



Research Report

**EDUCATION FOR SUSTAINABILITY
LITERATURE REVIEW**

**Amie Presley
Research Analyst**

09/10-08

December 2009

**Issued by the Organizational Development /
Research and Information Services Department**

Education for Sustainability Literature Review
Amie Presley

Copyright © December 2009 Toronto District School Board

Reproduction of this document for use in schools of the Toronto District School Board is encouraged.

For any other purpose, permission must be requested and obtained in writing from:

Organizational Development /
Research and Information Services
Toronto District School Board
1 Civic Centre Court, Lower Level
Etobicoke, ON M9C 2B3

Tel.: 416-394-4929

Fax: 416-394-4946

Every reasonable precaution has been taken to trace the owners of copyrighted material and to make due acknowledgement. Any omission will gladly be rectified in future printings.

ACKNOWLEDGEMENTS

The author would like to thank Eleanor Dudar and Richard Christie for their valuable insights into the Toronto District School Board EcoSchools initiative and Education for Sustainability in the Toronto District School Board.

BACKGROUND

This literature review was conducted in response to a Board request to examine recent literature and research regarding the concept of education for sustainability. In general terms, education for sustainability “encourages us to explore the profound interdependencies of ecological, societal, and economic systems. [It] is about respecting and preserving our histories, valuing culture and community, caring for others and the environment, and taking action to create a fair, healthy, and safe world for all beings. [It] also supports flexibility, creativity, critical reflection, and fosters a sense of personal responsibility for the economy, society, and environment” (Education Alliance for a Sustainable Ontario, 2008).

The purpose of this review is to provide a brief overview of recent literature regarding the interpretations of education for sustainability (ES), its relation to overall school curriculum and specifically environmental education (EE), and as well as EE within the Toronto District School Board (TDSB).

METHODOLOGY OF THE LITERATURE REVIEW

This review describes recent literature on ES and sourced journal articles from ProQuest Education and EBSCOhost as well as organization websites. The primary search term was “education for sustainability”. The search results uncovered more than one term used to refer to ES; the most common term being “education for sustainable development” (ESD). This term is used by the United Nations Educational, Scientific, and Cultural Organization (UNESCO). A third term found in the literature was “sustainability education” (SE). All three terms tend to reflect the same overarching principles of sustainability (i.e., respect for future generations and contributing to social, environmental, and economic well-being). This review will use the term ES when referring to general practices. When referencing a governing body, agency/organization, and/or school board, this review will use the term which they refer to, as the term used may reflect, in some way, the culture of the country, organization, or school board.

The search found that the literature varied by grade panel and therefore, articles specific to ES in post-secondary institutions were not included in this review as this review focuses on elementary and secondary. The collection of resources reflects global perspectives; however, for this review literature is concentrated in North America. While literature on ES is widespread, note that this review is not meant to be an extensive review but rather a concise summary of education for sustainability.

EDUCATION FOR SUSTAINABILITY

Background

As countries around the world face complex environmental, social, and economic issues, there is a growing recognition that education needs to play a role. Although ES has been discussed in previous years, it was brought to the forefront at the United Nations (UN) Earth Summit in 1992, which resulted in the publication of Agenda 21 (Wals, 2009). Chapter 36 of Agenda 21 identified four goals specific to ES: promote and improve the quality of education, reorient the curricula from pre-school to university, raise public awareness of the concept of sustainable development, and train the workforce. The UN admits these are very broad goals. The United Nations Decade of Education for Sustainable Development, 2005 - 2014 (DESD) was seen as a means to re-emphasize these over-arching, broad goals. The vision of the UN DESD is that of “a world in which everyone has the opportunity to benefit from education and learn the values, behaviors, and lifestyles required for a sustainable future and for positive societal transformation” (Wals 2009, p. 8). This vision translated into four objectives: “facilitate networking linkages, foster an increased quality of teaching and learning in ESD, help countries progress and attain the Millennium Development Goals¹, and provide countries with new opportunities to incorporate ESD into education reform efforts” (Wals 2009, p. 8).

Despite several reports on ESD prompted by the UN DESD, the precise meaning of ESD continues to be a worldwide debate; however, “these differences are seen as important in ensuring that ESD develops in a way that is locally relevant and culturally appropriate” (Wals 2009, p. 25). To fully understand ESD, the terminology enveloped by the practice must be examined. A mid-term review of the UN DESD was completed by the Monitoring and Evaluation Expert Group (MEEG). The definition of ESD used by MEEG in their evaluation is as follows:

Education for Sustainable Development (ESD) is a learning process (or approach to teaching) based on the ideals and principles that underlie sustainability and is concerned with all levels and types of education. ESD supports five fundamental types of learning to provide quality education and foster sustainable human development – learning to know, learning to be, learning to live together, learning to do and learning to transform oneself and

¹ Millennium Development Goals: “Nine years ago, world leaders set far-sighted goals to free a major portion of humanity from the shackles of extreme poverty, hunger, illiteracy, and disease. They established targets for achieving gender equality and the empowerment of women, **environmental sustainability**, and a global partnership for development. In short, they adopted a blueprint for a better world. The Millennium Declaration set 2015 as the target date for achieving most of the Millennium Development Goals which established quantitative benchmarks to halve extreme poverty in all its forms” (UN 2009, p. 1-2).

society. Education for Sustainable Development must be seen as a comprehensive package for quality education and learning within which key issues such as poverty reduction, sustainable livelihoods, climate change, gender equality, corporate social responsibility and protection of indigenous cultures, to name a few, are found. (Wals 2009, p. 26).

Applicable to the above definition, two pedagogical interpretations of ESD can be distinguished:

1. “ESD as a means to transfer the ‘appropriate’ sets of knowledge, attitudes, values and behaviour; and
2. ESD as a means to develop people’s capacities and opportunities to engage with sustainability issues so that they themselves can determine alternative ways of living. Where the emphasis is placed is likely to depend on the traditions and specificities regarding issues like governance and participation in a particular region or country. Although there is no hard evidence to support this claim, there is anecdotal evidence to suggest that there is more emphasis today on the E in ESD than there was at the beginning of the Decade” (Wals 2009, p. 27).

The framework of the UN DESD suggests that full-fledged ESD requires the integration of three dimensions: social-cultural, environmental, and economic. In detail these dimensions are:

- “the socio-cultural dimension which refers to issues related to human rights, peace and human security, gender equality, cultural diversity and intercultural understanding, health, HIV & AIDS and new forms of governance;
- the environmental dimension which refers to issues related to natural resources (water, energy, agriculture, biodiversity), climate change, rural development, sustainable urbanization, disaster prevention and mitigation;
- the economic dimension which refers to issues related to poverty reduction, corporate responsibility and accountability and re-orienting the market economy” (Wals 2009, p. 28).

It is the hope and vision of the UN DESD, that the integration of the three dimensions will help to facilitate a movement towards a world in which all citizens have the opportunity to “benefit from education and learn the values, behaviours, and lifestyles required for a sustainable future and for positive societal transformation” (UNESCO 2009, p.4).

Education for Sustainability Dimensions in School Curriculum

Literature specific to the social-cultural and economic dimensions of ESD is not as widely discussed as the environmental dimension. McKeown (2002) comments that “the contributions of the environmental education and science education communities to the environmental strand of ESD have been well-documented in the literature; however, equal attention has not been focused on the social and economic strands. Yet, the efforts of schools to create more just, peaceable, and equitable societies suggest that the social strand appears to be well-developed in many countries. In fact, schools that have programs in multicultural education, anti-racist education, gender equity, anti-bullying, and peace education contribute substantially to the social strand of ESD” (p. 26).

