <p>This reference book serves as a guide to the history of Canadian forests and more than 140 species of trees in Canada. The book provides detailed notes and illustrations on the habitat, size, shape, leaves, bark and wood for every Canadian tree species. A glossary and identification key are included.</p>	102	204	309
		104		

Basic Learning Resources (Continued.)

Distributor Code	Resources	Level/Module No.		
		1	2	3
LRDC	<p><i>Which Future? Investigating World Environmental Issues.</i> Don Harris and Chris Dolan. Mississauga, ON: Copp Clark Pitman, 1992.</p> <p>This text deals with a variety of environmental issues and cites examples from many parts of the world. Topics covered include food and population, land degradation, forest clearing, pollution and alternative energy sources.</p>	110	203	301
			210 212	312

SUPPORT LEARNING RESOURCES

The following support learning resources are authorized by Alberta Education to assist in addressing some of the learner expectations of a module or components of modules.

Distributor Code	Resources	Level/Module No.		
		1	2	3
LRDC	<i>Birders of a Feather.</i> Vancouver, BC: T.H.A. Media Distributors Ltd., 1993. Videotape. This video deals with the ecotourism dilemma in Beaverhill Lake, Mount Verde and Point Pellee. The positive and negative effects that ecotourism brings to human and natural communities are vividly portrayed.	109	203	301
		110	210	309
ACC	<i>Boreal Forest Issues.</i> Edmonton, AB: Friends of the Environmental Education Society of Alberta (FEESA), 1993. Videotape. This 59-minute video explains the characteristics of Alberta's boreal forests, outlines the nature of forest use in society today, and examines strategies used in forest management. Issues surrounding the use of our boreal forests are analyzed from both economic and environmental perspectives. The need for responsible decision making in forestry-related areas is emphasized throughout the video.	101	201	301
		102	203	309
		109	210	312
		110	212	
ACC	<i>Career and Technology Studies: Key Concepts.</i> Edmonton, AB: ACCESS: The Education Station. Series of videos and utilization guides relevant to all CTS strands. Series consists of <i>Anatomy of a Plan, Creativity, Electronic Communication, The Ethics Jungle, Go Figure, Innovation, Making Ethical Decisions, Portfolios, Professionalism, Project Planning, Responsibility and Technical Writing.</i>	all	all	all
LRDC	<i>Forest is in Our Hands, The.</i> Edmonton, AB: Caterpillar Incorporated, 1991. Videotape. This video explores the need to make informed decisions regarding our use of forests and other natural resources. Information is presented in three parts: "Tending the Forest" (describes the science of silviculture); "Sharing the Forest" (explores the concept of multiple-use management); and "Sustaining the Forest" (examines the crucial area of decision making). Viewers are reminded that there are at least two sides to every issue. A print component entitled "Forest Facts: The Forest is in our Hands" is available in booklet format.		212	301
				311
				312
SSC	<i>From the Mountains to the Sea - A Journey in Environmental Citizenship.</i> Ottawa, ON: Environment Canada, 1992. Booklet. This student booklet provides a brief directory of various "eco" activities that can be implemented in the community, home and/or school.		203	301

Support Learning Resources (continued)

Distributor Code	Resources	Level/Module No.		
		1	2	3
LRDC	<p><i>Importance of Wildlife to Canadians in 1987, The: Trends in Participation in Wildlife-Related Activities, 1981 to 2006.</i> F. L. Filion, et al. Ottawa, ON: Environment Canada, Canadian Wildlife Service, 1988. Booklet.</p> <p>This booklet addresses the consumptive and non-consumptive use of wildlife. The booklet provides factual content that would be useful for individual student research and investigation.</p>	101	201	301
		106	206	306
		109		
		110		
LRDC	<p><i>Identification Guide to the Trees of Canada.</i> Jean Lauriault. Markham, ON: Fitzhenry and Whiteside Limited, 1989.</p> <p>This reference guide identifies native trees of Canada. The book provides a distribution map for each species and detailed information about its leaves and fruit. The book also identifies some common ornamentals not native to Canada. Additional information is provided about the origin of names for tree species, the economic importance of trees, tree diseases, tree toxicity and the medical properties of trees. The book suggests some interesting activities related to the study of trees, including tips on how to start a leaf collection.</p>	102	204	309
		104		
LRDC	<p><i>Nature's Legacy: A Southwestern Safari.</i> Randy Tomiuk Productions Ltd./Wildhorse Productions/R&L Peregrine Productions/Amoco Petroleum Co. Ltd., 1995. Videotape.</p> <p>Examines the wildlife of southwestern Alberta. Most of the region's shorebirds, prairie birds and raptors are shown. Some mammals are also examined. The emphasis is on identification and appreciation.</p>	109	201	301
		110	210	309
LRDC	<p><i>New Leaf: Real Sustainability for the Boreal Forest,</i> A. Karen Baitgailis and Barbara Allard. Western Canada Wilderness Committee, 1993. Videotape.</p> <p>This video proposes a plan for Alberta's boreal forest. Current forestry mega projects are shown to be unsustainable, both environmentally and economically. The video provides a model for integrated, small scale, labour intensive economic development for northern Alberta that includes nature tourism, horse and machine selective logging, small sawmills, value-added wood products manufacturing and clean pulp mills. The focus in this video is supportive of environmental concerns taking precedence over economic development. Teachers should be prepared to provide a balance in perspective.</p>		212	301 312

Support Learning Resources (continued)

Distributor Code	Resources	Level/Module No.		
		1	2	3
LRDC	<p><i>One-Minute Readings: Issues in Science, Technology and Society.</i> R.F. Brinckerhoff, et al. Don Mills, ON: Addison-Wesley Publishing Company, 1992.</p> <p>This book contains readings and questions related to issues in science, technology and society. Applications of science are raising difficult questions and are creating problems that cannot be answered. The book is intended to give students practice in making the kinds of decisions they will experience in life. Students need a knowledge of science to find the best possible answers.</p>			301
LRDC	<p><i>Personal Equipment.</i> N. Kelba, et al. Calgary, AB: Calgary Board of Education, 1983. Booklet.</p> <p>This booklet examines the role of personal equipment (its selection and use) in safe and comfortable outdoor experiences. Topics addressed include temperature regulation, essential equipment for various situations, selection of quality equipment, sources of equipment, care and maintenance of equipment, packing equipment and safety considerations.</p>	104	204	
LRDC	<p><i>Place For Wildlife, A: A Way Is No Longer There.</i> Edmonton, AB: ACCESS: The Education Station, 1990. Videotape and print.</p> <p>This video was produced with the goal of increasing public understanding of pressures facing Canadian wildlife; in particular, the continuing loss of habitat. The program features "A Way Is No Longer There", an original song about the common fate of wildlife and humans in our changing environment. A utilization guide in print format is available to teachers.</p>	109	203	301 309
LRDC	<p><i>Shelters.</i> N. Kelba, et al. Calgary, AB: Calgary Board of Education, 1983. Booklet.</p> <p>This booklet develops knowledge of planned and emergency shelters essential to outdoor experiences. Topics addressed include site selection, summer and winter constructed shelters, tents, bivouac sacks, improvised and permanent shelters.</p>	104	204	
LRDC	<p><i>Singing In The Rain Forest (Warblers).</i> Vancouver, BC: T.H.A. Media Distributors Ltd. 1993. Videotape.</p> <p>This video describes the plight of many North American (Boreal) songbirds. Warblers are the main focus of attention. It provides a good overview of the bird's life cycle and migratory patterns. The video should be viewed with the understanding that many factors have attributed to the warblers' population decline (e.g., forest fires, urban expansion, agriculture).</p>	109 110	203 210	301 309

Support Learning Resources (continued)

