King County Waste Reduction and Recycling
EcoConnections Classroom Workshops

Washington State Education Standards - Biodiversity

Middle School Standards:

Next Generation Science Standards (NGSS)

Life Sciences

MS-LS2 Ecosystems: Interactions, Energy, and Dynamics

- MS-LS2-3. Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.
- MS-LS2-4. Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.
- MS-LS2-5. Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

Disciplinary Core ideas

- LS2.A: Interdependent Relationships in Ecosystems
  - Organisms, and populations of organisms, are dependent on their environmental interactions both with other living things and with nonliving factors. (MS-LS2-1)
  - In any ecosystem, organisms and populations with similar requirements for food, water, oxygen, or other resources may compete with each other for limited resources, access to which consequently constrains their growth and reproduction. (MS-LS2-1)
  - Growth of organisms and population increases are limited by access to resources. (MS-LS2-1)

- LS2.B: Cycle of Matter and Energy Transfer in Ecosystems - Food webs are models that demonstrate how matter and energy is transferred between producers, consumers, and decomposers as the three groups interact within an ecosystem. Transfers of matter into and out of the physical environment occur at every level. Decomposers recycle nutrients from dead plant or animal matter back to the soil in terrestrial environments or to the water in aquatic environments. The atoms that make up the organisms in an ecosystem are cycled repeatedly between the living and nonliving parts of the ecosystem. (MS-LS2-3)

- LS2.C: Ecosystem Dynamics, Functioning, and Resilience
  - Ecosystems are dynamic in nature; their characteristics can vary over time. Disruptions to any physical or biological component of an ecosystem can lead to shifts in all its populations. (MS-LS2-4)
  - Biodiversity describes the variety of species found in Earth's terrestrial and oceanic ecosystems. The completeness or integrity of an ecosystem's biodiversity is often used as a measure of its health. (MS-LS2-5)

- LS4.D: Biodiversity and Humans - Changes in biodiversity can influence humans' resources, such as food, energy, and medicines, as well as ecosystem services that humans rely on—for example, water purification and recycling.

Crosscutting Concepts

- Energy and Matter
  - The transfer of energy can be tracked as energy flows through a natural system. (MS-LS2-3)
  - Small changes in one part of a system might cause large changes in another part. (MS-LS2-4),(MS-LS2-5)
  - Biodiversity describes the variety of species found in Earth's terrestrial and oceanic ecosystems. The completeness or integrity of an ecosystem's biodiversity is often used as a measure of its health. (MS-LS2-5)

Common Core

Reading: Informational Text

Grade 6

- CCSS.ELA-LITERACY.RI.6.1 Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.

- CCSS.ELA-LITERACY.RI.6.2 Determine a central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.
- CCSS.ELA-LITERACY.RI.6.4 Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings.
- CCSS.ELA-LITERACY.RI.6.7 Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.

Grade 7

- CCSS.ELA-LITERACY.RI.7.1 Cite several pieces of textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.
- CCSS.ELA-LITERACY.RI.7.4 Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of a specific word choice on meaning and tone.

Grade 8

- CCSS.ELA-LITERACY.RI.8.1 Cite the textual evidence that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text.
- CCSS.ELA-LITERACY.RI.8.4 Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of specific word choices on meaning and tone, including analogies or allusions to other texts.

Speaking and Listening

Grade 6

- CCSS.ELA-LITERACY.SL.6.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly.
- CCSS.ELA-LITERACY.SL.6.2 Interpret information presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how it contributes to a topic, text, or issue under study.
- CCSS.ELA-LITERACY.SL.6.4 Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details to accentuate main ideas or themes; use appropriate eye contact, adequate volume, and clear pronunciation.

Grade 7

- CCSS.ELA-LITERACY.SL.7.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly.
- CCSS.ELA-LITERACY.SL.7.2 Analyze the main ideas and supporting details presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how the ideas clarify a topic, text, or issue under study.

Grade 8

- CCSS.ELA-LITERACY.SL.8.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others' ideas and expressing their own clearly.

Language

Grade 6-8

- CCSS.ELA-LITERACY.L.6-8.1 Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

Science and Technical Subjects

Grade 6-8

- CCSS.ELA-LITERACY.RST.6-8.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6-8 texts and topics*.

Integrated Environmental and Sustainability Learning Standards

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.

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.

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 decision and take actions that promote sustainability.