Progressing from the global concept of ESD to locally relevant curriculum and encompassing the environment, social-cultural, and economic dimensions is a difficult process. McKeown (2002) identifies that “Many decisions, assumptions about the future, and examinations of local cultures have to be made. Creating ESD curriculums will require knowledge of the present and foretelling of the future” (p. 24). Education communities need to identify knowledge, issues, perspectives, skills, and values central to sustainable development in each of the three components - environment, economy, and society to create an ESD curriculum. Figure 1 is an example of what one school community may select².

Figure 1: Components of ESD Curriculum³

	Environment	Economy	Society
Knowledge	hydrologic cycle	supply and demand	conflict
Issues	protecting and managing freshwater; managing hazardous wastes	combating poverty	changing consumption patterns
Skills	the ability to acquire, manage, and analyze data	the ability to identify components of full-cost accounting	the ability to think critically about value issues
Perspectives	linkage/interrelationship between/among contemporary global environmental issues	look beyond local and national boundaries	universal attributes of being human
Values	ecological value of undisturbed land	value of a sustainable livelihood	economic value, religious value, and societal value compete

² Many possible combinations of knowledge, issues, skills, perspectives, and values for ESD curriculums exist. The program should be tailored to fit community situations and needs (McKeown 2002, pg 24).

³ Adapted from <http://www.esdtoolkit.org/discussion/globalin.htm>

McKeown (2002) further explains that “many topics inherent in ESD are already part of the formal education curriculum, but these topics are not identified or seen to contribute to the larger concept of sustainability. Identifying and recognizing components of ESD is key to moving forward” (p. 25). McKeown identifies the following steps for moving forward.

1. Ensure that educators and administrators understand the concept of sustainability and are familiar with its principles.
2. Examine the curriculum and school activities for existing contributions to ESD.
3. Identify potential areas of the existing curriculum in which to insert examples that illustrate sustainability or additional knowledge, issues, perspective, skills or values related to sustainability.
4. “After identifying existing and potential contributions, leaders can create awareness among the educational community of these contributions to the larger ESD picture. Then, these contributions can be woven together to create ESD programs that are taught overtly to pupils and students. In this approach, the synergistic strengths of combined educational disciplines can convey the knowledge, issues, skills, perceptions, and values associated with ESD” (p. 25).

McKeown (2002) states that “no one discipline can or should claim ownership of ESD. In fact, ESD poses such broad and encompassing challenges that it requires contributions from many disciplines⁴” (p. 25). For example, consider these ESD contributions:

- “Mathematics helps students understand extremely small numbers (e.g., parts per hundred, thousand, or million), which allows them to interpret pollution data.
- Language Arts, especially media literacy, creates knowledgeable consumers who can analyze the messages of corporate advertisers and see beyond ‘green wash’.
- History teaches the concept of global change, while helping students to recognize that change has occurred for centuries.
- Reading develops the ability to distinguish between fact and opinion and helps students become critical readers of political campaign literature.

⁴ “Each discipline also has associated pedagogical techniques. The combined pedagogical techniques and strategies of each discipline contribute to an expanded vision of how to teach for creativity, critical thinking, and a desire for life-long learning - all mental habits that support sustainable societies” (McKeown 2002, pg. 25).

- Social Studies helps students to understand ethnocentrism, racism, and gender inequity as well as to recognize how these are expressed in the surrounding community and nations worldwide” (p. 25).

The Canadian organization, Learning for a Sustainable Future, further identified learning outcomes (knowledge, values, and skills) relevant to sustainable development, and which encompass the three dimensions of the UNDES, all three considered to be necessary for ensuring a sustainable future.

Knowledge: Below is a list of the knowledge that today's youth will need to acquire in order to become responsible citizens in the 21st century.

- “The planet earth as a finite system and the elements that constitute the planetary environment.
- The resources of the earth, especially soil, water, minerals, etc., and their distribution and role in supporting living organisms.
- The nature of ecosystems and biomes; their health, interdependence within the biosphere.
- The dependence of humans on the resources of the environment for life and sustenance.
- The sustainable relationship of native societies to the environment.
- The implications of the distributions of resources in determining the nature of societies and the rate and character of economic development.
- Characteristics of the development of human societies including nomadic, hunter gatherer, agricultural, industrial and post industrial and the impact of each on the natural environment.
- The role of science and technology in the development of societies and the impact of these technologies on the environment.
- Philosophies and patterns of economic activity and their different impacts on the environment, societies and cultures.
- The process of urbanization and implications of de-ruralization.
- The interconnectedness of present world political, economic, environmental and social issues.

- Aspects of perspectives and philosophies concerning the ecological and human environments; for example, the interconnectedness of matter, energy and human awareness.
- Cooperative international and national efforts to find solutions to common global issues, and to implement strategies for a more sustainable future.
- The implications for the global community of the political, economic and socio-cultural changes needed for a more sustainable future.
- Processes of planning, policy-making and action for sustainability by governments, businesses, non-governmental organizations and public” (Learning for a Sustainable Future, n.d.).

Skills: Below is a list of the skills that today's youth will require to contribute to a sustainable future.

- “Frame appropriate questions to guide relevant study and research.
- Apply definitions of fundamental concepts, such as environment, community, development and technology, to local, national and global experiences.
- Use a range of resources and technologies in addressing questions.
- Assess the nature of bias and evaluate different points of view.
- Develop hypotheses based on balanced information, critical analysis and careful synthesis, and test them against new information and personal experience and beliefs.
- Communicate information and viewpoints effectively.
- Develop cooperative strategies for appropriate action to change present relationships between ecological preservation and economic development.
- Work toward negotiated consensus and cooperative resolution of conflict” (Learning for a Sustainable Future, n.d.).

Values: Below is a list of the attitudes and values that today's youth will need to acquire in order to become responsible citizens in the 21st century.

- “An appreciation of the resilience, fragility and beauty of nature and the interdependence and equal importance of all life forms.
- An appreciation of the dependence of human life on the resources of a finite planet.
- An appreciation of the role of human ingenuity and the individual creativity in ensuring survival and the search for appropriate and sustainable progress.
- An appreciation of the power of humans to modify the environment.

- A sense of self-worth and rootedness in one's own culture and community. A respect for other cultures and recognition of the interdependence of the human community.
- A global perspective and loyalty to the world community. A concern for disparities and injustices, a commitment to human rights and to the peaceful resolution of conflict.
- An appreciation of the challenges faced by the human community in defining the processes needed for sustainability and in implementing the changes needed.
- A sense of balance in deciding among conflicting priorities. Personal acceptance of a sustainable lifestyle and a commitment to participation in change.
- A realistic appreciation of the urgency of the challenges facing the global community and the complexities that demand long-term planning for building a sustainable future.
- A sense of hope and a positive personal and social perspective on the future.
- An appreciation of the importance and worth of individual responsibility and action” (Learning for a Sustainable Future, n.d.).

The same organization, Learning for a Sustainable Future, developed a database of resources for educators specific to ESD. Included in this database is a list of themes that correspond to specific key areas of ESD and span cross-curriculum (see Appendix A).

A second example of ESD spanning cross-curriculum is presented by the Government of Manitoba. Manitoba has linked their ESD initiative to the UN DESD. In doing this, the Government developed an ESD website to assist Manitoba teachers in integrating sustainability topics/issues/approaches into their classroom activities; a component of the resources made available to teachers is ESD correlation charts. Student learning outcomes were selected as they related to Manitoba sustainable development priorities in social studies, science, and physical/health education from Kindergarten to Grade 10 (see Appendix B).

