

**Inquiry Investigations™**  
**Environmental Issues and Solutions MODULE - 1287226**  
**Grades: 7-10**

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**Alaska Content Standards**  
**Science**  
**Grade 7**

PERFORMANCE / CONTENT STANDARD	AK.A1.	Science as Inquiry and Process (SA1, SA2, SA3)
GRADE LEVEL EXPECTATION	[7] SA1.1.	<p>The student demonstrates an understanding of the processes of science by asking questions, predicting, observing, describing, measuring, classifying, making generalizations, inferring and communicating.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 6 Activity 1: Identifying Airborne Pollutants</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 6 Activity 2: Observing Air Pollution Indicators - Lichens</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 1: Soil Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 2: Soil Porosity and Permeability</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 3: Soil Testing For Nitrogen, pH, and Phosphates</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 1: How Water Pollutants Are Measured</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 2: Water Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 3: Determining the LD50 of a Water Pollutant</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 4: Observing the Effects of Acid Rain and Other Pollutants on Plants</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 1: Dissecting an Owl Pellet</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey</li> </ul>

		<ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 3: Constructing a Predator-Prey Food Web</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 1: Calculating a Biodiversity Index for Leaf Litter Ecosystems</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 2: Biological Treatment of Pollution</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem</li> <li>• Virtual Laboratory: The Effect of Temperature on Dissolved Oxygen</li> </ul>
<p><b>GRADE LEVEL EXPECTATION</b></p>	<p>[7] SA1.2.</p>	<p>The student demonstrates an understanding of the processes of science by collaborating to design and conduct simple repeatable investigations, in order to record, analyze (i.e., range, mean, median, mode), interpret data, and present findings. (L)</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 6 Activity 1: Identifying Airborne Pollutants</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 6 Activity 2: Observing Air Pollution Indicators - Lichens</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 1: Soil Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 2: Soil Porosity and Permeability</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 3: Soil Testing For Nitrogen, pH, and Phosphates</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 1: How Water Pollutants Are Measured</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 2: Water Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 3: Determining the LD50 of a Water Pollutant</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 4: Observing the Effects of Acid Rain and Other Pollutants on Plants</li> </ul>

		<ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 1: Dissecting an Owl Pellet</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 3: Constructing a Predator-Prey Food Web</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 1: Calculating a Biodiversity Index for Leaf Litter Ecosystems</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 2: Biological Treatment of Pollution</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem</li> <li>• Virtual Laboratory: The Effect of Temperature on Dissolved Oxygen</li> </ul>
<b>PERFORMANCE / CONTENT STANDARD</b>	<b>AK.B1.</b>	<b>Concepts of Physical Science (SB1, SB2, SB3, SB4)</b>
<b>GRADE LEVEL EXPECTATION</b>	<b>[7] SB1.1.</b>	<p>The student demonstrates understanding of the structure and properties of matter by using physical properties (i.e., density, boiling point, freezing point, conductivity) to differentiate among and/or separate materials (i.e., elements, compounds, and mixtures).</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem</li> </ul>
<b>GRADE LEVEL EXPECTATION</b>	<b>[7] SB4.3.</b>	<p>The student demonstrates an understanding of motions, forces, their characteristics, relationships, and effects by describing the characteristics of a wave (i.e., amplitude, wavelength, and frequency).</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem</li> </ul>
<b>PERFORMANCE / CONTENT STANDARD</b>	<b>AK.C1.</b>	<b>Concepts of Life Science (SC1, SC2, SC3)</b>
<b>GRADE LEVEL EXPECTATION</b>	<b>[7] SC1.2.</b>	<p>The student demonstrates an understanding of how science explains changes in life forms over time, including genetics, heredity, the process of natural selection and biological evolution by describing possible</p>

		<p>outcomes of mutations (i.e., no effect, damage, benefit).</p> <ul style="list-style-type: none"> <li>Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> </ul>
GRADE LEVEL EXPECTATION	[7] SC2.1.	<p>The student demonstrates an understanding of the structure, function, behavior, development, life cycles, and diversity of living organisms by describing the basic structure and function of plant and animal cells.</p> <ul style="list-style-type: none"> <li>Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population</li> <li>Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem</li> </ul>
GRADE LEVEL EXPECTATION	[7] SC2.2.	<p>The student demonstrates an understanding of the structure, function, behavior, development, life cycles, and diversity of living organisms by identifying the seven levels of classification of organisms.</p> <ul style="list-style-type: none"> <li>Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey</li> </ul>
GRADE LEVEL EXPECTATION	[7] SC3.1.	<p>The student demonstrates an understanding that all organisms are linked to each other and their physical environments through the transfer and transformation of matter and energy by recognizing and explaining that organisms can cause physical and chemical changes (e.g., digestion, growth, respiration, photosynthesis) to matter and recognizing and explaining the importance of energy transfer in these changes.</p> <ul style="list-style-type: none"> <li>Environmental Issues and Solutions: Unit 3 Lab 10 Activity 1: Dissecting an Owl Pellet</li> <li>Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey</li> <li>Environmental Issues and Solutions: Unit 3 Lab 10 Activity 3: Constructing a Predator-Prey Food Web</li> <li>Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization</li> <li>Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids</li> <li>Teacher Resource CD: Air, Water, and Soils</li> <li>Teacher Resource CD: Ecosystems, Energy, and Biodiversity</li> </ul>
GRADE LEVEL EXPECTATION	[7] SC3.2.	<p>The student demonstrates an understanding that all organisms are linked to each other and their physical environments through the transfer and transformation of matter and energy by classifying organisms within a food web as producers, consumers, or decomposers.</p> <ul style="list-style-type: none"> <li>Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>Environmental Issues and Solutions: Unit 3 Lab 10 Activity 1: Dissecting an Owl Pellet</li> </ul>

		<ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 3: Constructing a Predator-Prey Food Web</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids</li> <li>• Teacher Resource CD: Ecosystems, Energy, and Biodiversity</li> <li>• Teacher Resource CD: Environmental Issues</li> </ul>
<b>PERFORMANCE / CONTENT STANDARD</b>	<b>AK.D1.</b>	<b>Concepts of Earth Science (SD1, SD2, SD3, SD4)</b>
<b>GRADE LEVEL EXPECTATION</b>	<b>[7] SD1.2.</b>	<p>The student demonstrates an understanding of geochemical cycles by explaining the water cycle's connection to changes in the Earth's surface.</p> <ul style="list-style-type: none"> <li>• Teacher Resource CD: Air, Water, and Soils</li> </ul>
<b>PERFORMANCE / CONTENT STANDARD</b>	<b>AK.E1.</b>	<b>Science and Technology (SE1, SE2, SE3)</b>
<b>GRADE LEVEL EXPECTATION</b>	<b>[7] SE1.1.</b>	<p>The student demonstrates understanding of how to integrate scientific knowledge and technology to address problems by describing how public policy affects the student's life (e.g., public waste disposal). (L)</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 6 Activity 1: Identifying Airborne Pollutants</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 6 Activity 2: Observing Air Pollution Indicators - Lichens</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 1: Soil Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 2: Soil Porosity and Permeability</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 3: Soil Testing For Nitrogen, pH, and Phosphates</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 1: How Water Pollutants Are Measured</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 2: Water Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 3: Determining the LD50 of a Water Pollutant</li> </ul>

		<ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 4: Observing the Effects of Acid Rain and Other Pollutants on Plants</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 1: Dissecting an Owl Pellet</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 3: Constructing a Predator-Prey Food Web</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 1: Calculating a Biodiversity Index for Leaf Litter Ecosystems</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 2: Biological Treatment of Pollution</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem</li> <li>• Teacher Resource CD: Environmental Issues</li> <li>• Virtual Laboratory: The Effect of Temperature on Dissolved Oxygen</li> </ul>
<p><b>GRADE LEVEL EXPECTATION</b></p>	<p><b>[7] SE2.1.</b></p>	<p>The student demonstrates an understanding that solving problems involves different ways of thinking by identifying, designing, testing, and revising solutions to a local problem. (L)</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 6 Activity 1: Identifying Airborne Pollutants</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 6 Activity 2: Observing Air Pollution Indicators - Lichens</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 1: Soil Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 2: Soil Porosity and Permeability</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 3: Soil Testing For Nitrogen, pH, and Phosphates</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 1:</li> </ul>

		<p>How Water Pollutants Are Measured</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 2: Water Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 3: Determining the LD50 of a Water Pollutant</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 4: Observing the Effects of Acid Rain and Other Pollutants on Plants</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 1: Dissecting an Owl Pellet</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 3: Constructing a Predator-Prey Food Web</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 1: Calculating a Biodiversity Index for Leaf Litter Ecosystems</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 2: Biological Treatment of Pollution</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem</li> <li>• Virtual Laboratory: The Effect of Temperature on Dissolved Oxygen</li> </ul>
GRADE LEVEL EXPECTATION	[7] SE3.1.	<p>The student demonstrates an understanding of how scientific discoveries and technological innovations affect our lives and society by recognizing the effects of a past scientific discovery, invention, or scientific breakthrough (e.g., DDT, internal combustion engine).</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge</li> <li>• Teacher Resource CD: Environmental Issues</li> </ul>
PERFORMANCE / CONTENT STANDARD	AK.SA.	Science as Inquiry and Process: A student should understand and be able to apply the processes and applications of scientific inquiry. A student who meets the content standard should:
GRADE LEVEL EXPECTATION	SA1.	Develop an understanding of the processes of science used to investigate problems, design and conduct repeatable scientific investigations, and defend scientific arguments.

- Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill
- Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants
- Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill
- Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments
- Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes
- Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming
- Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge
- Environmental Issues and Solutions: Unit 2 Lab 6 Activity 1: Identifying Airborne Pollutants
- Environmental Issues and Solutions: Unit 2 Lab 6 Activity 2: Observing Air Pollution Indicators - Lichens
- Environmental Issues and Solutions: Unit 2 Lab 7 Activity 1: Soil Analysis
- Environmental Issues and Solutions: Unit 2 Lab 7 Activity 2: Soil Porosity and Permeability
- Environmental Issues and Solutions: Unit 2 Lab 7 Activity 3: Soil Testing For Nitrogen, pH, and Phosphates
- Environmental Issues and Solutions: Unit 2 Lab 8 Activity 1: How Water Pollutants Are Measured
- Environmental Issues and Solutions: Unit 2 Lab 8 Activity 2: Water Analysis
- Environmental Issues and Solutions: Unit 2 Lab 8 Activity 3: Determining the LD50 of a Water Pollutant
- Environmental Issues and Solutions: Unit 2 Lab 8 Activity 4: Observing the Effects of Acid Rain and Other Pollutants on Plants
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- Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population
- Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization
- Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids
- Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant
- Environmental Issues and Solutions: Unit 4 Lab 12 Activity 2: Biological Treatment of Pollution
- Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem
- Virtual Laboratory: The Effect of Temperature on Dissolved Oxygen

<b>PERFORMANCE / CONTENT STANDARD</b>	<b>AK.SB.</b>	<b>Concepts of Physical Science: A student should understand and be able to apply the concepts, models, theories, universal principles, and facts that explain the physical world. A student who meets the content standard should:</b>
<b>GRADE LEVEL EXPECTATION</b>	<b>SB1.</b>	<p>Develop an understanding of the characteristic properties of matter and the relationship of these properties to their structure and behavior.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> </ul>
<b>GRADE LEVEL EXPECTATION</b>	<b>SB3.</b>	<p>Develop an understanding of the interactions between matter and energy, including physical, chemical, and nuclear changes, and the effects of these interactions on physical systems.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 2: Water Analysis</li> </ul>
<b>PERFORMANCE / CONTENT STANDARD</b>	<b>AK.SC.</b>	<b>Concepts of Life Science: A student should understand and be able to apply the concepts, models, theories, facts, evidence, systems, and processes of life science. A student who meets the content standard should:</b>
<b>GRADE LEVEL EXPECTATION</b>	<b>SC2.</b>	<p>Develop an understanding of the structure, function, behavior, development, life cycles, and diversity of living organisms.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 1: Calculating a Biodiversity Index for Leaf Litter Ecosystems</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 2: Biological Treatment of Pollution</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem</li> <li>• Teacher Resource CD: Ecosystems, Energy, and Biodiversity</li> </ul>
<b>GRADE LEVEL EXPECTATION</b>	<b>SC3.</b>	<p>Develop an understanding that all organisms are linked to each other and their physical environments through the transfer and transformation of matter and energy.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 1: Dissecting an Owl Pellet</li> </ul>

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<b>PERFORMANCE / CONTENT STANDARD</b>	<b>AK.SD.</b>	<b>Concepts of Earth Science: A student should understand and be able to apply the concepts, processes, theories, models, evidence, and systems of earth and space sciences. A student who meets the content standard should:</b>
<b>GRADE LEVEL EXPECTATION</b>	<b>SD1.</b>	<p>Develop an understanding of Earth's geochemical cycles.</p> <ul style="list-style-type: none"> <li>Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>Environmental Issues and Solutions: Unit 2 Lab 7 Activity 1: Soil Analysis</li> <li>Environmental Issues and Solutions: Unit 2 Lab 7 Activity 2: Soil Porosity and Permeability</li> <li>Environmental Issues and Solutions: Unit 2 Lab 7 Activity 3: Soil Testing For Nitrogen, pH, and Phosphates</li> <li>Teacher Resource CD: Air, Water, and Soils</li> <li>Teacher Resource CD: Ecosystems, Energy, and Biodiversity</li> </ul>
<b>PERFORMANCE / CONTENT STANDARD</b>	<b>AK.SE.</b>	<b>Science and Technology: A student should understand the relationships among science, technology, and society. A student who meets the content standard should:</b>
<b>GRADE LEVEL EXPECTATION</b>	<b>SE1.</b>	<p>Develop an understanding of how scientific knowledge and technology are used in making decisions about issues, innovations, and responses to problems and everyday events.</p> <ul style="list-style-type: none"> <li>Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge</li> <li>Environmental Issues and Solutions: Unit 2 Lab 6 Activity 1: Identifying Airborne Pollutants</li> <li>Environmental Issues and Solutions: Unit 2 Lab 6 Activity 2: Observing Air Pollution Indicators - Lichens</li> <li>Environmental Issues and Solutions: Unit 2 Lab 7 Activity 1: Soil Analysis</li> </ul>

		<ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 2: Soil Porosity and Permeability</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 3: Soil Testing For Nitrogen, pH, and Phosphates</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 1: How Water Pollutants Are Measured</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 2: Water Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 3: Determining the LD50 of a Water Pollutant</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 4: Observing the Effects of Acid Rain and Other Pollutants on Plants</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 1: Dissecting an Owl Pellet</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 3: Constructing a Predator-Prey Food Web</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 1: Calculating a Biodiversity Index for Leaf Litter Ecosystems</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 2: Biological Treatment of Pollution</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem</li> <li>• Teacher Resource CD: Environmental Issues</li> <li>• Virtual Laboratory: The Effect of Temperature on Dissolved Oxygen</li> </ul>
<p><b>GRADE LEVEL EXPECTATION</b></p>	<p><b>SE2.</b></p>	<p>Develop an understanding that solving problems involves different ways of thinking, perspectives, and curiosity that lead to the exploration of multiple paths that are analyzed using scientific, technological, and social merits.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> </ul>
<p><b>GRADE LEVEL EXPECTATION</b></p>	<p><b>SE3.</b></p>	<p>Develop an understanding of how scientific discoveries and technological innovations affect and are affected by our lives and cultures</p>

		<ul style="list-style-type: none"> <li>Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge</li> <li>Teacher Resource CD: Environmental Issues</li> </ul>
<b>PERFORMANCE / CONTENT STANDARD</b>	<b>AK.SF.</b>	<b>Cultural, Social, Personal Perspectives and Science: A student should understand the dynamic relationships among scientific, cultural, social, and personal perspectives. A student who meets the content standard should:</b>
<b>GRADE LEVEL EXPECTATION</b>	<b>SF1.</b>	<p>Develop an understanding of the interrelationships among individuals, cultures, societies, science, and technology.</p> <ul style="list-style-type: none"> <li>Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> </ul>
<b>PERFORMANCE / CONTENT STANDARD</b>	<b>AK.SG.</b>	<b>History and Nature of Science: A student should understand the history and nature of science. A student who meets the content standard should:</b>
<b>GRADE LEVEL EXPECTATION</b>	<b>SG1.</b>	<p>Develop an understanding that historical perspectives of scientific explanations demonstrate that scientific knowledge changes over time, building on prior knowledge.</p> <ul style="list-style-type: none"> <li>Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> </ul>