Washington State Education Standards - Biodiversity

High School Standards:

Next Generation Science Standards (NGSS)

Life Sciences

HS-LS2 Interdependent Relationships in Ecosystems

- HS-LS2-2. Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.
- HS-LS2-6. Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem.
- HS-LS2-7. Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

Disciplinary Core

- LS2.C: Ecosystem Dynamics, Functioning, and Resilience
  - A complex set of interactions within an ecosystem can keep its numbers and types of organisms relatively constant over long periods of time under stable conditions. If a modest biological or physical disturbance to an ecosystem occurs, it may return to its more or less original status (i.e., the ecosystem is resilient), as opposed to becoming a very different ecosystem. Extreme fluctuations in conditions or the size of any population, however, can challenge the functioning of ecosystems in terms of resources and habitat availability. (HS-LS2-2),(HS-LS2-6)
  - Moreover, anthropogenic changes (induced by human activity) in the environment—including habitat destruction, pollution, introduction of invasive species, overexploitation, and climate change—can disrupt an ecosystem and threaten the survival of some species. (HS-LS2-7)
- LS4.D: Biodiversity and Humans
  - Biodiversity is increased by the formation of new species (speciation) and decreased by the loss of species (extinction). (secondary to HS-LS2-7)
  - Humans depend on the living world for the resources and other benefits provided by biodiversity. But human activity is also having adverse impacts on biodiversity through overpopulation, overexploitation, habitat destruction, pollution, introduction of invasive species, and climate change. Thus sustaining biodiversity so that ecosystem functioning and productivity are maintained is essential to supporting and enhancing life on Earth. Sustaining biodiversity also aids humanity by preserving landscapes of recreational or inspirational value. (secondary to HS-LS2-7) (Note: This Disciplinary Core Idea is also addressed by HS-LS4-6.)

HS-LS4 Natural Selection and Evolution

- HS-LS4-5. Evaluate the evidence supporting claims that changes in environmental conditions may result in: (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species.
- HS-LS4-6. Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity**.**

Disciplinary Core

- LS4.C: Adaptation
  - Changes in the physical environment, whether naturally occurring or human induced, have thus contributed to the expansion of some species, the emergence of new distinct species as populations diverge under different conditions, and the decline–and sometimes the extinction–of some species. (HS-LS4-5),(HS-LS4-6)
  - Species become extinct because they can no longer survive and reproduce in their altered environment. If members cannot adjust to change that is too fast or drastic, the opportunity for the species' evolution is lost. (HS-LS4-5)
- LS4.D: Biodiversity and Humans - Humans depend on the living world for the resources and other benefits provided by biodiversity. But human activity is also having adverse impacts on biodiversity through overpopulation, overexploitation, habitat destruction, pollution, introduction of invasive species, and climate change. Thus sustaining biodiversity so that ecosystem functioning and productivity are maintained is essential to supporting and enhancing life on Earth. Sustaining biodiversity also aids humanity by preserving landscapes of recreational or inspirational value. (HS-LS4-6) (Note: This Disciplinary Core Idea is also addressed by HS-LS2-7.)

Earth and Space Sciences

HS-ESS3 Human Sustainability

- HS-ESS3-3. Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.

Disciplinary Core

- ESS3.A: Natural Resources
  - Resource availability has guided the development of human society. (HS-ESS3-1)
  - All forms of energy production and other resource extraction have associated economic, social, environmental, and geopolitical costs and risks as well as benefits. New technologies and social regulations can change the balance of these factors. (HS-ESS3-2)
- ESS3.C: Human Impacts on Earth Systems
  - The sustainability of human societies and the biodiversity that supports them requires responsible management of natural resources. (HS-ESS3-3)
  - Scientists and engineers can make major contributions by developing technologies that produce less pollution and waste and that preclude ecosystem degradation. (HS-ESS3-4)

Common Core

Reading: Informational Text

Grade 9-10

- CCSS.ELA-LITERACY.RI.9-10.1 Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.

Grade 11-12

- CCSS.ELA-LITERACY.RI.11-12.1 Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.
- CCSS.ELA-LITERACY.RI.11-12.7 Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem.

Speaking and Listening

Grade 9-12

- CCSS.ELA-LITERACY.SL.9-12.1 Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 9-12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.
- CCSS.ELA-LITERACY.SL.9-12.2 Integrate multiple sources of information presented in diverse media or formats (e.g., visually, quantitatively, orally) evaluating the credibility and accuracy of each source.

Language

Grade 9-12

- CCSS.ELA-LITERACY.SL.9-12.1 Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- CCSS.ELA-LITERACY.SL.9-12.4 Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on *grades 9-12 reading and content*, choosing flexibly from a range of strategies.
- CCSS.ELA-LITERACY.SL.9-12.6 Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Science and Technical Subjects

Grade 9-10

- CCSS.ELA-LITERACY.SL.9-10.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 9-10 texts and topics*.