Environmental Education

As many countries have environmental education (EE) practices implemented in elementary and secondary curriculum, the existence of ESD has given rise to questions about the relationship between the two. Pepper and Wildy (2008) outline a general interpretation of EE and ESD. The major differences between the two concepts are “due to the ‘nature-study’ focus of environmental education and the three-pronged approach of sustainability” (p. 614) (i.e., the long-term future of the environment, the economy, and the social justice of communities).

Table 1 attempts to differentiate between EE and ESD interests (adapted from Marcinkowski 2010, p. 41).

Table 1: A General Conception of the Overlapping and Divergent Interests of EE and ESD

<i>Primarily EE</i>	<i>Shared</i>	<i>Primarily ESD</i>
Environmental	Development	Social/Economic
• Natural Resource	• Potable Water	• Poverty
• Environmental Quality	• Sanitation	• Health Care
• Biodiversity	• Food and Energy Resources	• Basic Literacy

The interpretation of EE and ESD Canada has taken is that the two “do overlap and both are legitimate and necessary. The old EE infrastructure and existing programs therefore, will still need to be supported and government support for ESD should not be at the expense of EE. At the same time, the development of ESD needs to be supported as well as it adds important new dimensions that EE does not address or only addresses lightly (e.g., the socio-economic and cultural dimensions)” (Wals 2009, p. 30).

Practices in Canada

In 2007, the Ontario Ministry of Education and the Working Group on Environmental Education published a report entitled *Shaping Our Schools, Shaping Our Future: Environmental Education in Ontario Schools*. This report identified key priorities for action to build on current strengths in EE in Ontario schools. The report notes that EE will embrace ES. There will be “an explicit focus on ensuring that the ways in which humans use or affect ecosystems do not compromise the natural ability of ecosystems for renewal or regeneration. Effective education for sustainability stresses the need for highly developed systems thinking and futures thinking” (Ontario Ministry of Education 2007, p. 6).

In the 2007 report, the Working Group on Environmental Education developed a comprehensive definition of EE and recommended that it be adopted and used in all Ontario schools. Although the Ministry of Education (p. 6) only refers to EE, their definition of EE does embrace values of ES.

“Environmental education is education about the environment, for the environment, and in the environment that promotes an understanding of, rich and active experience in, and an appreciation for the dynamic interactions of:

- The Earth’s physical and biological systems
- The dependency of our social and economic systems on these natural systems
- The scientific and human dimensions of environmental issues
- The positive and negative consequences, both intended and unintended, of the interactions between human-created and natural systems”

All provinces in Canada have agencies/working groups engaged in ES. These agencies / working groups inform policy, develop, and share resources, conduct research, and advocate for ES plus much more. Refer to Appendix C for a map of these agencies/working groups. Another example of these agencies is the British Columbia (BC) Working Group and Network on Sustainability Education. A summit in April 2009 brought together cross-sectoral teams to collaborate and advance ES in BC. The themes, which were generated from this summit, are as follows:

1. “Radically redesign the education system so that the 10 Principles of Sustainability Education are integrated into the foundation of the education system in BC.
2. Involve everyone in every sector, at each institution, in all parts of the province.
3. Communicate and Connect with each other, with sustainability education opponents and with the general public to keep a transformative discourse alive and collectively write a new story about education and its place in our society.
4. Collaborate and Share with each other. Working together rather than reinventing the wheel. Developing and sharing best practices together, coordinating projects and resources and keeping each other updated on successes.
5. Cultivate Leaders/Change Agents to increase the number of confident, capable and engaged individuals within the movement.
6. Develop common planning & measurement processes and tools to reduce work and allow for cross sector, organization and project comparisons.

7. Develop new funding and resource strategies to sustain the movement and ensure the legitimacy of sustainability education within the system.
8. Collectively advocate for policies that support top down AND bottom up change within the education system” (p. 4).

In 2009, the Ministry of the Environment published a policy framework for EE in Ontario schools. The policy seeks to move beyond symptoms (i.e., air and water pollution) to encompass the underlying causes of environmental stress “It seeks to promote changes in personal behaviour and organizational practices that will allow us to minimize our ecological footprint” (p. 4). This definition supports the definition noted above in *Shaping our Schools, Shaping our future*, which embraces ES values.

The UNESCO DESD explicitly recognizes the importance of re-orientating teaching and teacher education as a mechanism for social-political ecological transformation. The Ontario Ministry of Education (2009, p. 12-16) outlines actions, some which are specific to teacher training, to address the issue described by the UNESCO DESD. Some of these actions, specific to the Ministry, include:

- “embed environmental education expectations and opportunities in all grades and in all subjects of the Ontario Curriculum, as appropriate;
- provide resources for teaching concepts and practices related to environmental education;
- offer professional learning opportunities that develop field-based pedagogical skills;
- integrate environmental education into subject specific training activities related to the release of revised curriculum documents, including training aimed at new teachers;
- liaise with faculties of education about expectations and opportunities for environmental education as provided in the Ontario curriculum;
- encourage faculties of education to address environmental education in pre-service curricula;
- collaborate with the Ontario College of Teachers to ensure appropriate attention to environmental education is reflected in the colleges qualification guidelines;
- collaborate with the Ontario College of Teachers to ensure that an additional qualification course supports environmental education”.

It is the goal of the 2009 policy document referenced above that “By the end of grade 12, students will acquire the knowledge, skills, and perspectives that foster understanding of their fundamental connections to each other, to the world around them, and to all living things” (Ministry of Education 2009, p. 11).

Toronto District School Board Practices

EcoSchools Overview

In 2003, the then-Department of Ecological Literacy and Sustainable Development, School Services at the Toronto District School Board (TDSB) developed the EcoSchools program which certified thirteen schools in its first year. Presently, the program is a straightforward way for schools to fulfill the expectations of the Ministry of Education's new environmental education policy framework (2009). “It provides the structure and support for individual schools to develop students' environmental learning and provide opportunities for action. Program Coordinator Richard Christie's letter to all principals describes the 6 EcoSchools EcoReviews as forming the basis for the environmental action plan that *Acting Today, Shaping Tomorrow* requires of all schools” (EcoSchools, 2009 p.1). As of June 2009, the TDSB had 311 eco-certified schools.

Toronto District School Board and EcoSchools Addressing Sustainability

When examining the connection between EE and ES, it is important to take a look at the specific EcoSchools program developed in the context of Canada's largest and greenest school board. The UN definition names the three pillars as *social, environmental, and economic*. Overall, what this means in the context of the curriculum of a highly developed education system within a developed nation is not thoroughly examined in literature. However, specific to the TDSB Environment Policy (Policy P.028 CUR), the Board “recognizes the interdependence of the environment, the economy and society, and the challenge of balancing all three in building a healthy, sustainable future. To achieve this goal, the Board adopts the concepts of sustainable development as ‘meeting the needs of the present generation without compromising the ability of future generations to meet their needs’” (TDSB 2000).

Toronto schools have a Social and World Studies and the Humanities department with a strong human rights, peace, and social justice orientation to draw on for resources and support in helping teachers to place learning in that context. The TDSB's Student and Community Equity department is well-supported at all levels in helping to infuse gender equality, cultural diversity, and intercultural understanding throughout the board, in both curriculum and operations

practices. Indeed, the TDSB is part of creating and reflecting a culture that goes far beyond what most countries can dream of.

In the elementary panel, the social, cultural, and environmental consequences of individual and societal behaviour are part of a well-planned integrated approach to teaching and learning. While the work of integration comes more 'naturally' to some teachers than others, this is the persistent push of Instructional Leaders helping teachers to develop curriculum programs that centre on engaging learning that helps students interpret the world and their role in it. (The board's newest alternative school, Grove Community School, has as its mission the integration of social justice and environmental education; EcoSchools is committed to learning from this newest manifestation of bringing best practices together.)

