

**W a s h i n g t o n   S t a t e**

**K - 12**

**Integrated  
Environmental  
and Sustainability**

**Learning Standards**

**September 2009**



**Randy I. Dorn**  
State Superintendent of  
Public Instruction





# **Washington State K-12 Integrated Environmental and Sustainability Education Learning Standards**

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Dear Educators, Community Partners, Parents, and Students:

Our state's economy and the well-being of its people depend upon a healthy environment. Washington contains three beautiful national parks, exceptional natural resources, and many biologically-rich bodies of water. We are home to several internationally recognized businesses, industries, and foundations with a sustainability and "green jobs" focus. We are extremely fortunate to live, work, learn, and play in a state that places a high value on environmental stewardship and sustainability.

Our strong environmental ethic extends to the education system. State rule enacted in 1991 (Washington Administrative Code 392-410-115, "Mandatory areas of study in the common school") requires that "instruction about conservation, natural resources, and the environment ... be provided at all grade levels in an interdisciplinary manner through science, the social studies, the humanities, and other appropriate areas with an emphasis on solving the problems of human adaptation to the environment."

To support districts in implementing this requirement, in 2009 I adopted the Washington State K-12 Integrated Environmental and Sustainability Learning Standards. These learning standards describe what all students should know and be able to do to be environmentally and sustainability literate. Consistent with the intent of the law governing environmental education in Washington State, these standards are intended to be integrated into core content areas and across all grade levels.

The purpose of the standards is to provide strong support for students, parents, teachers, and the broader community by guiding the alignment and integration of environmental and sustainability content with curriculum, instruction, and assessment. My staff worked closely with educators from across the state to develop these standards, and they are now working to provide support for implementing the K-12 Integrated Environmental and Sustainability Learning Standards.

I encourage districts to access the K-12 Integrated Environmental and Sustainability Learning Standards resources and supports available from OSPI ([www.k12.wa.us/EnvironmentSustainability](http://www.k12.wa.us/EnvironmentSustainability)) and its education and business partners to ensure that all our students are well-prepared for the challenges and opportunities of the 21<sup>st</sup> Century.

Sincerely,

Randy I. Dorn  
State Superintendent  
of Public Instruction



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## I. Overview

Environmental and Sustainability Education offers a rich and meaningful context for integrated teaching and learning. The Washington State K-12 Integrated Environmental and Sustainability Education Learning Standards describe what all students should know and be able to do in the area of Environmental and Sustainability Education. Consistent with the intent of the law governing environmental education in Washington State, these standards are intended to be integrated into core content areas and across all grade levels.

Washington State has identified three broad overarching standards that are specific to Environmental and Sustainability Education. Unlike core content standards in Washington State, these standards do not include specific grade level expectations. Instead, included is an alignment of the Integrated Environmental and Sustainability Education Learning Standards with Washington K-12 science and social studies standards. These new standards also serve as a meaningful and engaging context for mathematics, reading, writing, communications, the arts, health and fitness, and world languages.

Additionally, the Integrated Environmental and Sustainability Education Learning Standards align with the state's Indian Education curriculum, "Since Time Immemorial: Tribal Sovereignty in Washington State." Environment and sustainability are key elements currently integrated into this powerful curriculum.

The purpose of this document is to provide strong support for students, parents, teachers, and the broader community by guiding the alignment and integration of environmental and sustainability content with curriculum, instruction, and assessment.

### **Phase Two – Examples and Models of Environmental and Sustainability Education**

Phase two of this work will involve providing specific examples and models of how the Integrated Environmental and Sustainability Education Learning Standards and the aligned core content standards can be met through specific lessons, units, and schoolwide programs. When completed, this information will be available on the Office of Superintendent of Public Instruction (OSPI) website.

## II. Background

In 1990, the State Board of Education created a rule defining environmental education as part of Basic Education and mandating its instruction in public school at all grade levels in all subject matters. WAC 392-410-115, Subsection (6) reads, "Pursuant to RCW 28A.230.020, instruction about conservation, natural resources, and the environment shall be provided at all grade levels in an interdisciplinary manner through science, the social studies, the humanities, and other appropriate areas with an emphasis on solving the problems of human adaptation to the environment."

In response to this legislation, the Office of Superintendent of Public Instruction created "Environmental Education Guidelines for Washington Schools" (EE Guidelines), with the most recent update to the EE Guidelines occurring in 2000. Since the last update, there has been significant development in learning standards at both the state and national level. In 1993, Washington State began developing grade level expectations (GLEs) in the core content areas. More recently, new and revised core content standards have been adopted in Washington State for mathematics (2008), social studies (2008), health and fitness (2008), educational technology (2008), and science (2009).

At the national level, in 2004 the North American Association for Environmental Education (NAAEE) updated the NAAEE Guidelines for Excellence K-12 Student Learning Standards. In 2008, the U.S. Partnership for Education for Sustainable Development (USPESD) developed Education for Sustainability K-12 Student Learning Standards. Additionally, there is much attention today on the role of K-12 learning in moving our country forward in the area of sustainable design and technology.

These trends and recent developments point to the critical need to create a set of Washington State K-12 Integrated Environmental and Sustainability Education Learning Standards that are research-based, interdisciplinary, and forward-thinking. These new standards reflect current research and emerging practices in the field of Environment and Sustainability Education.

### III. Process and Criteria for Development of the K-12 Integrated Environmental and Sustainability Education Learning Standards

The process for developing these standards began in April of 2008 with a review of existing state, national, and international environmental and sustainability education standards. The review and report was provided by an independent consultant, Facing the Future (a non-profit global sustainability education organization). The report was completed in June of 2008 and is available on the OSPI website at <http://www.k12.wa.us/curriculumInstruct/EnvironmentSustainability>.

The Office of Superintendent of Public Instruction convened a committee of teachers, administrators, and community educators to develop the Washington State K-12 Integrated Environmental and Sustainability Education Learning Standards. A draft document was produced in February of 2009 by the committee and underwent a two-month public review with comments gathered through an online survey. In addition to public review, the OSPI Curriculum Advisory and Review Committee reviewed the standards at two meetings in April and June of 2009. The Integrated Environmental and Sustainability Education Learning Standards were also reviewed by state and national content experts and cultural bias and sensitivity experts. Based on this comprehensive review, the Environmental and Sustainability Education Learning Standards committee revised and finalized the document in July of 2009.