Grade 11-12

- CCSS.ELA-LITERACY.SL.11-12.2 Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
- CCSS.ELA-LITERACY.SL.11-12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 11-12 texts and topics*.

- CCSS.ELA-LITERACY.SL.11-12.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

Integrated Environmental and Sustainability Learning Standards

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.

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.

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 decision and take actions that promote sustainability.

Washington State Education Standards – BIOSPHERES

Middle School Standards:

Life Sciences

MS-LS1 Structure, Function, and information Processing

- MS-LS1-1. Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.

Disciplinary Core Ideas

- LS1.A: Structure and Function - All living things are made up of cells, which is the smallest unit that can be said to be alive. An organism may consist of one single cell (unicellular) or many different numbers and types of cells (multicellular). (MS-LS1-1)

Crosscutting Concepts

- Structure and Function - Complex and microscopic structures and systems can be visualized, modeled, and used to describe how their function depends on the relationships among its parts, therefore complex natural structures/systems can be analyzed to determine how they function. (MS-LS1-2)

MS-LS1 Matter and Energy in Organisms and Ecosystems

- MS-LS1-6. Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.
- MS-LS1-7. Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.

Disciplinary Core ideas

- LS1.C: Organization for Matter and Energy Flow in Organisms
  - Plants, algae (including phytoplankton), and many microorganisms use the energy from light to make sugars (food) from carbon dioxide from the atmosphere and water through the process of photosynthesis, which also releases oxygen. These sugars can be used immediately or stored for growth or later use. (MS-LS1-6)
  - Within individual organisms, food moves through a series of chemical reactions in which it is broken down and rearranged to form new molecules, to support growth, or to release energy. (MS-LS1-7)
- LS2.A: Interdependent Relationships in Ecosystems
  - Organisms, and populations of organisms, are dependent on their environmental interactions both with other living things and with nonliving factors. (MS-LS2-1)
  - Growth of organisms and population increases are limited by access to resources. (MS-LS2-1)
- LS2.B: Cycle of Matter and Energy Transfer in Ecosystems - Food webs are models that demonstrate how matter and energy is transferred between producers, consumers, and decomposers as the three groups interact within an ecosystem. Transfers of matter into and out of the physical environment occur at every level. Decomposers recycle nutrients from dead plant or animal matter back to the soil in terrestrial environments or to the water in aquatic environments. The atoms that make up the organisms in an ecosystem are cycled repeatedly between the living and nonliving parts of the ecosystem. (MS-LS2-3)
- LS2.C: Ecosystem Dynamics, Functioning, and Resilience - Ecosystems are dynamic in nature; their characteristics can vary over time. Disruptions to any physical or biological component of an ecosystem can lead to shifts in all its populations. (MS-LS2-4)
- PS3.D: Energy in Chemical Processes and Everyday Life
  - The chemical reaction by which plants produce complex food molecules (sugars) requires an energy input (i.e., from sunlight) to occur. In this reaction, carbon dioxide and water combine to form carbon-based organic molecules and release oxygen. (secondary to MS-LS1-6)
  - Cellular respiration in plants and animals involve chemical reactions with oxygen that release stored energy. In these processes, complex molecules containing carbon react with oxygen to produce carbon dioxide and other materials. (secondary to MS-LS1-7)

Crosscutting Concepts

- Stability and Change - Small changes in one part of a system might cause large changes in another part. (MS-LS2-4), (MS-LS2-5)

- Energy and Matter - The transfer of energy can be tracked as energy flows through a natural system. (MS-LS2-3)

Earth and Space Sciences

MS-ESS2 Earth's Systems

- MS-ESS2-1. Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.

Disciplinary Core Ideas

- ESS2.A: Earth's Materials and Systems - All Earth processes are the result of energy flowing and matter cycling within and among the planet's systems. This energy is derived from the sun and Earth's hot interior. The energy that flows and matter that cycles produce chemical and physical changes in Earth's materials and living organisms. (MS-ESS2-1)

Crosscutting Concepts

- Scale Proportion and Quantity - Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small. (MS-ESS2-2)
- Systems and System Models - Models can be used to represent systems and their interactions—such as inputs, processes and outputs—and energy, matter, and information flows within systems. (MS-ESS2-6)
- Energy and Matter - Within a natural or designed system, the transfer of energy drives the motion and/or cycling of matter. (MS-ESS2-4)

Common Core

Speaking and Listening

Grade 6

- CCSS.ELA-LITERACY.SL.6.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly.
- CCSS.ELA-LITERACY.SL.6.2 Interpret information presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how it contributes to a topic, text, or issue under study.
- CCSS.ELA-LITERACY.SL.6.4 Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details to accentuate main ideas or themes; use appropriate eye contact, adequate volume, and clear pronunciation.

