

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

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Delaware Standards and Curricula
Science
Grade 7

CONTENT STANDARD	DE.1.	Nature and Application of Science and Technology
PERFORMANCE INDICATOR / GLE	1.1.	Enduring Understanding: Scientific inquiry involves asking scientifically-oriented questions, collecting evidence, forming explanations, connecting explanations to scientific knowledge and theory, and communicating and justifying the explanation.
GRADE LEVEL EXPECTATION	1.1.1.	<p>Frame and refine questions that can be investigated scientifically, and generate testable hypotheses.</p> <ul style="list-style-type: none"> • 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

		<ul style="list-style-type: none"> • 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
<p>GRADE LEVEL EXPECTATION</p>	<p>1.1.2.</p>	<p>Design and conduct investigations with controlled variables to test hypotheses.</p> <ul style="list-style-type: none"> • 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

		<p>Plants</p> <ul style="list-style-type: none"> • 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
<p>GRADE LEVEL EXPECTATION</p>	<p>1.1.3.</p>	<p>Accurately collect data through the selection and use of tools and techniques appropriate to the investigation. Construct tables, diagrams and graphs, showing relationships between two variables, to display and facilitate analysis of data. Compare and question results with and from other students.</p> <ul style="list-style-type: none"> • 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:

		<p>Water Analysis</p> <ul style="list-style-type: none"> • 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
<p>GRADE LEVEL EXPECTATION</p>	<p>1.1.4.</p>	<p>Form explanations based on accurate and logical analysis of evidence. Revise the explanation using alternative descriptions, predictions, models and knowledge from other sources as well as results of further investigation.</p> <ul style="list-style-type: none"> • 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:

		<p>Soil Testing For Nitrogen, pH, and Phosphates</p> <ul style="list-style-type: none"> • 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
<p>GRADE LEVEL EXPECTATION</p>	<p>1.1.5.</p>	<p>Communicate scientific procedures, data, and explanations to enable the replication of results. Use computer technology to assist in communicating these results. Critical review is important in the analysis of these results.</p> <ul style="list-style-type: none"> • 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:

		<p>Soil Analysis</p> <ul style="list-style-type: none"> • 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
<p>GRADE LEVEL EXPECTATION</p>	<p>1.1.6.</p>	<p>Use mathematics, reading, writing, and technology in conducting scientific inquiries.</p> <ul style="list-style-type: none"> • 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

		<ul style="list-style-type: none"> • 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
<p>GRADE LEVEL EXPECTATION</p>	<p>1.1.8.</p>	<p>Measure and record the temperature of ice water as it is heated. Plot the graph of measurements taken and interpret the change of phase graph using the particle model, identifying the states of matter.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge • Environmental Issues and Solutions: Unit 2 Lab 7 Activity 2: Soil Porosity and Permeability • 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

		<p>Plants</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant
GRADE LEVEL EXPECTATION	1.1.9.	<p>Analyze a standard change of phase graph of water. Using the particle model, identify where water is a solid, liquid or gas, is freezing/melting or evaporating/condensing. Relate the states of matter to the changes (increase, decrease) of energy in the system.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge
GRADE LEVEL EXPECTATION	1.1.11.	<p>Calculate the density of various solid materials. Use density to predict whether an object will sink or float in water. Given the density of various solids and liquids, create a density column and explain the arrangement in terms of density.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem
GRADE LEVEL EXPECTATION	1.1.12.	<p>Use physical properties to distinguish and separate one substance or material from another.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant
GRADE LEVEL EXPECTATION	1.1.13.	<p>Distinguish between homogeneous and heterogeneous mixtures. Using their physical properties, design and conduct an investigation to separate the components of a homogeneous or heterogeneous mixture. Recognize that a homogeneous mixture is a solution.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant
GRADE LEVEL EXPECTATION	1.1.14.	<p>Prepare solutions of different concentrations recognizing that the properties of the solution (color, density, boiling point) depend on the nature and concentration of the solute and solvent.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population
GRADE LEVEL EXPECTATION	1.1.18.	<p>Show that mass is conserved when adding a solute to a solvent (mass of solvent + mass of solute = total mass of solution).</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge Environmental Issues and Solutions: Unit 3 Lab 11 Activity