The following criteria guided the development of the Integrated Environmental and Sustainability Education Learning Standards. The standards were designed to be:

- **Interdisciplinary** – Applicable in the teaching of multiple subject areas in an integrated manner.
- **Inspirational & Transformational** – Encourages exceptional teaching and learning that promotes the transformation of education towards meaning, engagement, and relevancy.
- **Research-Based** – Grounded in current education and content research.
- **Grade Appropriate** – Suitable for all grade levels from kindergarten through 12<sup>th</sup> grade.
- **Clear and Useable** – Understandable and helpful to educators in guiding the selection of materials and development of curricular units that support student opportunities to apply their learning.

- **Realistic** – Teachable for all teachers and achievable for all students.
- **Measureable and Assessable** – Allows for formative and summative assessments.

## IV. Assessment

Because of its real-world, project-based application, Environmental and Sustainability Education offers excellent opportunities for authentic assessment. It is not intended for there to be a separate assessment of student learning in Environmental and Sustainability Education. Rather, these standards can be a tool to demonstrate student learning within core content areas. Environmental and Sustainability Education is required in Washington State to be taught across all grade levels in an interdisciplinary manner, therefore, the assessment of how well students meet these standards should be integrated into core content assessments, where appropriate. Educators can determine whether their present curricula and assessments are already aligned with these standards. For example, Environmental and Sustainability Education offers excellent content and context for Classroom-Based Assessments in social studies and the arts.

## V. Integrated Environmental and Sustainability Education Learning Standards

The standards indicate what students should know and be able to do in three areas of Environmental and Sustainability Education. Although each Integrated Environmental and Sustainability Education Learning Standard is distinct unto itself, they are interrelated and ideally would inform teaching and learning concurrently. The Integrated Environmental and Sustainability Education Learning Standards address the following areas:

- **Standard 1: Ecological, Social, and Economic Systems**
- **Standard 2: The Natural and Built Environment**
- **Standard 3: Sustainability and Civic Responsibility**



## Standard 1: Ecological, Social, and Economic Systems

**Students develop knowledge of the interconnections and interdependency of ecological, social, and economic systems. They demonstrate understanding of how the health of these systems determines the sustainability of natural and human communities at local, regional, national, and global levels.**

### Context and Background for Standard 1:

For the purposes of these standards, sustainability is defined as “meeting the needs of the present without compromising the ability of future generations to meet their needs while ensuring long-term ecological, social, and economic health.”

The most well-known definition of sustainability, “meeting the needs of the present without compromising the ability of future generations to meet their own needs,” is from the *Brundtland Report*, a product of a 1989 United Nations commission on development.

Many indigenous cultures are strongly rooted in the values of sustainability. For example, the Iroquois and other Native Americans have a tradition that asks, “What impact will this decision have on the seventh generation?” This value speaks to the intergenerational equity aspect of sustainability (how present decisions and actions affect future generations).

An essential element of sustainability is the interconnected nature of ecological, economic, and social systems. Interconnections and interdependency are distinct from each other in this standard. This distinction exists because while all natural and human systems are *interconnected* and may affect each other, not all are *interdependent*, requiring each other for survival.

Ecological systems encompass the living (biotic) and the non-living (abiotic) components of an environment. Social systems refer to human interactions, culture, and politics, with an emphasis on equity and fairness. Economic systems refer to the production, distribution, and consumption of resources including attention to economic equity and the fair distribution of opportunities and impacts.

## Standard 2: The Natural and Built Environment

**Students engage in inquiry and systems thinking and use information gained through learning experiences in, about, and for the environment to understand the structure, components, and processes of natural and human-built environments.**

### Context and Background for Standard 2:

For the purpose of this standard, “the environment” is broadly defined as the physical world, including living and nonliving components, ranging from pristine natural places to those heavily influenced by humans (e.g., rural landfill, forested areas, and densely populated urban environments).

Standard 2 encompasses thinking critically about how the human-built environment can be designed or modified to promote ecological health and better serve quality of life for all humans.

“Systems thinking” is an approach to problem solving that facilitates the analysis and understanding of complex phenomena. This approach considers the component parts of a system in the context of relationships with each other and with other systems, rather than in isolation. Systems thinking helps illustrate how events may be separated by distance and time, and that small catalytic events can cause large changes in complex systems.

The term “in, about, and for the environment” refers to learning that takes place *in* the environment (e.g., outdoor education), learning that is *about* the environment and environmental issues (e.g., loss of biodiversity, climate change, and water quality), and learning *for* conservation of the natural environment (e.g., service projects such as stream or parkland restoration).

Standard 2 promotes a sense of place through which students feel connected to and appreciate where they live. The standard encourages learning outside the formal classroom walls. These settings include school grounds, parks, streets, wilderness, local streams or beaches, community gardens or farms, community centers, museums, industrial areas, city landfills, and local businesses. Bringing the environment into the classroom helps students meet this standard. This may include using examples and artifacts from the local environment, considering the classroom itself as an environment, and inviting community members into the classroom.

### **Standard 3: Sustainability and Civic Responsibility**

**Students develop and apply the knowledge, perspective, vision, skills, and habits of mind necessary to make personal and collective decisions and take actions that promote sustainability.**

#### Context and Background for Standard 3:

A key aspect of sustainability is the impact of one’s decisions and actions on current and future generations. The intent of this standard is for students to apply the knowledge and experiences referred to in Standards 1 and 2 by taking an active role as responsible citizens and creating positive solutions for present and future generations.

Consideration of multiple perspectives allows for a wider range of possible solutions. Students should be able to envision a world that is sustainable, and articulate the changes that would be needed to achieve their vision. Necessary skills include communication, collaboration, and imagination. Desirable *habits of mind* include flexibility, commitment, appreciation, humor, confidence, and determination.

