

**Environmental Education Scope & Sequence -
to support the development of new curriculum in Alberta -
ensuring Alberta students are environmentally literate
environmental stewards and global citizens
- June 2014 Draft -**

**This document has been reviewed by 200 environmental educators at the 2014 Earth Matters conference that included teachers, program providers, and academics.
This draft captures the majority of the input and feedback that was gathered.**

What people liked?

- The key concepts were very broad and seemed to encompass all aspects of environmental education – *“everything we thought about fit in somewhere”*.
- The key concepts were leading edge and will prepare students well for their future.
- The reflection of systems thinking is much needed in our world.
- That the focus started at the local in younger years and expanded to global for later grades.
- That the economy was mentioned throughout – understanding economic processes helps foster a better understanding of social practices.
- That this is a living document that is adaptive and will continue to evolve.
- Liked the use of ‘wonder’ as this indicates that we continue to learn and re-evaluate the natural world.

What would make the scope and sequence better (these have been addressed with some work still needed on indigenous ways of knowing and outdoor education at the higher grade levels)?

- The key concepts need to check on the age appropriateness as some seemed beyond the age of the students as they may not be achievable for that age level.
- Social and cognitive components are well presented but need to include more hands-on skills

- Need more critical thinking and creativity
- Some of the more outdoor education aspects – risk management, leadership skills
- Add more connection to careers
- Connections with community
- Reflection
- Influencing ways to be actively involved
- More indigenous knowledge and ways of knowing
- Connection to place and heritage – context for place

Other comments were directed more on the how of teaching that is not prescribed in curriculum

- Include illustrative examples especially for outdoor/experiential learning
- Can a percentage of time that students spend outdoors be included (e.g. 25% of class time is spent outdoors)
- Help teachers identify that outdoor education is part of daily education and not always a field trip (using their school grounds)
- Role of technology in outdoor/environmental education
- Include students engaging in research – specifically field studies
- Planning and time for teachers to take students outdoors
- Teachers will need support and smaller class sizes

Background

In 2012 ACEE created the Environmental Education Framework¹ on contract to Alberta Education, as part of its work to support in the development of cross-curricular competencies. This provided the larger context for how environmental education can be integrated across K-12 curricula.

During 2014 Alberta Education will work with school divisions in its curriculum prototyping process. Prototyping teams will each create a K-12 scope and sequence, and then will create ten learning outcomes for six core subject areas in each grade. The scope and sequence, and the learning outcomes, will also incorporate the cross-curricular competencies (appended) as well as benchmarks in literacy and numeracy.

¹ Can be downloaded at <http://abcee.org/albertaeducation/>

Scope refers to the breadth and depth of the concepts to be learned in a K–12 subject/discipline area, while **sequence** refers to the order in which this learning is to take place from Kindergarten to Grade 12. A well-built scope and sequence is rooted in what is developmentally appropriate for students in the particular subject/discipline area, ensures that concepts are scaffolded from concrete to abstract, and provides opportunities for both broad and deep learning.

The scope and sequence is developed from the essence statements for each subject/discipline area, outlines the subject/discipline area concepts to be developed, and provides the frame for the organization and the development of the learning outcomes in the programs of study. Both of these deliverables (scope and sequence, and learning outcomes) are required to also deliver on the cross-curricular competencies and literacy and numeracy benchmarks that are set out by Alberta Education.²

About this document

In this document we propose a scope and sequence for environmental education for K-12, condensing and aligning the work from our 2012 Framework so that it can be readily incorporated into the prototyping process. We identify three themes that, taken together, capture the scope of environmental education: Interdependence, Diversity, and Responsibility & Citizenship. In the tables that follow the scope and sequence of each theme is illuminated by the subthemes and key concepts for each grade grouping:

- We offer a short, italicized phrase that captures the **essence** of each theme
- We use bulleted points to further develop and frame the theme
- In the left hand column we propose sub-themes (or elements) that provide the **depth and breadth** embedded in each theme
- Each row then shows the **sequence** of key environmental education **concepts** (or benchmarks) students should understand as they progress through each grade level grouping (K-3, 4-6, 7-9, and 10-12).
- The content of these tables have been written to ensure they develop the cross-curricular competencies identified by Alberta Education, and also support the literacy and numeracy benchmarks.

What's Next?

