

King County Waste Reduction and Recycling

Elementary Classroom Workshops

Washington State Education Standards – **GARBOLOGY**

Next Generation Science Standards (NGSS)

Physical Sciences

MS – PS1 Structures and Properties of Matter

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

Science and Engineering Practices

- Developing and Using Models– Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions. Modeling in 6–8 builds on K–5 and progresses to developing, using and revising models to describe, test, and predict more abstract phenomena and design systems.
 - ▲ Use models to describe phenomena. (5-PS3-1), (5-ESS2-1)
 - ▲ Develop a model to predict and/or describe phenomena. (MS-PS1-1), (MS-PS1-4), (MS-LS2-3)

Crosscutting Concepts

- Cause and Effect – Cause and effect relationships may be used to predict phenomena in natural or designed systems. (MS-PS1-4), (MS-ESS3-4)

Life Sciences

5-MS – LS2 Matter and Energy in Organisms and Ecosystems

- 5-LS2-1: Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.
- MS-LS2-1: Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.

MS – LS2 Interdependent Relationships in Ecosystems

- MS-LS2-5: Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

Science and Engineering Practices

- Science Models, Laws, Mechanisms, and Theories Explain Natural Phenomena
 - ▲ Science explanations describe the mechanisms for natural events. (5-LS2-1)

Disciplinary Core Ideas

- LS2.A: Interdependent Relationships in Ecosystems - The food of almost any kind of animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants. Some organisms, such as fungi and bacteria, break down dead organisms (both plants or plants parts and animals) and therefore operate as “decomposers.” Decomposition eventually restores (recycles) some materials back to the soil. Organisms can survive only in environments in which their particular needs are met. A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life. Newly introduced species can damage the balance of an ecosystem. (5-LS2-1)
- LS2.B: Cycles of Matter and Energy Transfer in Ecosystems - Matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die. Organisms obtain gases, and water, from the environment, and release waste matter (gas, liquid, or solid) back into the environment. (5-LS2-1)

Crosscutting Concepts

- Systems and System Models – A system can be described in terms of its components and their interactions. (5-LS2-1), (5-ESS2-1), (5-ESS3-1)
- Energy and Matter - Matter is transported into, out of, and within systems. (5-LS1-1)
- Patterns – Patterns can be used to identify cause and effect relationships. (MS-LS2-2)

King County Waste Reduction and Recycling

Elementary Classroom Workshops

Earth and Space Sciences

5-MS – ESS3 Earth’s Systems

- 5-ESS3-1: Obtain and combine information about ways individual communities use science ideas to protect the Earth’s resources environment
- MS-ESS3-3: Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment

Science and Engineering Practices

- Obtaining, Evaluating, and Communicating Information– Obtaining, evaluating, and communicating information in 3–5 builds on K–2 experiences and progresses to evaluating the merit and accuracy of ideas and methods.
 - ▲ Obtain and combine information from books and/or other reliable media to explain phenomena or solutions to a design problem. (5-ESS3-1)

Disciplinary Core Ideas

- ESS2.C: Human Impacts on Earth Systems - Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth’s resources and environments. (5-ESS3-1)

Crosscutting Concepts

- Science Addresses Questions about the Natural and Material World - Science findings are limited to questions that can be answered with empirical evidence. (5-ESS3-1)
- 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-ESS3-4), (MS-ETS1-1)

Engineering, Technology, and Applications of Science

3-5 – ETS1 Engineering Design

- 3-5-ETS1-1: Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
- 3-5-ETS1-2: Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
- MS-ETS1-1: Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
- MS-ETS1-2: Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

Science and Engineering Practices

- Asking Questions and Defining Problems – Asking questions and defining problems in 3–5 builds on grades K–2 experiences and progresses to specifying qualitative relationships.
 - ▲ Define a simple design problem that can be solved through the development of an object, tool, process, or system and includes several criteria for success and constraints on materials, time, or cost. (3-5-ETS1-1)
 - ▲ Define a design problem that can be solved through the development of an object, tool, process or system and includes multiple criteria and constraints, including scientific knowledge that may limit possible solutions. (MS-ETS1-1)
- Planning and Carrying Out Investigations - Planning and carrying out investigations to answer questions or test solutions to problems in 3–5 builds on K–2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions.
 - ▲ Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered. (3-5-ETS1-3)
- Constructing Explanations and Designing Solutions - Constructing explanations and designing solutions in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems.

King County Waste Reduction and Recycling

Elementary Classroom Workshops

- ▲ Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design problem. (3-5-ETS1-2)
- ▲ Apply scientific principles to design an object, tool, process or system. (MS-ESS3-3)

Disciplinary Core Ideas

- ETS1.A: Defining and Delimiting Engineering Problems - Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria). Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account. (3-5-ETS1-1)
- ETS1.B: Developing Possible Solutions - Research on a problem should be carried out before beginning to design a solution. Testing a solution involves investigating how well it performs under a range of likely conditions. (3-5-ETS1-2)
 - ▲ At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs. (3-5-ETS1-2)
 - ▲ There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem. (secondary to MS-LS2-5)
- ETS1.C: Optimizing the Design Solution - Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints. (3-5-ETS1-3)

Common Core

Speaking and Listening

Grade 4

- CCSS.ELA-LITERACY.SL.4.1 - Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 4 topics and texts*, building on others' ideas and expressing their own clearly.
- CCSS.ELA-LITERACY.SL.4.2 - Paraphrase portions of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.
- CCSS.ELA-LITERACY.SL.4.3 - Identify the reasons and evidence a speaker provides to support particular points.
- CCSS.ELA-LITERACY.SL.4.4 - Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.

Grade 5

- CCSS.ELA-LITERACY.SL.5.1 - Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 5 topics and texts*, building on others' ideas and expressing their own clearly.
- CCSS.ELA-LITERACY.SL.5.2 - Summarize a written text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.
- CCSS.ELA-LITERACY.SL.5.3 - Summarize the points a speaker makes and explain how each claim is supported by reasons and evidence.
- CCSS.ELA-LITERACY.SL.5.4 - Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.

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 and texts*, 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, and orally) and explain how it contributes to a topic, text, or issue under study.
- CCSS.ELA-LITERACY.SL.6.3 - Delineate a speaker's argument and specific claims, distinguishing claims that are supported by reasons and evidence from claims that are not.