## VI. Alignment with K-12 Science and Social Studies Standards

This section includes an alignment of the Integrated Environmental and Sustainability Education Learning Standards with Washington State K-12 standards for science and social studies. There are separate charts for each grade band (K-1, 2-3, 4-5, 6-8, and 9-12). The Integrated Environmental and Sustainability Education Learning Standard is in the left-hand column. The middle column includes the EALR (Cross-cutting Concept & Ability or Domain), Big Idea, Core Content, and Content Standards from the Washington State K-12 Science Learning Standards with which the Integrated Environmental and Sustainability Education Learning Standards are the most closely aligned. The Science content standard is represented in the middle column by the 4-digit reference code that is associated with content standard for that grade band for science. Users must refer to the Washington State K-12 Science Learning Standards document to access the detail of the content standards and associated performance expectation. The last column includes the Washington State Social Studies Grade Level Expectations (GLEs) with which the Integrated Environmental and Sustainability Education Learning Standards are most closely aligned.

While this alignment is by no means exhaustive, the intent of this section is to highlight the science and social studies standards that most obviously align with the Integrated Environmental and Sustainability Education Learning Standards. Teachers and other educators are encouraged to review the entire sets of Washington State K-12 Science Learning Standards and Social Studies Grade Level Expectations for other potential alignments with the Integrated Environmental and Sustainability Education Learning Standards.

The alignment included here offers a starting point for using Environmental and Sustainability Education as an integrating context. As educators begin and build on this work, they will likely recognize and be able to apply an integrated approach with additional core content standards.

While this document does not include a detailed alignment with other content areas, Environmental and Sustainability Education can serve as an engaging and meaningful context for mathematics, reading, writing, communications, the arts, health and fitness, and world languages. Section VII includes examples of how Environmental and Sustainability Education aligns with, and can be readily integrated into the other content areas.

## Environmental & Sustainability Education (ESE) Alignment with Science and Social Studies

<b>Grades K-1: ESE Alignment</b>		
<b>ESE Standard</b>	<b>Science Standard</b> Crosscutting Concept & Ability (CCA), Domain (D), Big Idea (BI), Core Content (CC), Content Standard	<b>Social Studies Standard</b> EALR, Component, Grade Level Expectation
<p><b>Standard 1: Ecological, Social, and Economic Systems</b> Students develop knowledge of the interconnections and interdependency of ecological, social, and economic systems. They demonstrate understanding of how the health of these systems determines the sustainability of natural and human communities at local, regional, national, and global levels.</p>	<p><b>EALR 1: Systems (CCA) Part-Whole Relationships (CC)</b> Identify parts of living and non-living systems. <b>SYSA</b></p> <p><b>EALR 4: Life Science (D) Ecosystems (BI) Habitats (CC)</b> Places that meet the daily needs of plants and animals. <b>LS2A, LS2B, LS2C</b></p>	<p><b>EALR 2: Economics 2.1 Understands that people have to make choices between wants and needs and evaluate the outcomes of those choices.</b> 2.1.1 Understands that when individuals and families make choices about meeting their needs and wants, something is gained and something is given up. (Gr. 1)</p>
<p><b>Standard 2: The Natural and Built Environment</b> Students engage in inquiry and systems thinking and use information gained through learning experiences in, about, and for the environment to understand the structure, components, and processes of natural and human-built environments.</p>	<p><b>EALR 2: Inquiry (CCA) Making Observations (CC)</b> Answer questions by explaining observations of the natural world. <b>INQA, INQC, INQC, INQE, INQF</b></p> <p><b>EALR 4: Earth and Space Science (D) Earth Systems, Structures, and Processes (BI) Properties and Change (CC)</b> Earth materials have various properties. <b>ES2A</b></p> <p><b>EALR 4: Life Science (D) Ecosystems (BI) Habitats (CC)</b> Places that meet the daily needs of plants and animals. <b>LS2A, LS2B, LS2C</b></p>	<p><b>EALR 3: Geography 3.1 Understands the physical characteristics, cultural characteristics, and location of places, regions, and spatial patterns on the Earth's surface.</b> 3.1.2 Understands the physical characteristics of places in the community. (Gr. 1)</p> <p><b>EALR 3: Geography 3.2 Understands human interaction with the environment.</b> 3.2.1 Understands that the way families live is shaped by the environment. (Gr. 1) 3.2.3 Understands why families make decisions to move. (Gr. 1)</p> <p><b>EALR 5: Social Studies Skills 5.2 Uses inquiry-based research.</b> 5.2.1 Understands how questions are used to find out information. (Gr. 1)</p>

**Grades K-1: ESE Alignment**

<b>ESE Standard</b>	<b>Science Standard</b> Crosscutting Concept & Ability (CCA), Domain (D), Big Idea (BI), Core Content (CC), Content Standard	<b>Social Studies Standard</b> EALR, Component, Grade Level Expectation
<p><b>Standard 3: Sustainability and Civic Responsibility</b> Students develop and apply the knowledge, perspective, vision, skills, and habits of mind necessary to make personal and collective decisions and take actions that promote sustainability.</p>	<p><b>EALR 3: Application (CCA) Tools and Materials (CC)</b> Use simple tools and materials to solve problems in creative ways. <b>APPA, APPC</b></p>	<p><b>EALR 5: Social Studies Skills 5.3 Deliberates public issues.</b> 5.3.1 States own viewpoints and listens to viewpoints of others. (Gr. K)</p>

