



Preschool–Grade 12 Students

This section is for individuals and organizations that support, provide, or deliver environmental and sustainability education to students enrolled in formal education institutions (private and publicly funded) in preschool–grade 12.

Outcomes

By the end of the course of their education, preschool–grade 12 students will:

1. Be familiar with their own bioregions, and understand basic ecological concepts (the interdependence of all life, energy flow, carrying capacity, cycles, **systems thinking**, and biodiversity)

Sample Indicators:

- They understand the interconnectedness and interdependence of all life on earth.
 - They are familiar with the common flora, fauna, geophysical features, and natural processes of their home bioregion.
 - They understand the value of the natural environment—its benefits and essential services—to humans.
 - They are able to explain basic ecological concepts and relate them to their daily lives (e.g., relate water usage to the water cycle, food production and transportation to energy flow, the impacts of energy generation, and available choices).
 - They are respectful of the natural world and local ecosystems, and they understand the importance of acting on behalf of other people and other living things.
2. Understand the interconnections between human and natural systems, and how people can choose between positive and negative impacts on natural systems

Sample Indicators:

- They recognize the links between their own health, happiness, and future well-being, and the health of the natural environment.
 - They are able to explain how humans are connected to and dependent on healthy, functioning ecosystems.
 - They are able to articulate how human and natural systems affect and are affected by human activity.
 - They examine and assess environmental costs and benefits of their own choices and choices made by businesses and industry.
 - They appreciate and understand the “ecological wake” (or **ecological footprint**) of product consumption as it impacts on both local bioregions and global communities.
 - They explore and critically analyze the sources of everyday goods and services and develop an understanding of their environmental impacts, as well as possible alternative choices.
- 3 Acquire the knowledge and skills required for sustainable living and working; become informed decision-makers who are able to incorporate environmental thinking and values into their decisions and actions

Sample Indicators:

- They recognize the importance of their own role in fostering ecological **sustainability**, and they investigate and discuss the major long-term changes required to create an ecologically sustainable society.
 - They acquire a systemic understanding of the nature of social and political processes such as the role of subsidies, full cost pricing, ecological accounting of goods and services, and consumption taxes on **sustainability**.
 - They know and are able to apply the skills of sustainable living including citizenship skills, communication, and daily living skills.
 - They ask informative questions, assess answers for reliability, make sense of conflicting reports and points of view about environmental issues, and recognize the cumulative effect of individual decisions and actions.
 - They are able to identify some methods for assessing and addressing environmental problems such as loss of biodiversity, ecosystem degradation, and environmental health risks.
 - They examine and discuss the existing range of environmental values and attitudes.
 - They are able to articulate a rationale for environmental choices.
4. Be actively involved in reducing their own **ecological footprint**, and that of their school and community

Sample Indicators:

- School environmental plans and action projects are completed and celebrated.



- Students actively participate in and monitor the reduction of their own and their school's **ecological footprints** (e.g., water and energy consumption, recycling, waste production, and resource use).
- There is an increase in the number of schools and percentage of students involved in naturalization projects and outdoor "learning grounds."
- Teachers and students organize and participate in environment clubs.
- Environmental projects in the community increase as awareness of the importance of participation grows.
- Being environmentally conscientious becomes a school norm.

Needs

Preschool–grade 12 students need:

- The environmental knowledge, skills, and values to ensure an ecologically literate and sustainable society, and a healthy future environment for all
- A coherent approach for Ontario to create a culture of **ecological literacy**, that reflects Canada's commitment to the United Nations' **Agenda 21** (Chapter 36)
- Cooperation, support and funding from all levels of government for the development and implementation of quality environmental and **sustainability** programs
- Ecological learning from the early years through to the end of secondary school
- Environmental and sustainability education from preschool to grade 12 that contains mandatory, focused courses, with additional focused courses available as electives, and the integration of appropriate environmental and **sustainability** content across all disciplines
- Education systems which include a focus on sustainable living skills and ecological problem solving
- Funding for environmental and **sustainability** training, programs, resources, and staffing
- School board support for environmental programs, hands-on learning, and institutional greening
- An appreciation and understanding of the importance of innovation and ingenuity, in both technological design and business, for advancing sustainable communities
- Parents who understand the importance of environmental learning to the health and well-being of their children
- Teachers trained in **environmental literacy** and supportive of environmental initiatives
- Teachers trained to adapt environmental resource materials for regular and special needs programs
- Teachers able to access excellent teaching and curriculum-related materials, and able to provide good ideas for environmental and ecology projects
- Teachers who foster curiosity, respect, and a sense of wonder in exploring nature
- Classroom resources for cross-curricular environmental and sustainability education
- Schools, teachers, and mentors that teach and model environmentally and culturally responsible actions and values