Grade 7

- CCSS.ELA-LITERACY.SL.7.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly.
- CCSS.ELA-LITERACY.SL.7.2 Analyze the main ideas and supporting details presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how the ideas clarify a topic, text, or issue under study.

Grade 8

- CCSS.ELA-LITERACY.SL.8.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others' ideas and expressing their own clearly.

Language

Grade 6-8

- CCSS.ELA-LITERACY.L.6-8.1 Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

Science and Technical Subjects

Grade 6-8

- CCSS.ELA-LITERACY.RST.6-8.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6-8 texts and topics*.

Integrated Environmental and Sustainability Learning Standards

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.

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.

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 decision and take actions that promote sustainability.

Washington State Education Standards – BIOSPHERES

High School Standards:

Next Generation Science Standards (NGSS)

Life Sciences

HS-LS1 Matter and Energy in Organisms and Ecosystems

- HS-LS1-5. Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy.
- HS-LS1-6. Construct and revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements to form amino acids and/or other large carbon-based molecules.
- HS-LS2-3. Construct and revise an explanation based on evidence for the cycling of matter and flow of energy in aerobic and anaerobic conditions.
- HS-LS2-4. Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem.
- HS-LS2-5. Develop a model to illustrate the role of photosynthesis and cellular respiration in the cycling of carbon among the biosphere, atmosphere, hydrosphere, and geosphere.

Science and Engineering Practices

- Developing and Using Models - Modeling in 9–12 builds on K–8 experiences and progresses to using, synthesizing, and developing models to predict and show relationships among variables between systems and their components in the natural and designed worlds.
- Develop and use a model based on evidence to illustrate the relationships between systems or between components of a system. (HS-LS1-2)
- Use a model based on evidence to illustrate the relationships between systems or between components of a system. (HS-LS1-4),(HS-LS1-5),(HS-LS1-7)

Disciplinary Core Ideas

- LS1.C: Organization for Matter and Energy Flow in Organisms - The process of photosynthesis converts light energy to stored chemical energy by converting carbon dioxide plus water into sugars plus released oxygen. (HS-LS1-5)

Crosscutting Concepts

- Systems and System Models - Models (e.g., physical, mathematical, computer models) can be used to simulate systems and interactions—including energy, matter, and information flows—within and between systems at different scales. (HS-LS1-2), (HS-LS1-4)
- Energy and Matter - Changes of energy and matter in a system can be described in terms of energy and matter flows into, out of, and within that system. (HS-LS1-5), (HS-LS1-6)

HS-LS2 Interdependent Relationships in Ecosystems

- HS-LS2-1. Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.

Disciplinary Core Ideas

- LS2.A: Interdependent Relationships in Ecosystems - Ecosystems have carrying capacities, which are limits to the numbers of organisms and populations they can support. These limits result from such factors as the availability of living and nonliving resources and from such challenges such as predation, competition, and disease. Organisms would have the capacity to produce populations of great size were it not for the fact that environments and resources are finite. This fundamental tension affects the abundance (number of individuals) of species in any given ecosystem. (HS-LS2-1),(HS-LS2-2)
- LS2.B: Cycles of Matter and Energy Transfer in Ecosystems
  - Photosynthesis and cellular respiration (including anaerobic processes) provide most of the energy for life processes. (HS-LS2-3)
  - Plants or algae form the lowest level of the food web. At each link upward in a food web, only a small fraction of the matter consumed at the lower level is transferred upward, to produce growth and release energy in cellular respiration at the higher level. Given this inefficiency, there are generally fewer organisms at higher levels of a food web. Some matter reacts to release energy for life functions, some matter is stored in newly made structures, and much is discarded. The chemical elements that make up the molecules of organisms pass through food webs and into and out

of the atmosphere and soil, and they are combined and recombined in different ways. At each link in an ecosystem, matter and energy are conserved. (HS-LS2-4)
  - Photosynthesis and cellular respiration are important components of the carbon cycle, in which carbon is exchanged among the biosphere, atmosphere, oceans, and geosphere through chemical, physical, geological, and biological processes. (HS-LS2-5)
- PS3.D: Energy in Chemical Processes - The main way that solar energy is captured and stored on Earth is through the complex chemical process known as photosynthesis. (*secondary to* HS-LS2-5)

Crosscutting Concepts
- Systems and System Models - Models (e.g., physical, mathematical, computer models) can be used to simulate systems and interactions—including energy, matter, and information flows—within and between systems at different scales. (HS-LS2-5)
- Energy and Matter - Energy drives the cycling of matter within and between systems. (HS-LS2-3)

Earth and Space Sciences
HS-ESS2 Earth's Systems
- HS-ESS2-6. Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere.