Distributor Code	Resources	Level/Module No.		
		1	2	3
LRDC	<i>This Living World: The Forest.</i> Edmonton, AB: Recreation, Parks and Wildlife Foundation, 1992. Videotape. The video present a historical perspective on the development of forests and the forest industry in Canada. Because forests provide a home for wildlife and serve many uses for human, it is necessary to protect and conserve them.	101	203	301
		109	210	
		110		
LRDC	<i>This Living World: Wildlife Habitat.</i> Edmonton, AB: Recreation, Parks and Wildlife Foundation, 1992. Videotape. This video informs viewers of the importance of "habitat" for living things. Interviews provide insight on issues concerning wildlife and its habitat (e.g., the need for ecological literacy, how habitat affects quality of life, the worldwide disappearance of natural habitats).	101	203	301
		109	210	
		110		
LRDC	<i>Three Environmental Concerns: Science Show The.</i> Francois St. Laurent. Montreal, PQ: The Multi Media Group of Canada, 1991. Videotape. This video explores the possible effects of electromagnetic waves, noise and radiation on living things. Conclusive evidence regarding the effects of these sources of pollution on ecosystems in not available. Nevertheless, the video examines related scientific principles and emerging societal issues.	109	203	301
		110	210	
LRDC	<i>Trees.</i> N. Kelba, et al. Calgary, AB: Calgary Board of Education, 1992. Booklet. This booklet provides a variety of environmental investigations that are suited to the classroom and school yard. The investigations involve students in hands-on and participatory learning situations.	102	203	
		104	204	
		109		
AFA	<i>Woodlot Management Information Series.</i> Edmonton, AB: Alberta Forestry Association, 1993. Brochures. This resource includes a series of 10 brochures that explain aspects of woodlot management in clear statements that use non-technical vocabulary. The series includes Taking Inventory of Your Forest Resources; Forests, Fish & Wildlife; Preparing a Management Plan; Business Plans for Woodlots; Logging & Selling Your Timber; Environmental Protection; Reforesting Your Woodlot; Practising Agroforestry in the Prairies; Add Value to Your Forest Products; and Woodlot Management to Diversify Farm Income.	101	203	301
		110	206	307
			207	311
			210	312
			212	

TEACHING RESOURCES

The following teaching resources are authorized by Alberta Education to assist teachers in the instructional process.

Distributor Code	Resources	Level/Module No.		
		1	2	3
LRDC	<p><i>Alberta's Focus on Forests.</i> Edmonton, AB: Alberta Forestry Association, 1993.</p> <p>This guidebook for teachers focuses attention on the nature of forests and forest management in Alberta. Lessons outlined in the manual incorporate activity-based learning, cooperative learning and critical/creative thinking skills. Materials have been organized into five modules which include Adaptations For Life (forest ecology), The Forest Tree, Conditions Affecting Growth, Forest Resources and Technologies, and Forest Management For All.</p>	101	207	307
		102	210	309
		105		
		106		
		109		
		110		
LRDC	<p><i>Ecology Studies of Lakes in Alberta.</i> Edmonton, AB: Alberta Environment, 1988. Resource materials include book and teacher's package, 1989.</p> <p>This print package deals with the ecology of freshwater environments. The unit of study discusses human impact on lake environments and involves students in the methods and technology employed to study lakes. Workshops on how to use the materials are provided by Alberta Environment.</p>	109	203	301
		110	206	309
			210	
LRDC	<p><i>Ecosystems.</i> B. Herridge and B. Chernin. Gage Educational Publishing, 1995. Teacher's resource booklet.</p> <p>See Basic Learning Resources for annotation and module correlation.</p>			
LRDC	<p><i>Managing The Forest: Support Materials for a Secondary School Course in Intensive Forest Management.</i> Don Jacques. Vancouver, BC: The University of British Columbia, Western Education Development Group, 1985. Teacher resource manual.</p> <p>This resource manual provides ideas and activities to support a high school forestry course. The book is not a course in itself, but places activities in a developmental sequence so that teachers may use it as a guide to develop and present a variety of forestry concepts.</p>	105	206	306
		106	207	307
			212	308
				311
				312

Teaching Resources (continued)

Distributor Code	Resources	Level/Module No.		
		1	2	3
LRDC	<p><i>Matter of Degrees, A: Primer on Global Warming: Environmental Citizenship Series.</i> Christine Hogan. Ottawa, ON: Environment Canada, 1993. Teacher's booklet.</p> <p>This instructor source book provides information about climate change, the greenhouse effect, human activities contributing to the greenhouse effect, current scientific initiatives, potential impacts (especially on Canada), and strategies for personal response to the issue. This book will assist the teacher to develop learning projects and programs that address global warming.</p>		203 210	301 309
LRDC	<p><i>Nature's Legacy: A Southwestern Safari.</i> Randy Tomiuk Productions Ltd./Wildhorse Productions/R&L Peregrine Productions/Amoco Petroleum Co. Ltd., 1995. Teacher's resource guide.</p> <p>The annotation for this resource requests teachers to ensure that a balanced viewpoint is presented regarding the drainage of wetlands.</p> <p>See Support Learning Resources for annotation and module correlation.</p>			
GEP	<p><i>Nature of Canada, The: A Primer on Spaces and Species.</i> Agincourt, ON: Gage Educational Publishing Co., 1993. Booklet.</p> <p>This resource is designed to provide information that will help Canadians make environmentally responsible decisions. It provides short information anecdotes, maps and charts, and questions and answers designed to promote critical thinking. The resource includes activities that can be initiated in the classroom or community. The book is one of a series of Environmental Citizenship Primers.</p>	101 109 110	201	301 309 312
LRDC	<p><i>National Occupational Standards For the Canadian Tourism Industry: Outdoor Guide.</i> Tourism Industry Association of Canada. Edmonton, AB: Alberta Tourism Education Council, 1991. Teacher booklet.</p> <p>This document contains competency standards that the tourism industry deems necessary for effective performance in the occupation of Outdoor Guide. The standards establish a base from which certification programs can be developed.</p>	104	204	
LRDC	<p><i>Northern Bushcraft.</i> (Expanded edition.) Mors Kochanski. Edmonton, AB: Lone Pine Publishing Company, 1988.</p> <p>This book provides practical information for everyday living in the northern forest. It discusses basic existence skills that allow survival in challenging situations. Topics such as firecraft, axecraft, knifecraft, sawcraft, rope work and shelter are discussed.</p>	104	204	

Teaching Resources (continued)

Distributor Code	Resources	Level/Module No.		
		1	2	3
LRDC	<p><i>One-Minute Readings: Issues in Science, Technology and Society.</i> R.F. Brinckerhoff, et al. Don Mills, ON: Addison-Wesley Publishing Company, 1992. Teacher's Manual.</p> <p>See Basic Learning Resources for annotation and module correlation.</p>			
LRDC	<p><i>Orienteering, Level I.</i> R. Robertson. Calgary, AB: Calgary Board of Education, 1982. Booklet.</p> <p>This booklet is designed to develop locomotor skills, map skills and space/time skills as they relate to orienteering. By using a variety of maps, the student's ability to "find his/her way" is developed. Activities for rural and urban geographical areas have been included.</p>	104 105	204	
LRDC	<p><i>Orienteering, Level II.</i> R. Robertson. Calgary, AB: Calgary Board of Education, 1980. Booklet.</p> <p>This booklet is designed to add the use of a compass to the fundamental orienteering skills of map reading, map making and map orientation. Activities address physical fitness and skills, knowledge and understanding, social skills, attitudes and appreciation. The material has been prepared for junior and senior high school students.</p>	104 105	204	
GEP	<p><i>Primer on Environmental Citizenship.</i> A. Agincourt, ON: Gage Educational Publishing Co., 1993.</p> <p>This resource is designed to provide information that will help Canadians make environmentally responsible decisions. It provides short informational anecdotes, maps and charts, and questions/answers designed to provide critical thinking. The resource includes information on ecological processes, relationships of human societies with the environment, and key environmental issues that Canadians face today. The book is one of a series of Environmental Citizenship Primers.</p>	101 109	201	301 309 312
LRDC	<p><i>Project Wild Activity Guide.</i> Ottawa, ON: Canadian Wildlife Federation, 1993. Book.</p> <p>This book provides a collection on interdisciplinary environmental education materials and activities that emphasize wildlife conservation and environmental stewardship. Activities are indexed by topic, grade, subject and skill, and foster responsible behaviour and constructive actions concerning wildlife and the environment.</p>	101 109 110	201 210 212	301 309 312

Teaching Resources (continued)

Distributor Code	Resources	Levels/Module No.		
		1	2	3
LRDC	<p><i>Trip Planning</i>. N. Kelba, et al. Calgary, AB: Calgary Board of Education, 1984. Booklet.</p> <p>This booklet outlines essential steps in planning successful outdoor education experiences. Planning should be based on an understanding of the potential hazards in the wilderness environment. The isolation factor of an outdoor trip shows the need for knowledge of emergency response, first aid and evacuation procedures. The booklet provides basic knowledge for the safety and enjoyment of outdoor experiences.</p>	104	204	
AFA	<p><i>Woodlot Management Guide for the Prairie Provinces</i>. Farm Woodlot Association of Saskatchewan. Edmonton, AB: Alberta Forestry Association, 1993.</p> <p>This guide in binder format provides an introduction to forestry and a general overview of woodlot Management. The guide is divided into four sections covering woodlot assessments, multiple land use, products and markets and woodlot management. Information provided is intended to help landowners understand their woodlots and develop appropriate goals for land use.</p>	101 110	203 206 207 210 212	301 307 311 312