## Grades 2-3: ESE Alignment

<b>ESE Standard</b>	<b>Science Standard</b> Crosscutting Concept & Ability (CCA), Domain (D), Big Idea (BI), Core Content (CC), Content Standard	<b>Social Studies Standard</b> EALR, Component, Grade Level Expectation
<p><b>Standard 1: Ecological, Social, and Economic Systems</b> Students develop knowledge of the interconnections and interdependency of ecological, social, and economic systems. They demonstrate understanding of how the health of these systems determines the sustainability of natural and human communities at local, regional, national, and global levels.</p>	<p><b>EALR 1: Systems (CCA)</b> <b>Role of Each Part in a System (CC)</b> See how parts of objects, plants, and animals are connected and work together. <b>SYSA, SYSB, SYSC, SYSD, SYSE</b></p> <p><b>EALR 4: Life Science (D)</b> <b>Ecosystems (BI)</b> <b>Changes in Ecosystems (CC)</b> Changes in ecosystems affect living populations and the non-living elements of a defined area. <b>LS2A, LS2B, LS2C, LS2D</b></p>	<p><b>EALR 2: Economics</b> <b>2.1 Understands that people have to make choices between wants and needs and evaluate the outcomes of those choices.</b> 2.1.1 Understands that members of the community make choices among products and services that have costs and benefits. (Gr. 2)</p> <p><b>EALR 2: Economics</b> <b>2.2 Understands how economic systems function.</b> 2.2.1 Understands the basic elements of a community's economic system, including producers, distributors, and consumers of goods and services. (Gr. 2) 2.2.1 Understands how the economic systems of groups are influenced by laws, values, and customs. (Gr. 3)</p>
<p><b>Standard 2: The Natural and Built Environment</b> Students engage in inquiry and systems thinking and use information gained through learning experiences in, about, and for the environment to understand the structure, components, and processes of natural and human-built environments.</p>	<p><b>EALR 2: Inquiry (CCA)</b> <b>Conducting Investigations (CC)</b> Carry out investigations by using instruments, observing, recording, and drawing evidence-based conclusions. <b>INQA, INQB, INQC, INQD, INQE, INQF, INQG</b></p> <p><b>EALR 4: Physical Science (D)</b> <b>Energy: Transfer, Transformation, and Conservation (BI)</b> <b>Forms of Energy (CC)</b> Energy comes in different forms. <b>PS3A</b></p> <p><b>EALR 4: Earth and Space Science (D)</b> <b>Earth Systems, Structures, and Processes (BI)</b> <b>Water and Weather (CC)</b> Water is essential in Earth systems. This is seen by observing and recording changes in weather patterns and Earth formations. <b>ES2A, ES2B, ES2C</b></p>	<p><b>EALR 3: Geography</b> <b>3.2 Understands human interaction with the environment.</b> 3.2.1 Understands that people in communities affect the environment as they meet their needs and wants. (Gr. 2) 3.2.1 Understands how the environment affects cultural groups and how cultural groups affect the environment. (Gr. 3)</p> <p><b>EALR 5: Social Studies Skills</b> <b>5.1 Uses critical reasoning skills to analyze and evaluate positions.</b> 5.1.1 Understands multiple points of view on issues in the community. (Gr. 2) 5.1.2 Evaluates if information is clear, specific, and detailed. (Gr. 3)</p>

**Grades 2-3: ESE Alignment**

<b>ESE Standard</b>	<b>Science Standard</b> Crosscutting Concept & Ability (CCA), Domain (D), Big Idea (BI), Core Content (CC), Content Standard	<b>Social Studies Standard</b> EALR, Component, Grade Level Expectation
Standard 2 (continued)	<b>EALR 4: Life Science (D)</b> <b>Ecosystems (BI)</b> <b>Changes in Ecosystems (CC)</b> Changes in ecosystems affect living populations and the non-living elements of a defined area. <b>LS2A, LS2B, LS2C, LS2D</b>	
<b>Standard 3: Sustainability and Civic Responsibility</b> Students develop and apply the knowledge, perspective, vision, skills, and habits of mind necessary to make personal and collective decisions and take actions that promote sustainability.	<b>EALR 3: Application (CCA)</b> <b>Solving Problems (BI)</b> Develop a solution to a problem by using a simplified technological design process. Investigate the use of tools. <b>APPA, APPB, APPC, APPD, APPE</b>	<b>EALR 1: Civics</b> <b>1.4 Understands civic involvement.</b> 1.4.1 Understands that citizenship and civic involvement in the neighborhood and community are the rights and responsibilities of individuals. (Gr. 2)  <b>EALR 5: Social Studies Skills</b> <b>5.3 Deliberates public issues.</b> 5.3.1 Engages in discussions to learn about different points of view on issues. (Gr. 2)

## Grades 4-5: ESE Alignment

ESE Standard	Science Standard Crosscutting Concept & Ability (CCA), Domain (D), Big Idea (BI), Core Content (CC), Content Standard	Social Studies Standard EALR, Component, Grade Level Expectation
<p><b>Standard 1: Ecological, Social, and Economic Systems</b> Students develop knowledge of the interconnections and interdependency of ecological, social, and economic systems. They demonstrate understanding of how the health of these systems determines the sustainability of natural and human communities at local, regional, national, and global levels.</p>	<p><b>EALR 1: Systems (CCA) Complex Systems (CC)</b> Analyze a system in terms of subsystems functions as well as input and outputs. <b>SYSA, SYSB, SYSC, SYSD</b></p> <p><b>EALR 4: Life Science (D) Ecosystems (BI) Food Webs (CC)</b> Changes in ecosystems affect the populations that can be supported in a food web. <b>LS2A, LS2B, LS2C, LS2D, LS2E</b></p>	<p><b>EALR 2: Economics</b> <b>2.1 Understands that people have to make choices between wants and needs and evaluate the outcomes of those choices.</b> 2.1.1 Understands and analyzes the costs and benefits of people’s decisions to move and relocate to meet their needs and wants. (Gr. 4)</p> <p><b>EALR 2: Economics</b> <b>2.2 Understands how economic systems function.</b> 2.2.1 Understands the basic elements of Washington State’s economic system, including agriculture, businesses, industry, natural resources, and labor. (Gr. 4)</p> <p><b>EALR 2: Economics</b> <b>2.4 Understands the economic issues and problems that all societies face.</b> 2.4.1 Understands how geography, natural resources, climate, and available labor contribute to the sustainability of the economy of regions in Washington State. (Gr. 4)</p> <p><b>EALR 4: History</b> <b>4.2 Understands and analyzes the causal factors that have shaped major events in history.</b> 4.2.3 Understands how technology and ideas have affected the way people lived and changed their values, beliefs, and attitudes. (Gr. 5)</p>
<p><b>Standard 2: The Natural and Built Environment</b> Students engage in inquiry and systems thinking and use information gained through learning experiences in,</p>	<p><b>EALR 2: Inquiry (CCA) Planning Investigations (CC)</b> Plan different kinds of investigations, including field studies, systematic observations, models, and controlled experiments. <b>INQA, INQB, INQC, INQD, INQE, INQF, INQG</b></p>	<p><b>EALR 3: Geography</b> <b>3.2 Understands human interaction with the environment.</b> 3.2.3 Understands that the geographic features of the Pacific Northwest have influenced the movement of people. (Gr. 4) 3.2.3 Understands and analyzes the impact of the European colonists’</p>