King County Waste Reduction and Recycling

Elementary Classroom Workshops

- 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.

Language

Grade 4-6

- CCSS.ELA-LITERACY.L4-6.1 - Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- CCSS.ELA-LITERACY.L4-6.3 - Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- CCSS.ELA-LITERACY.L4-6.4 - Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 4-6 reading and content, choosing flexibly from a range of strategies.

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.

King County Waste Reduction and Recycling
Elementary Classroom Workshops

Washington State Education Standards – HABITAT STEWARDSHIP

Next Generation Science Standards (NGSS)

Physical Sciences

MS – PS1 Structures and Properties of Matter

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

Science and Engineering Practices

- Developing and Using Models– Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions. Modeling in 6–8 builds on K–5 and progresses to developing, using and revising models to describe, test, and predict more abstract phenomena and design systems.
 - ▲ Use models to describe phenomena. (5-PS1-1), (5-PS3-1), (5-ESS2-1), (MS-LS2-3)
 - ▲ Develop a model to predict and/or describe phenomena. (MS-PS1-1), (MS-PS1-4), (MS-LS2-3)
- Planning and Carrying Out Investigations - Planning and carrying out investigations to answer questions or test solutions to problems in 3–5 builds on K–2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions.
 - ▲ Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered. (5-PS1-4), (3-5-ETS1-3)

Disciplinary Core Ideas

- PS1.A: Structure and Properties of Matter – the amount (weight) of matter is conserved when it changes form, even in transitions in which it seems to vanish. (5-PS1-2)

Crosscutting Concepts

- Cause and Effect – Cause and effect relationships may be used to predict phenomena in natural or designed systems. (MS-PS1-4), (MS-ESS3-4), (MS-LS2-1)

Life Sciences

3 – LS4 Interdependent Relationships in Ecosystems: Environmental Impacts on Organisms

- 3-LS4-3: Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.
- 3-LS4-4: Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.

MS – LS2 Interdependent Relationships in Ecosystems

- MS-LS2-5: Evaluate competing design solutions for maintaining biodiversity and ecosystem services

MS – LS4 Matter and Energy in Organisms and Ecosystems

- MS-LS2-1: Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.
- 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.

Science and Engineering Practices

- Analyzing and Interpreting Data – Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used. Analyzing data in 6–8 builds on K–5 experiences and progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis.
 - ▲ Analyze and interpret data to make sense of phenomena using logical reasoning. (3-LS4-1)

King County Waste Reduction and Recycling

Elementary Classroom Workshops

- ▲ Analyze and interpret data to provide evidence for phenomena. (MS-LS2-1)
- Constructing Explanations and Designing Solutions - Constructing explanations and designing solutions in 6–8 builds on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific knowledge, principles, and theories.
 - ▲ Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students’ own experiments) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (MS-LS1-6)
- Engaging in Argument from Evidence - Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s).
 - ▲ Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem. (3-LS4-4)

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: Cycles of Matter and Energy Transfer in Ecosystems - Matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die. Organisms obtain gases, and water, from the environment, and release waste matter (gas, liquid, or solid) back into the environment. (5-LS2-1)
- LS2.C: Ecosystem Dynamics, Functioning, and Resilience –
 - ▲ When the environment changes in ways that affect a place’s physical characteristics, temperature, or availability of resources, some organisms survive and reproduce, others move to new locations, yet others move into the transformed environment, and some die. (secondary to 3-LS4-4)
 - ▲ 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)
- LS4.D: Biodiversity and Humans - Populations live in a variety of habitats, and change in those habitats affects the organisms living there. (3-LS4-4)

Crosscutting Concepts

- Systems and System Models – A system can be described in terms of its components and their interactions. (3-LS4-4), (5-LS2-1), (5-ESS2-1), (5-ESS3-1)
- Energy and Matter - Matter is transported into, out of, and within systems. (5-LS1-1)
- Patterns – Patterns can be used to identify cause and effect relationships. (MS-LS2-2)
- Stability and Change – Small changes in one part of a system might cause large changes in another part. (MS-LS2-4)
- Scientific Knowledge Assumes an Order and Consistency in Natural Systems - 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. (3-LS4-4), (MS-LS2-4)

Earth and Space Sciences

5 – ESS3 Earth’s Systems

- 5-ESS3-1: Obtain and combine information about ways individual communities use science ideas to protect the Earth’s resources environment

MS – ESS3 Human Impacts

- MS-ESS3-3: Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment

Science and Engineering Practices

- Obtaining, Evaluating, and Communicating Information– Obtaining, evaluating, and communicating information in 3–5 builds on K–2 experiences and progresses to evaluating the merit and accuracy of ideas and methods.

King County Waste Reduction and Recycling

Elementary Classroom Workshops

- ▲ Obtain and combine information from books and/or other reliable media to explain phenomena or solutions to a design problem. (5-ESS3-1)

Disciplinary Core Ideas

- ESS2.C: Human Impacts on Earth Systems - Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth's resources and environments. (5-ESS3-1)

Crosscutting Concepts

- Science Addresses Questions about the Natural and Material World - Science findings are limited to questions that can be answered with empirical evidence. (5-ESS3-1)
- 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-ESS3-4), (MS-ETS1-1)

Engineering, Technology, and Applications of Science

3-MS – ETS1 Engineering Design

- 3-5-ETS1-1: Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
- 3-5-ETS1-2: Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
- MS-ETS1-1: Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
- MS-ETS1-2: Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

Science and Engineering Practices

- Asking Questions and Defining Problems – Asking questions and defining problems in 3–5 builds on grades K–2 experiences and progresses to specifying qualitative relationships.
 - ▲ Define a simple design problem that can be solved through the development of an object, tool, process, or system and includes several criteria for success and constraints on materials, time, or cost. (3-5-ETS1-1)
 - ▲ Define a design problem that can be solved through the development of an object, tool, process or system and includes multiple criteria and constraints, including scientific knowledge that may limit possible solutions. (MS-ETS1-1)
- Constructing Explanations and Designing Solutions - Constructing explanations and designing solutions in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems.
 - ▲ Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design problem. (3-5-ETS1-2)
 - ▲ Apply scientific principles to design an object, tool, process or system. (MS-ESS3-3)
- 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.
 - ▲ Evaluate competing design solutions based on jointly developed and agreed-upon design criteria. (MS-ETS1-2)