To continue to support the curriculum prototyping process, we will....

1. Use this document to generate environmental education Learning Outcomes that are subject and grade specific. We've shown an example of what this will look like in a section following the scope and sequence tables.

² Alberta Education Prototyping Guide, August 2013

Environmental Education Scope & Sequence

The following tables indicate the depth, breadth and development of key environmental education concepts - and show how they relate to subject disciplines, develop cross-curricular competencies, and support literacy and numeracy.

<p>Theme 1: Interdependence - <i>Understanding how ecological and social systems and processes are interdependent and influence personal and collective wellbeing through interactions with the natural world.</i></p> <ul style="list-style-type: none"> • learning about ecological systems and processes • understanding how these are interconnected with social systems, technology and the economy • understanding how these interconnections influence personal wellbeing and healthy communities that are both environmentally and economically sustainable, locally and globally • developing a sense of wonder, curiosity, and oneness with the natural environment 				
Sub-Theme (Elements)	K-3 (identify, explore, examine, am aware, understand, describe)	4-6 (analyse, demonstrate, understand, value, analyse ways to take initiative)	7-9 (evaluate the/how, create plans of action, take responsibility)	10-12 (advocate, committed to, demonstrate leadership, take responsibility)
<p>1.1 Ecological Systems and Processes</p> <p>(Cross-Curricular Competencies)</p>	<p>Environments provide for the needs of all species and that there is constant change (stages/seasons).</p> <p>Diversity of living things is essential for healthy ecosystems. (A1,2; B1,2; D1; E1,2; F; G1,2; H1,2;)</p>	<p>Understanding living & non-living systems & processes and how they interact and adapt locally and in different bioregions.</p> <p>(A, B, D, G, I)</p>	<p>Understand how natural systems and species adapt and change as environmental conditions change over time locally, regionally and globally.</p> <p>(D1, D2, G, I)</p>	<p>Understand how global, regional and local influences affect complex adaptive living systems.</p> <p>(C1, D, E, F, G, I)</p>

Literacy	(K&U1, 2, 3; S1,2, 3)	(Aw2; K&U1, 2, 3; S1,2,3)	(Aw2; K&U1,2, 3; S1,2,3)	(Aw2; K&U1, 2, 3; S1,2,3)
Numeracy	(Aw1,2; K&U2)	(Aw1,2; K&U2)	(Aw1,2, K&U2)	(Aw1,2; K&U2)
Subject Integration	(Sc, M, A, LA)	(Sc, M, SS, A, LA,)	(Sc, M, SS, A, LA)	(Sc, SS, M, A, LA)
1.2 Social systems & technology	Learn how our social systems interact with each other and with non-human systems.	Learn how humans can live collaboratively with each other (intergenerational, multiculture and indigeneous) with non-human systems based on learning how natural systems operate. Understand sustainability is the integration of the environment, society and economy.	Learn how humans can improve their social systems and technology to adapt to the needs of humans and the non-human world to develop a sustainable society.	Learn how we can adapt through our social systems and technology to develop authentic socioecological interactions at local, regional, national and international levels. Understand how social, cultural, global, political, economic and technical systems, structures, beliefs and actions impact the functioning of the Earth’s biosphere and influence the capacity of people, both individually and collectively, to live sustainably.
Cross-Curricular Competencies	(A, B, D, G, I)		(A, B, C, D, G, I1, I2, I3)	(A, B, C, D, E, F, G, I)
Literacy	(Aw1,2; K&U1,2,3; S1,2,3,4)		(Aw1,2; K&U1,2,3; S1,2,3,4)	(Aw1,2; K&U1,2,3; S1,2,3,4)
Numeracy	(Aw1,2; K&U2)	(A, B, D, G, I1, I2, I3)	(Aw1,2; K&U2)	(Aw1,2; K&U2)
Subject Integration	(SS, W, A, LA)	(Aw1,2; K&U1,2,3; S1,2,3,4)	(SS, Sc, W, A, LA)	(SS, W, A, LA)