LEVEL CODE:

- 1 - Introductory
2 - Intermediate
3 - Advanced

CSB: 96 06 07

FORESTRY RESOURCES

TIENE CODE:

- A. Social & Cultural Perspectives
- B. Technology & Applications
- C. Management & Conservation

FORMAT CODE:

- p* - Print
v - Video
s - Software

STATUS CODE:

- B - Basic*
S - Support
T - Teaching
O - Other

LEVEL CODE:

- 1 - Introductory
2 - Intermediate
3 - Advanced

[illegible]

- A. Social & Cultural Perspectives
- B. Technology & Applications
- C. Management & Conservation

p - Print
v - Video
s - Software

B - Basic
S - Support
T - Teaching

1 - Introductory
2 - Intermediate
3 - Advanced

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(Interim 1994)

THEME CODE:

- FORMAT CODE:**
p - Print
v - Video
s - Software

- STATUS CODE:**
B - Basic
S - Support
T - Teaching
O - Other

- LEVEL CODE:**
1 - Introductory
2 - Intermediate
3 - Advanced

[illegible]

FOR TRY RESOURCES

THEME CODE:

- A. Social & Cultural Perspectives
- B. Technology & Applications
- C. Management & Conservation

FORMAT CODE:

- p* - Print
v - Video
s - Software

STATUS CODE:

- B - Basic*
S - Support
T - Teaching

LEVEL CODE:

- 1 - Introductory
2 - Intermediate
3 - Advanced

[illegible]

FORESTRY RESOURCES

THEME CODE:

- A. Social & Cultural Perspectives
- B. Technology & Applications
- C. Management & Conservation

FORMAT CODE:

- p* - Print
v - Video
s - Software

STATUS CODE:

- B - Basic*
S - Support
T - Teaching
O - Other

LEVEL CODE:

- 1 - Introductory
2 - Intermediate
3 - Advanced

LEVEL	THEME	Format	Status	Junior/Senior High	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
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OTHER RESOURCES

These titles are provided as a service only to assist local jurisdictions to identify resources that contain potentially useful ideas for teachers. Alberta Education has done a preliminary review of the resources. However, the responsibility to evaluate these resources prior to selection rests with the user, in accordance with any existing local policy.

Distributor Code	Other Resources
EPPC	<i>Alberta Timber Harvest Planning and Operating Ground Rules.</i> Edmonton, AB: Alberta Forestry, Lands and Wildlife, 1986. Book.
ECA	<i>Alberta's Clean Air Act.</i> Edmonton, AB: Environment Council of Alberta, 1985. Booklet.
ECA	<i>Alberta's Clean Water Act.</i> Edmonton, AB: Environment Council of Alberta, 1985. Booklet.
EPPC	<i>Alberta's Forests.</i> Edmonton, AB: Alberta Forestry, Lands and Wildlife, 1988.
EPPC	<i>Alberta's Managed Forests.</i> Edmonton: Alberta, AB Forest Service. Book.
EPPC	<i>Alberta's Public Land and Resources – Planning for the Future.</i> Edmonton, AB: Alberta Forestry, Lands and Wildlife. Book.
EPPC	<i>Alberta's Threatened Wildlife Series.</i> Edmonton, AB: Alberta Environmental Protection. Factsheet Series.
LPP	<i>Animal Tracks of Western Canada.</i> Joanne Barwise. Edmonton, AB: Lone Pine Publishing, 1989. Book.
SSC	<i>Benefits of Wildlife, The.</i> Ottawa, Canada: Canadian Wildlife Service, 1990. Booklet.
SSC	<i>Canada's Eight Forest Regions.</i> Ottawa, ON: Environment Canada, Forestry Service, 1974. Pamphlet.
FOCA	<i>Canada's Forest Heritage.</i> Canadian Council of Forest Ministers. Ottawa, ON: Forestry Canada, 1986. Book.
PIAD	<i>Canadian Environmental Education Catalogue, The.</i> Drayton Valley, AB: Pembina Institute for Appropriate Development, 1991. Catalogue.
CBE	<i>Canoe Tripping.</i> N. Kelba, et al. Calgary, AB: Calgary Board of Education, 1983. Booklet.

Other Resources (continued)

Distributor Code	Other Resources
CBE	<i>Canoeing</i> . B. Hans, et al. Calgary, AB: Calgary Board of Education, 1980. Booklet.
ENED	<i>Caring For the Land Teaching Kit</i> (Grades 7–9). Edmonton, AB: Alberta Environmental Protection, Education Branch, 1993. Teacher's guide and student material.
NDM	<i>Ecology of a Temperate Ancient Rain Forest</i> . Survival/Anglia. Eugene, OR: New Dimension Media. 1991. Videotape.
EPPC	<i>Ecoregions of Alberta</i> . Edmonton, AB: Alberta Forestry, Lands and Wildlife, 1992. Book.
SSC	<i>Endangered Species in Canada</i> . Ottawa, ON: Canadian Wildlife Service, 1990. Brochure.
SSC	<i>Fact Sheet: The Forest Tent Caterpillar</i> . Ottawa, ON: Canadian Forestry Service, 1975. Pamphlet.
CPPA	<i>Farming Canada's Forests: Forest Management and Silviculture</i> . Montreal, PQ: Canadian Pulp and Paper Association. Booklet.
LRDC	<i>Fifty More Things You Can Do To Save The Earth</i> . Earthworks Group. Berkeley, CA: Andrews and McMeel, 1989.
LRDC	<i>Fifty Simple Things Kids Can Do To Save The Earth</i> . John Javna. Berkeley, CA: Andrews and McMeel, 1990. Book.
CBE	<i>Fires & Stoves</i> . N. Kelba, et al. Calgary, AB: Calgary Board of Education, 1983. Booklet.
EPPC	<i>First Harvest, The</i> . Edmonton, AB: Alberta Energy and Natural Resources. Pamphlet.
ENED	<i>Focus On Series (Acidic Deposition, Air Quality, Environment, Greenhouse Effect, Land Reclamation, Ozone Depletion, Pesticides, Pollution, Recycling, Water Conservation)</i> . Edmonton, AB: Alberta Environmental Protection, Education Branch. Booklets.
DEEF	<i>Forest, The: Understanding It, Using It, Keeping It</i> . Don Harris and Wendy Pobjoy. Charlottetown, PEI: Department of Energy and Forestry, 1991. Guidebook.

Other Resources (continued)

Distributor Code	Other Resources
AFPA	<i>Forest Care: Codes of Practice.</i> Edmonton, AB: Alberta Forest Products Association. 1994. Pamphlet.
FOCA	<i>Forest Explorers, The.</i> Canadian Council of Forest Ministers. Ottawa, ON: Forestry Canada. Booklet.
EPPC	<i>Forest Land Use Zones.</i> Edmonton, AB: Alberta Forestry, Lands and Wildlife. Pamphlet.
EPPC	<i>Forest Landscape Management Guidelines for Alberta.</i> Edmonton, AB: Alberta Forestry, Lands and Wildlife, 1986. Book.
AFPA	<i>Forest Line.</i> Edmonton, AB: Alberta Forest Products Association. Quarterly newsletter.
SSC	<i>Forest Regions of Canada.</i> J.S. Rowe. Ottawa, ON: Canadian Forestry Service, Supply and Services Canada. 1977. Student text.
AFA	<i>Forest Resources Directory.</i> Edmonton, AB: Alberta Forestry Association, 1993. Directory.
OFA	<i>Forestry Manual For Ontario Secondary School Teachers, A.</i> G.R. Morrison. Ottawa, ON: The Ontario Forestry Association, 1990. Guidebook.
CFA	<i>Forestry on the Hill (Series: Clearcutting, Biodiversity and Monocultures, Herbicides, Forest Wildfires).</i> Ottawa, ON: Canadian Forestry Association. 1991–1993. Booklets.
EPPC	<i>Forests and Water.</i> Edmonton, AB: Alberta Energy and Natural Resources, 1985. Pamphlet.
EPPC	<i>Forests For The Future: Pine Ridge Forest Nursery.</i> Edmonton, AB: Alberta Forestry, Lands and Wildlife, 1986. Pamphlet.
EPPC	<i>Framework for Alberta's Special Places, A (Natural Regions Report No. 1).</i> Edmonton, AB: Alberta Parks Service. Booklet.
CBE	<i>Freshwater Ecosystems.</i> N. Kelba, et al. Calgary, AB: Calgary Board of Education, 1992. Booklet.
CPPA	<i>From Watershed to Watermark.</i> Montreal, PQ: Canadian Pulp and Paper Association, 1987. Booklet.