Part of EcoSchools role is to produce curriculum resources that demonstrate the integration of learning across subject areas, and to partner with other departments in supporting teachers in the classroom in connecting environmental learning with social and economic consequences.

An equally important role is the way *the EcoSchools program itself* is an opportunity for students from a very young age and right up through the grades to learn at the local level about what sustainability means. The school often becomes a working laboratory, where students with support from teachers, administrators, and caretakers (in the elementary schools often parents as well) learn to apply "earth-friendly" housekeeping practices for maintaining the school and school grounds. Environment and economics meet in a very practical way when students decide, with their principal, that reducing paper use would allow the school to purchase only 100% recycled copy paper, as happened at Jarvis CI last year. It's a concrete example, a small initial step on the path to understanding what "sustainability" means.

At the secondary level, in addition to many courses with environmental topics as well as specifically dedicated courses, there are more specific courses in Law and Economics that can provide opportunities for examining the social and economic circumstances and consequences of environmental matters. Again, the role of the EcoSchools staff is to work with other departments to encourage an integrated approach to the extent possible at the secondary level. Such a highly evolved education system as TDSB's is already addressing issues in all of the three areas claimed by ES. Together TDSB schools in many subject areas are doing a lot of "education for sustainability."

The TDSB's approach to education for sustainability is very locally applied in schools as the TDSB educates greener students in greener buildings, as well as this perspective being pursued in specific subjects and through many volunteer student and parent projects. Three of the four main sections of the EcoSchools program constitute a fulfillment of what is required to meet ES goals: "Leadership and Teamwork" (section 1); "Student Achievement through Ecological Literacy" (section 3); and "Healthy and Caring Communities" (section 4). Only section 2, "Reducing Our Environmental Impact" goes beyond the usual list of best practices in being environmentally focussed. EcoSchools has never had merely a "nature-study environmental education focus" nor does it specifically boast of a "three-pronged approach of sustainability." The board as a whole is working on the latter; EcoSchools does both.

As part of the Department of Science, Environment, and Ecological Studies (within School Services) EcoSchools provides an extensive collection of resources for schools. For example:

- Curriculum guides for components of EE for both elementary and secondary as well as the integration of ecoliteracy⁵;
- Assessment and evaluation guides and tools;
- Professional development;
- Sponsored events; and
- Day and Residential Outdoor Education Centres, which are also part of this amalgamated department; these centres do indeed focus more on the "E" in Education for Sustainability⁶.

⁵ Ecoliteracy "implies a broad understanding of how people and societies relate to each other and to natural systems, and how they might do so sustainably. It presumes both an awareness of the interrelatedness of life and knowledge of how the work works as a system" (Ecoschools 2007, p. 6).

⁶ The TDSB operates Day and Residential Outdoor Education Centres to provide students with "beyond the classroom" learning experiences aimed at awakening their connectedness to the world around them. The staff at TDSB Outdoor Educations Centres provide leadership in conservation and sustainability education.

CONCLUDING REMARKS

“As we approach the mid-point of the UN DESD (2005-2014) governments across Canada and around the world have introduced a wide variety of environmental education and sustainability initiatives” (Ministry of Education, 2009, p.3). In Canada, there is a widespread assortment of networks and resources within school boards and government and non-government agencies dedicated to the act of educating current and future generations on sustainable practices. In Ontario, it is no accident that the TDSB EcoSchools program is so closely aligned with the environmental action plan outlined in the Ministry of Education’s environmental policy framework *Acting Today, Shaping Tomorrow* (2009) and its definition of EE. In fact, the Minister’s Working Group on Environmental Education (2007) drew extensively on the TDSB’s years of EcoSchools experience in writing the report that became the basis of the 2009 policy framework. Now in its seventh year, EcoSchools provides all TDSB schools with a very fully-developed resource to respond to and address the global changes happening around us.

REFERENCES

- EcoSchools, Toronto District School Board. (2009). Ontario environmental policy framework expectations and EcoSchools. *EcoSchools Newsletter*, 1(6), 1. Retrieved November 2009, <<http://archive.constantcontact.com/fs029/1102339695326/archive/1102571998203.html>>
- EcoSchools, Toronto District School Board. (2007). GRASP: A Tool for Developing Ecological Literacy Through Richer Performance Tasks. Toronto, Ontario, Canada: Toronto District School Board. Retrieved November 2009, <<http://www.tdsb.on.ca/wwwdocuments/programs/ecoschools/docs/GRASP%20FINAL.pdf>>
- Education Alliance for a Sustainable Ontario. (2008). Retrieved November 2009 <<http://www.sustainable-ontario.org/>>
- Learning For a Sustainable Future. (2008). *2008 annual report*. North York, Ontario, Canada: York University.
- Learning For a Sustainable Future. (n.d.). *ESD learning outcomes*. North York, Ontario, Canada: York University. Retrieved December 2009, <<http://www.lsf-1st.ca/en/what-is-esd/esd-learning-outcomes>>
- Learning For a Sustainable Future. (n.d.). *Resources 4 rethinking: Issues and themes*. North York, Ontario, Canada: York University. Retrieved December 2009, <<http://www.resources4rethinking.ca/en/tool/issues>>
- Manitoba Education. (n.d.). *Education for sustainable development: ESD correlation charts of student learning outcomes*. Manitoba, Canada: Government of Manitoba. Retrieved December 2009, <<http://www.edu.gov.mb.ca/k12/esd/index.html>>
- Marcinkowski, T. (2010). Contemporary challenges and opportunities in environmental education: where are we headed and what deserves our attention. *The Journal of Environmental Education*, 41(1), 34-54
- McKeown, Rosalyn. (2002). *Education for sustainable development toolkit*. Tennessee: Waste Management Research and Education Institution. Retrieved December 2009, <http://www.esdtoolkit.org/esd_toolkit_v2.pdf>
- Ontario Ministry of Education. (2007). *Shaping our schools, shaping our future: Environmental education in Ontario schools*. Ontario, Canada: Queens Printer for Ontario
- Ontario Ministry of Education. (2009). *Acting today, shaping tomorrow: A policy framework for environmental education in Ontario schools*. Ontario, Canada: Queens Printer for Ontario.
- Pepper, C. & Wildy, H. (2008). Leading for sustainability: Is surface understanding enough. *Journal for Educational Administration*, 46 (5), 613-629.
- Toronto District School Board. (2009). *Annual program opportunities: TDSB outdoor education centres*. Toronto, Ontario, Canada: Toronto District School Board.
- Toronto District School Board. (2000). *Policy P.028 CUR: Environment*. Toronto, Ontario, Canada: Toronto District School Board.

United Nations (UN). (2009). *The millennium development goals report*. New York: United Nations.

Walking the Walk - BC Working Group and Network on Sustainability Education. (2008). *How sustainability education: Solutions summit report*. British Columbia, Canada: Simon Fraser University.

Wals, A. (2009). *Review of contexts and structures for education for sustainable development*. United Nations Educational, Scientific, Cultural Organization (UNESCO). France, Paris: UNESCO.