Disciplinary Core Ideas

- ETS1.A: Defining and Delimiting Engineering Problems - Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria). Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account. (3-5-ETS1-1)

King County Waste Reduction and Recycling

Elementary Classroom Workshops

- ETS1.B: Developing Possible Solutions - Research on a problem should be carried out before beginning to design a solution. Testing a solution involves investigating how well it performs under a range of likely conditions. (3-5-ETS1-2)
 - ▲ At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs. (3-5-ETS1-2)
 - ▲ There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem. (secondary to MS-LS2-5)
- ETS1.C: Optimizing the Design Solution - Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints. (3-5-ETS1-3)

Common Core

Speaking and Listening

Grade 3

- CCSS.ELA-LITERACY.SL.3.1 - Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 3 topics and texts*, building on others' ideas and expressing their own clearly.
- CCSS.ELA-LITERACY.SL.3.2 - Determine the main ideas and supporting details of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.
- CCSS.ELA-LITERACY.SL.3.3 - Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.
- CCSS.ELA-LITERACY.SL.3.4 - Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.

Grade 4

- CCSS.ELA-LITERACY.SL.4.1 - Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 4 topics and texts*, building on others' ideas and expressing their own clearly.
- CCSS.ELA-LITERACY.SL.4.2 - Paraphrase portions of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.
- CCSS.ELA-LITERACY.SL.4.3 - Identify the reasons and evidence a speaker provides to support particular points.
- CCSS.ELA-LITERACY.SL.4.4 - Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.

Grade 5

- CCSS.ELA-LITERACY.SL.5.1 - Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 5 topics and texts*, building on others' ideas and expressing their own clearly.
- CCSS.ELA-LITERACY.SL.5.2 - Summarize a written text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.
- CCSS.ELA-LITERACY.SL.5.3 - Summarize the points a speaker makes and explain how each claim is supported by reasons and evidence.
- CCSS.ELA-LITERACY.SL.5.4 - Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.

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 and texts*, 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, and orally) and explain how it contributes to a topic, text, or issue under study.
- CCSS.ELA-LITERACY.SL.6.3 - Delineate a speaker's argument and specific claims, distinguishing claims that are supported by reasons and evidence from claims that are not.

King County Waste Reduction and Recycling

Elementary Classroom Workshops

- 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.

Language

Grade 3-6

- CCSS.ELA-LITERACY.L3-6.1 - Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- CCSS.ELA-LITERACY.L3-6.3 - Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- CCSS.ELA-LITERACY.L3-6.4 - Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 3-6 reading and content, choosing flexibly from a range of strategies.

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 – **Healthy Habitats**

Next Generation Science Standards (NGSS)

Life Sciences

2 –LS4 Interdependent Relationships in Ecosystems

- 2-LS4-1: Make observations of plants and animals to compare the diversity of life in different habitats.

3 – LS2 Matter and Energy in Organisms and Ecosystems

- 3-LS4-3: Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.
- 3-LS4-4: Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.

Science and Engineering Practices

- Scientific Knowledge is based on Empirical Evidence - Scientists look for patterns and order when making observations about the world. (2-LS4-1)
- Analyzing and Interpreting Data – Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used. Analyzing data in 6–8 builds on K–5 experiences and progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis.
 - ▲ Analyze and interpret data to make sense of phenomena using logical reasoning. (3-LS4-1)
- Planning and Carrying Out Investigations - Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions.
 - ▲ Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question. (2-LS2-1)
 - ▲ Make observations (firsthand or from media) to collect data which can be used to make comparisons. (2-LS4-1)
- Engaging in Argument from Evidence - Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s).
 - ▲ Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem. (3-LS4-4)

Disciplinary Core Ideas

- LS2.C: Ecosystem Dynamics, Functioning, and Resilience –
 - ▲ When the environment changes in ways that affect a place’s physical characteristics, temperature, or availability of resources, some organisms survive and reproduce, others move to new locations, yet others move into the transformed environment, and some die. (secondary to 3-LS4-4)
- LS4.D: Biodiversity and Humans –
 - ▲ There are many different kinds of living things in any area, and they exist in different places on land and in water. (2-LS4-1)
 - ▲ Populations live in a variety of habitats, and change in those habitats affects the organisms living there. (3-LS4-4)

Crosscutting Concepts

- Systems and System Models – A system can be described in terms of its components and their interactions. (3-LS4-4)
- Scientific Knowledge Assumes an Order and Consistency in Natural Systems - 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. (3-LS4-4)

Engineering, Technology, and Applications of Science

King County Waste Reduction and Recycling

Elementary Classroom Workshops

1-5 – ETS1 Engineering Design

- K-2-ETS1-1: Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.
- 3-5-ETS1-1: Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
- 3-5-ETS1-2: Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

Science and Engineering Practices

- Asking Questions and Defining Problems – Asking questions and defining problems in 3–5 builds on grades K–2 experiences and progresses to specifying qualitative relationships.
 - ▲ Define a simple design problem that can be solved through the development of an object, tool, process, or system and includes several criteria for success and constraints on materials, time, or cost. (3-5-ETS1-1)
- Constructing Explanations and Designing Solutions - Constructing explanations and designing solutions in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems.
 - ▲ Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design problem. (3-5-ETS1-2)

Disciplinary Core Ideas

- ETS1.A: Defining and Delimiting Engineering Problems - Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria).
 - ▲ Before beginning to design a solution, it is important to clearly understand the problem. (K-2-ETS1-1)
 - ▲ Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account. (3-5-ETS1-1)
- ETS1.B: Developing Possible Solutions - Research on a problem should be carried out before beginning to design a solution. Testing a solution involves investigating how well it performs under a range of likely conditions. (3-5-ETS1-2)
 - ▲ At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs. (3-5-ETS1-2)
- ETS1.C: Optimizing the Design Solution - Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints. (3-5-ETS1-3)

Common Core

Speaking and Listening

Grade 1

- CCSS.ELA-LITERACY.SL.1.1 - Participate in collaborative conversations with diverse partners about *grade 1 topics and texts* with peers and adults in small and larger groups.
- CCSS.ELA-LITERACY.SL.1.2 - Ask and answer questions about key details in a text read aloud or information presented orally or through other media.
- CCSS.ELA-LITERACY.SL.1.3 - Ask and answer questions about what a speaker says in order to gather additional information or clarify something that is not understood.
- CCSS.ELA-LITERACY.SL.1.4 - Describe people, places, things, and events with relevant details, expressing ideas and feelings clearly.