Alaska Content Standards  
Science  
Grade 8

<b>PERFORMANCE / CONTENT STANDARD</b>	<b>AK.A1.</b>	<b>Science as Inquiry and Process (SA1, SA2, SA3)</b>
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<p>GRADE LEVEL EXPECTATION</p>	<p>[8] SA1.1.</p>	<p>The student demonstrates an understanding of the processes of science by asking questions, predicting, observing, describing, measuring, classifying, making generalizations, inferring and communicating.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 6 Activity 1: Identifying Airborne Pollutants</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 6 Activity 2: Observing Air Pollution Indicators - Lichens</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 1: Soil Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 2: Soil Porosity and Permeability</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 3: Soil Testing For Nitrogen, pH, and Phosphates</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 1: How Water Pollutants Are Measured</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 2: Water Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 3: Determining the LD50 of a Water Pollutant</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 4: Observing the Effects of Acid Rain and Other Pollutants on Plants</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 1: Dissecting an Owl Pellet</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 3: Constructing a Predator-Prey Food Web</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 1: Calculating a Biodiversity Index for Leaf Litter Ecosystems</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 2: Biological Treatment of Pollution</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity</li> </ul>
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		<p>3: Evaluating the Health of an Ecosystem</p> <ul style="list-style-type: none"> <li>Virtual Laboratory: The Effect of Temperature on Dissolved Oxygen</li> </ul>
<p>GRADE LEVEL EXPECTATION</p>	<p>[8] SA1.2.</p>	<p>The student demonstrates an understanding of the processes of science by collaborating to design and conduct repeatable investigations, in order to record, analyze (i.e., range, mean, median, mode), interpret data, and present findings. (L)</p> <ul style="list-style-type: none"> <li>Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge</li> <li>Environmental Issues and Solutions: Unit 2 Lab 6 Activity 1: Identifying Airborne Pollutants</li> <li>Environmental Issues and Solutions: Unit 2 Lab 6 Activity 2: Observing Air Pollution Indicators - Lichens</li> <li>Environmental Issues and Solutions: Unit 2 Lab 7 Activity 1: Soil Analysis</li> <li>Environmental Issues and Solutions: Unit 2 Lab 7 Activity 2: Soil Porosity and Permeability</li> <li>Environmental Issues and Solutions: Unit 2 Lab 7 Activity 3: Soil Testing For Nitrogen, pH, and Phosphates</li> <li>Environmental Issues and Solutions: Unit 2 Lab 8 Activity 1: How Water Pollutants Are Measured</li> <li>Environmental Issues and Solutions: Unit 2 Lab 8 Activity 2: Water Analysis</li> <li>Environmental Issues and Solutions: Unit 2 Lab 8 Activity 3: Determining the LD50 of a Water Pollutant</li> <li>Environmental Issues and Solutions: Unit 2 Lab 8 Activity 4: Observing the Effects of Acid Rain and Other Pollutants on Plants</li> <li>Environmental Issues and Solutions: Unit 3 Lab 10 Activity 1: Dissecting an Owl Pellet</li> <li>Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey</li> <li>Environmental Issues and Solutions: Unit 3 Lab 10 Activity 3: Constructing a Predator-Prey Food Web</li> <li>Environmental Issues and Solutions: Unit 3 Lab 11 Activity 1: Calculating a Biodiversity Index for Leaf Litter Ecosystems</li> <li>Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population</li> <li>Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization</li> <li>Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids</li> </ul>

		<ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 2: Biological Treatment of Pollution</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem</li> <li>• Virtual Laboratory: The Effect of Temperature on Dissolved Oxygen</li> </ul>
<p>GRADE LEVEL EXPECTATION</p>	<p>[8] SA2.1.</p>	<p>The student demonstrates an understanding of the attitudes and approaches to scientific inquiry by recognizing and analyzing differing scientific explanations and models.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 6 Activity 1: Identifying Airborne Pollutants</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 6 Activity 2: Observing Air Pollution Indicators - Lichens</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 1: Soil Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 2: Soil Porosity and Permeability</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 3: Soil Testing For Nitrogen, pH, and Phosphates</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 1: How Water Pollutants Are Measured</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 2: Water Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 3: Determining the LD50 of a Water Pollutant</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 4: Observing the Effects of Acid Rain and Other Pollutants on Plants</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 1: Dissecting an Owl Pellet</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 3: Constructing a Predator-Prey Food Web</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 1: Calculating a Biodiversity Index for Leaf Litter Ecosystems</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population</li> </ul>

		<ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 2: Biological Treatment of Pollution</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem</li> <li>• Virtual Laboratory: The Effect of Temperature on Dissolved Oxygen</li> </ul>
<p>GRADE LEVEL EXPECTATION</p>	<p>[8] SA3.1.</p>	<p>The student demonstrates an understanding that interactions with the environment provide an opportunity for understanding scientific concepts by conducting research to learn how the local environment is used by a variety of competing interests (e.g., competition for habitat/resources, tourism, oil and mining companies, hunting groups). (L)</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 6 Activity 1: Identifying Airborne Pollutants</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 6 Activity 2: Observing Air Pollution Indicators - Lichens</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 1: Soil Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 2: Soil Porosity and Permeability</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 3: Soil Testing For Nitrogen, pH, and Phosphates</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 1: How Water Pollutants Are Measured</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 2: Water Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 3: Determining the LD50 of a Water Pollutant</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 4: Observing the Effects of Acid Rain and Other Pollutants on Plants</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 1: Dissecting an Owl Pellet</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey</li> </ul>

		<ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 3: Constructing a Predator-Prey Food Web</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 1: Calculating a Biodiversity Index for Leaf Litter Ecosystems</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 2: Biological Treatment of Pollution</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem</li> <li>• Teacher Resource CD: Environmental Issues</li> <li>• Virtual Laboratory: The Effect of Temperature on Dissolved Oxygen</li> </ul>
<b>PERFORMANCE / CONTENT STANDARD</b>	<b>AK.B1.</b>	<b>Concepts of Physical Science (SB1, SB2, SB3, SB4)</b>
<b>GRADE LEVEL EXPECTATION</b>	<b>[8] SB1.1.</b>	<p>The student demonstrates an understanding of the structure and properties of matter by using physical and chemical properties (i.e., density, boiling point, freezing point, conductivity, flammability) to differentiate among materials (i.e., elements, compounds, and mixtures).</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem</li> </ul>
<b>PERFORMANCE / CONTENT STANDARD</b>	<b>AK.C1.</b>	<b>Concepts of Life Science (SC1, SC2, SC3)</b>
<b>GRADE LEVEL EXPECTATION</b>	<b>[8] SC3.1.</b>	<p>The student demonstrates an understanding that all organisms are linked to each other and their physical environments through the transfer and transformation of matter and energy by stating that energy flows and that matter cycles but is conserved within an ecosystem.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 1: Soil Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity</li> </ul>

		<p>2: Soil Porosity and Permeability</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 3: Soil Testing For Nitrogen, pH, and Phosphates</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 1: Dissecting an Owl Pellet</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 3: Constructing a Predator-Prey Food Web</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids</li> <li>• Teacher Resource CD: Air, Water, and Soils</li> <li>• Teacher Resource CD: Ecosystems, Energy, and Biodiversity</li> </ul>
GRADE LEVEL EXPECTATION	[8] SC3.2.	<p>The student demonstrates an understanding that all organisms are linked to each other and their physical environments through the transfer and transformation of matter and energy by organizing a food web that shows the cycling of matter.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 1: Dissecting an Owl Pellet</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 3: Constructing a Predator-Prey Food Web</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids</li> <li>• Teacher Resource CD: Ecosystems, Energy, and Biodiversity</li> </ul>
PERFORMANCE / CONTENT STANDARD	AK.D1.	Concepts of Earth Science (SD1, SD2, SD3, SD4)
GRADE LEVEL EXPECTATION	[8] SD1.2.	<p>The student demonstrates an understanding of geochemical cycles by applying knowledge of the water cycle to explain changes in the Earth's surface.</p> <ul style="list-style-type: none"> <li>• Teacher Resource CD: Air, Water, and Soils</li> </ul>
GRADE LEVEL EXPECTATION	[8] SD2.1.	<p>The student demonstrates an understanding of the forces that shape Earth by interpreting topographical maps to identify features (i.e., rivers, lakes, mountains, valleys, islands, and tundra).</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> </ul>
GRADE LEVEL EXPECTATION	[8] SD3.2.	<p>The student demonstrates an understanding of cycles influenced by energy from the sun and by Earth's position and motion in our solar system by recognizing types of energy transfer (convection,</p>

		<p>conduction, and radiation) and how they affect weather.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>• Teacher Resource CD: Air, Water, and Soils</li> </ul>
<b>PERFORMANCE / CONTENT STANDARD</b>	<b>AK.E1.</b>	<b>Science and Technology (SE1, SE2, SE3)</b>
<b>GRADE LEVEL EXPECTATION</b>	<b>[8] SE1.1.</b>	<p>The student demonstrates an understanding of how to integrate scientific knowledge and technology to address problems by describing how public policy affects their lives and participating diplomatically in evidence-based discussions relating to their community. (L)</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 6 Activity 1: Identifying Airborne Pollutants</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 6 Activity 2: Observing Air Pollution Indicators - Lichens</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 1: Soil Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 2: Soil Porosity and Permeability</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 3: Soil Testing For Nitrogen, pH, and Phosphates</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 1: How Water Pollutants Are Measured</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 2: Water Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 3: Determining the LD50 of a Water Pollutant</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 4: Observing the Effects of Acid Rain and Other Pollutants on Plants</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 1: Dissecting an Owl Pellet</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 3: Constructing a Predator-Prey Food Web</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 1: Calculating a Biodiversity Index for Leaf Litter Ecosystems</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity</li> </ul>

		<p>2: Determining the Carrying Capacity of a Population</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 2: Biological Treatment of Pollution</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem</li> <li>• Teacher Resource CD: Environmental Issues</li> <li>• Virtual Laboratory: The Effect of Temperature on Dissolved Oxygen</li> </ul>
<p>GRADE LEVEL EXPECTATION</p>	<p>[8] SE2.1.</p>	<p>The student demonstrates an understanding that solving problems involves different ways of thinking by identifying, designing, testing, and revising solutions to a local problem. (L)</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 6 Activity 1: Identifying Airborne Pollutants</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 6 Activity 2: Observing Air Pollution Indicators - Lichens</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 1: Soil Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 2: Soil Porosity and Permeability</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 3: Soil Testing For Nitrogen, pH, and Phosphates</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 1: How Water Pollutants Are Measured</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 2: Water Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 3: Determining the LD50 of a Water Pollutant</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 4: Observing the Effects of Acid Rain and Other Pollutants on Plants</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 1: Dissecting an Owl Pellet</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey</li> </ul>