		2: Determining the Carrying Capacity of a Population
GRADE LEVEL EXPECTATION	1.1.19.	Describe how heat energy when added to a substance, will increase its temperature or change its state. Explain that as more heat energy is added to a substance, the particles' vibrations increase and the spacing between the particles increases, but the size of the particles stays the same. <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming
GRADE LEVEL EXPECTATION	1.1.22.	Use diagrams of the hydrologic cycle to show and describe the circulation of water through the Earth's crust, oceans, and atmosphere. <ul style="list-style-type: none"> Teacher Resource CD: Air, Water, and Soils
GRADE LEVEL EXPECTATION	1.1.23.	Use the particle model to describe solids, liquids, and gases in terms of the packing, motion of particles, and energy gain or loss. Apply this to the processes of evaporation, condensation, and precipitation in the water cycle. Explain how heat energy drives the water cycle. <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge Teacher Resource CD: Air, Water, and Soils
GRADE LEVEL EXPECTATION	1.1.24.	Use models or diagrams to explain how water stored underground (groundwater and aquifers) and water stored above ground (lakes, rivers, air, etc...) interact to form a continuous cycle. <ul style="list-style-type: none"> Teacher Resource CD: Air, Water, and Soils
GRADE LEVEL EXPECTATION	1.1.25.	Investigate, through the use of models, how water acts as a solvent and as it passes through the water cycle it dissolves minerals, gases, and pollutants and carries them to surface water and ground water supplies. <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill 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 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 Teacher Resource CD: Air, Water, and Soils Teacher Resource CD: Environmental Issues Virtual Laboratory: The Effect of Temperature on Dissolved Oxygen

GRADE LEVEL EXPECTATION	1.1.26.	<p>Conduct investigations and use the data to describe the extent to which the permeability and porosity of a soil sample affect the rate of water percolation.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill • 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 3 Lab 11 Activity 1: Calculating a Biodiversity Index for Leaf Litter Ecosystems • Teacher Resource CD: Air, Water, and Soils
GRADE LEVEL EXPECTATION	1.1.28.	<p>Conduct tests including temperature, pH, salinity, dissolved oxygen, turbidity, nitrate, and phosphate to determine the potability of local water samples.</p> <ul style="list-style-type: none"> • 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 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 • Teacher Resource CD: Air, Water, and Soils • Teacher Resource CD: Environmental Issues • Virtual Laboratory: The Effect of Temperature on Dissolved Oxygen
GRADE LEVEL EXPECTATION	1.1.29.	<p>Identify macro-invertebrates in a local stream and apply this identification in determining the stream's ecological health.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge • Environmental Issues and Solutions: Unit 2 Lab 8 Activity 3: Determining the LD50 of a Water Pollutant
GRADE LEVEL EXPECTATION	1.1.31.	<p>Classify organisms based on shared characteristics into currently recognized kingdoms and justify their placement. Give examples of organisms from each kingdom.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill • Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey • Environmental Issues and Solutions: Unit 3 Lab 11 Activity