Crosscutting Concepts
- Energy and Matter - The total amount of energy and matter in closed systems is conserved. (HS-ESS2-6)

Common Core

Speaking and Listening
Grade 9-12
- CCSS.ELA-LITERACY.SL.9-12.1 Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 9-12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.
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Language
Grade 9-12
- CCSS.ELA-LITERACY.SL.9-12.1 Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- CCSS.ELA-LITERACY.SL.9-12.6 Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Science and Technical Subjects
Grade 9-10
- CCSS.ELA-LITERACY.SL.9-10.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 9-10 texts and topics*.

Grade 11-12
- CCSS.ELA-LITERACY.SL.11-12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 11-12 texts and topics*.
- CCSS.ELA-LITERACY.SL.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.

Integrated Environmental and Sustainability Learning Standards

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.

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.

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 decision and take actions that promote sustainability.

Washington State Education Standards – Consumption Junction

Middle School Standards:

Next Generation Science Standards (NGSS)

Physical Sciences

MS-PS1 Matter and Its Interactions

- MS-PS1-3: Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.

Earth and Space Sciences

MS-ESS3 Earth and Human Activity

- MS-ESS3-1. Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.

- MS-ESS3-4. Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

Disciplinary Core Ideas

- ESS3.A: Natural Resources - Humans depend on Earth's land, ocean, atmosphere, and biosphere for many different resources. Minerals, fresh water, and biosphere resources are limited, and many are not renewable or replaceable over human lifetimes. These resources are distributed unevenly around the planet as a result of past geologic processes. (MS-ESS3-1)
- ESS3.C: Human Impacts on Earth Systems
  - Human activities have significantly altered the biosphere, sometimes damaging or destroying natural habitats and causing the extinction of other species. But changes to Earth's environments can have different impacts (negative and positive) for different living things. (MS-ESS3-3)
  - Typically as human populations and per-capita consumption of natural resources increase, so do the negative impacts on Earth unless the activities and technologies involved are engineered otherwise. (MS-ESS3-3),(MS-ESS3-4)
- ESS3.D: Global Climate Change - Human activities, such as the release of greenhouse gases from burning fossil fuels, are major factors in the current rise in Earth's mean surface temperature (global warming). Reducing the level of climate change and reducing human vulnerability to whatever climate changes do occur depend on the understanding of climate science, engineering capabilities, and other kinds of knowledge, such as understanding of human behavior and on applying that knowledge wisely in decisions and activities. (MS-ESS3-5)

Crosscutting Concepts

- Influence of Science, Engineering, and Technology on Society and the Natural World - All human activity draws on natural resources and has both short and long-term consequences, positive as well as negative, for the health of people and the natural environment. (MS-ESS3-1), (MS-ESS3-4)

Common Core

Reading: Informational Text

Grade 6

- CCSS.ELA-LITERACY.RI.6.1 Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.
- CCSS.ELA-LITERACY.RI.6.2 Determine a central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.
- CCSS.ELA-LITERACY.RI.6.4 Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings.
- CCSS.ELA-LITERACY.RI.6.7 Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.

Grade 7
- CCSS.ELA-LITERACY.RI.7.1 Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.
- CCSS.ELA-LITERACY.RI.7.4 Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of a specific word choice on meaning and tone.

Grade 8
- CCSS.ELA-LITERACY.RI.8.1 Cite the textual evidence that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text.
- CCSS.ELA-LITERACY.RI.8.4 Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of specific word choices on meaning and tone, including analogies or allusions to other texts.

Speaking and Listening
Grade 6
- CCSS.ELA-LITERACY.SL.6.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly.
- CCSS.ELA-LITERACY.SL.6.2 Interpret information presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how it contributes to a topic, text, or issue under study.

Grade 7
- CCSS.ELA-LITERACY.SL.7.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly.
- CCSS.ELA-LITERACY.SL.7.2 Analyze the main ideas and supporting details presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how the ideas clarify a topic, text, or issue under study.

Grade 8
- CCSS.ELA-LITERACY.SL.8.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others' ideas and expressing their own clearly.
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Language
Grade 6-8
- CCSS.ELA-LITERACY.L.6-8.1 Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- CCSS.ELA-LITERACY.L.6-8.4 Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 6-8 reading and content, choosing flexibly from a range of strategies

Science and Technical Subjects
Grade 6-8
- CCSS.ELA-LITERACY.RST.6-8.2 Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
- CCSS.ELA-LITERACY.RST.6-8.3 Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
- CCSS.ELA-LITERACY.RST.6-8.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6-8 texts and topics*.