		<ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 3: Constructing a Predator-Prey Food Web</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 1: Calculating a Biodiversity Index for Leaf Litter Ecosystems</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 2: Biological Treatment of Pollution</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem</li> <li>• Virtual Laboratory: The Effect of Temperature on Dissolved Oxygen</li> </ul>
GRADE LEVEL EXPECTATION	[8] SE3.1.	<p>The student demonstrates an understanding of how scientific discoveries and technological innovations affect our lives and society by predicting the possible effects of a recent scientific discovery, invention, or scientific breakthrough. (L)</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge</li> <li>• Teacher Resource CD: Environmental Issues</li> </ul>
PERFORMANCE / CONTENT STANDARD	AK.F1.	Cultural, Social, Personal Perspectives, and Science (SF1, SF2, SF3)
GRADE LEVEL EXPECTATION	[8] SF1.1-SF3.1.	<p>The student demonstrates an understanding of the dynamic relationships among scientific, cultural, social, and personal perspectives by describing how local knowledge, culture, and the technologies of various activities (e.g., hunting, fishing, subsistence) influence the development of scientific knowledge. (L) Cross referenced with SA3.1, grade 8</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> </ul>

		<ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 6 Activity 1: Identifying Airborne Pollutants</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 6 Activity 2: Observing Air Pollution Indicators - Lichens</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 1: Soil Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 2: Soil Porosity and Permeability</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 3: Soil Testing For Nitrogen, pH, and Phosphates</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 1: How Water Pollutants Are Measured</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 2: Water Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 3: Determining the LD50 of a Water Pollutant</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 4: Observing the Effects of Acid Rain and Other Pollutants on Plants</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 1: Dissecting an Owl Pellet</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 3: Constructing a Predator-Prey Food Web</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 1: Calculating a Biodiversity Index for Leaf Litter Ecosystems</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 2: Biological Treatment of Pollution</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem</li> <li>• Teacher Resource CD: Environmental Issues</li> <li>• Virtual Laboratory: The Effect of Temperature on Dissolved Oxygen</li> </ul>
<b>PERFORMANCE / CONTENT STANDARD</b>	<b>AK.SA.</b>	Science as Inquiry and Process: A student should understand and be able to apply the processes and applications of scientific inquiry. A student who meets the content standard should:
<b>GRADE LEVEL EXPECTATION</b>	<b>SA1.</b>	Develop an understanding of the processes of science used to investigate problems, design and conduct repeatable scientific investigations, and defend scientific arguments.

- Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill
- Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants
- Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill
- Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments
- Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes
- Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming
- Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge
- Environmental Issues and Solutions: Unit 2 Lab 6 Activity 1: Identifying Airborne Pollutants
- Environmental Issues and Solutions: Unit 2 Lab 6 Activity 2: Observing Air Pollution Indicators - Lichens
- Environmental Issues and Solutions: Unit 2 Lab 7 Activity 1: Soil Analysis
- Environmental Issues and Solutions: Unit 2 Lab 7 Activity 2: Soil Porosity and Permeability
- Environmental Issues and Solutions: Unit 2 Lab 7 Activity 3: Soil Testing For Nitrogen, pH, and Phosphates
- Environmental Issues and Solutions: Unit 2 Lab 8 Activity 1: How Water Pollutants Are Measured
- Environmental Issues and Solutions: Unit 2 Lab 8 Activity 2: Water Analysis
- Environmental Issues and Solutions: Unit 2 Lab 8 Activity 3: Determining the LD50 of a Water Pollutant
- Environmental Issues and Solutions: Unit 2 Lab 8 Activity 4: Observing the Effects of Acid Rain and Other Pollutants on Plants
- Environmental Issues and Solutions: Unit 3 Lab 10 Activity 1: Dissecting an Owl Pellet
- Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey
- Environmental Issues and Solutions: Unit 3 Lab 10 Activity 3: Constructing a Predator-Prey Food Web
- Environmental Issues and Solutions: Unit 3 Lab 11 Activity 1: Calculating a Biodiversity Index for Leaf Litter Ecosystems
- Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population
- Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization
- Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids
- Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant
- Environmental Issues and Solutions: Unit 4 Lab 12 Activity 2: Biological Treatment of Pollution
- Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem
- Virtual Laboratory: The Effect of Temperature on Dissolved Oxygen

<b>PERFORMANCE / CONTENT STANDARD</b>	<b>AK.SB.</b>	<b>Concepts of Physical Science: A student should understand and be able to apply the concepts, models, theories, universal principles, and facts that explain the physical world. A student who meets the content standard should:</b>
<b>GRADE LEVEL EXPECTATION</b>	<b>SB1.</b>	<p>Develop an understanding of the characteristic properties of matter and the relationship of these properties to their structure and behavior.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> </ul>
<b>GRADE LEVEL EXPECTATION</b>	<b>SB3.</b>	<p>Develop an understanding of the interactions between matter and energy, including physical, chemical, and nuclear changes, and the effects of these interactions on physical systems.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 2: Water Analysis</li> </ul>
<b>PERFORMANCE / CONTENT STANDARD</b>	<b>AK.SC.</b>	<b>Concepts of Life Science: A student should understand and be able to apply the concepts, models, theories, facts, evidence, systems, and processes of life science. A student who meets the content standard should:</b>
<b>GRADE LEVEL EXPECTATION</b>	<b>SC2.</b>	<p>Develop an understanding of the structure, function, behavior, development, life cycles, and diversity of living organisms.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 1: Calculating a Biodiversity Index for Leaf Litter Ecosystems</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 2: Biological Treatment of Pollution</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem</li> <li>• Teacher Resource CD: Ecosystems, Energy, and Biodiversity</li> </ul>
<b>GRADE LEVEL EXPECTATION</b>	<b>SC3.</b>	<p>Develop an understanding that all organisms are linked to each other and their physical environments through the transfer and transformation of matter and energy.</p>

		<ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 1: Dissecting an Owl Pellet</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 3: Constructing a Predator-Prey Food Web</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 1: Calculating a Biodiversity Index for Leaf Litter Ecosystems</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids</li> <li>• Teacher Resource CD: Ecosystems, Energy, and Biodiversity</li> </ul>
<b>PERFORMANCE / CONTENT STANDARD</b>	<b>AK.SD.</b>	<b>Concepts of Earth Science: A student should understand and be able to apply the concepts, processes, theories, models, evidence, and systems of earth and space sciences. A student who meets the content standard should:</b>
<b>GRADE LEVEL EXPECTATION</b>	<b>SD1.</b>	<p>Develop an understanding of Earth's geochemical cycles.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 1: Soil Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 2: Soil Porosity and Permeability</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 3: Soil Testing For Nitrogen, pH, and Phosphates</li> <li>• Teacher Resource CD: Air, Water, and Soils</li> <li>• Teacher Resource CD: Ecosystems, Energy, and Biodiversity</li> </ul>
<b>PERFORMANCE / CONTENT STANDARD</b>	<b>AK.SE.</b>	<b>Science and Technology: A student should understand the relationships among science, technology, and society. A student who meets the content standard should:</b>
<b>GRADE LEVEL EXPECTATION</b>	<b>SE1.</b>	<p>Develop an understanding of how scientific knowledge and technology are used in making decisions about issues, innovations, and responses to problems and everyday events.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 6 Activity</li> </ul>

		<p>1: Identifying Airborne Pollutants</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 2 Lab 6 Activity 2: Observing Air Pollution Indicators - Lichens</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 1: Soil Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 2: Soil Porosity and Permeability</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 3: Soil Testing For Nitrogen, pH, and Phosphates</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 1: How Water Pollutants Are Measured</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 2: Water Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 3: Determining the LD50 of a Water Pollutant</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 4: Observing the Effects of Acid Rain and Other Pollutants on Plants</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 1: Dissecting an Owl Pellet</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 3: Constructing a Predator-Prey Food Web</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 1: Calculating a Biodiversity Index for Leaf Litter Ecosystems</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 2: Biological Treatment of Pollution</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem</li> <li>• Teacher Resource CD: Environmental Issues</li> <li>• Virtual Laboratory: The Effect of Temperature on Dissolved Oxygen</li> </ul>
<p>GRADE LEVEL EXPECTATION</p>	<p>SE2.</p>	<p>Develop an understanding that solving problems involves different ways of thinking, perspectives, and curiosity that lead to the exploration of multiple paths that are analyzed using scientific, technological, and social merits.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity</li> </ul>