**Grades 4-5: ESE Alignment**

<b>ESE Standard</b>	<b>Science Standard</b> Crosscutting Concept & Ability (CCA), Domain (D), Big Idea (BI), Core Content (CC), Content Standard	<b>Social Studies Standard</b> EALR, Component, Grade Level Expectation
<p>Standard 2 (continued)</p> <p>about, and for the environment to understand the structure, components, and processes of natural and human-built environments.</p>	<p><b>EALR 4: Physical Science (D)</b> <b>Energy: Transfer, Transformation, and Conservation (BI)</b> <b>Heat, Light, Sound, and Electricity (CC)</b> Heat, light, sound, and electrical energy can be transferred. <b>PS3A, PS3B, PS3E</b></p> <p><b>EALR 4: Earth and Space Science (D)</b> <b>Earth Systems, Structures, and Processes (BI)</b> <b>Formation of Earth Materials (CC)</b> Earth materials are formed by various natural processes and can be used in different ways. <b>ES2A, ES2B, ES2C, ES2D, ES2E, ES2F</b></p> <p><b>EALR 4: Life Science (D)</b> <b>Ecosystems (BI)</b> <b>Food Webs (CC)</b> Changes in ecosystems affect the populations that can be supported in a food web. <b>LS2A, LS2B, LS2C, LS2D, LS2E</b></p>	<p>movement to the Americas on the land and the indigenous peoples. (Gr. 5)</p> <p><b>EALR 5: Social Studies Skills</b> <b>5.2 Uses inquiry-based research</b> 5.2.1 Creates and uses a research question to conduct research on an issue or event. (Gr. 4) 5.2.1 Understands how essential questions define the significance of researching an issue or event. (Gr. 5)</p>
<p><b>Standard 3: Sustainability and Civic Responsibility</b> Students develop and apply the knowledge, perspective, vision, skills, and habits of mind necessary to make personal and collective decisions and take actions that promote sustainability.</p>	<p><b>EALR 3: Application (CCA)</b> <b>Different Technologies (CC)</b> Define technologies and the technological design process to understand the use of technology in different cultures and career fields. <b>APPA, APPB, APPC, APPD, APPE, APPF, APPG, APPH</b></p>	<p><b>EALR 1: Civics</b> <b>1.4: Understands civic involvement.</b> 1.4.1 Understands that civic participation involves being informed about public issues and voting in elections. (Gr. 4) 1.4.1 Understands that civic participation involves being informed about how public issues are related to rights and responsibilities. (Gr. 5)</p> <p><b>EALR 5: Social Studies Skills</b> <b>5.3: Deliberates public issues.</b> 5.3.1 Engages others in discussions that attempt to clarify and address multiple viewpoints on public issues based on key ideals. (Gr. 5)</p>

**Grades 6-8: ESE Alignment**

<b>ESE Standard</b>	<b>Science Standard</b> Crosscutting Concept & Ability (CCA), Domain (D), Big Idea (BI), Core Content (CC), Content Standard	<b>Social Studies Standard</b> EALR, Component, Grade Level Expectation
<p><b>Standard 1: Ecological, Social, and Economic Systems</b> Students develop knowledge of the interconnections and interdependency of ecological, social, and economic systems. They demonstrate understanding of how the health of these systems determines the sustainability of natural and human communities at local, regional, national, and global levels.</p>	<p><b>EALR 1: Systems (CCA)</b> <b>Inputs, Outputs, Boundaries &amp; Flows (CC)</b> Look at a complex situation and see how it can be analyzed as systems with boundaries, inputs, outputs, and flows. <b>SYSA, SYSB, SYSC, SYSD, SYSE, SYSF</b></p> <p><b>EALR 4: Life Science (D)</b> <b>Structure &amp; Function of Living Systems (BI)</b> <b>From Cells to Organisms (CC)</b> Cell type and organization provide living systems structure and function. <b>LS1F</b></p> <p><b>EALR 4: Life Science (D)</b> <b>Ecosystems (BI)</b> <b>Flow of Energy through Ecosystems (CC)</b> Energy flows through ecosystems from a primary source through all living organisms. <b>LS2A, LS2B, LS2C, LS2D, LS2E</b></p>	<p><b>EALR 2: Economics</b> <b>2.1 Understands that people have to make choices between wants and needs and evaluate the outcomes of those choices.</b> 2.1.1 Analyzes the costs and benefits of economic choices made by groups and individuals in the past or present. (Gr. 6)</p> <p><b>EALR 2: Economics</b> <b>2.2: Understands how economic systems function.</b> 2.2.1 Understands the production, distribution, and consumption of goods, services, and resources in societies from the past or in the present. (Gr. 6) 2.2.1 Analyzes the production, distribution, and consumption of goods, services, and resources in societies from the past or in the present. (Gr. 7) 2.2.1 Analyzes how the forces of supply and demand have affected the production, distribution, and consumption of goods, services, and resources in the United States in the past or present. (Gr. 8)</p> <p><b>EALR 2: Economics</b> <b>2.4: Understands the economic issues and problems that all societies face.</b> 2.4.1 Understands the distribution of wealth and sustainability of resources in the world in the past or present. (Gr. 6) 2.4.1 Understands and analyzes the distribution of wealth and sustainability of resources in Washington State. (Gr. 7) 2.4.1 Understands and analyzes the distribution of wealth and sustainability of resources in the United States in the past or present. (Gr. 8)</p> <p><b>EALR 3: Geography</b> <b>3.3: Understands the geographic context of global issues.</b> 3.3.1 Understands that learning about the geography of the world helps us understand the global issue of sustainability. (Gr. 6)</p>