Grade 2

- CCSS.ELA-LITERACY.SL.2.1 - Participate in collaborative conversations with diverse partners about *grade 2 topics and texts* with peers and adults in small and larger groups.
- CCSS.ELA-LITERACY.SL.2.2 - Recount or describe key ideas or details from a text read aloud or information presented orally or through other media.
- CCSS.ELA-LITERACY.SL.2.3 - Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information, or deepen understanding of a topic or issue.

King County Waste Reduction and Recycling

Elementary Classroom Workshops

- CCSS.ELA-LITERACY.SL.2.4 - Tell a story or recount an experience with appropriate facts and relevant, descriptive details, speaking audibly in coherent sentences.

Grade 3

- CCSS.ELA-LITERACY.SL.3.1 - Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 3 topics and texts*, building on others' ideas and expressing their own clearly.
- CCSS.ELA-LITERACY.SL.3.2 - Determine the main ideas and supporting details of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.
- CCSS.ELA-LITERACY.SL.3.3 - Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.
- CCSS.ELA-LITERACY.SL.3.4 - Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.

Language

Grade 1-3

- CCSS.ELA-LITERACY.L1-3.1 - Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- CCSS.ELA-LITERACY.L2-3.3 - Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- CCSS.ELA-LITERACY.L1-3.4 - Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 3 reading and content, choosing flexibly from a range of strategies.

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 –OUR CLIMATE, R CHOICES

Next Generation Science Standards (NGSS)

Physical Sciences

5– PS1 Structure and Properties of Matter

- 5-PS1-1: Develop a model to describe that matter is made of particles too small to be seen.

Science and Engineering Practices

- Developing and Using Models - Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions.
 - ▲ Use models to describe phenomena. (5-PS1-1)
 - ▲ Develop a model to describe unobservable phenomena. (MS-LS2-1)
- Planning and Carrying Out Investigations - Planning and carrying out investigations to answer questions or test solutions to problems in 3–5 builds on K–2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions.
 - ▲ Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered. (5-PS1-4), 3-5-ETS1-3)

Disciplinary Core Ideas

- PS1.A: Structure and Properties of Matter - Matter of any type can be subdivided into particles that are too small to see, but even then the matter still exists and can be detected by other means. (5-PS1-1)

Crosscutting Concepts

- Cause and Effect - Cause and effect relationships are routinely identified and used to explain change. (5-PS1-4)
 - ▲ Cause and effect relationships may be used to predict phenomena in natural or designed systems. (MS-ESS2-5)

Life Sciences

MS– LS2 Matter and Energy in Organisms and Ecosystems

- 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 Interdependent Relationships in Ecosystems

- MS-LS2-5: Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

Science and Engineering Practices

- Constructing Explanations and Designing Solutions - Constructing explanations and designing solutions in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems.
 - ▲ Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students' own experiments) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (MS-LS1-6)
 - ▲ Construct an explanation that includes qualitative or quantitative relationships between variables that predict phenomena. (MS-LS2-2)
 - ▲ Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design problem. (3-5-ETS1-2)
 - ▲ Apply scientific principles to design an object, tool, process or system. (MS-ESS3-3)
 - ▲ Use evidence (e.g., measurements, observations, patterns) to construct an explanation. (4-PS3-1)

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)

King County Waste Reduction and Recycling

Elementary Classroom Workshops

Crosscutting Concepts

- Energy and Matter - Within a natural system, the transfer of energy drives the motion and/or cycling of matter. (MS-LS1-6)
- Stability and Change - Small changes in one part of a system might cause large changes in another part. (MS-LS2-5)
 - Stability might be disturbed either by sudden events or gradual changes that accumulate over time. (MS-ESS3-5)
- Scientific Knowledge Assumes an Order and Consistency in Natural Systems - Science assumes that objects and events in natural systems occur in consistent patterns that are understandable through measurement and observation. (MS-LS2-3)

Earth and Space Sciences

3 – ESS2 Weather and Climate

- 3-ESS2-2: Obtain and combine information to describe climates in different regions of the world.

4– ESS3 Energy

- 4-ESS3-1: Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.

5– ESS3 Earth’s Systems

- 5-ESS3-1: Obtain and combine information about ways individual communities use science ideas to protect the Earth’s resources environment

MS– ESS3 Human Impacts

- MS-ESS3-3: Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment
- 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.

MS– ESS3 Earth’s Systems

- MS-ESS3-5: Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.

Science and Engineering Practices

- Obtaining, Evaluating, and Communicating Information– Obtaining, evaluating, and communicating information in 3–5 builds on K–2 experiences and progresses to evaluating the merit and accuracy of ideas and methods.
 - ▲ Obtain and combine information from books and/or other reliable media to explain phenomena or solutions to a design problem. (5-ESS3-1)

Disciplinary Core Ideas

- ESS2.C: Human Impacts on Earth Systems - Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth’s resources and environments. (5-ESS3-1)
- ESS2.D: Weather and Climate - Climate describes a range of an area's typical weather conditions and the extent to which those conditions vary over years. (3-ESS2-2) Weather and climate are influenced by interactions involving sunlight, the ocean, the atmosphere, ice, landforms, and living things. These interactions vary with latitude, altitude, and local and regional geography, all of which can affect oceanic and atmospheric flow patterns. (MS-ESS2-6)
- ESS3.A: Natural Resources - Energy and fuels that humans use are derived from natural sources, and their use affects the environment in multiple ways. Some resources are renewable over time, and others are not. (4-ESS3-1)
- 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

King County Waste Reduction and Recycling

Elementary Classroom Workshops

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-ESS3-4), (MS-ETS1-1)
- Science is a Human Endeavor – Science affects everyday life. (4-PS3-4)
- Systems and Systems 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)

Engineering, Technology, and Applications of Science

3-MS – ETS1 Engineering Design

- 3-5-ETS1-2: Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
- MS-ETS1-1: Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
- MS-ETS1-2: Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