Other Resources (continued)

Distributor Code	Other Resources
EPPC	<i>Genetics and Tree Improvement: Better Forests for the Future</i> . Edmonton, AB: Alberta Energy and Natural Resources, 1983. Booklet.
EPPC	<i>Grazing in the Green Area</i> . Edmonton, AB: Alberta Energy and Natural Resources, 1984. Pamphlet.
PBC	<i>Green Future: How To Make A World of Difference</i> . Lorraine Johnson. Markham, ON: Penguin Books, 1990. Textbook.
ACC	<i>Green Guide, The (Series I and II)</i> . Edmonton, AB: ACCESS: The Education Station, 1991. Videotapes.
EPPC	<i>Green Tree Trailblazer Leader Manual</i> . Edmonton, AB: Alberta Provincial Advisory Council, Junior Forest Warden Association, 1992. Book.
EPPC	<i>Growing Opportunity, A: Alberta's Forest Resources</i> . Edmonton, AB: Alberta Forestry, Lands and Wildlife. Booklet.
SSC	<i>Hinterland Who's Who (Series)</i> . Ottawa, ON: Canadian Wildlife Service. Monographs.
OCV	<i>How Green Is Your School?</i> Don E. McAllister. Ottawa, ON: Ocean Voice, 1991. Booklet.
CBE	<i>Human Environments</i> . N. Kelba, et al. Calgary, AB: Calgary Board of Education, 1993. Teacher Resource Manual.
EPPC	<i>Industrial Land Disturbance and Reclamation in Forestry Areas</i> . Edmonton, AB: Alberta Forestry, Lands and Wildlife, 1992. Pamphlet.
CBE	<i>Kananaskis Country Environmental Education Teaching Activity Guide: Earth Science</i> . R. Lengsfeld, et al. Calgary, AB: Calgary Board of Education, 1987. Guidebook.
AFPA	<i>Key Issues Relating to the Alberta Forest Industry</i> . Edmonton, AB: Alberta Forest Products Association, 1992. Pamphlet.
ENED	<i>Land Conservation Education Program</i> . Edmonton, AB: Alberta Environmental Protection, Education Branch. Teacher's guide and student materials.
FHW	<i>Mammals of the Northern Rockies</i> . Tom J. Ulrich. Missoula, MT: Mountain Press Publishing Company, 1990. Book.

Other Resources (continued)

Distributor Code	Other Resources
FOCA	<i>Managing Your Woodland: A Non-Forester's Guide To Small-Scale Forestry in British Columbia.</i> Canadian Forestry Service. Ottawa, ON: Forestry Canada, 1988. Book.
EPPC	<i>Native Trees of Alberta.</i> Edmonton, AB: Alberta Forestry, Lands and Wildlife. Pamphlet.
EPPC	<i>Natural Regions of Alberta: Poster Series.</i> Edmonton, AB: Alberta Environmental Protection, 1990. Posters and manual.
CBE	<i>Navigation.</i> N. Kelba, et al. Calgary, AB: Calgary Board of Education, 1983. Booklet.
CBE	<i>Nutrition.</i> N. Kelba, et al. Calgary, AB: Calgary Board of Education, 1983. Booklet.
EPPC	<i>Occupational Profile: (Forest Technologist, Forester/Forestry Scientist, Heavy Duty Equipment Operator, Logging and Forestry Workers).</i> Edmonton, AB: Alberta Career Development and Employment. Pamphlet.
AFPA	<i>Our Growing Resource: Alberta's Forest Industry....Meeting Global Challenges.</i> Edmonton, AB: Alberta Forest Products Association, 1992. Booklet.
ENED	<i>Pesticide Education Program.</i> Edmonton, AB: Alberta Environmental Protection, Education Branch. Teacher's guide and student materials.
CTV	<i>Perils of Pulp.</i> Toronto, ON: CTV Television Network Ltd., 1992. Videotape.
EPPC	<i>Reforestation in Alberta.</i> Edmonton, AB: Alberta Forestry, Lands and Wildlife. Booklet.
EPPC	<i>Resource Road Planning Guidelines.</i> Edmonton, AB: Alberta Energy and Natural Resources, 1985. Book.
EPPC	<i>Spruce Budworm Management.</i> Edmonton, AB: Alberta Forestry, Lands and Wildlife Forest Service, 1992. Pamphlet.
FOCA	<i>Sustainable Forests: A Canadian Commitment.</i> Canadian Council of Forest Ministers. Ottawa, ON: Forestry Canada. 1992. Book.
EPPC	<i>Timber Harvesting.</i> Edmonton, AB: Alberta Energy and Natural Resources, 1983. Pamphlet.

Other Resources (continued)

Distributor Code	Other Resources
EPPC	<i>Timber Harvesting and the Environment.</i> Edmonton, AB: Alberta Forestry, Lands and Wildlife. Pamphlet.
EPPC	<i>Timber Quota Policy.</i> Edmonton, AB: Alberta Energy and Natural Resources, 1984. Book.
LPP	<i>Trees and Shrubs of Alberta.</i> Kathleen Wilkinson. Edmonton, AB: Lone Pine Publishing, 1990. Book.
ENED	<i>Water In Alberta: The Living Flow.</i> Edmonton, AB: Alberta Environmental Protection, Education Branch, 1993. Teacher resource kit.
ENED	<i>Water Quality Questions: The Nature and Importance of Water Quality Variables in Alberta.</i> Edmonton, AB: Alberta Environmental Protection, Education Branch, 1990. Teacher guide and student booklet.
SSC	<i>What We Can Do For Our Environment: Hundreds of Things To Do Now.</i> (4th edition.) Hull, PQ: Environment Canada, Minister of Supply and Services, 1991. Booklet.

ADDITIONAL SOURCES

Available to Forestry teachers, both locally and provincially, are many resources that can be used to enhance Career and Technology Studies courses. These resources can be accessed through the community, government agencies, resource centres and organizations. Some of these sources, e.g., government departments, undergo frequent name and/or telephone number changes. Please check your telephone directory or an appropriate government directory.

The following is a partial list of sources to consider:

TEACHER-LIBRARIANS

Planned and purposeful use of library resources helps students grow in their ability to gather, process and share information. Research activities require access to an adequate quantity and variety of appropriate, up-to-date print and non-print resources from the school library, other libraries, the community and additional sources. Some techniques to consider are:

- planning together
- establishing specific objectives
- integrating research skills into planning.

Cooperation between the teacher-librarian and the subject area teacher in the development of effectively planned resource-based research activities ensures that students are taught the research skills as well as the subject content.

Also see *Focus on Research: A Guide to Developing Student's Research Skills* referenced in the Alberta Education Resources section.

ALBERTA EDUCATION SOURCES

The following monographs are available for purchase from:

Learning Resources Distributing Centre
12360 – 142 Street
Edmonton, AB
T5L 4X9
Telephone: 427-2767
Fax: 422-9750

Please consult the "Support Documents" section or the "Legal, Service and Information Publications" section in the *Buyers Guide* for ordering information and costs.

Developmental Framework Documents

- *The Emerging Student: Relationships Among the Cognitive, Social and Physical Domains of Development*, 1991

This document looks at the whole child, or student, as a productive learner, integrating all the domains of development: cognitive, social and physical. It emphasizes the need for providing balanced curriculum and instruction.

- *Students' Interactions Developmental Framework: The Social Sphere*, 1988

This document focuses on the student as a social being. It looks at the student's affective or emotional growth and examines moral development. These three domains make up the social sphere.

- *Students' Physical Growth: Developmental Framework Physical Dimension*, 1988

This document examines children's normal physical growth in three areas: perceptual, structural and motor development. In none of these areas is the child's growth in a single continuous curve throughout the first two decades of life. Physical growth is characterized by periods of rapid growth and periods of slower growth. Consequently, differences and changes in growth patterns may affect the timing of certain learning processes.

- *Students' Thinking: Developmental Framework Cognitive Domain*, 1987

This document explores children's cognitive development from infancy to adolescence. The Piagetian stages of pre-operational, concrete operational and formal operational thinking are explained. Suggestions for improving the learning process are also presented.

Others

- *Focus on Research: A Guide to Developing Students' Research Skills*, 1990

This document outlines a resource-based research model that helps students manage information efficiently and effectively, and in this process, to gain skills that are transferable to all school and work situations. This model provides a developmental approach to teaching students how to do research.

- *Teaching Thinking: Enhancing Learning*, 1990

Principles and guidelines for cultivating thinking, ECS to Grade 12, have been developed in this resource. It offers a definition of thinking, describes nine basic principles on which the suggested practices are based, and discusses possible procedures for implementation in schools and classrooms.