		3: Examining Oil-Degrading Microbes
GRADE LEVEL EXPECTATION	SE3.	<p>Develop an understanding of how scientific discoveries and technological innovations affect and are affected by our lives and cultures</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge</li> <li>• Teacher Resource CD: Environmental Issues</li> </ul>
PERFORMANCE / CONTENT STANDARD	AK.SF.	Cultural, Social, Personal Perspectives and Science: A student should understand the dynamic relationships among scientific, cultural, social, and personal perspectives. A student who meets the content standard should:
GRADE LEVEL EXPECTATION	SF1.	<p>Develop an understanding of the interrelationships among individuals, cultures, societies, science, and technology.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> </ul>
PERFORMANCE / CONTENT STANDARD	AK.SG.	History and Nature of Science: A student should understand the history and nature of science. A student who meets the content standard should:
GRADE LEVEL EXPECTATION	SG1.	<p>Develop an understanding that historical perspectives of scientific explanations demonstrate that scientific knowledge changes over time, building on prior knowledge.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> </ul>

Alaska Content Standards  
Science  
Grade 9

PERFORMANCE / CONTENT STANDARD	AK.A1.	Science as Inquiry and Process (SA1, SA2, SA3)
GRADE LEVEL EXPECTATION	[9] SA1.1.	<p>The student develops an understanding of the processes of science by asking questions, predicting, observing, describing, measuring, classifying, making generalizations, inferring and communicating.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 6 Activity 1: Identifying Airborne Pollutants</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 6 Activity 2: Observing Air Pollution Indicators - Lichens</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 1: Soil Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 2: Soil Porosity and Permeability</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 3: Soil Testing For Nitrogen, pH, and Phosphates</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 1: How Water Pollutants Are Measured</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 2: Water Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 3: Determining the LD50 of a Water Pollutant</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 4: Observing the Effects of Acid Rain and Other Pollutants on Plants</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 1: Dissecting an Owl Pellet</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 3: Constructing a Predator-Prey Food Web</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 1: Calculating a Biodiversity Index for Leaf Litter Ecosystems</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2:</li> </ul>

		<p>A Closer Look at Energy Pyramids</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 2: Biological Treatment of Pollution</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem</li> <li>• Virtual Laboratory: The Effect of Temperature on Dissolved Oxygen</li> </ul>
<p>GRADE LEVEL EXPECTATION</p>	<p>[9] SA1.2.</p>	<p>The student develops an understanding of the processes of science by hypothesizing, designing a controlled experiment, making qualitative and quantitative observations, interpreting data, and using this information to communicate conclusions.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 6 Activity 1: Identifying Airborne Pollutants</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 6 Activity 2: Observing Air Pollution Indicators - Lichens</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 1: Soil Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 2: Soil Porosity and Permeability</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 3: Soil Testing For Nitrogen, pH, and Phosphates</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 1: How Water Pollutants Are Measured</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 2: Water Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 3: Determining the LD50 of a Water Pollutant</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 4: Observing the Effects of Acid Rain and Other Pollutants on Plants</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 1: Dissecting an Owl Pellet</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 3: Constructing a Predator-Prey Food Web</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 1: Calculating a Biodiversity Index for Leaf Litter Ecosystems</li> </ul>

		<ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 2: Biological Treatment of Pollution</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem</li> <li>• Virtual Laboratory: The Effect of Temperature on Dissolved Oxygen</li> </ul>
<p><b>GRADE LEVEL EXPECTATION</b></p>	<p>[9] SA2.1.</p>	<p>The student will demonstrate an understanding of the attitudes and approaches to scientific inquiry by formulating conclusions that are logical and supported by evidence.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 6 Activity 1: Identifying Airborne Pollutants</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 6 Activity 2: Observing Air Pollution Indicators - Lichens</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 1: Soil Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 2: Soil Porosity and Permeability</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 3: Soil Testing For Nitrogen, pH, and Phosphates</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 1: How Water Pollutants Are Measured</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 2: Water Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 3: Determining the LD50 of a Water Pollutant</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 4: Observing the Effects of Acid Rain and Other Pollutants on Plants</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 1: Dissecting an Owl Pellet</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey</li> </ul>

		<ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 3: Constructing a Predator-Prey Food Web</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 1: Calculating a Biodiversity Index for Leaf Litter Ecosystems</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 2: Biological Treatment of Pollution</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem</li> <li>• Virtual Laboratory: The Effect of Temperature on Dissolved Oxygen</li> </ul>
<b>PERFORMANCE / CONTENT STANDARD</b>	<b>AK.B1.</b>	<b>Concepts of Physical Science (SB1, SB2, SB3, SB4)</b>
<b>GRADE LEVEL EXPECTATION</b>	<b>[9] SB2.1.</b>	<p>The student demonstrates an understanding of how energy can be transformed, transferred, and conserved by applying the concepts of heat transfer (i.e., conduction, convection, radiation) to Alaskan dwellings.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>• Teacher Resource CD: Air, Water, and Soils</li> </ul>
<b>GRADE LEVEL EXPECTATION</b>	<b>[9] SB3.1.</b>	<p>The student demonstrates an understanding of the interactions between matter and energy and the effects of these interactions on systems by recognizing that a chemical reaction has taken place.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge</li> </ul>
<b>GRADE LEVEL EXPECTATION</b>	<b>[9] SB3.2.</b>	<p>The student demonstrates an understanding of the interactions between matter and energy and the effects of these interactions on systems by explaining that in chemical and nuclear reactions, energy (e.g., heat, light, mechanical, and electrical) is transferred into and out of a system.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge</li> </ul>
<b>PERFORMANCE / CONTENT STANDARD</b>	<b>AK.C1.</b>	<b>Concepts of Life Science (SC1, SC2, SC3)</b>
<b>GRADE LEVEL EXPECTATION</b>	<b>[9] SC1.1.</b>	<p>The student demonstrates an understanding of how science explains changes in life forms over time, including genetics, heredity, the process of natural selection and biological evolution by recognizing that all organisms have chromosomes made of DNA and that DNA determines traits.</p>

		<ul style="list-style-type: none"> <li>Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> </ul>
GRADE LEVEL EXPECTATION	[9] SC2.1.	<p>The student demonstrates an understanding of the structure, function, behavior, development, life cycles, and diversity of living organisms by describing and comparing the characteristics of phyla/divisions from each kingdom.</p> <ul style="list-style-type: none"> <li>Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey</li> </ul>
GRADE LEVEL EXPECTATION	[9] SC3.1.	<p>The student demonstrates an understanding that all organisms are linked to each other and their physical environments through the transfer and transformation of matter and energy by describing the carbon and nitrogen cycle within an ecosystem and how the continual input of energy from sunlight keeps the process going. (L)</p> <ul style="list-style-type: none"> <li>Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>Environmental Issues and Solutions: Unit 2 Lab 7 Activity 3: Soil Testing For Nitrogen, pH, and Phosphates</li> <li>Teacher Resource CD: Air, Water, and Soils</li> <li>Teacher Resource CD: Ecosystems, Energy, and Biodiversity</li> </ul>
GRADE LEVEL EXPECTATION	[9] SC3.3.	<p>The student demonstrates an understanding that all organisms are linked to each other and their physical environments through the transfer and transformation of matter and energy by identifying dynamic factors (e.g., carrying capacity, limiting factors, biodiversity, and productivity) that affect population size.</p> <ul style="list-style-type: none"> <li>Environmental Issues and Solutions: Unit 3 Lab 11 Activity 1: Calculating a Biodiversity Index for Leaf Litter Ecosystems</li> <li>Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population</li> <li>Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization</li> <li>Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids</li> <li>Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant</li> <li>Environmental Issues and Solutions: Unit 4 Lab 12 Activity 2: Biological Treatment of Pollution</li> <li>Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem</li> <li>Teacher Resource CD: Ecosystems, Energy, and Biodiversity</li> </ul>
PERFORMANCE / CONTENT STANDARD	AK.D1.	Concepts of Earth Science (SD1, SD2, SD3, SD4)
GRADE LEVEL EXPECTATION	[9] SD1.2.	<p>The student demonstrates an understanding of geochemical cycles by applying knowledge of the water cycle to explain changes in the Earth's surface.</p>

		<ul style="list-style-type: none"> <li>Teacher Resource CD: Air, Water, and Soils</li> </ul>
GRADE LEVEL EXPECTATION	[9] SD2.1.	<p>The student demonstrates an understanding of the forces that shape Earth by recognizing the dynamic interaction of erosion and deposition including human causes.</p> <ul style="list-style-type: none"> <li>Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge</li> </ul>
PERFORMANCE / CONTENT STANDARD	AK.E.1.	Science and Technology (SE1, SE2, SE3)
GRADE LEVEL EXPECTATION	[9] SE1.1.	<p>The student demonstrates an understanding of how to integrate scientific knowledge and technology to address problems by recognizing that the value of any given technology may be different for different groups of people and at different points in time (e.g., different uses of snow machines in different regions of Alaska).</p> <ul style="list-style-type: none"> <li>Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge</li> <li>Teacher Resource CD: Environmental Issues</li> </ul>
GRADE LEVEL EXPECTATION	[9] SE2.1.	<p>The student demonstrates an understanding that solving problems involves different ways of thinking, by questioning, researching, modeling, simulating, and testing a solution to a problem. (L)</p> <ul style="list-style-type: none"> <li>Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge</li> <li>Environmental Issues and Solutions: Unit 2 Lab 6 Activity 1: Identifying Airborne Pollutants</li> <li>Environmental Issues and Solutions: Unit 2 Lab 6 Activity 2: Observing Air Pollution Indicators - Lichens</li> </ul>