Science and Engineering Practices

- Asking Questions and Defining Problems – Asking questions and defining problems in 3–5 builds on grades K–2 experiences and progresses to specifying qualitative relationships.
 - ▲ Define a simple design problem that can be solved through the development of an object, tool, process, or system and includes several criteria for success and constraints on materials, time, or cost. (3-5-ETS1-1)
 - ▲ Define a design problem that can be solved through the development of an object, tool, process or system and includes multiple criteria and constraints, including scientific knowledge that may limit possible solutions. (MS-ETS1-1)
 - ▲ Asks questions to identify and clarify evidence of an argument. (MS-ESS3-5)

Disciplinary Core Ideas

- ETS1.A: Defining and Delimiting Engineering Problems - Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria).
 - ▲ Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account. (3-5-ETS1-1)
- ETS1.B: Developing Possible Solutions - Research on a problem should be carried out before beginning to design a solution. Testing a solution involves investigating how well it performs under a range of likely conditions. (3-5-ETS1-2)
 - ▲ At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs. (3-5-ETS1-2)
 - ▲ There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem. (secondary to MS-LS2-5)

Common Core

Speaking and Listening

Grade 3

- CCSS.ELA-LITERACY.SL.3.1 - Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 3 topics and texts*, building on others' ideas and expressing their own clearly.

King County Waste Reduction and Recycling

Elementary Classroom Workshops

- CCSS.ELA-LITERACY.SL.3.2 - Determine the main ideas and supporting details of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.
- CCSS.ELA-LITERACY.SL.3.3 - Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.
- CCSS.ELA-LITERACY.SL.3.4 - Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.

Grade 4

- CCSS.ELA-LITERACY.SL.4.1 - Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 4 topics and texts*, building on others' ideas and expressing their own clearly.
- CCSS.ELA-LITERACY.SL.4.2 - Paraphrase portions of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.
- CCSS.ELA-LITERACY.SL.4.3 - Identify the reasons and evidence a speaker provides to support particular points.
- CCSS.ELA-LITERACY.SL.4.4 - Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.

Grade 5

- CCSS.ELA-LITERACY.SL.5.1 - Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 5 topics and texts*, building on others' ideas and expressing their own clearly.
- CCSS.ELA-LITERACY.SL.5.2 - Summarize a written text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.
- CCSS.ELA-LITERACY.SL.5.3 - Summarize the points a speaker makes and explain how each claim is supported by reasons and evidence.
- CCSS.ELA-LITERACY.SL.5.4 - Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.

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 and texts*, 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, and orally) and explain how it contributes to a topic, text, or issue under study.
- CCSS.ELA-LITERACY.SL.6.3 - Delineate a speaker's argument and specific claims, distinguishing claims that are supported by reasons and evidence from claims that are not.
- 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.

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.

King County Waste Reduction and Recycling

Elementary Classroom Workshops

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.

King County Waste Reduction and Recycling Elementary Classroom Workshops

Washington State Education Standards – **RECYCLING AND BEYOND** **(INTERMEDIATE)**

Next Generation Science Standards (NGSS)

Physical Sciences

5-MS – PS1 Structures and Properties of Matter

- 5-PS1-3: Make observations and measurements to identify materials based on their properties.
- MS-PS1-3: Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.

Science and Engineering Practices

- Developing and Using Models– Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions. Modeling in 6–8 builds on K–5 and progresses to developing, using and revising models to describe, test, and predict more abstract phenomena and design systems.
 - ▲ Use models to describe phenomena. (5-PS1-1), (5-PS3-1), (5-ESS2-1)
 - ▲ Develop a model to predict and/or describe phenomena. (MS-PS1-1), (MS-PS1-4), (MS-LS2-3)
- Planning and Carrying Out Investigations - Planning and carrying out investigations to answer questions or test solutions to problems in 3–5 builds on K–2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions.
 - ▲ Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered. (5-PS1-4), (3-5-ETS1-3)
 - ▲ Make observations and measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon. (5-PS1-3)

Disciplinary Core Ideas

- PS1.A: Structure and Properties of Matter – the amount (weight) of matter is conserved when it changes form, even in transitions in which it seems to vanish. (5-PS1-2)

Crosscutting Concepts

- Cause and Effect – Cause and effect relationships may be used to predict phenomena in natural or designed systems. (MS-PS1-4), (MS-ESS3-4)

Life Sciences

5-MS – LS2 Matter and Energy in Organisms and Ecosystems

- 5-LS2-1: Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.
- MS-LS2-1: Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.

MS – LS2 Interdependent Relationships in Ecosystems

- MS-LS2-5: Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

Disciplinary Core Ideas

- LS2.B: Cycles of Matter and Energy Transfer in Ecosystems - Matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die. Organisms obtain gases, and water, from the environment, and release waste matter (gas, liquid, or solid) back into the environment. (5-LS2-1)

Crosscutting Concepts

- Systems and System Models – A system can be described in terms of its components and their interactions. (5-LS2-1), (5-ESS2-1), (5-ESS3-1)
- Energy and Matter - Matter is transported into, out of, and within systems. (5-LS1-1)
- Patterns – Patterns can be used to identify cause and effect relationships. (MS-LS2-2)

Earth and Space Sciences

King County Waste Reduction and Recycling

Elementary Classroom Workshops

5– ESS3 Earth’s Systems

- 5-ESS3-1: Obtain and combine information about ways individual communities use science ideas to protect the Earth’s resources environment

MS– ESS3 Human Impacts

- MS-ESS3-3: Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment

Science and Engineering Practices

- Obtaining, Evaluating, and Communicating Information– Obtaining, evaluating, and communicating information in 3–5 builds on K–2 experiences and progresses to evaluating the merit and accuracy of ideas and methods.
 - ▲ Obtain and combine information from books and/or other reliable media to explain phenomena or solutions to a design problem. (5-ESS3-1)

Disciplinary Core Ideas

- ESS2.C: Human Impacts on Earth Systems - Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth’s resources and environments. (5-ESS3-1)

Crosscutting Concepts

- Science Addresses Questions about the Natural and Material World - Science findings are limited to questions that can be answered with empirical evidence. (5-ESS3-1)
- 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-ESS3-4), (MS-ETS1-1)

Engineering, Technology, and Applications of Science

3-MS – ETS1 Engineering Design

- 3-5-ETS1-1: Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
- 3-5-ETS1-2: Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
- MS-ETS1-1: Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
- MS-ETS1-2: Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

Science and Engineering Practices

- Asking Questions and Defining Problems – Asking questions and defining problems in 3–5 builds on grades K–2 experiences and progresses to specifying qualitative relationships.
 - ▲ Define a simple design problem that can be solved through the development of an object, tool, process, or system and includes several criteria for success and constraints on materials, time, or cost. (3-5-ETS1-1)
 - ▲ Define a design problem that can be solved through the development of an object, tool, process or system and includes multiple criteria and constraints, including scientific knowledge that may limit possible solutions. (MS-ETS1-1)
- Constructing Explanations and Designing Solutions - Constructing explanations and designing solutions in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems.
 - ▲ Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design problem. (3-5-ETS1-2)
 - ▲ Apply scientific principles to design an object, tool, process or system. (MS-ESS3-3)
- 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.