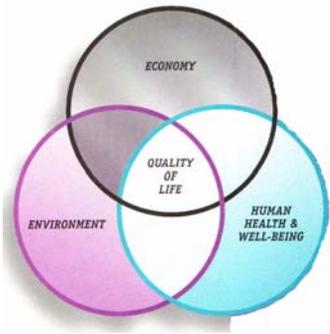
<p>Air, Atmosphere & Climate</p> 	<p>Action Projects Related to the Theme</p> <ul style="list-style-type: none"> Acid Rain Air Pollution Climate Change Ozone Depletion
<p>Citizenship</p> 	<p>Action Projects Related to the Theme</p> <ul style="list-style-type: none"> Alternative Globalization Community-Building & Participation Ecological Footprint General Guide to Taking Action Lifestyle Analysis Sustainable Consumption Media
<p>Economics</p> 	<p>Action Projects Related to the Theme</p> <ul style="list-style-type: none"> Alternative economic systems Corporate Social Responsibility Globalization Poverty Reduction Trade
<p>Ecosystems</p> 	<p>Action Projects Related to the Theme</p> <ul style="list-style-type: none"> Appreciating the Natural World Biodiversity Bioregionalism Carrying Capacity Endangered Species Habitat Loss Interdependence Invasive Species Wildlife Protection

<p>Energy</p> 	<p>Action Projects Related to the Theme</p> <ul style="list-style-type: none"> Alternative/Renewable Energy Energy Use Energy Generation
<p>Food & Agriculture</p> 	<p>Action Projects Related to the Theme</p> <ul style="list-style-type: none"> Animal Rights Aquaculture Biotechnology Conventional Farming Food Security Local Food Organic Farming Pesticides Subsistence Farming
<p>Governance</p> 	<p>Action Projects Related to the Theme</p> <ul style="list-style-type: none"> Democracy Government Regulations International Relations
<p>Human Health & Environment</p> 	<p>Access to Health Care</p> <p>Action Projects Related to the Theme</p> <ul style="list-style-type: none"> Environmental Contaminants and Health Hazards Health Promotion HIV/AIDS Hunger and Malnutrition

<p>Human Rights</p> 	<p>Action Projects Related to the Theme</p> <ul style="list-style-type: none"> Cultural Diversity Education Gender Equality Poverty Refugees & Immigration Religious Diversity Sexual Diversity Social Justice War & Peace
<p>Indigenous Knowledge</p> 	<p>Action Projects Related to the Theme</p> <ul style="list-style-type: none"> Rituals, Spirituality & Worldviews TEK – Traditional Ecological Knowledge
<p>Land Use & Natural Resources</p> 	<p>Action Projects Related to the Theme</p> <ul style="list-style-type: none"> Fisheries Forests Habitat Restoration Planting Indigenous Species Recreation Rocks and Minerals Rural Issues Sustainable Urbanization Transportation
<p>Science & Technology</p> 	<p>Alternative Ways of Doing Science</p> <ul style="list-style-type: none"> Analysing Conventional Science Appropriate Technology

<p>Waste Management</p> 	<p>Action Projects Related to the Theme</p> <ul style="list-style-type: none"> Composting Cradle-to-Cradle Hazardous Wastes Liquid Waste Rethink Reduce Reuse Recycle Solid Waste Disposal Source Reduction
<p>Water</p> 	<p>Action Projects Related to the Theme</p> <ul style="list-style-type: none"> Freshwater Environments Marine Environments Privatization & Sale of Water Water Cycle Water Quality Water Treatment & Distribution Water Use Watershed Protection

“The Resources for Rethinking Issues List is based on key action areas outlined by the United Nations Decade for Education for Sustainable Development. Educators and community organizations from across Canada helped refine these issues into themes”. Retrieved from (<http://r4r.ca/en/tool/issues>).



Grade 1 Physical Education Health Education
*Kindergarten to Grade 4 Physical Education/Health
 Education: A Foundation for Implementation 2001*

Student Learning Outcomes Related to Sustainable
 Development

1. Movement

A.1.6 Appreciate and respect the natural environment while participating in physical activity.

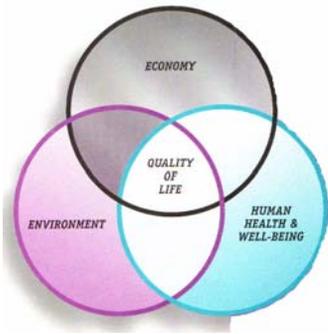
S.1.1.C.1 **Demonstrate functional use of basic movement skills** (e.g., hopping, jumping, kicking ...) **and equipment in outdoor activities and/or special events** (e.g., hopscotch, rope skipping, snow soccer, tabloids, cultural theme days, Aboriginal games...).

3. Safety

K.3.1.A.2 **Identify how weather conditions may affect safe exercising** (e.g., ice/rain, makes a running surface slippery, hot weather requires fluid replacement, danger of frostbite...).

K.3.1.B.2 **Identify unsafe situations related to the environment** (i.e., forest fires, floods, tornados, lighting) **and safety rules for own protection.**

K.3.1.B.4 **Recognize community helpers** (e.g., safe adult, police officer, bus driver, teacher, Block Parent, babysitter...) **and how to seek help** (e.g. , know emergency telephone numbers, ask a safe adult or teenager for help, use a telephone, dial emergency telephone number, report what happened...).



Grade 1 Science

Kindergarten to Grade 4 Science: A Foundation for Implementation 1999

Student Learning Outcomes Related to Sustainable Development

Cluster 1: Characteristics and Needs of Living Things

1-1-08 Describe what is needed to care for a pet, a farm animal, or an indoor plant.

Example: provide fresh water for their hamster daily ...

1-1-10 Describe how humans and other living things depend on their environment to meet their needs.

Examples: the environment provides humans and other living things with food ...

1-1-12 Identify hobbies and jobs that require knowledge of the needs of living things.

Examples: gardeners, nurses, zookeepers...

1-1-13 Develop, implement, and evaluate personal and group action plans that contribute to a healthy environment for themselves and for other living things.

Examples: wash hands before eating, reduce amount of waste produced by class...

1-1-14 Show respect for living things in their immediate environment.

Examples: handling the class gerbil with care...

Cluster 3: Characteristics of Objects and Materials

1-3-11 Demonstrate ways to reduce, reuse, and recycle materials during classroom learning experiences.

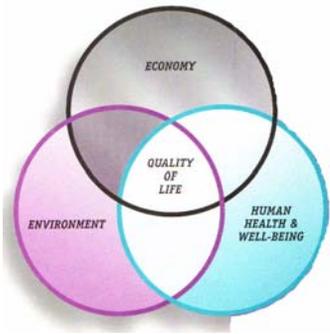
Cluster 4: Daily and Seasonal Changes

1-4-14 Describe safety precautions related to daily weather, the changing of the season, and weather extremes.

Examples: wearing a raincoat if rain is expected, staying indoors during a blizzard, staying off thin ice in the spring and fall ...

1-4-17 Use the design process to construct a device or structure that helps a Manitoba animal adjust to seasonal changes.

Examples: winter birdfeeder, dog house, dog "booties" for winter...



Grade 1 Social Studies

Connecting and Belonging: A Foundation for Implementation 2005

Student Learning Outcomes Related to Sustainable Development

Skills

Active Democratic Citizenship

S-103 Make decisions that reflect care, concern, and responsibility for the environment.

Cluster 1: Belong

VI-003 Respect the stories, traditions, and celebrations of others.

Cluster 2 My Environment

KL-012 Recognize that people depend on the environment for survival.

KH-019 Describe how the repeating patterns of the seasons influence their lives.

1KE-027 Give examples to distinguish needs from wants.

KE-028 Give examples of how media may influence their needs wants, and choices.
Include: advertising and television programming.

VL-007 Appreciate the beauty and benefits that the natural environment brings to their lives.

VL-007A Value the special relationships Aboriginal people have with the natural environment.