		<ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 1: Soil Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 2: Soil Porosity and Permeability</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 3: Soil Testing For Nitrogen, pH, and Phosphates</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 1: How Water Pollutants Are Measured</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 2: Water Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 3: Determining the LD50 of a Water Pollutant</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 4: Observing the Effects of Acid Rain and Other Pollutants on Plants</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 1: Dissecting an Owl Pellet</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 3: Constructing a Predator-Prey Food Web</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 1: Calculating a Biodiversity Index for Leaf Litter Ecosystems</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 2: Biological Treatment of Pollution</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem</li> <li>• Virtual Laboratory: The Effect of Temperature on Dissolved Oxygen</li> </ul>
<p>GRADE LEVEL EXPECTATION</p>	<p>[9] SE3.1.</p>	<p>The student demonstrates an understanding of how scientific discoveries and technological innovations affect our lives and society by predicting and evaluating the possible effects of a recent scientific discovery, invention, or scientific breakthrough. (L)</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge</li> </ul>

		<ul style="list-style-type: none"> <li>Teacher Resource CD: Environmental Issues</li> </ul>
<b>PERFORMANCE / CONTENT STANDARD</b>	<b>AK.SA.</b>	<b>Science as Inquiry and Process: A student should understand and be able to apply the processes and applications of scientific inquiry. A student who meets the content standard should:</b>
<b>GRADE LEVEL EXPECTATION</b>	<b>SA1.</b>	<p>Develop an understanding of the processes of science used to investigate problems, design and conduct repeatable scientific investigations, and defend scientific arguments.</p> <ul style="list-style-type: none"> <li>Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge</li> <li>Environmental Issues and Solutions: Unit 2 Lab 6 Activity 1: Identifying Airborne Pollutants</li> <li>Environmental Issues and Solutions: Unit 2 Lab 6 Activity 2: Observing Air Pollution Indicators - Lichens</li> <li>Environmental Issues and Solutions: Unit 2 Lab 7 Activity 1: Soil Analysis</li> <li>Environmental Issues and Solutions: Unit 2 Lab 7 Activity 2: Soil Porosity and Permeability</li> <li>Environmental Issues and Solutions: Unit 2 Lab 7 Activity 3: Soil Testing For Nitrogen, pH, and Phosphates</li> <li>Environmental Issues and Solutions: Unit 2 Lab 8 Activity 1: How Water Pollutants Are Measured</li> <li>Environmental Issues and Solutions: Unit 2 Lab 8 Activity 2: Water Analysis</li> <li>Environmental Issues and Solutions: Unit 2 Lab 8 Activity 3: Determining the LD50 of a Water Pollutant</li> <li>Environmental Issues and Solutions: Unit 2 Lab 8 Activity 4: Observing the Effects of Acid Rain and Other Pollutants on Plants</li> <li>Environmental Issues and Solutions: Unit 3 Lab 10 Activity 1: Dissecting an Owl Pellet</li> <li>Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey</li> <li>Environmental Issues and Solutions: Unit 3 Lab 10 Activity 3: Constructing a Predator-Prey Food Web</li> <li>Environmental Issues and Solutions: Unit 3 Lab 11 Activity 1: Calculating a Biodiversity Index for Leaf Litter Ecosystems</li> <li>Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population</li> <li>Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization</li> <li>Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids</li> </ul>

		<ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 2: Biological Treatment of Pollution</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem</li> <li>• Virtual Laboratory: The Effect of Temperature on Dissolved Oxygen</li> </ul>
<b>PERFORMANCE / CONTENT STANDARD</b>	<b>AK.SB.</b>	<b>Concepts of Physical Science: A student should understand and be able to apply the concepts, models, theories, universal principles, and facts that explain the physical world. A student who meets the content standard should:</b>
<b>GRADE LEVEL EXPECTATION</b>	<b>SB1.</b>	<p>Develop an understanding of the characteristic properties of matter and the relationship of these properties to their structure and behavior.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> </ul>
<b>GRADE LEVEL EXPECTATION</b>	<b>SB3.</b>	<p>Develop an understanding of the interactions between matter and energy, including physical, chemical, and nuclear changes, and the effects of these interactions on physical systems.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 2: Water Analysis</li> </ul>
<b>PERFORMANCE / CONTENT STANDARD</b>	<b>AK.SC.</b>	<b>Concepts of Life Science: A student should understand and be able to apply the concepts, models, theories, facts, evidence, systems, and processes of life science. A student who meets the content standard should:</b>
<b>GRADE LEVEL EXPECTATION</b>	<b>SC2.</b>	<p>Develop an understanding of the structure, function, behavior, development, life cycles, and diversity of living organisms.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 1: Calculating a Biodiversity Index for Leaf Litter Ecosystems</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 2: Biological Treatment of Pollution</li> </ul>

		<ul style="list-style-type: none"> <li>Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem</li> <li>Teacher Resource CD: Ecosystems, Energy, and Biodiversity</li> </ul>
GRADE LEVEL EXPECTATION	SC3.	<p>Develop an understanding that all organisms are linked to each other and their physical environments through the transfer and transformation of matter and energy.</p> <ul style="list-style-type: none"> <li>Environmental Issues and Solutions: Unit 3 Lab 10 Activity 1: Dissecting an Owl Pellet</li> <li>Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey</li> <li>Environmental Issues and Solutions: Unit 3 Lab 10 Activity 3: Constructing a Predator-Prey Food Web</li> <li>Environmental Issues and Solutions: Unit 3 Lab 11 Activity 1: Calculating a Biodiversity Index for Leaf Litter Ecosystems</li> <li>Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization</li> <li>Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids</li> <li>Teacher Resource CD: Ecosystems, Energy, and Biodiversity</li> </ul>
PERFORMANCE / CONTENT STANDARD	AK.SD.	<p>Concepts of Earth Science: A student should understand and be able to apply the concepts, processes, theories, models, evidence, and systems of earth and space sciences. A student who meets the content standard should:</p>
GRADE LEVEL EXPECTATION	SD1.	<p>Develop an understanding of Earth's geochemical cycles.</p> <ul style="list-style-type: none"> <li>Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>Environmental Issues and Solutions: Unit 2 Lab 7 Activity 1: Soil Analysis</li> <li>Environmental Issues and Solutions: Unit 2 Lab 7 Activity 2: Soil Porosity and Permeability</li> <li>Environmental Issues and Solutions: Unit 2 Lab 7 Activity 3: Soil Testing For Nitrogen, pH, and Phosphates</li> <li>Teacher Resource CD: Air, Water, and Soils</li> <li>Teacher Resource CD: Ecosystems, Energy, and Biodiversity</li> </ul>
PERFORMANCE / CONTENT STANDARD	AK.SE.	<p>Science and Technology: A student should understand the relationships among science, technology, and society. A student who meets the content standard should:</p>
GRADE LEVEL EXPECTATION	SE1.	<p>Develop an understanding of how scientific knowledge and technology are used in making decisions about issues, innovations, and responses to problems and everyday events.</p> <ul style="list-style-type: none"> <li>Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3:</li> </ul>

		<p>Examining Oil-Degrading Microbes</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 6 Activity 1: Identifying Airborne Pollutants</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 6 Activity 2: Observing Air Pollution Indicators - Lichens</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 1: Soil Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 2: Soil Porosity and Permeability</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 3: Soil Testing For Nitrogen, pH, and Phosphates</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 1: How Water Pollutants Are Measured</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 2: Water Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 3: Determining the LD50 of a Water Pollutant</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 4: Observing the Effects of Acid Rain and Other Pollutants on Plants</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 1: Dissecting an Owl Pellet</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 3: Constructing a Predator-Prey Food Web</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 1: Calculating a Biodiversity Index for Leaf Litter Ecosystems</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 2: Biological Treatment of Pollution</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem</li> <li>• Teacher Resource CD: Environmental Issues</li> <li>• Virtual Laboratory: The Effect of Temperature on Dissolved Oxygen</li> </ul>
<p><b>GRADE LEVEL EXPECTATION</b></p>	<p><b>SE2.</b></p>	<p>Develop an understanding that solving problems involves different ways of thinking, perspectives, and curiosity that lead to the exploration of multiple paths that are analyzed using scientific, technological, and social merits.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1:</li> </ul>

		<p>Observing Radiation Effects on Plants</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> </ul>
GRADE LEVEL EXPECTATION	SE3.	<p>Develop an understanding of how scientific discoveries and technological innovations affect and are affected by our lives and cultures</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge</li> <li>• Teacher Resource CD: Environmental Issues</li> </ul>
PERFORMANCE / CONTENT STANDARD	AK.SF.	<p>Cultural, Social, Personal Perspectives and Science: A student should understand the dynamic relationships among scientific, cultural, social, and personal perspectives. A student who meets the content standard should:</p>
GRADE LEVEL EXPECTATION	SF1.	<p>Develop an understanding of the interrelationships among individuals, cultures, societies, science, and technology.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> </ul>
PERFORMANCE / CONTENT STANDARD	AK.SG.	<p>History and Nature of Science: A student should understand the history and nature of science. A student who meets the content standard should:</p>
GRADE LEVEL EXPECTATION	SG1.	<p>Develop an understanding that historical perspectives of scientific explanations demonstrate that scientific knowledge changes over time, building on prior knowledge.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1:</li> </ul>