Integrated Environmental and Sustainability Learning Standards

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.

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.

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 decision and take actions that promote sustainability.

Washington State Education Standards – Consumption Junction

High School Standards:

Next Generation Science Standards (NGSS)

Earth and Space Sciences

HS-ESS3 Earth and Human Activity

- HS-ESS3-2. Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.
- HS-ESS3-3. Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.
- HS-ESS3-6. Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.

Disciplinary Ideas

- ESS3.A: Natural Resources
  - Resource availability has guided the development of human society. (HS-ESS3-1)
  - All forms of energy production and other resource extraction have associated economic, social, environmental, and geopolitical costs and risks as well as benefits. New technologies and social regulations can change the balance of these factors. (HS-ESS3-2)
- ESS3.C: Human Impacts on Earth Systems
  - The sustainability of human societies and the biodiversity that supports them requires responsible management of natural resources. (HS-ESS3-3)
  - Scientists and engineers can make major contributions by developing technologies that produce less pollution and waste and that preclude ecosystem degradation. (HS-ESS3-4)

Common Core

Reading: Informational Text

Grade 9-10

- CCSS.ELA-LITERACY.RI.9-10.1 Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.
- CCSS.ELA-LITERACY.RI.9-10.4 Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the cumulative impact of specific word choices on meaning and tone (e.g., how the language of a court opinion differs from that of a newspaper).

Grade 11-12

- CCSS.ELA-LITERACY.RI.11-12.1 Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.
- CCSS.ELA-LITERACY.RI.11-12.4 Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze how an author uses and refines the meaning of a key term or terms over the course of a text (e.g., how Madison defines faction in Federalist No. 10).

Speaking and Listening

Grade 9-12

- CCSS.ELA-LITERACY.SL.9-12.1 Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 9-12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.

Language

Grade 9-12

- CCSS.ELA-LITERACY.SL.9-12.1 Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

- CCSS.ELA-LITERACY.SL.9-12.6 Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Science and Technical Subjects

Grade 9-10

- CCSS.ELA-LITERACY.SL.9-10.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 9-10 texts and topics*.

Grade 11-12

- CCSS.ELA-LITERACY.SL.11-12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 11-12 texts and topics*.
- CCSS.ELA-LITERACY.SL.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.

Integrated Environmental and Sustainability Learning Standards

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.

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Standard 3: Sustainability and Civic Responsibility

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Washington State Education Standards – Food for Thought

Middle School Standards:

Next Generation Science Standards (NGSS)

Earth and Space Sciences

MS-ESS3 Earth and Human Activity

- MS-ESS3-4. Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

Disciplinary Core Ideas

- ESS3.A: Natural Resources - Humans depend on Earth's land, ocean, atmosphere, and biosphere for many different resources. Minerals, fresh water, and biosphere resources are limited, and many are not renewable or replaceable over human lifetimes. These resources are distributed unevenly around the planet as a result of past geologic processes. (MS-ESS3-1)
- ESS3.C: Human Impacts on Earth Systems
  - Human activities have significantly altered the biosphere, sometimes damaging or destroying natural habitats and causing the extinction of other species. But changes to Earth's environments can have different impacts (negative and positive) for different living things. (MS-ESS3-3)
  - Typically as human populations and per-capita consumption of natural resources increase, so do the negative impacts on Earth unless the activities and technologies involved are engineered otherwise. (MS-ESS3-3), (MS-ESS3-4)
- ESS3.D: Global Climate Change - Human activities, such as the release of greenhouse gases from burning fossil fuels, are major factors in the current rise in Earth's mean surface temperature (global warming). Reducing the level of climate change and reducing human vulnerability to whatever climate changes do occur depend on the understanding of climate science, engineering capabilities, and other kinds of knowledge, such as understanding of human behavior and on applying that knowledge wisely in decisions and activities. (MS-ESS3-5)

Crosscutting Concepts

- Influence of Science, Engineering, and Technology on Society and the Natural World - All human activity draws on natural resources and has both short and long-term consequences, positive as well as negative, for the health of people and the natural environment. (MS-ESS3-1), (MS-ESS3-4)

Common Core

Speaking and Listening

Grade 6

- CCSS.ELA-LITERACY.SL.6.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly.
- CCSS.ELA-LITERACY.SL.6.2 Interpret information presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how it contributes to a topic, text, or issue under study.

Grade 7

- CCSS.ELA-LITERACY.SL.7.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly.

Grade 8

- CCSS.ELA-LITERACY.SL.8.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others' ideas and expressing their own clearly.