Cluster 3: Connecting with Others

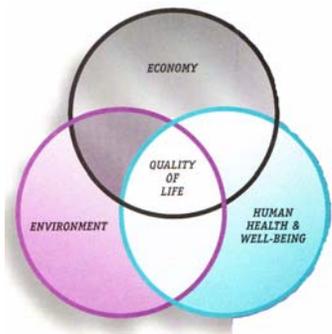
KG-020 Recognize that people all over the world have similar concerns, needs, and relationships.

KG-021 Identify relationships or connections they have with people in other places in the world.

VC-001 Respect the rights and need of others.

VC-002 Be willing to contribute to their groups and communities.

VG-010 Be willing to consider the needs of people elsewhere in the world.
Examples: Project Love, UNICEF...



Grade 5 Physical Education Health Education *Grades 5 to 8 Physical Education/Health Education: A Foundation for Implementation 2002*

Student Learning Outcomes Related to Sustainable Development

1. Movement

A.1.6 Appreciate and respect the natural environment while participating in physical activity.

S.1.5.C.1 Demonstrate functional use of basic movement skills (e.g., striking a ball with the hand and/or implement, balancing...) **in outdoor activities on the school grounds and/or special events** (e.g., four square ball, T-ball, skating, snowshoeing, tabloids, mini-Olympics, multicultural games...).

3-Safety

K.3.5.A.5a Show an understanding of potential safety risks related to environments for selected alternative pursuits (e.g., jogging, cycling, tobogganing/sliding, snowboarding, skiing, in-line skating...).

K.3.5.A.5b Identify water safety rules, hazards, and practices (e.g., wearing flotation devices, importance of swimming lessons, recognizing safety symbols, steps in an emergency...) **related to aquatic activities** (e.g., swimming, boating...).

K.3.5.B.1 Investigate safety concerns in the community and/or the media related to roads, traffic, bus transportation, recreational vehicles, and unsupervised area.

K.3.5.B.2 Describe ways to respond appropriately to potentially dangerous situations related to environmental conditions (e.g., floods, fires, extreme weather conditions, icy conditions, lightning...) **relevant to self and others.**

K.3.5.B.4 Identify available community supports that promote safety and community health (e.g., helplines, dentists, doctors, nurses, police officers, social workers, security guards, lifeguards, natural healing modalities, physiotherapists, Block Parents...).

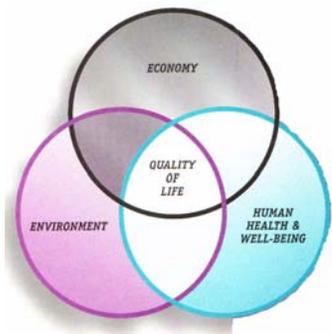
4. Personal and Social

S.4.5.A.2 Demonstrate the ability to set priorities for possible solutions that show responsible decision-making for physically active and healthy living choices.

5. Healthy Lifestyle Practices

K.5.5.D.3 Identify peer, cultural, media, and social influences related to substance use and abuse (e.g., dares from friends; pressure to belong to a group; attractive advertisement/television/videos; family/cultural/ religious values; peer pressure from groups and gangs; alcoholics or smokers in the family...).

K.5.5.E.3a Identify influences (e.g., family, friends, role models, religion, culture, media, advertising and videos, social trends, fashion...) **on sexuality and gender roles.**



Grade 5 Science

Grades 5 to 8 Science: A Foundation for Implementation 2000

Student Learning Outcomes Related to Sustainable Development

Cluster 1: Maintaining a Healthy Body

5-1-02 Interpret nutritional information found on food labels.

Examples: ingredient proportions, identification of potential allergens, information related to energy content and nutrients...

5-1-14 Evaluate information related to body image and health from media sources for scientific content and bias.

Examples: glamorization of smoking in movies, promotion of unrealistic role models in magazines, trivialization of scientific information on television...

5-1-15 Explain how human health may be affected by lifestyle choices and natural-and-human caused environmental factors.

Include: smoking and poor air quality, may cause respiratory disorders; unhealthy eating and physical inactivity may lead to diabetes and heart disease; prolonged exposure to the Sun can cause skin cancer.

Cluster 2: Properties of and Changes in Substances

5-2-12 Identify potentially harmful chemical products used at home, and describe practices to ensure personal safety. Include: use of products with parental supervision, recognition of safety symbols, procedures to follow in case of an emergency, proper storage of chemical products.

5-2-13 Evaluate household chemical products using the design process.

Example: glass-cleaner, laundry soap, toothpaste...

Cluster 4: Weather

5-4-02 Describe how weather conditions may affect the activities of humans and other animals.

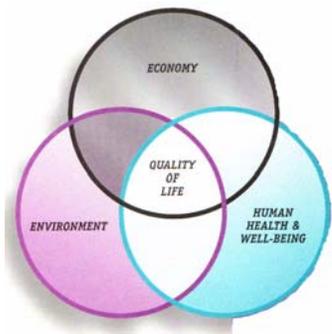
Examples: heavy rainfall may cause roads to wash out; stormy conditions may prevent a space shuttle launching; in excessive heat cattle may produce less milk...

5-4-09 Provide examples of severe weather forecasts, and describe preparations for ensuring personal safety during severe weather and related natural disasters.

Examples: tornado, thunderstorm, blizzard, extreme wind chill, flood, forest fire...

5-4-18 Recognize that climates around the world are ever changing, and identify possible explanations.

Examples: volcanic eruptions, ozone depletion, greenhouse effect, El Niño, deforestation...



Grade 5 Social Studies

People and Stories of Canada to 1867: A Foundation for Implementation 2005

Student Learning Outcomes Related to Sustainable Development

Skills

Active Democratic Citizenship

S-103 Make decisions that reflect care, concern, and responsibility for the environment.

Managing Information and Ideas

S-207A Use traditional knowledge to read the land.

Cluster 1 First Peoples

KL-017 Describe practices and beliefs that reflect First Peoples' connections with the land and the natural environment.

Cluster 2: Early European Colonization (1600 to 1763)

KL-019 Identify factors that influence the movement and settlement of Europeans in early Canada.

Include: natural environment, fur trade, military posts.

KE-051 Compare First Peoples' and European approaches to natural resource use in early Canada.

Examples: hunting and fishing, agriculture, trade, landholding and ownership...

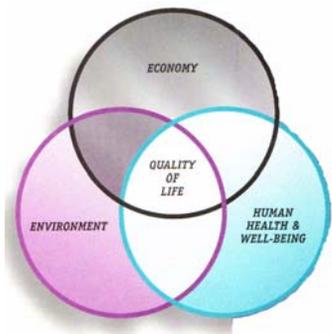
VE-015 Be willing to consider diverse approaches to resource and land use.

Cluster 3: Fur Trade

VL-007 Appreciate the significance of the land and natural resources in the development of Canada.

Cluster 4: From British Colony to Confederation

VC-002 Be willing to contribute to their groups and communities.



Grade 8 Physical Education/Health Education *Grades 5 to 8 Physical Education/Health Education: A Foundation for Implementation 2002*

Student Learning Outcomes Related to Sustainable Development

1. Movement

A.1.6 Appreciate and respect the natural environment while participating in physical activity.

S.1.8.C.1 **Apply functional use of selected activity-specific skills** (e.g., care and carrying of equipment, compass and map reading, star turn, snowplough...) **in alternate pursuits** (e.g., orienteering, hiking, skiing...).

2. Fitness Management

K.2.8.C.4 **Identify personal factors and preferences for choosing physical activities** (e.g., personal interests, influences of friends, appreciation of the outdoors, affiliation, competition, cooperation, fun...) **for fitness and health.**

3. Safety

K.3.8.A.3 **Justify reasons** (e.g., ease of movement; personal hygiene; prevention of injury, sunburn, frostbite, hyperthermia, hypothermia...) **for appropriate dress for selected physical activities.**

K.3.8.A.5a **Investigate potential safety risks inherent in selected alternative pursuits** e.g., climbing walls, in-line skating, downhill skiing, activities on ice...).