		(Aw1,2; K&U2) (SS, Sc, W, A, LA)		
1.3 Wellbeing through interconnections	Develop a sense of wonder, curiosity, and belonging with the natural environment through direct, personal experience that helps develop self-esteem and confidence.	Develop environmental experiences and connections with the natural world based on wonder, curiosity and belonging, personally and collectively, in daily living and working conditions that helps develop locus of control.	Develop internal locus of control, through personal development of self-esteem, a positive self-image, confidence and efficacy through positive social-environmental interactions based on wonder, curiosity and belonging.	Understand how our physical, emotional and mental wellness is affected by healthy physical and emotional interactions with the natural environment based on wonder, curiosity and belonging; and how we can positively affect environmental health.
(Cross-Curricular Competencies)	Reflection could be here			
Literacy		(A1, 2; B1, 2; E1, 2; F; G1,2; H1, 2; I3, J)	(A1, 2; B1, 2; E1, 2; F; G1, 2; H1, 2; I3, J)	(A1, 2; B1, 2; E1, 2; F; G1, 2; H1, 2; I3, J)
Numeracy	(A1, 2; B1, 2; E1, 2; F; G1, 2; H1, 2; I3, J)	(Aw2; K&U1, 2, 3; S3)	(Aw2; K&U1, 2, 3; S3)	(Aw2; K&U1, 2, 3; S3)
Subject Integration	(Aw2; K&U1, 2,3; S3)	(Aw1, 2; K&U2)	(Aw1, 2; K&U2)	(Aw1, 2; K&U2)
	(Aw1, 2; K&U2)	(W, SS, Sc, A, LA)	(W, SS, Sc, A, LA)	(W, SS, Sc, A, LA)
	(W, SS, Sc, A, LA)			

Theme 2: Diversity and Place - Valuing the significance of biological and cultural diversity as well as diverse perspectives both locally and globally with an understanding of changes over time as conditions change

- considering and honouring biodiversity and cultural diversity as well as diverse perspectives and worldviews regionally and globally
- developed through reflecting on, comprehending, negotiating, communicating and debating personal as well as others' fundamental beliefs, perceptual orientations, ethical principles and values
- identifying perceptions, feelings and values and clarifying beliefs, ethics and actions
- developing a sense of place, both locally and globally, and identifying how we adapt and change over time as conditions change

Sub-Theme (Elements)	K-3	4-6	7-9	10-12
<p>2. 1 Biological and cultural diversity; and diverse perspectives</p> <p>Cross-Curricular Competencies</p> <p>Literacy</p> <p>Numeracy</p> <p>Subject Integration</p>	<p>Recognize that diversity in our natural world and in our communities build stronger and resilient communities.</p>	<p>Through natural exploration, defend biological diversity and diverse perspectives in relating to the environment.</p> <p>Understand that diversity leads to strength and resilience socially, culturally and environmentally.</p>	<p>Adapt, develop and implement innovative ways of interacting with the environment in response to diverse perspectives in relation to the environment - regionally, socially, culturally and globally.</p>	<p>Compare and contrast the impact of diverse perspectives and worldviews related to social, cultural, global and environmental issues.</p> <p>Spend time in nature on ways to bring into discussions an ecological perspective, potential rights of nature, or how nature solves a similar issue.</p>

<p>2.2 Perceptions, feelings, ethics values and actions</p> <p>Cross-Curricular Competencies</p> <p>Literacy</p> <p>Numeracy</p> <p>Subject Integration</p>	<p>Accept diverse feelings, ways of knowing, perceiving and valuing the environment.</p>	<p>Generate new understandings, ideas and values that incorporate biological and social diversity and share these ideas with others.</p>	<p>Facilitate common ground for collaboration on a project, by recognizing and accommodating diverse ways of knowing, perceptions, feelings, values, ethics and behaviours towards ecosystems and the biosphere.</p>	<p>Seek greater understanding through reflection of the beliefs, ethics, values, needs and wants of others and the natural world in order to enrich an understanding of the world, and debate others' beliefs, perceptual orientations, ethical principles and values.</p>
<p>2.3 Sense of place, local to global, and changes over time as conditions change</p>	<p>Explore their local social and ecological community to develop a sense of place.</p>	<p>Explore their local social and ecological community to identify unique aspects of their community both ecologically and socially to develop an understanding of diversity and changing conditions.</p>	<p>Reflect and communicate on the changes that have occurred over time in their local region, specifically from an aboriginal perspective.</p>	<p>Compare the unique aspects of their community and the changes and conditions that have occurred with other regions in Canada and around the world.</p>