**Grades 6-8: ESE Alignment**

<b>ESE Standard</b>	<b>Science Standard</b> Crosscutting Concept & Ability (CCA), Domain (D), Big Idea (BI), Core Content (CC), Content Standard	<b>Social Studies Standard</b> EALR, Component, Grade Level Expectation
<p><b>Standard 2: The Natural and Built Environment</b> Students engage in inquiry and systems thinking and use information gained through learning experiences in, about, and for the environment to understand the structure, components, and processes of natural and human-built environments.</p>	<p><b>EALR 2: Inquiry (CCA) Questioning and Investigating (CC)</b> Investigate an answerable question through valid experimental techniques. Conclusions are based on evidence and are repeatable. <b>INQA, INQB, INQC, INQD, INQE, INQF, INQG, INQH, INQI</b></p> <p><b>EALR 4: Physical Science (D) Interactions of Energy and Matter (CC)</b> Energy and matter interact resulting in energy transfers and transformations. There are multiple forms of energy. <b>PS3A, PS3B, PS3C, PS3E</b></p> <p><b>EALR 4: Earth and Space Science (D) Earth Systems, Structures, and Processes (BI) Cycles in Earth Systems (CC)</b> Earth is an interacting system of solids, liquids, and gases. Important Earth processes include the water cycle and the rock cycle. <b>ES2B, ES2C, ES2F, ES2G</b></p> <p><b>EALR 4: Life Science (D) Structure &amp; Function of Living Systems (BI) From Cells to Organisms (CC)</b> Cell type and organization provide living systems structure and function. <b>LS1F</b></p> <p><b>EALR 4: Life Science (D) Ecosystems (BI) Flow of Energy through Ecosystems (CC)</b> Energy flows through ecosystems from a primary source through all living organisms. <b>LS2A, LS2B, LS2C, LS2D, LS2E</b></p> <p><b>EALR 4: Life Science (D) Biological Evolution (BI) Inheritance, Variation and Adaptation (CC)</b> Multiple lines of evidence support biological evolution. These include genetics, reproduction, adaptation and speciation. <b>LS3E, LS3F</b></p>	<p><b>EALR 3: Geography 3.1: Understands the physical characteristics, cultural characteristics, and location of places, regions, and spatial patterns on the Earth’s surface.</b> 3.1.2 Understands how human spatial patterns have emerged from natural processes and human activities in the past or present. (Gr. 7)</p> <p><b>EALR 3: Geography 3.2 Understands human interaction with the environment.</b> 3.2.1 Understands and analyzes how the environment has affected people and how people have affected the environment in the past or present. (Gr. 6) 3.2.1 Understands and analyzes how the environment has affected people and how people have affected the environment in Washington State in the past or present. (Gr. 7) 3.2.1 Analyzes how the environment has affected people and how people have affected the environment in the United States in the past or present. (Gr. 8)</p> <p><b>EALR 5: Social Studies Skills 5.2 Uses inquiry-based research.</b> 5.2.1 Creates and uses research questions to guide inquiry on an issue or event. (Gr. 7) 5.2.1 Creates and uses research questions that are tied to an essential question to focus inquiry on an issue. (Gr. 8)</p>

**Grades 6-8: ESE Alignment**

<b>ESE Standard</b>	<b>Science Standard</b> Crosscutting Concept & Ability (CCA), Domain (D), Big Idea (BI), Core Content (CC), Content Standard	<b>Social Studies Standard</b> EALR, Component, Grade Level Expectation
<p><b>Standard 3: Sustainability and Civic Responsibility</b> Students develop and apply the knowledge, perspective, vision, skills, and habits of mind necessary to make personal and collective decisions and take actions that promote sustainability.</p>	<p><b>EALR 3: Application (CCA) Science, Technology, and Problem Solving (CC)</b> Work with other members of a team to apply the full process of technological design and relevant science concepts to solving a problem. <b>APPA, APPB, APPC, APPD, APPE, APPF, APPG, APPH</b></p>	<p><b>EALR 1: Civics</b> <b>1.4: Understands civic involvement.</b> 1.4.1 Understands the historical origins of civic involvement. (Gr. 6) 1.4.1 Understands the effectiveness of different forms of civic involvement. (Gr. 7) 1.4.1 Analyzes how a position on an issue attempts to balance individual rights and the common good. (Gr. 8)</p> <p><b>EALR 5: Social Studies Skills</b> <b>5.3: Deliberates public issues.</b> 5.3.1 Engages in discussions that clarify and address multiple viewpoints on public issues. (Gr. 6) 5.3.1 Analyzes and responds to multiple viewpoints on public issues brought forth in the context of a discussion. (Gr. 7) 5.3.1 Applies key ideals outlined in fundamental documents to clarify and address public issues in the context of a discussion. (Gr. 8)</p>

## Grades 9-12: ESE Alignment

ESE Standard	Science Standard Crosscutting Concept & Ability (CCA), Domain (D), Big Idea (BI), Core Content (CC), Content Standard	Social Studies Standard EALR, Component, Grade Level Expectation
<p><b>Standard 1: Ecological, Social, and Economic Systems</b> Students develop knowledge of the interconnections and interdependency of ecological, social, and economic systems. They demonstrate understanding of how the health of these systems determines the sustainability of natural and human communities at local, regional, national, and global levels.</p>	<p><b>EALR 1: Systems (CCA) Predictability and Feedback (CC)</b> Create realistic models with feedback loops, and recognize that all models are limited in their predictive power. <b>SYSA, SYSB, SYSC, SYSD</b></p> <p><b>EALR 4: Life Science (D) Ecosystems (BI) Maintenance and Stability of Populations (CC)</b> A variety of factors can affect the ability of an ecosystem to maintain current population levels. <b>LS2A, LS2B, LS2C, LS2D, LS2E</b></p>	<p><b>EALR 1: Civics 1.3: Understands the purposes and organization of international relationships and U.S. foreign policy.</b> 1.3.1 Analyzes the relationships and tensions between national interests and international issues in the world in the past or present. (Gr. 9/10) 1.3.1 Analyzes and evaluates the causes and effects of U.S. foreign policy on people in the United States and the world in the past or present. (Gr. 11) 1.3.1 Evaluates the impact of international agreements on contemporary world issues. (Gr. 12)</p> <p><b>EALR 2: Economics 2.1 Understands that people have to make choices between wants and needs and evaluate the outcomes of those choices.</b> 2.1.1 Analyzes how the costs and benefits of economic choices have shaped events in the world in the past or present. (Gr. 9/10) 2.1.1 Analyzes the incentives for people’s economic choices in the United States in the past or present. (Gr. 11) 2.1.1 Analyzes how economic choices made by groups and individuals in the global economy can impose costs and provide benefits. (Gr. 12)</p> <p><b>EALR 2: Economics 2.2: Understands how economic systems function.</b> 2.2.1 Understands and analyzes how planned and market economies have shaped the production, distribution, and consumption of goods, services, and resources around the world in the past or present. (Gr. 9/10) 2.2.1 Understands that nations have competing philosophies about how best to produce, distribute, and consume goods, services, and resources. (Gr. 11) 2.2.1 Analyzes and evaluates the advantages and disadvantages of</p>