OTHER GOVERNMENT SOURCES

ACCESS: The Education Station

ACCESS: The Education Station offers a variety of resource and services to teachers. For a nominal dubbing and tape fee, teachers may have ACCESS: The Education Station audio and video library tapes copied.

ACCESS: The Education Station publishes a listing of audio and video cassettes as well as a comprehensive programming schedule.

Of particular interest are the Career and Technology Studies videos that are available with teacher utilization guides. The guides outline key points in each video and suggest questions for discussion, classroom projects and other activities. Video topics are listed in the Support Learning Resources section of this Guide. The videos listed and accompanying support material can be obtained from:

ACCESS: The Education Station
3720 – 76 Avenue
Edmonton, AB
T5B 2N6
Telephone: 440-7777 (in Edmonton)
1-800-352-8293
(outside Edmonton)

Agriculture Canada

Communications Branch
Ottawa, ON
K1A 0C7
Telephone: (819) 994-0246

General and Technical Publications (a comprehensive listing of free and inexpensive print materials on a variety of topics in agriculture; updated each year).

Alberta Advanced Education and Career Development

Information Development and Marketing
9th Floor, City Centre Building
10155 – 102 Street
Edmonton, AB
T5J 4L5
Telephone: 422-1794
Fax: 422-5126

Career Information Catalogue Update, 1994
The Career Planner
Children Challenges Choice
Entrepreneur: A Big Word for Small Business
Rural Women as Business Entrepreneurs
Positive Works
Skills are your Passport.

Videos on career planning and entrepreneurial topics are available through the library of this department. Call 422-4752 for more information. The following videos are representative of the library's holdings:

The Entrepreneur

Get a Job

A Head for Business

The Seven Phases of a Job Interview.

Alberta Agriculture, Food And Rural Development

Print Media Branch

7000 – 113 Street

Edmonton, AB

T6H 5T6

Telephone: 427-2121

Fax: 427-2861

Publications List (a comprehensive listing of free and inexpensive print materials on a variety of topics in agriculture; updated each year).

Broadcast Media Branch

7000 – 113 Street

Edmonton, AB

T6H 5T6

Telephone: 427-2127

Fax: 427-2861

Audio Visual Catalogue (an annotated listing of films and videos available for loan upon request; updated each year).

Alberta Tree Nursery and Horticulture Centre

R.R. #6

Edmonton, AB

T5B 4K3

Telephone: 422-1789

Fax: 427-6096

Alberta Economic Development and Tourism
(formerly Alberta Economic Development and Trade)

Strategic Planning and Research

9th Floor, Sterling Place

9940 – 106 Street

Edmonton, AB

T5K 2P6

Telephone: 422-9494

Fax: 422-5922

Financing a Small Business

Marketing a Small Business

Starting a Small Business.

Alberta Environmental Protection

Education Branch

12th Floor, 9820 – 106 Street

Edmonton, AB

T5K 2J6

Telephone: 427-6310

Fax: 427-2512

Land Conservation Education Program

Pesticide Education Program

The Water Literacy Program

Focus On Series

Poster Education Series

(Workshops and presentations on these program materials can be arranged.)

Alberta Environmental Protection

Land and Forest Services

9920 – 108 Street

10th Floor, Bramalea Building

Edmonton, AB

T5K 2M4

Telephone: 427-3551

Fax: 427-0292

Junior Forest Wardens Program.

Alberta Environmental Protection

Fish and Wildlife Services

9920 – 108 Street

Edmonton, AB

T5K 2M4

Telephone: 944-0313

Or

200 Sloan Square

5920 – 1A Street SW

Calgary, AB

T2H 0G3

Telephone: 297-6423

Fax: 297-2843

Project Wild
Alberta Conservation and Hunter Education
Program
Alberta Fishing Education Program.

Alberta Environmental Protection

Alberta Parks Service Division
8th Floor, Standard Life Centre
10405 Jasper Avenue
Edmonton, AB
T5J 3N4
Telephone: 427-6781
Fax: 427-5980

Alberta Justice

Chief Provincial Firearms Office
Ground Floor, 10365 – 97 Street
Edmonton, AB
T5J 3W5
Telephone: 427-0437
Fax: 427-1100

Canadian Firearms Safety Course.

Alberta Labour

9940 – 106 Street
Edmonton, AB
T5K 2N2
Telephone: 427-8848

Offices are also in Calgary, Camrose, Edson,
Fort McMurray, Grande Prairie, Lethbridge,
Medicine Hat, Red Deer and Vermillion.

Alberta Tourism Education Council (ATEC)

12th Floor, Sterling Place
9940 – 106 Street
Edmonton, AB
T5K 2N2
Telephone: 422-0781
Fax: 422-3069

Employment Standards Code (Teacher resource
package).

Energy Conservation and Renewable Energy

Western Regional Office
200 Grandin Park Plaza
22 Winston Churchill Avenue
St. Albert, AB
T8N 1B4

Or

Regional Communications
355, 200 – 4 Avenue SE
Calgary, AB
T2G 4X3

Environment Canada

Inquiry Centre
1st Floor, 10 Wellington Street
Hull, Quebec
K1A 0H3
Telephone: (819) 997-2800
Fax: (613) 953-2225

Or

Environment Canada

Canadian Wildlife Service
Communications Directorate
Western and Northern Region
200, 4999 – 98 Avenue
Edmonton, AB
T6B 2X3
Telephone: 951-8720
Fax: 495-2615

Or

Environment Canada

Canadian Parks Service
Room 552, 220 – 4 Avenue SE
Calgary, AB
T2P 3H8
Telephone: 292-4401

Environmental Council of Alberta

400, 9925 – 109 Street
Edmonton, AB T5K 2J8
Telephone: 427-5792
Fax: 427-0388

Forestry Canada

351 St. Joseph Boulevard
Hull, Quebec
K1A 1G5
Telephone: (819) 997-1107

Or

5320 - 122 Street
Edmonton, AB
T6H 3S5
Telephone:

Industry and Science Canada

Consumer Affairs
10225 - 100 Avenue
Edmonton, AB
T5J 0A1
Telephone: 495-2485
Fax: 495-6451

Or

301, 510 - 12 Avenue SW
Calgary, AB
T2R 0H3
Telephone: 292-5604
Fax: 292-6175

National Film Board of Canada (NFB)

The NFB has numerous films and videotapes that may be suitable for Forestry. For a listing of NFB films and videotapes indexed by title, subject and director, or for rental or purchase of NFB films and videotapes, call 1-800-267-7710 (toll-free).

Educational Marketing Officers in Calgary and Edmonton are available, province wide, for workshops, conferences, professional development days and similar activities. For northern Alberta and the Northwest Territories, the Educational Marketing Officer can be reached at 495-3012 (fax, 495-6412). For southern Alberta, contact the Educational Marketing Officer at 292-5411 (fax, 292-5458).

ACCESS: The Education Station and some school boards have acquired duplication rights to some NFB videotapes. Please consult the relevant catalogues in your school or school district.

The Calgary Public Library has a selection of NFB films and videotapes that can be borrowed free of charge with a Calgary Public Library borrower's card. For further information, contact:

Calgary Public Library
Films and Recordings Department
616 Macleod Trail SE
Calgary, AB
T2G 2M2
Telephone: 260-2781
Fax: 292-5458

Resource Centres***Urban Resource Centres*****Calgary Board of Education**

Supervisor, Education Media
3610 - 9 Street SE
Calgary, AB
T2G 3C5
Telephone: 294-8540
Fax: 287-9739

Calgary Separate School Board

Supervisor, Instructional Materials
1000 - 5 Avenue SW
Calgary, AB
T2P 4T9
Telephone: 246-6663
Fax: 249-3054

County of Strathcona

Director, Learning Resource Service
2001 Sherwood Drive
Sherwood Park, AB
T8A 3W7

Edmonton Public School Board

Learning Resource Consultant
Centre for Education
One Kingsway Avenue
Edmonton, AB
T5H 4G9
Telephone: 429-8320
Fax: 429-8318

Lakeland School District No. 5460

Area Superintendent
Postal Bag 1001
6005 - 50 Avenue
Bonnyville, AB
T9N 2L4
Telephone: 826-3145
Fax: 826-4600

Medicine Hat School District No. 76

IMC Manager
601 - 1 Avenue SW
Medicine Hat, AB
T1A 4Y7
Telephone: 526-1323
Fax: 529-5339

Red Deer Public School Board

Coordinator of Instruction
4747 - 53 Street
Red Deer, AB
T4N 2E6
Telephone: 343-1405
Fax: 347-8190

St. Anthony's Teacher Centre

Supervisor, Curricular Resources
10425 - 84 Avenue
Edmonton, AB
T6E 2H3
Telephone: 439-7356
Fax: 433-0181