King County Waste Reduction and Recycling

Elementary Classroom Workshops

- ▲ Evaluate competing design solutions based on jointly developed and agreed-upon design criteria. (MS-ETS1-2)

Disciplinary Core Ideas

- ETS1.A: Defining and Delimiting Engineering Problems - Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria). Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account. (3-5-ETS1-1)
- ETS1.B: Developing Possible Solutions - Research on a problem should be carried out before beginning to design a solution. Testing a solution involves investigating how well it performs under a range of likely conditions. (3-5-ETS1-2)
 - ▲ At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs. (3-5-ETS1-2)
 - ▲ There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem. (secondary to MS-LS2-5)
- ETS1.C: Optimizing the Design Solution - Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints. (3-5-ETS1-3)

Common Core

Speaking and Listening

Grade 3

- CCSS.ELA-LITERACY.SL.3.1 - Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 3 topics and texts*, building on others' ideas and expressing their own clearly.
- CCSS.ELA-LITERACY.SL.3.2 - Determine the main ideas and supporting details of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.
- CCSS.ELA-LITERACY.SL.3.3 - Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.
- CCSS.ELA-LITERACY.SL.3.4 - Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.

Grade 4

- CCSS.ELA-LITERACY.SL.4.1 - Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 4 topics and texts*, building on others' ideas and expressing their own clearly.
- CCSS.ELA-LITERACY.SL.4.2 - Paraphrase portions of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.
- CCSS.ELA-LITERACY.SL.4.3 - Identify the reasons and evidence a speaker provides to support particular points.
- CCSS.ELA-LITERACY.SL.4.4 - Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.

Grade 5

- CCSS.ELA-LITERACY.SL.5.1 - Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 5 topics and texts*, building on others' ideas and expressing their own clearly.
- CCSS.ELA-LITERACY.SL.5.2 - Summarize a written text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.
- CCSS.ELA-LITERACY.SL.5.3 - Summarize the points a speaker makes and explain how each claim is supported by reasons and evidence.

King County Waste Reduction and Recycling

Elementary Classroom Workshops

- CCSS.ELA-LITERACY.SL.5.4 - Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.

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 and texts*, 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, and orally) and explain how it contributes to a topic, text, or issue under study.
- CCSS.ELA-LITERACY.SL.6.3 - Delineate a speaker's argument and specific claims, distinguishing claims that are supported by reasons and evidence from claims that are not.
- 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.

Language

Grade 3-6

- CCSS.ELA-LITERACY.L3-6.1 - Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- CCSS.ELA-LITERACY.L3-6.3 - Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- CCSS.ELA-LITERACY.L3-6.4 - Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 3-6 reading and content, choosing flexibly from a range of strategies.

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.

King County Waste Reduction and Recycling Elementary Classroom Workshops

Washington State Education Standards – **RECYCLING AND BEYOND** **(PRIMARY)**

Next Generation Science Standards (NGSS)

Engineering, Technology, and Applications of Science

1-5 – ETS1 Engineering Design

- K-2-ETS1-1: Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.
- 3-5-ETS1-1: Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
- 3-5-ETS1-2: Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

Science and Engineering Practices

- Asking Questions and Defining Problems – Asking questions and defining problems in 3–5 builds on grades K–2 experiences and progresses to specifying qualitative relationships.
 - ▲ Define a simple design problem that can be solved through the development of an object, tool, process, or system and includes several criteria for success and constraints on materials, time, or cost. (3-5-ETS1-1)
- Constructing Explanations and Designing Solutions - Constructing explanations and designing solutions in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems.
 - ▲ Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design problem. (3-5-ETS1-2)

Disciplinary Core Ideas

- ETS1.A: Defining and Delimiting Engineering Problems - Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria).
 - ▲ Before beginning to design a solution, it is important to clearly understand the problem. (K-2-ETS1-1)
 - ▲ Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account. (3-5-ETS1-1)
- ETS1.B: Developing Possible Solutions - Research on a problem should be carried out before beginning to design a solution. Testing a solution involves investigating how well it performs under a range of likely conditions. (3-5-ETS1-2)
 - ▲ At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs. (3-5-ETS1-2)
- ETS1.C: Optimizing the Design Solution - Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints. (3-5-ETS1-3)

Common Core

Speaking and Listening

Grade 1

- CCSS.ELA-LITERACY.SL.1.1 - Participate in collaborative conversations with diverse partners about *grade 1 topics and texts* with peers and adults in small and larger groups.
- CCSS.ELA-LITERACY.SL.1.2 - Ask and answer questions about key details in a text read aloud or information presented orally or through other media.
- CCSS.ELA-LITERACY.SL.1.3 - Ask and answer questions about what a speaker says in order to gather additional information or clarify something that is not understood.
- CCSS.ELA-LITERACY.SL.1.4 - Describe people, places, things, and events with relevant details, expressing ideas and feelings clearly.

Grade 2

King County Waste Reduction and Recycling

Elementary Classroom Workshops

- CCSS.ELA-LITERACY.SL.2.1 - Participate in collaborative conversations with diverse partners about *grade 2 topics and texts* with peers and adults in small and larger groups.
- CCSS.ELA-LITERACY.SL.2.2 - Recount or describe key ideas or details from a text read aloud or information presented orally or through other media.
- CCSS.ELA-LITERACY.SL.2.3 - Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information, or deepen understanding of a topic or issue.
- CCSS.ELA-LITERACY.SL.2.4 - Tell a story or recount an experience with appropriate facts and relevant, descriptive details, speaking audibly in coherent sentences.