Theme 3: Responsibility and Citizenship - *Designing, creating and implementing viable solutions to take responsible action as global citizens and environmental stewards to create a sustainable future*

- designing and engaging in responsible and innovative actions to become engaged global citizens and environmental stewards that contribute to a sustainable future
- identifying trends and patterns to explore options, and work collaboratively to develop and implement action plans for a preferred future

Sub-Theme (Elements)	K-3	4-6	7-9	10-12
3.1 Systems Thinking	<p>Recognize how individual actions affect others, human and non-human, and identify if actions need to change.</p> <p>Believe personal actions can have a positive effect in creating positive change in a larger system.</p>	<p>Use a systems model to identify major causes of observed trends and to evaluate existing or past responses that impacted the system.</p> <p>Create a model of a system and use it to demonstrate how change to part of the system affects the whole system.</p>	<p>Identify significant processes and relationships in a system from a wide or big picture view of sustainability. Incorporate multiple variables from social, economic and environmental imperatives</p> <p>Explore options for making a change, identifying available resources and constraints, seeking consensus, and developing an agreed upon action and plan, implement the action plan and reflect and evaluate its effectiveness.</p>	<p>Use a systems model to identify and provide reasons for the most concerning trends, to critically evaluate past policy and management responses to the issue, and to identify and evaluate possible leverage responses that address the trends.</p> <p>Propose and implement a course of action to engage effective leverages for change considering social, economic and environmental parameters and reflect and evaluate its effectiveness.</p>
3.3 Designing for the future	<p>Predict events and changes based on trends and patterns that have been personally and socially experienced and use</p>	<p>Generate ideas for strategies, environments and products that reflect a preferred future in relation to emerging social</p>	<p>Identify continuities, trends and patterns and use this information to develop innovations for a preferred future and illustrate the</p>	<p>Backcast from the preferred future back to the present to generate ideas for behaviours, strategies, environments and products</p>

	<p>creativity and imagination to design products and environments that respond to people’s needs that reflect a view of their personal future.</p> <p>Demonstrate flexibility by adjusting designs and actions as a result of feedback and reflection.</p>	<p>and environmental issues.</p> <p>Use a systems approach to identify and analyze potential future impacts of designs and actions on people and environments.</p> <p>Envision preferred futures that respond to emerging social and environmental issues based on identified continuities, trends and patterns.</p>	<p>impacts of the innovation on environmental, social and economic systems.</p> <p>Build detailed future scenarios that support personal values in relation to global and intergenerational equity and ecosystem health.</p>	<p>needed to create the preferred future.</p> <p>Develop an action plan to develop an innovative product or strategy that creates a change in behaviour.</p> <p>Anticipate and influence developments in science, technology and design in relation to cultural, economic and environmental imperatives.</p>
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Example of our next step: Environmental Education Learning Outcomes

On this page we demonstrate the next step we'll take: we use one of our three themes (Interdependence) and one grade level grouping (Kindergarten to Grade 3) to create relevant environmental education learning outcomes.

1.1 Ecological Systems & Processes:

- Environments provide for the needs of all species and how they change with the seasons.
- Diversity of living things is essential for healthy ecosystems.

Science K: I compare and contrast the similarities and differences between living and non-living systems.

Science 1: I explore how living and non-living systems work and interact.

Science 2: I investigate with others what species needs are and how they are provided for.

Science 3: I create with others the conditions for healthy natural environments in my community.

Cross-Curricular Competencies: (A1,2; B1,2; D1; E1,2; F; G1,2; H1,2; I3)

Literacy: (K&U1, 2, 3; S1,2, 3)

Numeracy: (Aw1,2; K&U2)

Subjects: (Sc, Math, Art, LA)

1.2 Social Systems & Technology:

- Human systems interact with each other and depend on non-human systems for the health of the biosphere and all species.

Social Studies K: I explore how human systems interact with non-human systems.

Social Studies 1: I imagine and create new ways to address human needs based on learning from the natural world.

Social Studies 2: I explore how social systems need to interact positively with non-human systems for the health of the biosphere and all species.

Social Studies 3: I develop new ways to interact socially, economically and technically based on learning how natural systems operate.