		Biodegrading a Simulated Oil Spill <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> </ul>
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**Alaska Content Standards**  
**Science**  
**Grade 10**

PERFORMANCE / CONTENT STANDARD	AK.A1.	Science as Inquiry and Process (SA1, SA2, SA3)
GRADE LEVEL EXPECTATION	[10] SA1.1.	<p>The student develops an understanding of the processes of science by asking questions, predicting, observing, describing, measuring, classifying, making generalizations, analyzing data, developing models, inferring and communicating.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 6 Activity 1: Identifying Airborne Pollutants</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 6 Activity 2: Observing Air Pollution Indicators - Lichens</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 1: Soil Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 2: Soil Porosity and Permeability</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 3: Soil Testing For Nitrogen, pH, and Phosphates</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 1: How Water Pollutants Are Measured</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 2: Water Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 3: Determining the LD50 of a Water Pollutant</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 4: Observing the Effects of Acid Rain and Other Pollutants on Plants</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 1: Dissecting an Owl Pellet</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 3: Constructing a Predator-Prey Food Web</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity</li> </ul>

		<p>1: Calculating a Biodiversity Index for Leaf Litter Ecosystems</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 2: Biological Treatment of Pollution</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem</li> <li>• Virtual Laboratory: The Effect of Temperature on Dissolved Oxygen</li> </ul>
<p><b>GRADE LEVEL EXPECTATION</b></p>	<p>[10] SA1.2.</p>	<p>The student develops an understanding of the processes of science by reviewing pertinent literature, hypothesizing, making qualitative and quantitative observations, controlling experimental variables, analyzing data statistically (i.e., mean, median, mode), and using this information to draw conclusions, compare results to others, suggest further experimentation, and apply their conclusions to other problems. (L)</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 6 Activity 1: Identifying Airborne Pollutants</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 6 Activity 2: Observing Air Pollution Indicators - Lichens</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 1: Soil Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 2: Soil Porosity and Permeability</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 3: Soil Testing For Nitrogen, pH, and Phosphates</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 1: How Water Pollutants Are Measured</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 2: Water Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 3: Determining the LD50 of a Water Pollutant</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 4: Observing the Effects of Acid Rain and Other Pollutants on Plants</li> </ul>

		<ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 1: Dissecting an Owl Pellet</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 3: Constructing a Predator-Prey Food Web</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 1: Calculating a Biodiversity Index for Leaf Litter Ecosystems</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 2: Biological Treatment of Pollution</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem</li> <li>• Virtual Laboratory: The Effect of Temperature on Dissolved Oxygen</li> </ul>
<p>GRADE LEVEL EXPECTATION</p>	<p>[10] SA2.1.</p>	<p>The student will demonstrate an understanding of the attitudes and approaches to scientific inquiry by examining methodology and conclusions to identify bias and determining if evidence logically supports the conclusions.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 6 Activity 1: Identifying Airborne Pollutants</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 6 Activity 2: Observing Air Pollution Indicators - Lichens</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 1: Soil Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 2: Soil Porosity and Permeability</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 3: Soil Testing For Nitrogen, pH, and Phosphates</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 1: How Water Pollutants Are Measured</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 2: Water Analysis</li> </ul>

		<ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 3: Determining the LD50 of a Water Pollutant</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 4: Observing the Effects of Acid Rain and Other Pollutants on Plants</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 1: Dissecting an Owl Pellet</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 3: Constructing a Predator-Prey Food Web</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 1: Calculating a Biodiversity Index for Leaf Litter Ecosystems</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 2: Biological Treatment of Pollution</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem</li> <li>• Virtual Laboratory: The Effect of Temperature on Dissolved Oxygen</li> </ul>
<b>PERFORMANCE / CONTENT STANDARD</b>	<b>AK.C1.</b>	<b>Concepts of Life Science (SC1, SC2, SC3)</b>
<b>GRADE LEVEL EXPECTATION</b>	<b>[10] SC2.2.</b>	<p>The student demonstrates an understanding of the structure, function, behavior, development, life cycles, and diversity of living organisms by explaining that cells have specialized structures in which chemical reactions occur.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population</li> </ul>
<b>GRADE LEVEL EXPECTATION</b>	<b>[10] SC2.3.</b>	<p>The student demonstrates an understanding of the structure, function, behavior, development, life cycles, and diversity of living organisms by explaining the functions of organs of major systems (i.e., respiratory, digestive, circulatory, reproductive, nervous, musculoskeletal, and excretory).</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 1: Dissecting an Owl Pellet</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey</li> </ul>
<b>GRADE LEVEL EXPECTATION</b>	<b>[10] SC2.4.</b>	<p>The student demonstrates an understanding of the structure, function, behavior, development, life cycles, and diversity of living organisms by tracing the pathways of the digestive, circulatory, and excretory systems.</p>

		<ul style="list-style-type: none"> <li>Environmental Issues and Solutions: Unit 3 Lab 10 Activity 1: Dissecting an Owl Pellet</li> <li>Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey</li> </ul>
GRADE LEVEL EXPECTATION	[10] SC3.1.	<p>The student demonstrates an understanding that all organisms are linked to each other and their physical environments through the transfer and transformation of matter and energy by relating the carbon cycle to global climate change.</p> <ul style="list-style-type: none"> <li>Teacher Resource CD: Air, Water, and Soils</li> </ul>
GRADE LEVEL EXPECTATION	[10] SC3.2.	<p>The student demonstrates an understanding that all organisms are linked to each other and their physical environments through the transfer and transformation of matter and energy by exploring ecological relationships (e.g., competition, niche, feeding relationships, symbiosis). (L)</p> <ul style="list-style-type: none"> <li>Environmental Issues and Solutions: Unit 3 Lab 10 Activity 1: Dissecting an Owl Pellet</li> <li>Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey</li> <li>Environmental Issues and Solutions: Unit 3 Lab 10 Activity 3: Constructing a Predator-Prey Food Web</li> <li>Environmental Issues and Solutions: Unit 3 Lab 11 Activity 1: Calculating a Biodiversity Index for Leaf Litter Ecosystems</li> <li>Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization</li> <li>Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids</li> <li>Teacher Resource CD: Ecosystems, Energy, and Biodiversity</li> </ul>
PERFORMANCE / CONTENT STANDARD	AK.D1.	Concepts of Earth Science (SD1, SD2, SD3, SD4)
GRADE LEVEL EXPECTATION	[10] SD1.2.	<p>The student demonstrates an understanding of geochemical cycles by describing their interrelationships (i.e., water cycle, carbon cycle, oxygen cycle).</p> <ul style="list-style-type: none"> <li>Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>Environmental Issues and Solutions: Unit 2 Lab 7 Activity 1: Soil Analysis</li> <li>Environmental Issues and Solutions: Unit 2 Lab 7 Activity 2: Soil Porosity and Permeability</li> <li>Environmental Issues and Solutions: Unit 2 Lab 7 Activity 3: Soil Testing For Nitrogen, pH, and Phosphates</li> <li>Teacher Resource CD: Air, Water, and Soils</li> <li>Teacher Resource CD: Ecosystems, Energy, and Biodiversity</li> </ul>
GRADE LEVEL EXPECTATION	[10] SD2.1.	<p>The student demonstrates an understanding of the forces that shape Earth by recognizing the dynamic interaction of erosion and deposition including human causes.</p>

		<ul style="list-style-type: none"> <li>Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge</li> </ul>
GRADE LEVEL EXPECTATION	[10] SD3.1.	<p>The student demonstrates an understanding of cycles influenced by energy from the sun and by Earth's position and motion in our solar system by describing causes, effects, preventions, and mitigations of human impact on climate.</p> <ul style="list-style-type: none"> <li>Teacher Resource CD: Air, Water, and Soils</li> </ul>
PERFORMANCE / CONTENT STANDARD	AK.E1.	Science and Technology (SE1, SE2, SE3)
GRADE LEVEL EXPECTATION	[10] SE1.1.	<p>The student demonstrates an understanding of how to integrate scientific knowledge and technology to address problems by identifying that progress in science and invention is highly interrelated to what else is happening in society.</p> <ul style="list-style-type: none"> <li>Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge</li> <li>Environmental Issues and Solutions: Unit 2 Lab 6 Activity 1: Identifying Airborne Pollutants</li> <li>Environmental Issues and Solutions: Unit 2 Lab 6 Activity 2: Observing Air Pollution Indicators - Lichens</li> <li>Environmental Issues and Solutions: Unit 2 Lab 7 Activity 1: Soil Analysis</li> <li>Environmental Issues and Solutions: Unit 2 Lab 7 Activity 2: Soil Porosity and Permeability</li> <li>Environmental Issues and Solutions: Unit 2 Lab 7 Activity 3: Soil Testing For Nitrogen, pH, and Phosphates</li> <li>Environmental Issues and Solutions: Unit 2 Lab 8 Activity 1: How Water Pollutants Are Measured</li> <li>Environmental Issues and Solutions: Unit 2 Lab 8 Activity 2: Water Analysis</li> <li>Environmental Issues and Solutions: Unit 2 Lab 8 Activity 3: Determining the LD50 of a Water Pollutant</li> <li>Environmental Issues and Solutions: Unit 2 Lab 8 Activity 4: Observing the Effects of Acid Rain and Other Pollutants on Plants</li> <li>Environmental Issues and Solutions: Unit 3 Lab 10 Activity 1: Dissecting an Owl Pellet</li> <li>Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey</li> <li>Environmental Issues and Solutions: Unit 3 Lab 10 Activity</li> </ul>