Language

Grade 6-8

- CCSS.ELA-LITERACY.L.6-8.1 Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- CCSS.ELA-LITERACY.L.6-8.4 Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 6-8 reading and content, choosing flexibly from a range of strategies

Science and Technical Subjects

Grade 6-8

- CCSS.ELA-LITERACY.RST.6-8.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6-8 texts and topics*.
- CCSS.ELA-LITERACY.RST.6-8.7 Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

Integrated Environmental and Sustainability Learning Standards

Standard 1: Ecological, Social and Economic Systems

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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 decision and take actions that promote sustainability.

Washington State Education Standards – Food for Thought

High School Standards:

Next Generation Science Standards (NGSS)

Earth and Space Sciences

HS-ESS3 Earth and Human Activity

- HS-ESS3-3. Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.
- HS-ESS3-6. Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.

Disciplinary Ideas

- ESS3.A: Natural Resources
  - Resource availability has guided the development of human society. (HS-ESS3-1)
  - All forms of energy production and other resource extraction have associated economic, social, environmental, and geopolitical costs and risks as well as benefits. New technologies and social regulations can change the balance of these factors. (HS-ESS3-2)
- ESS3.C: Human Impacts on Earth Systems
  - The sustainability of human societies and the biodiversity that supports them requires responsible management of natural resources. (HS-ESS3-3)
  - Scientists and engineers can make major contributions by developing technologies that produce less pollution and waste and that preclude ecosystem degradation. (HS-ESS3-4)

Common Core

Speaking and Listening

Grade 9-10

- CCSS.ELA-LITERACY.SL.9-10.1 Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 9-10 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.
- CCSS.ELA-LITERACY.SL.9-10.2 Integrate multiple sources of information presented in diverse media or formats (e.g., visually, quantitatively, orally) evaluating the credibility and accuracy of each source.

Grade 11-12

- CCSS.ELA-LITERACY.SL.11-12.1 Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11-12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.
- CCSS.ELA-LITERACY.SL.11-12.2 Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data.

Language

Grade 9-12

- CCSS.ELA-LITERACY.SL.9-12.1 Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- CCSS.ELA-LITERACY.SL.9-12.6 Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Science and Technical Subjects

Grade 9-10

- CCSS.ELA-LITERACY.SL.9-10.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 9-10 texts and topics*.

Grade 11-12

- CCSS.ELA-LITERACY.SL.11-12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 11-12 texts and topics*.
- CCSS.ELA-LITERACY.SL.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.

Integrated Environmental and Sustainability Learning Standards

Standard 1: Ecological, Social and Economic Systems

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Washington State Education Standards – Let's Talk Trash

Middle School Standards:

Next Generation Science Standards (NGSS)

Earth and Space Sciences

MS-ESS3 Earth and Human Activity

- MS-ESS3-4. Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

Science and Engineering Practices

- Engaging in Argument from Evidence - Engaging in argument from evidence in 6–8 builds on K–5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed world(s).
  - Construct an oral and written argument supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or a solution to a problem. (MS-ESS3-4)

Disciplinary Core Ideas

- ESS3.A: Natural Resources - Humans depend on Earth's land, ocean, atmosphere, and biosphere for many different resources. Minerals, fresh water, and biosphere resources are limited, and many are not renewable or replaceable over human lifetimes. These resources are distributed unevenly around the planet as a result of past geologic processes. (MS-ESS3-1)
- ESS3.C: Human Impacts on Earth Systems
  - Human activities have significantly altered the biosphere, sometimes damaging or destroying natural habitats and causing the extinction of other species. But changes to Earth's environments can have different impacts (negative and positive) for different living things. (MS-ESS3-3)
  - Typically as human populations and per-capita consumption of natural resources increase, so do the negative impacts on Earth unless the activities and technologies involved are engineered otherwise. (MS-ESS3-3), (MS-ESS3-4)
- ESS3.D: Global Climate Change - Human activities, such as the release of greenhouse gases from burning fossil fuels, are major factors in the current rise in Earth's mean surface temperature (global warming). Reducing the level of climate change and reducing human vulnerability to whatever climate changes do occur depend on the understanding of climate science, engineering capabilities, and other kinds of knowledge, such as understanding of human behavior and on applying that knowledge wisely in decisions and activities. (MS-ESS3-5)

Crosscutting Concepts

- Influence of Science, Engineering, and Technology on Society and the Natural World - All human activity draws on natural resources and has both short and long-term consequences, positive as well as negative, for the health of people and the natural environment. (MS-ESS3-1), (MS-ESS3-4)

Common Core

Reading: Informational Text

Grade 6

- CCSS.ELA-LITERACY.RI.6.1 Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.
- CCSS.ELA-LITERACY.RI.6.4 Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings.
- CCSS.ELA-LITERACY.RI.6.7 Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.