Cross-Curricular Competencies: (A1, 2; B1,2; C; D1; E1,2; F; G1,2; H1,2; I1,2,3)

Literacy: (Aw1, 2; K&U1, 2, 3; S1, 2, 3, 4)

Numeracy: (Aw1, 2; K&U2)

Subjects: (SS, Sc, W, A, LA)

1.3 Wellbeing & Interconnections:

- Develop a sense of wonder, curiosity, and oneness with the natural environment.

Wellbeing K: I respond positively with wonder to time spent in natural environments.

Wellbeing 1: I discover new ways to enjoy spending time in nature independently and with others.

Wellbeing 2: I evaluate how to improve my and other's health and wellbeing through positive interactions with the natural world.

Wellbeing 3: I am aware of how different environments affect me and I seek out ways to connect with the natural world, individually and collectively.

Cross-Curricular Competencies: (A1, 2; B1, 2; E1, 2; F; G1, 2; H1, 2; I3, J)

Literacy: (Aw2; K&U1, 2, 3; S3)

Numeracy: (K&U2)

Subjects: (W, Sc, SS, A, LA)

Appendices

Cross-curricular Competencies defined by Alberta Education

A: Know how to learn—to gain knowledge, understanding or skills through experience, study and interaction with others

- A1 Develop a resourceful and resilient learner identity through reflective practices
- A2 Optimize the development of new knowledge, understanding and skills through experiences, interaction and exploration

B: Think critically—conceptualize, apply, analyze, synthesize and evaluate to construct knowledge

- B1 Cultivate abilities to think critically.
- B2 Develop qualities of critical thinking.

C: Identify and solve complex problems

- C1 Generate solutions to complex problems.

D: Manage information—access, interpret, evaluate and use information effectively, efficiently, and ethically

- D1 Understand, critically interpret and respectfully use information.
- D2 Advocate and practise safe, legal and ethical management of information and technology.

E: Innovate—create, generate and apply new ideas or concepts

- E1 Develop attitudes that foster creativity and innovation.
- E2 Create, generate and apply innovative concepts.

F: Create opportunities—through play, imagination, reflection, negotiation and competition—with an entrepreneurial spirit

- F1 Create opportunities to benefit communities.

G: Apply multiple literacies—reading, writing, mathematics, technology, languages, media and personal finance

- G1 Attain broader and deeper understandings through multiple literacies.
- G2 Engage in multiple literacies through tools and resources used to store, create or deliver information.

H: Demonstrate good communication skills and the ability to **work cooperatively** with others

- H1 Communicate effectively or empathetically with audiences of diverse backgrounds.
- H2 Build community through collaboration, leadership and valuing diversity.

I: Demonstrate global and cultural understanding—considering the economy and sustainable development

- I1 Understand economic, environmental and political aspects of interconnections and issues.
- I2 Value the social and cultural diversity of communities
- I3 Take personal responsibility as a local and global contributor and leader, and as an environmental steward.

J: Identify and apply career and life skills—through personal growth and well-being

- J1 Take personal responsibility to identify and apply career and life skills through personal growth and well-being.

Subject Disciplines

Art (A), Language Arts (LA), Mathematics (M), Science (Sc), Social Studies (SS), Wellness (W)

Literacy

Awareness (Aw), Knowledge & Understanding (K&U), Strategies (S)

Numeracy

Awareness (Aw), Knowledge & Understanding (K&U), Strategies (S)

Environmental Education Curricular emphasis

Environmental education and sustainability education are seeing a shift from a focus on just issues and trying to reduce our footprint to including interconnections – a sense of oneness with the natural world, honouring diversity, and helping learners to think in the context of systems, futures and design thinking to envision and develop a sustainable world. Central to this work is a consideration that the emphasis placed on each element will change from K-12, recognizing that although students at K-3 are capable of higher cognitive, affective and psychomotor abilities, environmental education learning that is sensitive to different developmental levels.

Grade Level Ranges	Major Emphasis	Minor Emphasis
K-3	Environmental sensitivity Ecological foundations	Issues and values Investigation and evaluation Action skills
4-6	Environmental sensitivity Ecological foundations Issues and values	Investigation and evaluation Action skills
7-9	Ecological foundations Issues and values Investigation and evaluation Action skills	Environmental sensitivity
10-12	Issues and values Investigation and evaluation Action skills	Environmental sensitivity Ecological foundations

Emphasis of environmental education elements at grade level groupings (adapted from Volk, 1993)