		<p>3: Constructing a Predator-Prey Food Web</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 1: Calculating a Biodiversity Index for Leaf Litter Ecosystems</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 2: Biological Treatment of Pollution</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem</li> <li>• Teacher Resource CD: Environmental Issues</li> <li>• Virtual Laboratory: The Effect of Temperature on Dissolved Oxygen</li> </ul>
<p>GRADE LEVEL EXPECTATION</p>	<p>[10] SE2.1.</p>	<p>The student demonstrates an understanding that solving problems involves different ways of thinking by questioning, researching, modeling, simulating, and testing multiple solutions to a problem. (L)</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 6 Activity 1: Identifying Airborne Pollutants</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 6 Activity 2: Observing Air Pollution Indicators - Lichens</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 1: Soil Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 2: Soil Porosity and Permeability</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 3: Soil Testing For Nitrogen, pH, and Phosphates</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 1: How Water Pollutants Are Measured</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 2: Water Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 3: Determining the LD50 of a Water Pollutant</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 4: Observing the Effects of Acid Rain and Other Pollutants on Plants</li> </ul>

		<ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 1: Dissecting an Owl Pellet</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 3: Constructing a Predator-Prey Food Web</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 1: Calculating a Biodiversity Index for Leaf Litter Ecosystems</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 2: Biological Treatment of Pollution</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem</li> <li>• Virtual Laboratory: The Effect of Temperature on Dissolved Oxygen</li> </ul>
GRADE LEVEL EXPECTATION	[10] SE3.1.	<p>The student demonstrates an understanding of how scientific discoveries and technological innovations affect our lives and society by researching a current problem, identifying possible solutions, and evaluating the impact of each solution. (L)</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge</li> <li>• Teacher Resource CD: Environmental Issues</li> </ul>
PERFORMANCE / CONTENT STANDARD	AK.SA.	Science as Inquiry and Process: A student should understand and be able to apply the processes and applications of scientific inquiry. A student who meets the content standard should:
GRADE LEVEL EXPECTATION	SA1.	<p>Develop an understanding of the processes of science used to investigate problems, design and conduct repeatable scientific investigations, and defend scientific arguments.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> </ul>

		<ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 6 Activity 1: Identifying Airborne Pollutants</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 6 Activity 2: Observing Air Pollution Indicators - Lichens</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 1: Soil Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 2: Soil Porosity and Permeability</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 3: Soil Testing For Nitrogen, pH, and Phosphates</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 1: How Water Pollutants Are Measured</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 2: Water Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 3: Determining the LD50 of a Water Pollutant</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 4: Observing the Effects of Acid Rain and Other Pollutants on Plants</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 1: Dissecting an Owl Pellet</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 3: Constructing a Predator-Prey Food Web</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 1: Calculating a Biodiversity Index for Leaf Litter Ecosystems</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 2: Biological Treatment of Pollution</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem</li> <li>• Virtual Laboratory: The Effect of Temperature on Dissolved Oxygen</li> </ul>
PERFORMANCE / CONTENT STANDARD	AK.SB.	Concepts of Physical Science: A student should understand and be able to apply the concepts, models, theories, universal principles, and facts that explain the physical world. A student who meets the content standard should:
GRADE LEVEL EXPECTATION	SB1.	Develop an understanding of the characteristic properties of matter and

		<p>the relationship of these properties to their structure and behavior.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> </ul>
GRADE LEVEL EXPECTATION	SB3.	<p>Develop an understanding of the interactions between matter and energy, including physical, chemical, and nuclear changes, and the effects of these interactions on physical systems.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 2: Water Analysis</li> </ul>
PERFORMANCE / CONTENT STANDARD	AK.SC.	<p>Concepts of Life Science: A student should understand and be able to apply the concepts, models, theories, facts, evidence, systems, and processes of life science. A student who meets the content standard should:</p>
GRADE LEVEL EXPECTATION	SC2.	<p>Develop an understanding of the structure, function, behavior, development, life cycles, and diversity of living organisms.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 1: Calculating a Biodiversity Index for Leaf Litter Ecosystems</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 2: Biological Treatment of Pollution</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem</li> <li>• Teacher Resource CD: Ecosystems, Energy, and Biodiversity</li> </ul>
GRADE LEVEL EXPECTATION	SC3.	<p>Develop an understanding that all organisms are linked to each other and their physical environments through the transfer and transformation of matter and energy.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 1: Dissecting an Owl Pellet</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 3: Constructing a Predator-Prey Food Web</li> </ul>

		<ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 1: Calculating a Biodiversity Index for Leaf Litter Ecosystems</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids</li> <li>• Teacher Resource CD: Ecosystems, Energy, and Biodiversity</li> </ul>
<b>PERFORMANCE / CONTENT STANDARD</b>	<b>AK.SD.</b>	<b>Concepts of Earth Science: A student should understand and be able to apply the concepts, processes, theories, models, evidence, and systems of earth and space sciences. A student who meets the content standard should:</b>
<b>GRADE LEVEL EXPECTATION</b>	<b>SD1.</b>	<p>Develop an understanding of Earth's geochemical cycles.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 1: Soil Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 2: Soil Porosity and Permeability</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 3: Soil Testing For Nitrogen, pH, and Phosphates</li> <li>• Teacher Resource CD: Air, Water, and Soils</li> <li>• Teacher Resource CD: Ecosystems, Energy, and Biodiversity</li> </ul>
<b>PERFORMANCE / CONTENT STANDARD</b>	<b>AK.SE.</b>	<b>Science and Technology: A student should understand the relationships among science, technology, and society. A student who meets the content standard should:</b>
<b>GRADE LEVEL EXPECTATION</b>	<b>SE1.</b>	<p>Develop an understanding of how scientific knowledge and technology are used in making decisions about issues, innovations, and responses to problems and everyday events.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 6 Activity 1: Identifying Airborne Pollutants</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 6 Activity 2: Observing Air Pollution Indicators - Lichens</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 1: Soil Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 2: Soil Porosity and Permeability</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 7 Activity 3:</li> </ul>

		<p>Soil Testing For Nitrogen, pH, and Phosphates</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 1: How Water Pollutants Are Measured</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 2: Water Analysis</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 3: Determining the LD50 of a Water Pollutant</li> <li>• Environmental Issues and Solutions: Unit 2 Lab 8 Activity 4: Observing the Effects of Acid Rain and Other Pollutants on Plants</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 1: Dissecting an Owl Pellet</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 10 Activity 3: Constructing a Predator-Prey Food Web</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 1: Calculating a Biodiversity Index for Leaf Litter Ecosystems</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization</li> <li>• Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 2: Biological Treatment of Pollution</li> <li>• Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem</li> <li>• Teacher Resource CD: Environmental Issues</li> <li>• Virtual Laboratory: The Effect of Temperature on Dissolved Oxygen</li> </ul>
<p>GRADE LEVEL EXPECTATION</p>	<p>SE2.</p>	<p>Develop an understanding that solving problems involves different ways of thinking, perspectives, and curiosity that lead to the exploration of multiple paths that are analyzed using scientific, technological, and social merits.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> </ul>
<p>GRADE LEVEL EXPECTATION</p>	<p>SE3.</p>	<p>Develop an understanding of how scientific discoveries and technological innovations affect and are affected by our lives and cultures</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> </ul>

		<ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge</li> <li>• Teacher Resource CD: Environmental Issues</li> </ul>
<b>PERFORMANCE / CONTENT STANDARD</b>	<b>AK.SF.</b>	<b>Cultural, Social, Personal Perspectives and Science: A student should understand the dynamic relationships among scientific, cultural, social, and personal perspectives. A student who meets the content standard should:</b>
<b>GRADE LEVEL EXPECTATION</b>	<b>SF1.</b>	<p>Develop an understanding of the interrelationships among individuals, cultures, societies, science, and technology.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> </ul>
<b>PERFORMANCE / CONTENT STANDARD</b>	<b>AK.SG.</b>	<b>History and Nature of Science: A student should understand the history and nature of science. A student who meets the content standard should:</b>
<b>GRADE LEVEL EXPECTATION</b>	<b>SG1.</b>	<p>Develop an understanding that historical perspectives of scientific explanations demonstrate that scientific knowledge changes over time, building on prior knowledge.</p> <ul style="list-style-type: none"> <li>• Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 2: Cleaning Up Shore Environments</li> <li>• Environmental Issues and Solutions: Unit 1 Lab 3 Activity 3: Examining Oil-Degrading Microbes</li> </ul>