Grade 7

- CCSS.ELA-LITERACY.RI.7.1 Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.
- CCSS.ELA-LITERACY.RI.7.4 Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of a specific word choice on meaning and tone.

Grade 8

- CCSS.ELA-LITERACY.RI.8.1 Cite the textual evidence that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text.
- CCSS.ELA-LITERACY.RI.8.4 Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of specific word choices on meaning and tone, including analogies or allusions to other texts.

Speaking and Listening

Grade 6

- CCSS.ELA-LITERACY.SL.6.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly.
- CCSS.ELA-LITERACY.SL.6.2 Interpret information presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how it contributes to a topic, text, or issue under study.
- CCSS.ELA-LITERACY.SL.6.4 Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details to accentuate main ideas or themes; use appropriate eye contact, adequate volume, and clear pronunciation.

Grade 7

- CCSS.ELA-LITERACY.SL.7.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly.
- CCSS.ELA-LITERACY.SL.7.2 Analyze the main ideas and supporting details presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how the ideas clarify a topic, text, or issue under study.
- CCSS.ELA-LITERACY.SL.7.4 Present claims and findings, emphasizing salient points in a focused, coherent manner with pertinent descriptions, facts, details, and examples; use appropriate eye contact, adequate volume, and clear pronunciation.

Grade 8

- CCSS.ELA-LITERACY.SL.8.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others' ideas and expressing their own clearly.
- CCSS.ELA-LITERACY.SL.8.4 Present claims and findings, emphasizing salient points in a focused, coherent manner with relevant evidence, sound valid reasoning, and well-chosen details; use appropriate eye contact, adequate volume, and clear pronunciation.

Language

Grade 6-8

- CCSS.ELA-LITERACY.L.6-8.1 Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- CCSS.ELA-LITERACY.L.6-8.4 Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 6-8 reading and content, choosing flexibly from a range of strategies

Science and Technical Subjects

Grade 6-8

- CCSS.ELA-LITERACY.RST.6-8.2 Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
- CCSS.ELA-LITERACY.RST.6-8.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6-8 texts and topics*.

Integrated Environmental and Sustainability Learning Standards

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Washington State Education Standards – Let's Talk Trash

High School Standards:

Next Generation Science Standards (NGSS)

Earth and Space Sciences

HS-ESS3 Earth and Human Activity

- HS-ESS3-2. Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.
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- HS-ESS3-6. Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.

Disciplinary Ideas

- ESS3.A: Natural Resources
  - Resource availability has guided the development of human society. (HS-ESS3-1)
  - All forms of energy production and other resource extraction have associated economic, social, environmental, and geopolitical costs and risks as well as benefits. New technologies and social regulations can change the balance of these factors. (HS-ESS3-2)
- ESS3.C: Human Impacts on Earth Systems
  - The sustainability of human societies and the biodiversity that supports them requires responsible management of natural resources. (HS-ESS3-3)
  - Scientists and engineers can make major contributions by developing technologies that produce less pollution and waste and that preclude ecosystem degradation. (HS-ESS3-4)

Common Core

Reading: Informational Text

Grade 9-10

- CCSS.ELA-LITERACY.RI.9-10.1 Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.
- CCSS.ELA-LITERACY.RI.9-10.4 Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the cumulative impact of specific word choices on meaning and tone (e.g., how the language of a court opinion differs from that of a newspaper).

Grade 11-12

- CCSS.ELA-LITERACY.RI.11-12.1 Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.
- CCSS.ELA-LITERACY.RI.11-12.4 Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze how an author uses and refines the meaning of a key term or terms over the course of a text (e.g., how Madison defines faction in Federalist No. 10).
- CCSS.ELA-LITERACY.RI.11-12.7 Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem.

Speaking and Listening

Grade 9-12

- CCSS.ELA-LITERACY.SL.9-12.1 Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 9-12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.
- CCSS.ELA-LITERACY.SL.9-12.2 Integrate multiple sources of information presented in diverse media or formats (e.g., visually, quantitatively, orally) evaluating the credibility and accuracy of each source.

- CCSS.ELA-LITERACY.SL.9-12.4 Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task.

Language

Grade 9-12

- CCSS.ELA-LITERACY.SL.9-12.1 Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- CCSS.ELA-LITERACY.SL.9-12.6 Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Science and Technical Subjects

Grade 9-10

- CCSS.ELA-LITERACY.SL.9-10.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 9-10 texts and topics*.

Grade 11-12

- CCSS.ELA-LITERACY.SL.11-12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 11-12 texts and topics*.
- CCSS.ELA-LITERACY.SL.11-12.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

Integrated Environmental and Sustainability Learning Standards

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.

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