Regional Resource Centres**Zone I**

Zone I Regional Resource Centre
Film Supervisor
10020 - 101 Street
P.O. Box 6536
Peace River, AB

T8S 1S3
Telephone: 624-3187
Fax: 624-5941

Zone II and III

Central Alberta Media Services (CAMS)
Film Supervisor
182 Sioux Road
Sherwood Park, AB
T8A 3K5
Telephone: 464-5540
Fax: 467-5469

Zone IV

Alberta Central Regional Education
Services (ACRES)
Operations Manager
County of Lacombe
Parkland Regional Library Building
56 Avenue and 53 Street Corner
Box 3220
Lacombe, AB
T0C 1S0
Telephone: 782-5730
Fax: 782-5831

Zone V

South Central Alberta Resource Centre
(SCARC)
c/o County of Wheatland
435 B Hwy #1
Strathmore, AB
T1P 1J4
Telephone: 934-5028
Fax: 934-4889

Zone VI

Southern Alberta Learning Resource Centre
(SALRC)
Film Supervisor
Provincial Government Administration
Building
120, 909 Third Avenue North
Box 845
Lethbridge, AB
T1J 3Z8
Telephone: 320-7807
Fax: 320-7817

Statistics Canada
Regional Office
8th Floor, Park Square
10001 Bellamy Hill
Edmonton, AB
T5J 3B6
Telephone: 495-3023
Fax: 495-5318

PROFESSIONAL ASSOCIATIONS

Alberta Teachers' Association
Specialist Council
Environmental and Outdoor Education
Barnett House
11010 - 142 Street
Edmonton, AB
T5N 2R1

Association of Canada Land Surveyors
Box 5378
Station F
Ottawa, ON
K2C 3J1

Alberta Land Surveyors Association
14403 - 115 Avenue
Edmonton, AB
T5M 3B8

Alberta Logging Association
10916 - 97 Avenue
Grande Prairie, AB
T8V 3J8

Alberta Registered Professional Foresters Association
55, 9912 - 106 Street
Edmonton, AB
T5K 1C5

Canadian Association of Plant Physiologists
c/o Department of Botany
University of Guelph
Guelph, ON
N1G 2W1

Canadian Botanical Association
Agriculture Canada
Biosystems Research Centre
Saunders Building, CDF
Ottawa, ON
K1A 0C6

Canadian Society of Environmental Biologists
Box 962 Postal Station F
Toronto, ON
M4Y 2N9

Industrial Vegetation Management Association of Alberta
9205 - 37 Avenue
Edmonton, AB
T6E 5K9

INDUSTRY ORGANIZATIONS

Alberta Forest Products Association
11710 Kingsway Avenue
Edmonton, AB
T5G 0X5
Telephone: 452-2841
Fax: 455-0505

Canadian Forest Products Ltd.
Postal Bag 100
Grande Prairie, AB
T8V 3A3
Telephone: 538-7711
Fax: 538-7800

Spray Lake Sawmills (1980) Ltd.
P.O. Box 100
Cochrane, AB
T0L 0W0
Telephone: 932-2234
Fax: 932-6675

Weldwood of Canada Limited
760 Switzer Drive
Hinton, AB
T7V 1V7
Telephone: 865-2251
Fax: 865-8129

Weyerhaeuser Canada Ltd.

P.O. Bag 1020
Grande Prairie, AB
T8V 3A9
Telephone: 539-8500
Fax: 539-8597

Blue Ridge Lumber (1981) Ltd.

1200, 10707 - 100 Avenue
Edmonton, AB
T5J 3M1
Telephone: 423-7560
Fax: 423-7550

Alberta-Pacific Forest Industries Inc.

Box 8000
Boyle, AB
T0A 0M0
Telephone: 525-8000
Fax: 525-3300

Daishowa-Marubeni International Ltd.

P.O. Box 4400
Peace River, AB
T8S 1V7
Telephone: 624-7000
Fax: 624-7054

Millar Western Pulp Ltd.

P.O. Box 279
Edmonton, AB
T5J 2J2
Telephone: 486-2444
Fax: 489-0512

Alberta Newsprint Company Ltd.

P.O. Bag 9000
Whitecourt, AB
T7S 1P9
Telephone: 778-7000
Fax: 778-7070

Canadian Pulp and Paper Association

23rd Floor, Sun Life Building
1155 Metcalfe Street
Montreal, Quebec
H3B 2X9
Telephone: (514) 866-6621

Alberta Special Waste Management Corp.

610, 10909 Jasper Avenue
Edmonton, AB
T5J 3L9
Telephone: 422-5029 or
1-800-272-8873
Fax: 428-9627

ENVIRONMENTAL FACILITIES

The following is a partial list of facilities that provide hands-on experience for student in aspects of resource management and environmental education. Contact should be made directly with the facility to obtain details of what is offered to school groups or students.

Alberta Forest Service Museum

Forest Technology School
1176 Switzer Drive
Hinton, AB
T0E 1B0
Telephone: 865-8211

Alberta Tree Nursery and Horticulture Centre

RR #6
17507 Fort Road
Edmonton, AB
T5B 4K3
Telephone: 422-1789 (in Edmonton)
198-5272 (toll-free through any
government R.I.T.E. Operator)

Alford Lake Conservation Education Centre

c/o Fish and Wildlife Division
Box 369
Caroline, AB
T0M 0M0
Telephone: 722-2423

Bennett Environmental Education Centre

Edmonton Public Schools
9703 - 94 Street
Edmonton, AB
T6C 3W1
Telephone: 468-1439

Calgary Zoo

Botanical Gardens and Prehistoric Park
P.O. Box 3036, Station "B"
Calgary, AB
T2M 4R8
Telephone: 265-9310

Crowsnest Portable Camp

c/o Fish and Wildlife Division
200 Sloane Square
5920 - 1A Street SW
Calgary, AB
T2H 0G3
Telephone: 297-7639

Devonian Botanic Garden

University of Alberta
Edmonton, AB
T6G 2E1
Telephone: 987-3054

Energieum

(Energy Resources Conservation Board)
640 - 5 Avenue SW
Calgary, AB
T2P 3G4
Telephone: 297-4293

Environmental Resource Centre

10511 Saskatchewan Drive
Edmonton, AB
T6E 4S1
Telephone: 433-4808

Fort Calgary Preservation Society

P.O. Box 2100, Station "M", #106
Calgary, AB
T2P 2M5
Telephone: 290-1875

Ft. McMurray Oil Sands Interpretive Centre

515 MacKenzie Blvd.
Ft. McMurray, AB
T9H 4X3
Telephone: 743-7167

Glenbow Museum

130 - 9 Avenue SE
Calgary, AB
T2G 0P3
Telephone: 264-8300

John Janzen Nature Centre

P.O. Box 2359
Edmonton, AB
T5J 2R7
Telephone: 434-7446

Kananaskis Field Station

Coordinator of School Programs
Bio Sciences 186
University of Calgary
2500 University Drive NW
Calgary, AB
T2N 1N4
Telephone: 220-5355
Fax: 673-3671

McKinnon Flats Resource Education Centre

c/o Fish and Wildlife Division
200 Sloane Square
5920 - 1A Street SW
Calgary, AB
T2H 0G3
Telephone: 297-7639

Narrow Lake Conservation Education Centre

c/o Fish and Wildlife Division
Provincial Building
Athabasca, AB
T0B 0B0
Telephone: 675-9137

OTHER AGENCIES**Alberta Debate and Speech Association**

202, 17308 - 108 Avenue
Edmonton, AB
T5X 3Y8
Telephone: 484-7929
Fax: 484-2710

Alberta Forestry Association

101, 10526 Jasper Avenue
Edmonton, AB
T5J 1Z7

Telephone: 428-7582

Fax: 428-7557

Alberta's Focus on Forests

Woodlot Management Information Series

Woodlot Management Guide for the Prairie Provinces

Alberta Foundation for Economic Education

901, 10179 – 105 Street
Edmonton, AB T5J 1E2

Telephone: 421-9331

Fax: 426-2987

The Chartered Banks and Canada's Economy
Labour in the Canadian Economy (teacher resource)

Retail Marketing in Canada

Using Money Wisely.

Canadian Co-operative Association

400, 275 Bank Street
Ottawa, ON K2P 2L6

Cooperative Entrepreneurship: A Case Study in Worker Ownership

Canadian Foundation for Economic Education

501, 2 St. Clair Avenue West
Toronto, ON M4V 1L5
Telephone: (416) 968-2236
Fax: (416) 968-0488

Entrepreneurship: A Primer for Canadians (teacher resource)

Labour Market: Teacher's Resource Package (teacher resource)

Money and Youth

Women in the Work Force.