K.3.8.A.5b **Determine safe areas and opportunities for cycling and/or other similar activities in the community** (e.g., in-line skating, skateboarding, walking...).

K.3.8.B.1 **Evaluate the effectiveness of laws and policies that promote personal and community safety** (e.g. driving age, drinking/driving, boating, domestic violence, vandalism, shaken baby syndrome...).

K.3.8.B.4 **Demonstrate the ability to access valid health information, and health-promoting products and services available in the community** (e.g., doctors, public health nurses, health agencies and associations related to cancer, heart disease, sexuality education, alcoholism; youth advocates, help lines, school/community counselling programs, friendship centers, ombudsperson, the Internet...).

4. Personal and Social Management

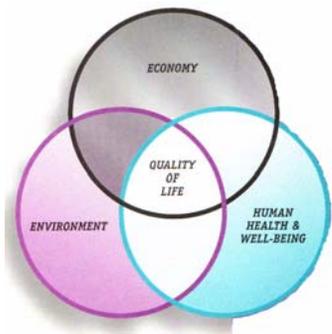
K.4.8.A.1 Examine the effects of stereotyping based on a variety of factors (e.g., gender, age, race, roles, media influences, body type, sexual orientation, source of income...), **and ways** (e.g., set/review personal and group norms, standards...) **to promote acceptance of self and others.**

5. Healthy Lifestyle Practices

K.5.8.B.2 Investigate different ways to increase physical activity in daily living as it relates to sustainable development (e.g., using stairs, cycling/walking to school to help the environment and to contribute to the health of society...).

K.5.8.B.3 Determine the degree to which technology has had an impact on personal health (e.g., personal fitness equipment/aids; prolonged exposure to technological devices and machines decreases physical activity; effect of media messages on body image...).

K.5.8.C.1b Explain influences (i.e. healthy eating, regular activity, media, healthy body image) **on growth and development during adolescence.**



Grade 8 Science

Grades 5 to 8 Science: A Foundation for Implementation 2000

Student Learning Outcomes Related to Sustainable Development

Cluster 1: Cells and Systems

8-1-02 Identify characteristics of living things, and describe how different living things exhibit these characteristics.

Include: composed of cells; reproduce; grow; repair themselves; require energy; respond to the environment; have a lifespan; produce wastes.

8-1-18 Research and describe disorders/diseases that affect body systems, and identify possible preventative measures.

Cluster 2: Optics

8-2-08 Provide examples of technologies that use electromagnetic radiation, and describe potential positive and negative impacts of their uses.

Examples: satellite dish, x-ray machine, light telescope, motion sensors, microwave ovens...

Cluster 4: Water Systems

8-4-05 Describe how the heat capacity of large bodies of water and the movement of ocean currents influence regional climates.

Examples: Gulf Stream effects, El Niño, lake effect...

8-4-11 Describe examples of human interventions to prevent riverbank or coastal erosion.

Examples: vegetation, reinforcement (concrete, boulders), piers, breakwaters...

8-4-12 Identify factors that can cause flooding either individually or in combination.

Examples: heavy snow pack, quick thaw, rain in spring, lack of vegetation to remove water through transpiration, frozen ground preventing absorption, agricultural systems, dams, diversions...

8-4-13 Provide examples of the way in which technology is used to contain or prevent damage due to flooding, and discuss related positive and negative impacts.

Examples: floodway, diversion, dike, levee ...

8-4-14 Identify sources of drinking water and describe methods for obtaining water in areas where supply is limited.

Examples: desalination, melting of ice, condensation...

8-4-15 Explain how and why water may need to be treated for use by humans.

Include: filtration, settling, chlorination, fluoridation.

8-4-16 Compare the waste-water disposal system within their communities to one used elsewhere.

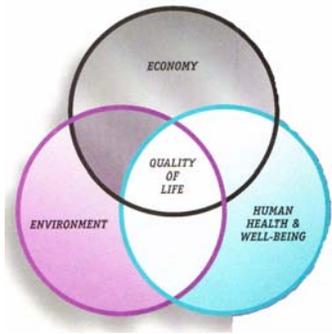
Include: process involved, environmental impact, cost.

8-4-17 Identify substances that may pollute water, related environmental and societal impacts of pollution, and ways to reduce or eliminate effects of pollution.

8-4-18 Identify environmental, social, and economic factors that should be considered in the management of water resources.

Examples: ecosystem preservation, employment, recreation, industrial growth, water quality...

8-4-19 Use the design process to develop a system to solve a water-related problem.



Grade 8 Social Studies

World History: Societies of the Past: A Foundation for Implementation 2006

Student Learning Outcomes Related to Sustainable Development

Skills

Active Democratic Citizenship

S-101 Use a variety of strategies to resolve conflicts peacefully and fairly.

Examples: clarification, negotiation, compromise...

S-103 Make decisions that reflect the principles of sustainable development.

S-105 Recognize bias and discrimination and propose solutions. Examples: racism, ageism, heterosexism...

Managing Information and Ideas

S-207A Use traditional knowledge to read the land.

Critical and Creative Thinking

S-311 Analyze prejudice, racism, stereotyping, and other forms of bias in the media and other information sources.

Cluster 1: Understanding Societies Past and Present

KI-005 Explain the concept of world view.

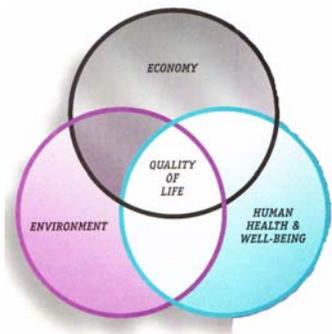
KL-022 Give examples of the influence of the natural environment on the development of societies.

VI-004 Be willing to consider differing world view.

VL-008 Appreciate the importance of sustaining the natural environment for future societies.

Cluster 2: Early Societies of Mesopotamia, Egypt, or the Indus Valley

KL-024 Give examples of the influence of the natural environment on ways of life in an early society of Mesopotamia, Egypt, or the Indus Valley.



Grade 10 Physical Education/Health Education Senior 1 and Senior 2 Physical Education/Health Education: A Foundation for Implementation 2004

1. Movement

A.1.6 Appreciate and respect the natural environment while participating in physical activity.

3-Safety

K.3.10.B.4 Investigate the contributions self and/or others can make to community/global health and sustainable development (*i.e., maintaining safe and healthy lifestyle practices, volunteering, reducing, reusing, recycling*).

5-Healthy Lifestyle Practices

K.5.10.E.1c Describe the importance of and conditions for a healthy pregnancy (e.g., avoid alcohol and tobacco, poor nutrition ...).

K.5.10.E.2 Analyze the components e.g. communication, decision making, sharing, managing sexual feelings and desires...) **in different case scenarios for building and maintaining healthy relationships** (e.g., friendships, dating, commitment, engagement, marriage, parenthood, cohabitating...).

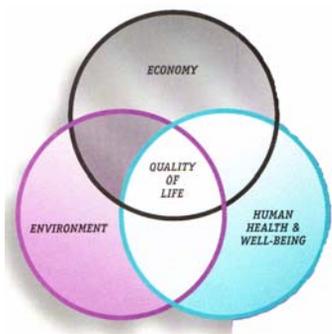
K.5.10.E.3a Examine sexuality as it is portrayed in media (e.g., fashion magazines, music videos, advertisements, movies, songs ...).