**Grades 9-12: ESE Alignment**

<b>ESE Standard</b>	<b>Science Standard</b> Crosscutting Concept & Ability (CCA), Domain (D), Big Idea (BI), Core Content (CC), Content Standard	<b>Social Studies Standard</b> EALR, Component, Grade Level Expectation
Standard 1 (continued)		<p>different economic systems for countries and groups of people. (Gr. 12)</p> <p>2.2.2 Analyzes how and why countries have specialized in the production of particular goods and services in the past or present. (Gr. 9/10)</p> <p>2.2.2 Analyzes how comparative advantage has affected U.S. imports and exports in the past or present. (Gr. 11)</p> <p>2.2.2 Analyzes and evaluates the effects of specialization on global trade. (Gr. 12)</p> <p><b>EALR 2: Economics</b> <b>2.3: Understands the government’s role in the economy.</b></p> <p>2.3.1 Analyzes the costs and benefits of government trade policies from around the world in the past or present. (Gr. 9/10)</p> <p>2.3.1 Evaluates the role of the U.S. government in regulating a market economy in the past or present. (Gr. 11)</p> <p>2.3.1 Evaluates the costs and benefits of governmental fiscal and monetary policies. (Gr. 12)</p> <p><b>EALR 2: Economics</b> <b>2.4: Understands the economic issues and problems that all societies face.</b></p> <p>2.4.1 Analyzes and evaluates how people across the world have addressed issues involved with the distribution of resources and sustainability in the past or present. (Gr. 9/10)</p> <p>2.4.1 Analyzes and evaluates how people in the U.S. have addressed issues involved with the distribution of resources and sustainability in the past or present. (Gr. 11)</p> <p>2.4.1 Analyzes and evaluates how individuals affect and are affected by the distribution of resources and sustainability. (Gr. 12)</p> <p><b>EALR 4: History</b> <b>4.2: Understands and analyzes the causal factors that have shaped major events in history.</b></p> <p>4.2.3 Analyzes and evaluates how technology and ideas have shaped world</p>

**Grades 9-12: ESE Alignment**

<b>ESE Standard</b>	<b>Science Standard</b> Crosscutting Concept & Ability (CCA), Domain (D), Big Idea (BI), Core Content (CC), Content Standard	<b>Social Studies Standard</b> EALR, Component, Grade Level Expectation
Standard 1 (continued)		history (1450–present). (Gr. 9/10) 4.2.3 Analyzes and evaluates how technology and ideas have shaped U.S. history (1890–present). (Gr. 11) 4.2.3 Evaluates the ethics of current and future uses of technology based on how technology has shaped history. (Gr. 12)
<p><b>Standard 2: The Natural and Built Environment</b> Students engage in inquiry and systems thinking and use information gained through learning experiences in, about, and for the environment to understand the structure, components, and processes of natural and human-built environments.</p>	<p><b>EALR 2: Inquiry (CCA)</b> <b>Conducting Analyses and Thinking Logically (CC)</b> Expand and refine skill and abilities of inquiry to gain a deeper understanding of natural phenomena. <b>INQA, INQB, INQC, INQD, INQE, INQF, INQG, INQH</b></p> <p><b>EALR 4: Physical Science (D)</b> <b>Energy: Transfer, Transformation, and Conservation (BI)</b> Transformation and Conservation of Energy (CC) Energy can take many forms and be transferred and transformed. Within a closed system the total energy is conserved. <b>PS3A</b></p> <p><b>EALR 4: Earth and Space Science</b> <b>Earth Systems, Structures, and Processes (BI)</b> <b>Energy in Earth Systems (CC)</b> Energy from the Sun drives our weather system and climate, while energy from Earth’s interior drives the rock cycle and crustal plates. <b>ES2A, ES2B, ES2C, ES2D</b></p> <p><b>EALR 4: Life Science (D)</b> <b>Structures and Functions of Living Organisms (BI)</b> <b>Processes Within Cells (CC)</b> Cells contain the mechanisms for life functions, reproduction, and inheritance. <b>LS1B</b></p> <p><b>EALR 4: Life Science (D)</b> <b>Ecosystems (BI)</b> <b>Maintenance and Stability of Populations</b></p>	<p><b>EALR 3: Geography</b> <b>3.1 Understands the physical characteristics, cultural characteristics, and location of places, regions, and spatial patterns on the Earth’s surface.</b> 3.1.2 Analyzes how differences in regions and spatial patterns have emerged in the United States from natural processes and human activities. (Gr. 11)</p> <p><b>EALR 3: Geography</b> <b>3.2 Understands human interaction with the environment.</b> 3.2.1 Analyzes and evaluates human interaction with the environment across the world in the past or present. (Gr. 9/10) 3.2.1 Analyzes and evaluates human interaction with the environment in the United States in the past or present. (Gr. 11) 3.2.1 Evaluates how human interaction with the environment has affected economic growth and sustainability. (Gr. 12)</p> <p><b>EALR 5: Social Studies Skills</b> <b>5.2 Uses inquiry-based research.</b> 5.2.1 Creates and uses research questions that are tied to an essential question to focus inquiry on an idea, issue, or event. (Gr. 9/10) 5.2.1 Evaluates and revises research questions to refine inquiry on an issue or event. (Gr. 11)</p>