Canadian Wildlife Federation

1673 Carling Avenue
Ottawa, ON K2A 3Z1
Telephone: (613) 725-2191
Fax: (613) 725-2902

Canadian Parks and Wilderness Society

160 Bloor Street East
Suite 1150
Toronto, ON
M4W 1B9
Telephone: (416) 972-0868

The Conference Board of Canada

255 Smyth Road
Ottawa, ON
K1H 8M7
Telephone: (613) 526-3280
Fax: (613) 526-4857

Economic Forecast: Provincial Outlook (research reports, personalized information services).

Ducks Unlimited Canada

1190 Waverly Street
Winnipeg, Manitoba
R3T 2E2

FEESA

320, 9939 Jasper Avenue
Edmonton, AB
T5J 2X5
Telephone: 421-1497
Fax: 425-4506

FEESA offers education training and resource materials focusing on a variety of environmental and educational needs. Programs are developed in partnership with business, industry, government, environmental and education groups.

Harmony Foundation of Canada

P.O. Box 4016, Station C
Ottawa, ON K1Y 4P2
Telephone: (613) 230-7353

Junior Achievement of Northern Alberta

(Alberta north of Lacombe, and NWT)
161, 10700 – 104 Avenue
Edmonton, AB
T5J 4S2
Telephone: 482-1421
Fax: 428-1031

Junior Achievement of Southern Alberta

(Lacombe and south)
739 – 10 Avenue SW
Calgary, AB
T2R 0B3
Telephone: 263–2545
Fax: 261–6988

The SEEDS Foundation

440, 10169 – 104 Street
Edmonton, AB
T5J 1A5
Telephone: 424–0971
Fax: 424–2444

Materials are available only where Junior Achievement has identified community business consultants and provided inservice.

Kananaskis Country

Coordinator of Environmental Education
Box 280
Canmore, AB
T0L 0M0
Telephone: 678–5508
Fax:

The Pembina Institute for Appropriate Development

P.O. Box 7558
Drayton Valley, AB
T0E 0M0
Telephone: 542–6272
Fax: 542–6464

The Canadian Environmental Education Catalogue.

Rural Education and Development Association

14815 – 119 Avenue
Edmonton, AB
T5L 2N9
Telephone: 451–5959
Fax: 452–5385

List of speakers for schools

Several modules on cooperatives and entrepreneurship

Teacher resource package on cooperatives.

DISTRIBUTOR DIRECTORY

The entries in the distributor directory are arranged alphabetically by code.

CODE	Distributor/Address	Telephone/Fax
ACC	ACCESS: The Education Station 3270 – 76 Avenue Edmonton, AB T5B 2N9	(403) 440-777 1-800-252-9363
AFA	Alberta Forestry Association 101 Alberta Block 10526 Jasper Avenue Edmonton, AB T5J 1Z7	(403) 428-7582 Fax: (403) 428-7557
AFPA	Alberta Forest Products Association 200, 11738 Kingsway Avenue Edmonton, AB T5G 0X5	(403) 452-2841 Fax: (403) 455-0505
CBE	Calgary Board of Education Education Centre Building 515 Macleod Trail SE Calgary, AB T2G 2L9	(403) 294-8211 Fax: (403) 294-8336
CFA	Canadian Forestry Association 203, 185 Somerset Street West Ottawa, ON K2P 0J2	(613) 232-1815 Fax: (613) 232-4210
CPPA	Canadian Pulp and paper Association 23rd Floor, Sun Life Building 1155 Metcalfe Street Montreal, PQ H3B 2X9	(514) 866-6621
CTV	CTV Program and Archive Sales 42 Charles Street East Toronto, ON M4Y 1T5	(416) 928-6096

CODE	Distributor/Address	Telephone/Fax
DEEF	Prince Edward Island Department of Energy and Forestry Forestry Branch P.O. Box 2000 Charlottetown, Prince Edward Island C1A 7N8	(902) 368-4700 Fax: (902) 368-5544
ECA	Environment Council of Alberta 8th Floor, Weber Centre 5555 Calgary Trail South Edmonton, AB T6H 5P9	427-5792
ENED	Alberta Environmental Protection, Education Branch 12th Floor, 9820 - 106 Street Edmonton, AB T5K 2J6	(403) 427-6310
EPPC	Environmental Protection Publications Centre 14th Floor, Oxbridge Place 9820 - 106 Street Edmonton, AB T5K 2J6	(403) 427-6132
FHW	Fitzhenry and Whiteside See LRDC Buyers Guide for information	
FOCA	Forestry Canada Place Vincent Massey 351 St. Joseph Boulevard Hull, PQ K1A 1G5	(819) 997-1107 Fax: (819) 953-7048
GEP	Gage Educational Publishing Company 164 Commander Blvd. Agincourt, ON M1S 3C7	(416) 293-8141
KPB	Key Porter Books Ltd. 2775 Matheson Boulevard East Mississauga, ON L4W 4P7	(416) 238-0709 Fax: (416) 625-8008

CODE	Distributor/Address	Telephone/Fax
LPP	Lone Pine Publishing 206, 10426 – 81 Avenue Edmonton, AB T6E 1X5	(403) 433-9333 1-800-661-9017 Fax: (403) 433-9646
LRDC	Learning Resources Distributing Centre 12360 – 142 Street Edmonton, AB T5L 4X9	(403) 427-2767
NDM	New Dimension Media 85803 Lorane Highway Eugene, OR USA 97405	(503) 484-7125 Fax: (503) 484-5267
OCV	Ocean Voice 2883 Otterson Drive Ottawa, ON K1V 7B2	(613) 996-9915
OFA	Ontario Forestry Association 502, 150 Consumers Road Willowdale, ON M2J 1P9	(416) 493-4565
PBC	Penguin Books 1220 Nicholson Road Hewmarket, ON L3Y 7V1	(905) 836-6730
PIAD	Pembina Institute for Appropriate Development Box 7558 Drayton Valley, AB T0E 0M0	(403) 542-6272 Fax: (403) 542-6464
SSC	Canada Communications Group Place du Portage Phase 3 16A1 IL Laurier Street Hull, PQ K1A 0S5	(819) 956-4802

FORESTRY

SECTION J: SAMPLE STUDENT LEARNING GUIDES

(INTERIM, 1996)

TABLE OF CONTENTS

A student learning guide presents information and direction to help students attain the expectations defined in a specified CTS module. It is designed to be used by students under the direction of a teacher.

The student learning guides included in this section are organized as follows:

- Why take this module?
- What do you need to know before you start?
- What will you know and be able to do when you finish?
- When should your work be done?
- How will your mark for this module be determined?
- Which resources may you use?
- Activities/Worksheets

A student learning guide is not a self-contained learning package (e.g., Distance Learning Module), such as you might receive from the Alberta Distance Learning Centre (ADLC) or Distance Learning Options South (DLOS).

SAMPLE STUDENT LEARNING GUIDES

Forest Regions of Canada (FOR102)J.1

Woods Survival I (FOR104).....J.5

Basic Forest Ecology (FOR109).....J.9

TAKE THIS MODULE?

- A fundamental requirement for anyone working in the forest is to be able to identify the types of vegetation present. This often gives clues as to the location and climate of the area. FOR102 is an introduction to dendrology, the study of trees. This is a module for students interested in being able to identify local tree species and to explain the reasons for the locations of the forest regions of Canada and Alberta.
- This course should be taken in the late spring or early in the fall to make it much easier to identify trees, by their leaves rather than the bare twigs in winter.

DO YOU NEED TO KNOW BEFORE YOU START?

- Locate and describe the geographic regions of Canada
- Use and understand maps
- Know the Scientific Method of Inquiry

**WILL YOU KNOW AND
BE ABLE TO DO
WHEN YOU FINISH?**

- Identify factors that enhance the development of forests and determine the distribution of living organisms within forest regions.
- Describe relationships between climatic factors and the growth of trees.
- Describe relationships between land forms and the distribution of forests.
- Suggest reasons for the distribution of trees in natural regions in Canada and Alberta.
- Locate and describe the eight forest regions of Canada.
- Read, interpret and create visual representations of species distribution in Canada and Alberta.
- Identify common trees and other plants that grow specific regions of Canada and Alberta.
- Prepare a display of details that help to identify local trees, shrubs and non-woody plants.

SHOULD YOUR WORK BE DONE?

WILL YOUR MARK FOR THIS MODULE BE DETERMINED?

	PERCENTAGE
<p>You must first demonstrate all of the competencies required for this module.</p> <p>When you have done this, your percentage mark for the module will be determined as follows:</p> <ul style="list-style-type: none">• Moisture Lab• Test on Factors• Forest Region Maps (Canada)• (Alberta)• Leaf Collection	<ul style="list-style-type: none">10%10%25%15%40%

RESOURCES MAY YOU USE?