- An appreciation of and respect for the views of other cultures, including their attitudes towards human–nature relationships
- Experiential learning based on developmentally appropriate curriculum and learning methodologies, which includes local natural and built environments
- Schools which offer hands-on learning outdoors, including schoolyard naturalization
- Programs that recognize and work with the particular resources and needs of each diverse community
- Experiential learning based on research and participation in maintaining healthy ecosystems
- Support for outdoor education facilities and programs, and transportation to access them
- Opportunities to initiate, participate in, and maintain environmental projects within the community
- Environmental health education supported by school boards and departments of health
- Ideas for affordable environmental projects
- A legal system that supports ecological learning, change, and sustainable living
- Encouragement, recognition, and incentives for their work in school and community action projects
- Recognition of the expanding global market for eco-products and services, and the career opportunities in environmental technologies and services



Strategies

Programs, Projects, and Policies

1. Develop environmental and sustainability education policies at the provincial and school board levels, providing for funding, curriculum, programs, teacher training, and resources.
2. Mandate E&SE as a separate subject in the core curriculum, with its own learning expectations and assessment noted on report cards, conferring upon it academic status as a basic area of education. Include ecological concepts; environmental health and **sustainability** issues, philosophy, values; historical and cultural contexts; technologies and process design needs and options; consumer and behaviour choices; societal implications; diverse points of view; and career opportunities.
3. Establish in-service and pre-service programs to train current teachers and teachers in training in E&SE, to make optimal use of existing environmental and **sustainability** content in the Ontario curriculum, and to integrate E&SE into their own disciplines.
4. Integrate essential environmental and **sustainability** knowledge, skills, and values into student learning across other subject areas: science, geography, design and technology, business and entrepreneurship, family studies, art, law, economics, and philosophy. Examine impacts of technology and human decision-making on the health of ecosystems that support human life and well-being (e.g., growth, urban sprawl, smog, fossil fuel use, climate change, genetic engineering).
5. Create **sustainability** programs for technological, business, science, and entrepreneurial subjects that teach
 - a) how technological systems can be improved through the study of natural systems (e.g., the principles of **bio-mimicry**, **living machines**, and industrial ecologies);



- b) the application of the principles of **life cycle analysis** to the design of eco-efficient products and product systems, including design for disassembly, recycling, and remanufacture;
 - c) the “**embodied energy**” of technological materials and processes;
 - d) how ‘service systems’ may reduce the need for owning and consuming products;
 - e) how business, science, and technology can contribute to bio-urbanism and sustainable urban planning; and
 - f) sustainable product ethics, incorporating extended product responsibility and seventh generation thinking.
6. Incorporate all the best from the field of contemporary curriculum planning (e.g., developmentally appropriate outcomes, outcome atlases, and fundamental concept-driven instruction).
 7. Establish, maintain, and support outdoor recreation and environmental facilities, programs, and staff that are sufficient to provide experiential learning for every student during their school career.
 8. Create environmental school projects that provide authentic contexts for developing knowledge in sustainable technologies and practices for the students and the whole school community (e.g., the Kyoto “One Tonne Challenge;” food growing, gardening, green roofs, or school ground naturalization projects; environmental conferences, contests, festivals, presentations, and speakers; green schools—school environmental plans and audits, reduction of waste, energy conservation, reduced water consumption, low-emission vehicles, good insulation, energy saving windows, environmentally sustainable renovations—as a model for student learning; calculate whole school transportation emissions, energy use, repercussions, alternatives, and emerging sustainable technologies; “citizen science” that monitors local ecosystem health and contributes to the body of scientific knowledge).
 9. Establish participatory environmental management programs for greening school boards and schools (e.g., ISO 14001, a model for “continual improvement”).
 10. Design take-home components in environmental teaching, so students can share **ecological literacy** with their parents and families; enable students to share environmental interests and concerns with parents so that parents can better support environmental programs.
 11. Create programs to educate parents and caregivers on the importance of **environmental literacy**.