**Grades 9-12: ESE Alignment**

<b>ESE Standard</b>	<b>Science Standard</b> Crosscutting Concept & Ability (CCA), Domain (D), Big Idea (BI), Core Content (CC), Content Standard	<b>Social Studies Standard</b> EALR, Component, Grade Level Expectation
Standard 2 (continued)	(CC) A variety of factors can affect the ability of an ecosystem to maintain current population levels. <b>LS2A, LS2B, LS2C, LS2D, LS2E</b>	
<p><b>Standard 3: Sustainability and Civic Responsibility</b> Students develop and apply the knowledge, perspective, vision, skills, and habits of mind necessary to make personal and collective decisions and take actions that promote sustainability.</p>	<p><b>EALR 3: Application (CCA)</b> <b>Science, Technology, and Society (CC)</b> Transfer and apply abilities in science and technological design to develop solutions to societal issues. <b>APPA, APPB, APPC, APPD, APPE, APPF</b></p>	<p><b>EALR 1: Civics</b> <b>1.4 Understands civic involvement.</b> 1.4.1 Analyzes and evaluates ways of influencing local, state, and national governments to preserve individual rights and promote the common good. (Gr. 11) 1.4.1 Analyzes and evaluates ways of influencing local, state, and national governments to preserve individual rights and promote the common good. (Gr. 11)</p> <p><b>EALR 4: History</b> <b>4.2 Understands and analyzes the causal factors that have shaped major events in history.</b> 4.2.1 Analyzes how individuals and movements have shaped world history (1450–present). (Gr. 9/10) 4.2.1 Evaluates how individuals and movements have shaped the United States (1890–present). (Gr. 11) 4.2.1 Evaluates how individuals and movements have shaped contemporary world issues. (Gr. 12)</p> <p><b>4.4 Uses history to understand the present and plan for the future.</b> 4.4.1 Analyzes how an understanding of world history can help us prevent problems today. (Gr. 9/10) 4.4.1 Analyzes how an understanding of United States history can help us prevent problems today. (Gr. 11) 4.4.1 Evaluates positions on a current issue based on an analysis of history. (Gr. 12)</p>

## VII. Alignment with Additional Washington State K-12 Standards

In addition to science and social studies as indicated in the previous tables, Environmental and Sustainability Education can also serve as an engaging and meaningful context for mathematics, reading, writing, communications, the arts, health and fitness, and world languages. The following table provides a few examples of how Environmental and Sustainability Education is aligned with and can be readily integrated into these content areas. Please note that this table represents a short list of example alignments and strategies and should not be considered a comprehensive review of the potential alignment of Environmental and Sustainability Education with these content areas.

Content Areas and Example of Standards that Align with ESE	Strategies for ESE Integration with Content Areas
<b>Mathematics</b> EALR 5: The student understands how mathematical ideas connect within mathematics, to other subjects.	Students use mathematical descriptions, representations, or models to explain and solve for a local or global sustainability issue (e.g. environmental justice, carbon emissions, or loss of biodiversity).
<b>Reading</b> EALR 3: The student reads different materials for a variety of purposes.	Students read fiction and non-fiction in areas such as environmental health, economic opportunity, and social justice.
<b>Writing</b> EALR 2: The student writes in a variety of forms for different audiences and purposes.	Students write in expository and persuasive modes to address issues such as conservation of natural resources, renewable energy, and global health, with mediums that range from technological media to more traditional formats such as letters, essays, and research papers.
<b>Communications</b> EALR 2: The student uses communication skills and strategies to interact/work effectively with others.	Students develop communication skills for effective group work and problem solving that are critical to addressing environmental, social, and economic issues.
<b>The Arts</b> EALR 4: The student makes connections within and across the arts (dance, music, theatre, and visual arts) to other disciplines, life, cultures, and work.	Students use art to convey the content, indigenous knowledge, story, and vision of sustainability.
<b>Health and Fitness</b> EALR 3: The student analyzes and evaluates the impact of real-life influences on health.	Students analyze and evaluate the effects of air quality on human health.
<b>World Languages (ACTFL)</b> Standard 1.3: Communicate in languages other than English. Students present information, concepts, and ideas to an audience of listeners or readers on a variety of topics.	Students develop and present information in other languages about community-related sustainability issues (e.g. ecological footprints, recycling, community gardens).

## VIII. Acknowledgments

The Washington State K-12 Integrated Environmental and Sustainability Education Learning Standards were developed by Washington teachers, community educators, and higher education faculty with support from the Office of Superintendent of Public Instruction. Listed here are individuals who played key roles in developing and reviewing this document and of whom we are extremely grateful.

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## IX. Glossary

**authentic assessment** – The demonstration of student knowledge in a variety of different ways and in “real-world” contexts.

**built environment** – The buildings, roads, utilities, homes, fixtures, parks, and all other man-made entities that form the physical characteristics of a community.

**ecological systems** – The collection of interconnected living organisms and the systems in which they co-exist.

**economic systems** – The systems of production, distribution, and consumption of goods and services between the entities in a particular society.

**education for sustainability** – A combination of content, learning methods, and outcomes that helps students develop a knowledge base about the environment, the economy, and society, in addition to helping them learn skills, perspectives, and values that guide and motivate them to seek sustainable livelihoods, participate in a democratic society, and live in a sustainable manner.

**environmental education** – A learning process that increases knowledge and awareness about the environment and associated challenges; develops the necessary skills and expertise to address these challenges; and fosters attitudes, motivations, and commitments to make informed decisions and take responsible action. It can include three dimensions: education about the environment, for the environment, and in the environment.

**habits of mind** – A set of attributes identified by Drs. Arthur L. Costa and Bena Kallick that describe what “intelligent people do when they are confronted with problems, the resolution to which are not immediately apparent.” The 16 Habits of Mind identified by Costa and Kallick include: persisting; thinking and communicating with clarity and precision; managing impulsivity; gathering data through all senses; listening with understanding and empathy; creating, imagining, innovating; thinking flexibly; responding with wonderment and awe; thinking about thinking (metacognition); taking responsible risks; striving for accuracy; finding humor; questioning and posing problems; thinking interdependently; applying past knowledge to new situations; remaining open to continuous learning.

**interconnected** – A connection (physical or logical) between multiple things.

**interdependent** – A relationship in which things depend on one another for survival.

**natural environment** – Living and non-living things that occur naturally on Earth.

**sense of place** – Connecting to and valuing the places in which one lives or visits. Sense of place includes the feeling that a geographic location or community is a special place, distinct from anywhere else.

**social systems** – The systems of a society that encompass human interactions, culture, and politics.

**sustainability** – Meeting present needs without compromising the ability of future generations to meet their needs. Sustainability is a holistic approach to living and problem solving that addresses ecological health, social equity, and economic prosperity for present and future generations.

**sustainability education** – See “education for sustainability”

**system** – A group of interacting, interrelated, and interdependent components that form a complex and unified whole. A system is a collection of “things” in which the whole is greater than the sum of its parts. Some systems are “nested” within larger systems (e.g. the circulatory system is nested within the human body system).

**systems thinking** – An approach to problem solving that involves the considerations of systems; interconnectedness; the whole versus its parts; respect for limits; unexpected consequences; and, identifying patterns, root causes, and leverage points for change.

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