Curriculum Connections for Climate Change & Forests: From Seed to Carbon Sink

In Canada, each province or territory defines its own program and curriculum materials for schools[1]; therefore, curriculum links for this resource will vary for each jurisdiction. However, on a national level, this guide supports Canadian efforts to provide Education for Sustainable Development (ESD), which is recognized as one of eight key activity areas that are common to all provinces and territories. Its objective is to "raise students' awareness and encourage them to become actively engaged in working for a sustainable society."[2] The Council of Ministers of Canada works with all provinces and territories to coordinate the integration of ESD at all levels of the education system.[7]

ESD is cross-curricular, and teaching/learning about climate change is an integral part of ESD. It can be easily incorporated into diverse subject areas beyond Science, including Career Education, Biology and Environmental Science, Math, Geography, Languages, Arts, Social Studies, Indigenous Studies, and more. Some jurisdictions offer multi-credit courses, such as Ontario's Specialist High Skills Major, and these can also provide learners with interesting opportunities to explore green jobs.

Although there are no overarching Canadian curriculum standards, provinces and territories tend to offer similar types of courses at the secondary level with similar expected outcomes. The table below provides a sample (but not an exhaustive) list of possible secondary school curriculum links for the eight activities included in this unit.

Activity Links to Secondary School Curricula in Canadian Provinces and Territories

SECONDARY SCHOOL CURRICULUM OUTCOMES	COURSE TITLES FROM VARIOUS PROVINCES & TERRITORIES	ACTIVITIES
SCIENCE		
Use scientific knowledge, identify questions, and draw evidence-based conclusions in order to understand and help make decisions about the natural world and the changes made to it through human activity.[9]	Science Biology Environmental Science	1, 2, 3, 4, 5, 6
Science inquiry: understanding how inquiries are conducted in science to provide evidence-based explanations of natural phenomena.[4]	Natural Resource Management Experiential Science Earth Science	2, 3, 4
Problem solving: using scientific knowledge and skills to solve problems in social and environmental contexts.[4]		1, 2, 3, 4, 5, 6
Scientific reasoning: being able to reason scientifically and make connections by applying scientific knowledge and skills to make decisions and address issues involving science, technology, society, and the environment.[4]		1, 4, 6

SECONDARY SCHOOL CURRICULUM OUTCOMES	COURSE TITLES FROM VARIOUS PROVINCES & TERRITORIES	ACTIVITIES
MATHEMATICS		
Identify, understand, and engage in mathematics, and make well-founded judgments about the role that mathematics plays in the private, occupational, and social lives of constructive, concerned, and reflective citizens.[4,9]	Mathematics Mathematics for the Workplace Mathematics for Work and Everyday Life	1, 2, 3, 5
ENGLISH		
Engage with language to acquire, construct, and communicate meaning in all aspects of daily living. [11]	English English as a Second Language Media & Communication Studies	1, 3, 5, 6, 7
Understand, use, and reflect on written texts in order to achieve one's goals and potential, develop knowledge, and participate in society.[4,9]		
BUSINESS STUDIES		
Demonstrate an understanding of ethics and social responsibility in business.[17]		3
CAREER EDUCATION		
Have the skills, strategies, supports, and resilience needed to transition effectively through studies and into work.[5]	Co-op Education Vocational Education Green Industries Production Technology Skilled Trades Knowledge & Employability Transitions	7
ARTS		
Express and understand meaning, and engage in dynamic ways of creating, thinking, and problem solving. [8]	Media & Communication Studies Visual Arts Drama	1, 3, 4, 5, 6
Select and use appropriate forms to present identified issues from a variety of perspectives. [17]		

SECONDARY SCHOOL CURRICULUM OUTCOMES	COURSE TITLES FROM VARIOUS PROVINCES & TERRITORIES	ACTIVITIES
SOCIAL STUDIES [7]		
Show active democratic citizenship within the diverse communities to which one belongs.	Geography Canadian & World Studies History & Citizenship Environmental Stewardship Natural Resource Management Indigenous Studies Global Issues: Citizenship & Sustainability Entrepreneurship Living in a Sustainable World	1, 2, 3, 4, 5, 6
Manage ideas and information.		
Use critical and creative thinking to solve problems.		
Communicate ideas and decisions about significant developments, events, and issues.		
INDIGENOUS STUDIES[19,20]		
Use Indigenous principles of learning (holistic, experiential, reflective, and relational) to better understand connectedness and the reciprocal relationship of Indigenous Peoples to the land.	Contemporary Indigenous Studies Mi'kmaq Studies Native Studies	4
Demonstrate an understanding of the interdependent relationship among individuals, societies, and the environment—locally, nationally, and globally—and the implications for a sustainable future.		
INFORMATION AND COMMUNICATION TECHNOLOGIES		
Design, share, and adapt knowledge in critical, ethical, purposeful, and innovative ways, and develop skills to responsibly take ownership of these technologies to augment learning and benefit society.[8]	Computer Science Spatial Technologies Communications Technology Computer Technology	5, 6

Sources: The competencies for reading, math, and science literacy in the table are derived from the Pan-Canadian Assessment Program,[4] which in turn is based on the Programme for International Student Assessment (PISA).[9] Competencies for other subjects are derived from a composite of statements from other national and provincial/territorial curriculum documents.

CMEC Global Competencies

The Council of Ministers of Education Canada (CMEC) articulated six broad global competencies that "provide learners with the abilities to meet the shifting and ongoing demands of life, work and learning; to be active and responsive in their communities; to understand diverse perspectives; and to act on issues of global significance."[22] All activities in this unit contribute to the development of these competencies; the table below identifies the most prominent competencies developed in each of the activities.

CMEC GLOBAL COMPETENCIES	ACTIVITIES
Critical Thinking and Problem Solving	2, 3, 5, 6
Creativity, Innovation and Entrepreneurship	6, 8
Communication	1, 4, 7
Collaboration	1, 3, 4, 5, 7, 8
Global Citizenship and Sustainability	2, 3
Learning to Learn/ Self-aware and Self-directed	7

Source: Derived from Pan-American Systems-Level Framework on Global Competencies

PLT Canada Forest Literacy Framework

To translate the complex language of forests, trees, forest practices, and sustainable forest management into concepts that are appropriate for K–12 learners, PLT Canada has developed a Forest Literacy Framework. The framework offers 100 forest concepts organized into four themes, each with topics and concepts that address its central question. All activities in this unit advance learners' forest literacy. The table below identifies specific connections between the activities and each of the sub-topics of the Forest Literacy Framework. Please refer to each activity for the connections to specific concepts within each sub-theme.

FRAMEWORK THEME AND SUB-THEME	ACTIVITIES
THEME 1: WHAT IS A FOREST?	
1A. Definition of a forest	6
1B. Trees as part of the forest	8
1C. Forests as ecosystems	1, 5
1D. Forest classification	5, 6
THEME 2: WHY DO FORESTS MATTER?	
2A. Environmental importance	1, 2, 6
2B. Social importance	4, 6, 8
2C. Economic importance	3, 7
THEME 3: HOW DO WE SUSTAIN OUR FORESTS?	
3A. Forest ownership	2, 3, 8
3B. Forest management	3, 6
3C. Forest management policy	3
3D. Perspectives on forest management	4
3E. Forest management certification	3
THEME 4: WHAT IS OUR RESPONSIBILITY TO FORESTS?	
4A. Our connection to our forests	3
4B. Working for the future of our forests	3, 5, 7, 8

Source: Derived from **PLT Canada Forest Literacy Framework**

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