Grade 3

- CCSS.ELA-LITERACY.SL.3.1 - Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 3 topics and texts*, building on others' ideas and expressing their own clearly.
- CCSS.ELA-LITERACY.SL.3.2 - Determine the main ideas and supporting details of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.
- CCSS.ELA-LITERACY.SL.3.3 - Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.
- CCSS.ELA-LITERACY.SL.3.4 - Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.

Language

Grade 1-3

- CCSS.ELA-LITERACY.L1-3.1 - Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- CCSS.ELA-LITERACY.L2-3.3 - Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- CCSS.ELA-LITERACY.L1-3.4 - Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 3 reading and content, choosing flexibly from a range of strategies.

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.

King County Waste Reduction and Recycling Elementary Classroom Workshops

Washington State Education Standards – **RETHINK AND REUSE**

Next Generation Science Standards (NGSS)

Engineering, Technology, and Applications of Science

1-5 – ETS1 Engineering Design

- K-2-ETS1-1: Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.
- 3-5-ETS1-1: Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
- 3-5-ETS1-2: Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

Science and Engineering Practices

- Asking Questions and Defining Problems – Asking questions and defining problems in 3–5 builds on grades K–2 experiences and progresses to specifying qualitative relationships.
 - ▲ Define a simple design problem that can be solved through the development of an object, tool, process, or system and includes several criteria for success and constraints on materials, time, or cost. (3-5-ETS1-1)
- Constructing Explanations and Designing Solutions - Constructing explanations and designing solutions in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems.
 - ▲ Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design problem. (3-5-ETS1-2)

Disciplinary Core Ideas

- ETS1.A: Defining and Delimiting Engineering Problems - Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria).
 - ▲ Before beginning to design a solution, it is important to clearly understand the problem. (K-2-ETS1-1)
 - ▲ Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account. (3-5-ETS1-1)
- ETS1.B: Developing Possible Solutions - Research on a problem should be carried out before beginning to design a solution. Testing a solution involves investigating how well it performs under a range of likely conditions. (3-5-ETS1-2)
 - ▲ At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs. (3-5-ETS1-2)
- ETS1.C: Optimizing the Design Solution - Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints. (3-5-ETS1-3)

Common Core

Speaking and Listening

Grade 1

- CCSS.ELA-LITERACY.SL.1.1 - Participate in collaborative conversations with diverse partners about *grade 1 topics and texts* with peers and adults in small and larger groups.
- CCSS.ELA-LITERACY.SL.1.2 - Ask and answer questions about key details in a text read aloud or information presented orally or through other media.
- CCSS.ELA-LITERACY.SL.1.3 - Ask and answer questions about what a speaker says in order to gather additional information or clarify something that is not understood.
- CCSS.ELA-LITERACY.SL.1.4 - Describe people, places, things, and events with relevant details, expressing ideas and feelings clearly.

Grade 2

King County Waste Reduction and Recycling

Elementary Classroom Workshops

- CCSS.ELA-LITERACY.SL.2.1 - Participate in collaborative conversations with diverse partners about *grade 2 topics and texts* with peers and adults in small and larger groups.
- CCSS.ELA-LITERACY.SL.2.2 - Recount or describe key ideas or details from a text read aloud or information presented orally or through other media.
- CCSS.ELA-LITERACY.SL.2.3 - Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information, or deepen understanding of a topic or issue.
- CCSS.ELA-LITERACY.SL.2.4 - Tell a story or recount an experience with appropriate facts and relevant, descriptive details, speaking audibly in coherent sentences.

Grade 3

- CCSS.ELA-LITERACY.SL.3.1 - Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 3 topics and texts*, building on others' ideas and expressing their own clearly.
- CCSS.ELA-LITERACY.SL.3.2 - Determine the main ideas and supporting details of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.
- CCSS.ELA-LITERACY.SL.3.3 - Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.
- CCSS.ELA-LITERACY.SL.3.4 - Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.

Language

Grade 1-3

- CCSS.ELA-LITERACY.L1-3.1 - Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- CCSS.ELA-LITERACY.L2-3.3 - Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- CCSS.ELA-LITERACY.L1-3.4 - Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 3 reading and content, choosing flexibly from a range of strategies.

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 – WORM BINS AND FOOD COMPOSTING

Next Generation Science Standards (NGSS)

Life Sciences

5-MS – LS2 Matter and Energy in Organisms and Ecosystems

- 5-LS2-1: Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.
- MS-LS2-1: Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.
- 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 Interdependent Relationships in Ecosystems

- MS-LS2-5: Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

Science and Engineering Practices

- Science Models, Laws, Mechanisms, and Theories Explain Natural Phenomena
 - ▲ Science explanations describe the mechanisms for natural events. (5-LS2-1)
- Developing and Using Models - Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems.
 - ▲ Develop a model to describe phenomena. (MS-LS2-3)

Disciplinary Core Ideas

- LS1.C: Organization for Matter and Energy Flow in Organisms - 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 - The food of almost any kind of animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants. Some organisms, such as fungi and bacteria, break down dead organisms (both plants or plants parts and animals) and therefore operate as “decomposers.” Decomposition eventually restores (recycles) some materials back to the soil. Organisms can survive only in environments in which their particular needs are met. A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life. Newly introduced species can damage the balance of an ecosystem. (5-LS2-1)
- LS2.B: Cycles of Matter and Energy Transfer in Ecosystems - Matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die. Organisms obtain gases, and water, from the environment, and release waste matter (gas, liquid, or solid) back into the environment. (5-LS2-1)
 - ▲ 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)

Crosscutting Concepts

- Systems and System Models – A system can be described in terms of its components and their interactions. (5-LS2-1), (5-ESS2-1), (5-ESS3-1)
- Energy and Matter –
 - ▲ Matter is transported into, out of, and within systems. (5-LS1-1)
 - ▲ Within a natural system, the transfer of energy drives the motion and/or cycling of matter. (MS-LS1-6)
- Patterns – Patterns can be used to identify cause and effect relationships. (MS-LS2-2)
- Scientific Knowledge Assumes an Order and Consistency in Natural Systems - Within a natural system, the transfer of energy drives the motion and/or cycling of matter. (MS-LS1-6)