- Trees and Shrubs of Alberta
- Native Trees of Canada
- Flora of Alberta
- Visions
- Guide to Common Native Trees and Shrubs of Alberta

Forest Regions of Canada (FOR102)**Assignments:**

1. Research and prepare a detailed list of factors that act independently and together to determine the type of forest on a given area. These factors should include information on climate, soil, landforms and topography, and the interactions between the three.
2. Using the Scientific Method develop a hypothesis that tests plant growth rates against moisture availability. Write up the experiment, conduct it, and interpret the data collected. Remember to practise safe laboratory habits.
3. Forest Regions of Canada
 - on a large sheet of paper (min. 11x17) pencil in the boundaries of this country. Add the provincial boundaries
 - pencil in the forest regions
 - make sure your map is neat and clearly understandable. It must have a key, scale, north arrow and legend
 - on the next page is a sample sheet you can use to fill in information on each forest region
 - repeat the above list for Alberta and its forest regions.
4. Leaf collection

Collect and prepared for formal presentation the leaves (twigs if winter) of five grasses (omit in winter), five local shrubs, willow, aspen, balsam poplar, white birch, jack pine, lodgepole pine, white and black spruce, larch and balsam fir. The species list may be altered by your teacher to fit local conditions.

TAKE THIS MODULE?

- This is a two-part module that will teach you safe and enjoyable skills and attitudes that will aid you in working and/or recreationing in the forest environment.
- This module will introduce you to the physical demands faced by a person travelling in the forest and provide structure and direction to learn from these experiences.
- It is recommended that this module be taken in conjunction with Woodmanship II (FOR203) and that you do this module in the spring (April-May).
- Remember that when in the forest the attitude of Minimal Impact interaction should direct all your activities.

DO YOU NEED TO KNOW BEFORE YOU START?

- Standard St. John's Ambulance First Aid course.
- You should have the attitude that you want to experience the forest environment first hand, in a positive fashion. If you are not interested you may find the field activities distasteful or even dangerous.

WILL YOU KNOW AND BE ABLE TO DO WHEN YOU FINISH?

- Identify, assess, avoid and/or respond to physical hazards that may be imposed by the forest environment
- Identify, assess, avoid and/or respond to physiological and psychological factors often associated with outdoor experiences in the forest
- List and explain necessary steps to take in emergency and survival situations in the forest
- Select appropriate personal and group gear for outdoor forest activities
- Demonstrate safe use and appropriate care of outdoor handtools, including knives, axes and saws
- Demonstrate safe procedures for building and using outdoor fires
- Explain techniques used to plan, pack, carry and prepare foods during outdoor forest expeditions
- Explain techniques required for maintaining hygiene during outdoor forest expeditions
- Plan and conduct safe outdoor expeditions in the forest
- Use different modes of travel to participate in a variety of forest activities
- Acquire and apply minimal impact skills while participating in outdoor forest expeditions

SHOULD YOUR WORK BE DONE?

WILL YOUR MARK FOR THIS MODULE BE DETERMINED?

	PERCENTAGE
<p>You must first demonstrate all of the competencies required for this module.</p> <p>When you have done this, your percentage mark for the module will be determined as follows:</p> <ul style="list-style-type: none">• Hazardous list and test• Adverse conditions (discussion)• Shelter construction• Fire construction• Pack and walk• Water management• Tool use	<ul style="list-style-type: none">5%5%20%10%30%10%20%

RESOURCES MAY YOU USE?

- The Common Sense and Medical Guide and Outdoor Reference.
- Wilderness Survival
- Wilderness Survival Handbook
- Finding Your Way in the Outdoors
- Two in One Survival Library
- Local Forest Station and it's employees

- Prepare a list of possible hazards one may encounter in the natural environment, and on a test explain in detail several of the hazards.
- Explain why one must always be prepared for adverse conditions in the forest i.e.;
 - having adequate and sufficient food
 - having adequate and sufficient water
 - adequate and sufficient first aid equipment
- Demonstrate the proper construction of a quinze, or lean-to if there isn't enough snow in the area.
- correctly build, use and contain a small campfire, making sure you address all safety precautions.
- prepare a list of equipment, food, and clothing required for a three day hiking trip. Assemble the list and walk all of it a minimum of three kilometres without removing the pack.
- Explain and demonstrate proper water management i.e.;
 - drinking water
 - disposal of waste water
 - proper latrine location
- Demonstrate the following skill:
 - correct axe and knife carrying
 - correct axe and knife use
 - correct axe and knife maintenance

TAKE THIS MODULE?

- Being able to work with living things means you have to understand how things work. The easiest way is to look at the component parts of a system. Therefore, in this module you will look at several parts of the forest. These include tree structure, biotic and abiotic factors of the forest ecosystem, and the role of the tree in the forest.
- Remember you must practise safe work habits in anything you do, especially lab or outdoor activities. If you are not sure how to do something, ask someone having knowledge for instructions first.

DO YOU NEED TO KNOW BEFORE YOU START?

- Use the Scientific Method of Inquiry.
- Know the lab safety measures and procedures of your school.
- Access a copy of Investigating Terrestrial Ecosystems
- Have access to a laboratory.

WILL YOU KNOW AND BE ABLE TO DO WHEN YOU FINISH?

- Identify living and non-living elements within a local forest ecosystem.
- Describe the interrelatedness of elements within a local forest environment.
- Explain the role of trees within a local forest ecosystem.
- Analyze food relationships among living organisms within a local forest ecosystem.
- Analyze food relationships among living organisms within a local forest environment.
- Compare the ecological niches of selected plant and animal species native to Alberta.
- Explain the vital life processes performed by trees and other forest plants.
- Describe structural units and component parts of the tree, and their function in performing vital life processes.
- Infer interrelationships among tree structures, their functions and vital life processes that are performed.
- Illustrate the approximate range of one or more tree species throughout North America.

SHOULD YOUR WORK BE DONE?

WILL YOUR MARK FOR THIS MODULE BE DETERMINED?

	PERCENTAGE
<p>You must first demonstrate all of the competencies required for this module.</p> <p>When you have done this, your percentage mark for the module will be determined as follows:</p> <ul style="list-style-type: none">• Tree Biology:<ul style="list-style-type: none">Activity 1.6 10%Activity 3.2 10%Tree Drawing 10%Test 20%• Forest Ecosystems<ul style="list-style-type: none">Activity 2.8 10%Food Web 20%Test 20%	

RESOURCES MAY YOU USE?

- *Alberta Parks and Recreation: Learning Resources Manual* (Alberta Government)
- *Investigating Terrestrial Ecosystems*
- *Field and Laboratory Methods for General Ecology*
- *Managing Your Wood Lot* (Canadian Forest Service)
- *Seeing the Forest Among the Trees*
- *Ecology*
- *Biology*

Section 1: Tree Biology

- Activity 1.6 on page 11 in *Investigating Terrestrial Ecosystems*.
- Activity 3.7 on page 47 in *Investigating Terrestrial Ecosystems*.
- On a large sheet of paper, draw a cross-section of a tree (top to bottom) that shows all components. Label each component. Then, on a separate sheet of paper (one for each component; see page 5) explain the importance of each structure as well as the processes it carries out. List the percentage by weight and volume that each structure makes up of the tree total; e.g., the leaves make up 1% of the tree's weight and 1.7% of its volume. As well, explain what would happen to the tree if the specific structure had its function impaired or destroyed.
- Completed a written test that will examine you on the structural components of trees, and the function of these components.

Section 2: Forest Ecosystems

- Read chapters 1, 2 and 3 in *Investigating Terrestrial Ecosystems*.
- Activity 2.8 on page 33 of *Investigating Terrestrial Ecosystems*.
- Visit a forested area and prepare a comprehensive food web of the area. Plan this trip with your teacher. Make sure you address all aspects of safety. Plan two trip dates so that if the weather is bad on the first you can go on the second. Once at the area collect data on:
 - types of animals present. Determine numbers and area in which animals are found.
Look for: scat
tracks
bones
actual sightings
 - types of grass/shrubs/fungi and mosses present.
Determine numbers and area in which species are found.
 - types and numbers of trees present and area in which trees are found.
 - types and numbers of insects present
 - soil quality (use a soil test kit).

Return to classroom with the data. On a large sheet of paper draw a food web using the data you collected. Explain the interrelationships that your food web shows. Prepare it for presentation (make it look good) and hand it in with your field notes.

- Write a test on the material presented in the three chapters and your observations on the field trip.

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