K.5.10.E.3b Examine the influences (e.g., family values, culture and religion, peer pressure, media images and advertising, substance use...) **on making decisions for responsible sexual behaviour.**

K.5.10.E.3c Review personal responsibilities and sources of support (e.g., parents, nurses, doctors, helplines, community health services, religious leaders, recommended books...) **with regard to sex-related health issues.**

K.5.10.E.4b Describe ways to prevent STIs to promote the health of society (e.g., practicing abstinence, using condoms, avoiding intercourse with infected victims, requesting blood tests for partners, maintaining monogamous relationships...).

S.5.10.A.5 Apply a decision-making/problem-solving process in case scenarios related to effective communication for building healthy relationships and demonstrating responsible sexual behaviours.



Grade 10 Science

Senior 2 Science: A Foundation for Implementation 2003

Student Learning Outcomes Related to Sustainable Development

Cluster 1: Dynamics of Ecosystems

10-1-01 Illustrate and explain how carbon, nitrogen, and oxygen are cycled through an ecosystem.

10-1-02 Discuss factors that may disturb biogeochemical cycles.
Include natural events, human activities

10-1-03 Describe bioaccumulation and explain its potential impact on consumers.
Examples: DDT, lead, dioxin, PCBs, mercury...

10-1-07 Discuss the potential consequences of introducing new species and of species extinction to an ecosystem.

10-1-10 Investigate how human activities affect an ecosystem and use the decision-making model to propose a course of action to enhance its sustainability.
Include: impact on biogeochemical cycling, population dynamics, and biodiversity

Cluster 2: Chemistry in Action

10-2-09 Discuss the occurrences of acids and bases in biological systems, industrial processes, and domestic applications.
Include safety and health considerations

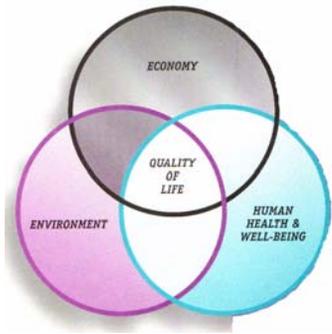
10-2-12 Investigate technologies that are used to reduce emissions of potential air pollutants.
Examples: catalytic converters in automobiles, regulation of vehicle emissions, elimination of CFCs from refrigerants and aerosol propellants...

Cluster 4: Weather Dynamics

10-4-06 Investigate the social, economic and environmental impact of a recent severe weather event.
Include related consequences on personal and societal decision-making

10-4-07 Investigate and evaluate evidence that climatic change occurs naturally and can be influenced by human activities.
Include: the use of technology in gathering and interpreting data

10-4-08 Discuss potential consequences of climate change.
Examples: changes in ocean temperature may effect aquatic populations, higher frequency of severe weather events influencing social and economic activities, scientific debate over nature and degree of change...



Grade 10 Social Studies

Geographic Issues of the 21st Century: Manitoba Curriculum Framework of Outcomes and a Foundation for Implementation 2006

Student Learning Outcomes Related to Sustainable Development

Skills

Active Democratic Citizenship

S-103 Promote actions that reflect principles of sustainable development.

S-105 Recognize and take a stand against discriminatory practices and behaviours.

S-107 Make decisions that reflect social responsibility.

Critical and Creative Thinking

S-306 Analyze prejudice, racism, stereotyping, and other forms of bias in the media and other information sources.

Cluster 1: Geographic Literacy

KL-017 Identify on a map of the world major population clusters and explain the relationship between population and global environment types.

KL-018 Explain the importance of stewardship in the preservation of the Earth's complex environment.

VL-005 Respect the Earth as a complex environment in which humans have important responsibilities.

Cluster 2: Natural Resources

KC-002 Describe sustainability issues related to natural resource extraction and consumption.

KG-035 Identify implications of more-developed countries extracting resources from less-developed countries.

Examples: social, political, economic, environmental...

VP-009 Be willing to consider the implications of personal choices regarding natural resources.

KI-004 Identify Aboriginal perspectives and rights regarding natural resources and their use.

Examples: perspectives-sacred, caretaking; resources-land claims, fishing and hunting rights, mineral rights...

KH-033 Identify factors that influence the changing use of natural resources over time.

Examples: technology, culture...

KP-041 Identify ways in which competing interests and needs influence control and use of the land and natural resources in Canada.

Examples: mining, forestry, water...

VI-003 Be willing to consider diverse views regarding the use of natural resources.

Cluster 3: Food from the Land

KL-023 Describe the impact of various agricultural practices on the physical environment.

Examples: soil erosion, water quality, soil fertility...

KH-034 Give examples of ways in which food production has changed over time.

Examples: soil conservation strategies, technological change...

KG-036 C3 Describe issues related to freshwater and saltwater food resources.

KG- 037 Give examples of the potential impact of climate change on food production.

KG-038 Identify issues related to scarcity and distribution of food.

KE- 043 Identify the changing nature of farming on the prairies and describe social and economic implications for communities.

KE-045 Identify issues related to genetic modification of plants and animals.

VL- 010 Be willing to consider the economic and political influence of their food choices.

Examples: food fashions, food aid, food shortages...

Cluster 4: Industry and Trade

KG- 039 Define the concept of globalization and identify related social issues.

KE-047 Identify factors that determine the location of industry.

Examples: energy, raw materials, transportation, labour, markets government policies...

KE-048 Use examples to describe the advantages and disadvantages of locating a manufacturing industry in a particular area.

KE- 049 Identify current issues related to industry and trade.

Include sustainable development, balance of trade.

VG-008 Be willing to consider the social and environmental impacts of their consumer choices.

VE-011 Be willing to consider the economic implications of their consumer choices.

Cluster 5: Urban Places

KI-007 Analyze urban social issues.

KL-029 Describe the impact of urbanization on Canadian ways of life.

KL-030 Describe urban environmental and economic issues.

Examples: land use, relationship to hinterland, infrastructure...

KL-031 Describe the role of urban planning and use examples to illustrate its importance.

KE-050 Use Canadian examples to describe the major functions of urban places.

Examples: administration, service, tourism, transportation...

KE-51 Identify issues related to urban growth and decline.

VE-012 Appreciate the interdependence between urban centres and hinterlands.



ESD CANADA

TODAY'S LEADERS CREATING A SUSTAINABLE TOMORROW!

ESD Canada brings together leaders from across Canada to support systemic change toward **Education for Sustainable Development** within the formal, non-formal and informal education systems.

ESD Canada addresses crosscutting issues of ESD including:

COMMUNICATION

Raising awareness of ESD

RESEARCH

Identifying, nurturing and disseminating ESD research

INNOVATION & LEADERSHIP

Sharing best practices in ESD policies and programs

"...people are able to do much more towards environmental stewardship, economic development and social justice when they work together."

- ASSISTANT PROFESSOR, UNIVERSITY OF REGINA

PROVINCIAL/TERRITORIAL EDUCATION FOR SUSTAINABLE DEVELOPMENT WORKING GROUPS

The Provincial/Territorial ESD Working Groups foster a culture of ESD in each jurisdiction. They engage leaders from public, private and civil society in supporting the regional advancement of formal, non-formal and informal ESD.

In 2008, ESD Canada and the Provincial/Territorial ESD Working groups engaged over 1,000 stakeholders and leveraged over \$3.0 million dollars to advance ESD programs across Canada. LSF serves as secretariat to ESD Canada.



"LSF and ESD Canada are in an optimal position to increase awareness of ESD and ultimately, provide a key leadership role for Canada in emerging ESD research and partnerships."

- MEMBER, SUSTAINABILITY EDUCATION IN NOVA SCOTIA FOR EVERYONE