Resources

1. Develop a central environmental communications vehicle (e.g., website or environmental learning database/exchange) where school systems and home educators can access high quality, locally relevant, reliable information from a variety of professionals in their fields of expertise.
2. Develop a process to ensure that every school’s teaching staff includes teachers who have E&SE as part of their training and certification, and support the training in E&SE for all new teachers.
3. Develop quality, standardized student resources such as books, CDs, video, and kits with thematic units, using the environment as a learning context; include an exploration of the range of values regarding **sustainability** and the natural world.
4. Research and create a list of effective, successful model programs, schools, and resources for E&SE, including engaging ideas for ecological projects for teachers and students.



5. Create an on-line resource of environmental monitoring and calculating tools, and databases for use by middle and secondary school students (e.g., climate calculators, ecological design and performance indicators, and product **life cycle analysis**).
6. Compile lists of sustainable technologies, products, and lifestyle choices quantified in terms of their environmental impacts (e.g., organic food, reusable containers, compact fluorescent bulbs, bicycles, local produce, durable goods, low-meat diets, renewable energy sources, and green technologies).
7. Create cross-curricular, environmental teaching resources and packages that are clearly written and include appropriate, engaging experiential activities to provide direct student involvement.
8. Develop a roster of prominent environmental role models and knowledgeable guest speakers on environmentally sustainable behaviour.
9. Develop media resources for E&SE (e.g., an environmental learning magazine, regular broadcasts, reports, and discussions).
10. Develop an assessment tool or “report card” that rates education systems according to their progress towards teaching students to understand and solve ecological problems.

Support

1. Create and support a culture of **ecological literacy** in Ontario by
 - a) recognizing Canada’s commitment to E&SE in the United Nations’ **Agenda 21**, Chapter 36: *Promoting Education, Public Awareness, and Training*;
 - b) amending Ontario’s Environmental Bill of Rights to guarantee all Ontarians the right to an education that makes them ecologically literate, equipped with the knowledge and skills to ensure a sustainable and healthy province for their future;
 - c) establishing a permanent, coordinating, provincial body or agency to implement, facilitate, and be accountable for environmental learning across the province, particularly for the formal education sector;
 - d) establishing a citizens’ advisory board to advise the above board or agency, and to complement official support for E&SE;
 - e) making E&SE a required “teachable” towards teaching certification;
 - f) designing and implementing new environmental and **sustainability** courses as core curriculum with supporting electives;
 - g) establishing benchmarks and standards for E&SE; and
 - h) making outdoor education facilities exempt from the present provincial funding formula.
2. Provide formal support for E&SE at the school board level through
 - a) the development of environmental policies and planning (e.g., schools and school boards that practice what they teach; institutional greening initiatives);
 - b) whole school involvement in E&SE as a central part of the school experience;



- c) cooperative **environmental education** projects between departments of health and school boards; and
 - d) start-up and maintenance costs for school–community environmental projects.
3. Evolve teaching strategies for environmental content.
 4. Allow students a minimum of ten days of education in the outdoors during their school career.
 5. Develop new evaluation techniques specific to environmental and **sustainability** learning.
 6. Develop partnerships among the formal education community and government ministries, conservation authorities, non-governmental organizations, businesses, and community organizations to create effective E&SE opportunities, as well as access to expertise and resources.
 7. Create, with industry partners, a provincial or national ecological design competition showcasing excellence in sustainable design education.
 8. Establish an E&SE foundation with tax deductions for supporters.
 9. Conduct research on public support for environmental learning as it supports future human health and well-being.
 10. Create a higher public profile for E&SE as a public health issue; make E&SE a public health issue in all media; create public advertisements to promote E&SE as “good for you and your health;” publicize ecosystem–human health success stories.
 11. Offer provincial recognition for **environmental education** efforts and successes.
 12. Make school principals aware of good environment work; ask for validation and recognition.

Please see Appendix 1 for a list of useful websites.