King County Waste Reduction and Recycling

Elementary Classroom Workshops

Earth and Space Sciences

5– ESS3 Earth’s Systems

- 5-ESS3-1: Obtain and combine information about ways individual communities use science ideas to protect the Earth’s resources environment

MS– ESS3 Human Impacts

- MS-ESS3-3: Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment

Science and Engineering Practices

- Obtaining, Evaluating, and Communicating Information– Obtaining, evaluating, and communicating information in 3–5 builds on K–2 experiences and progresses to evaluating the merit and accuracy of ideas and methods.
 - ▲ Obtain and combine information from books and/or other reliable media to explain phenomena or solutions to a design problem. (5-ESS3-1)

Disciplinary Core Ideas

- ESS2.C: Human Impacts on Earth Systems - Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth’s resources and environments. (5-ESS3-1)

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-ESS3-4), (MS-ETS1-1)

Engineering, Technology, and Applications of Science

1-5 – ETS1 Engineering Design

- K-2-ETS1-1: Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.
- 3-5-ETS1-1: Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
- 3-5-ETS1-2: Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
- MS-ETS1-1: Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
- MS-ETS1-2: Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

Science and Engineering Practices

- Asking Questions and Defining Problems – Asking questions and defining problems in 3–5 builds on grades K–2 experiences and progresses to specifying qualitative relationships.
 - ▲ Define a simple design problem that can be solved through the development of an object, tool, process, or system and includes several criteria for success and constraints on materials, time, or cost. (3-5-ETS1-1)
 - ▲ Define a design problem that can be solved through the development of an object, tool, process or system and includes multiple criteria and constraints, including scientific knowledge that may limit possible solutions. (MS-ETS1-1)
- Planning and Carrying Out Investigations - Planning and carrying out investigations to answer questions or test solutions to problems in 3–5 builds on K–2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions.
 - ▲ Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered. (3-5-ETS1-3)

King County Waste Reduction and Recycling

Elementary Classroom Workshops

- Constructing Explanations and Designing Solutions - Constructing explanations and designing solutions in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems.
 - ▲ Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design problem. (3-5-ETS1-2)
 - ▲ Apply scientific principles to design an object, tool, process or system. (MS-ESS3-3)

Disciplinary Core Ideas

- ETS1.A: Defining and Delimiting Engineering Problems - Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria).
 - ▲ Before beginning to design a solution, it is important to clearly understand the problem. (K-2-ETS1-1)
 - ▲ Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account. (3-5-ETS1-1)
- ETS1.B: Developing Possible Solutions - Research on a problem should be carried out before beginning to design a solution. Testing a solution involves investigating how well it performs under a range of likely conditions. (3-5-ETS1-2)
 - ▲ At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs. (3-5-ETS1-2)
 - ▲ There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem. (secondary to MS-LS2-5)
- ETS1.C: Optimizing the Design Solution - Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints. (3-5-ETS1-3)

Common Core

Speaking and Listening

Grade 1

- CCSS.ELA-LITERACY.SL.1.1 - Participate in collaborative conversations with diverse partners about *grade 1 topics and texts* with peers and adults in small and larger groups.
- CCSS.ELA-LITERACY.SL.1.2 - Ask and answer questions about key details in a text read aloud or information presented orally or through other media.
- CCSS.ELA-LITERACY.SL.1.3 - Ask and answer questions about what a speaker says in order to gather additional information or clarify something that is not understood.
- CCSS.ELA-LITERACY.SL.1.4 - Describe people, places, things, and events with relevant details, expressing ideas and feelings clearly.

Grade 2

- CCSS.ELA-LITERACY.SL.2.1 - Participate in collaborative conversations with diverse partners about *grade 2 topics and texts* with peers and adults in small and larger groups.
- CCSS.ELA-LITERACY.SL.2.2 - Recount or describe key ideas or details from a text read aloud or information presented orally or through other media.
- CCSS.ELA-LITERACY.SL.2.3 - Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information, or deepen understanding of a topic or issue.
- CCSS.ELA-LITERACY.SL.2.4 - Tell a story or recount an experience with appropriate facts and relevant, descriptive details, speaking audibly in coherent sentences.

Grade 3

- CCSS.ELA-LITERACY.SL.3.1 - Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 3 topics and texts*, building on others' ideas and expressing their own clearly.
- CCSS.ELA-LITERACY.SL.3.2 - Determine the main ideas and supporting details of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.
- CCSS.ELA-LITERACY.SL.3.3 - Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.

King County Waste Reduction and Recycling

Elementary Classroom Workshops

- CCSS.ELA-LITERACY.SL.3.4 - Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.

Grade 4

- CCSS.ELA-LITERACY.SL.4.1 - Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 4 topics and texts*, building on others' ideas and expressing their own clearly.
- CCSS.ELA-LITERACY.SL.4.2 - Paraphrase portions of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.
- CCSS.ELA-LITERACY.SL.4.3 - Identify the reasons and evidence a speaker provides to support particular points.
- CCSS.ELA-LITERACY.SL.4.4 - Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.

Grade 5

- CCSS.ELA-LITERACY.SL.5.1 - Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 5 topics and texts*, building on others' ideas and expressing their own clearly.
- CCSS.ELA-LITERACY.SL.5.2 - Summarize a written text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.
- CCSS.ELA-LITERACY.SL.5.3 - Summarize the points a speaker makes and explain how each claim is supported by reasons and evidence.
- CCSS.ELA-LITERACY.SL.5.4 - Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.

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 and texts*, 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, and orally) and explain how it contributes to a topic, text, or issue under study.
- CCSS.ELA-LITERACY.SL.6.3 - Delineate a speaker's argument and specific claims, distinguishing claims that are supported by reasons and evidence from claims that are not.
- 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.

Language

Grade 1-6

- CCSS.ELA-LITERACY.L1-6.1 - Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- CCSS.ELA-LITERACY.L2-6.3 - Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- CCSS.ELA-LITERACY.L1-6.4 - Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 1-6 reading and content, choosing flexibly from a range of strategies.

Science and Technical Subjects

Grade 6

- CCSS.ELA-LITERACY.RST.6-8.4 - Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

King County Waste Reduction and Recycling
Elementary Classroom Workshops

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.