		<p>2: Determining the Carrying Capacity of a Population</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem
GRADE LEVEL EXPECTATION	1.1.33.	<p>Recognize that reproduction is a process that occurs in all living systems and is essential to the continuation of the species. Use models or diagrams to identify the structures of a flowering plant that produce eggs and sperm and explain that plants as well as animals can reproduce sexually.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants Environmental Issues and Solutions: Unit 2 Lab 8 Activity 4: Observing the Effects of Acid Rain and Other Pollutants on Plants
GRADE LEVEL EXPECTATION	1.1.42.	<p>Identify 'kingdom' as the first main level of the standard classification system. Observe a variety of living organisms and determine into which kingdom they would be classified.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey
CONTENT STANDARD	DE.1.	Nature and Application of Science and Technology
PERFORMANCE INDICATOR / GLE	1.2.	Enduring Understanding: The development of technology and advancement in science influence and drive each other forward.
GRADE LEVEL EXPECTATION	1.2.2.	<p>Discuss the social, economic, and/or environmental consequences of the production of new materials to meet human wants and needs.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill Teacher Resource CD: Environmental Issues
GRADE LEVEL EXPECTATION	1.2.3.	<p>Research and report on the processes used by municipalities to ensure water taken from local reservoirs is safe to return to the environment.</p> <ul style="list-style-type: none"> 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 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 Teacher Resource CD: Air, Water, and Soils Teacher Resource CD: Environmental Issues Virtual Laboratory: The Effect of Temperature on Dissolved Oxygen

GRADE LEVEL EXPECTATION	1.2.5.	<p>List ways in which human intervention can help maintain an adequate supply of fresh water for human consumption. Apply knowledge and skills learned about water as a resource to study local sources of drinking water and devise a water quality stewardship plan.</p> <ul style="list-style-type: none"> • 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 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 • Teacher Resource CD: Air, Water, and Soils • Teacher Resource CD: Environmental Issues • Virtual Laboratory: The Effect of Temperature on Dissolved Oxygen
GRADE LEVEL EXPECTATION	1.2.6.	<p>Use various indicators (pH, turbidity, nitrates, phosphates, salinity, and macro-invertebrate surveys) to establish the health and potential potability of local bodies of water.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 2 Lab 6 Activity 2: Observing Air Pollution Indicators - Lichens • 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 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 • Teacher Resource CD: Air, Water, and Soils • Teacher Resource CD: Environmental Issues • Virtual Laboratory: The Effect of Temperature on Dissolved Oxygen
GRADE LEVEL EXPECTATION	1.2.9.	<p>Explain how sanitation measures such as sewers, landfills, and water treatment are important in controlling the spread of organisms that contaminate water and cause disease.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant

		<ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 4 Lab 12 Activity 2: Biological Treatment of Pollution Teacher Resource CD: Environmental Issues
CONTENT STANDARD	DE.1.	Nature and Application of Science and Technology
PERFORMANCE INDICATOR / GLE	1.3.	Enduring Understanding: Understanding past processes and contributions is essential in building scientific knowledge.
GRADE LEVEL EXPECTATION	1.3.1.	<p>Research the sequence of events that led to the formation of the cell theory and correlate these events with technological advancements (e.g., hand lens, microscopes, and staining techniques).</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill 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 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 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem
CONTENT STANDARD	DE.2.	Materials and Their Properties
PERFORMANCE INDICATOR / GLE	2.1.	Enduring Understanding: The structures of materials determine their properties.
GRADE LEVEL EXPECTATION	2.1.2.	<p>Measure and record the temperature of ice water as it is heated. Plot the graph of measurements taken and interpret the change of phase graph using the particle model, identifying the states of matter.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge Environmental Issues and Solutions: Unit 2 Lab 7 Activity 2: Soil Porosity and Permeability 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 4 Lab 12 Activity 1: Modeling a Water Treatment Plant
GRADE LEVEL EXPECTATION	2.1.3.	<p>Analyze a standard change of phase graph of water. Using the particle model, identify where water is a solid, liquid or gas, is freezing/melting or evaporating/condensing. Relate the states of matter to the changes (increase, decrease) of energy in the system.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1:

		Modeling Salt Runoff Discharge
GRADE LEVEL EXPECTATION	2.1.5.	<p>Distinguish between physical properties that are dependent upon mass (size, shape) and those physical properties such as boiling point, melting point, solubility, density, conduction of heat and pH of a substance or material that are not altered when the mass of the material is changed.</p> <ul style="list-style-type: none"> • 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 5 Activity 1: Modeling Salt Runoff Discharge • 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 2: Water Analysis • 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 11 Activity 2: Determining the Carrying Capacity of a Population • Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem
GRADE LEVEL EXPECTATION	2.1.6.	<p>Calculate the density of various solid materials. Use density to predict whether an object will sink or float in water. Given the density of various solids and liquids, create a density column and explain the arrangement in terms of density.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge • Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population • Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem
GRADE LEVEL EXPECTATION	2.1.7.	<p>Use physical properties to distinguish and separate one substance or material from another.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant
CONTENT STANDARD	DE.2.	Materials and Their Properties
PERFORMANCE INDICATOR / GLE	2.2.	Enduring Understanding: The properties of the mixture are based on the properties of its components.
GRADE LEVEL EXPECTATION	2.2.1.	<p>Distinguish between homogeneous and heterogeneous mixtures. Using their physical properties, design and conduct an investigation to separate the components of a homogeneous or heterogeneous mixture. Recognize that a homogeneous mixture is a solution.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge • Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population

		<ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant
GRADE LEVEL EXPECTATION	2.2.2.	<p>Prepare solutions of different concentrations recognizing that the properties of the solution (color, density, boiling point) depend on the nature and concentration of the solute and solvent.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population
CONTENT STANDARD	DE.2.	Materials and Their Properties
PERFORMANCE INDICATOR / GLE	2.3.	Enduring Understanding: When materials interact within a closed system, the total mass of the system remains the same.
GRADE LEVEL EXPECTATION	2.3.1.	<p>Show that mass is conserved when adding a solute to a solvent (mass of solvent + mass of solute = total mass of solution).</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population
CONTENT STANDARD	DE.2.	Materials and Their Properties
PERFORMANCE INDICATOR / GLE	2.4.	Enduring Understanding: People develop new materials as a response to the needs of society and the pursuit of knowledge. This development may have risks and benefits to humans and the environment.
GRADE LEVEL EXPECTATION	2.4.2.	<p>Discuss the social, economic, and/or environmental consequences of the production of new materials to meet human wants and needs.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill Teacher Resource CD: Environmental Issues
CONTENT STANDARD	DE.3.	Energy and Its Effects
PERFORMANCE INDICATOR / GLE	3.1.	Enduring Understandings: Energy takes many forms. These forms can be grouped into types of energy that are associated with the motion of mass (kinetic energy) and types of energy associated with the position of mass and energy fields (potential energy).
GRADE LEVEL EXPECTATION	3.1.1.	<p>Describe how heat energy when added to a substance, will increase its temperature or change its state. Explain that as more heat energy is added to a substance, the particles' vibrations increase and the spacing between the particles increases, but the size of the particles stays the same.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming
CONTENT STANDARD	DE.5.	Earth's Dynamic Systems
PERFORMANCE INDICATOR / GLE	5.2.	Enduring Understanding: Earth's components form systems. These systems continually interact at different rates of time, affecting the Earth locally and globally.
GRADE LEVEL EXPECTATION	5.2.1.	Use diagrams of the hydrologic cycle to show and describe the circulation of

		<p>water through the Earth's crust, oceans, and atmosphere.</p> <ul style="list-style-type: none"> • Teacher Resource CD: Air, Water, and Soils
GRADE LEVEL EXPECTATION	5.2.2.	<p>Use the particle model to describe solids, liquids, and gases in terms of the packing, motion of particles, and energy gain or loss. Apply this to the processes of evaporation, condensation, and precipitation in the water cycle. Explain how heat energy drives the water cycle.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge • Teacher Resource CD: Air, Water, and Soils
GRADE LEVEL EXPECTATION	5.2.3.	<p>Use models or diagrams to explain how water stored underground (groundwater and aquifers) and water stored above ground (lakes, rivers, air, etc.) interact to form a continuous cycle.</p> <ul style="list-style-type: none"> • Teacher Resource CD: Air, Water, and Soils
GRADE LEVEL EXPECTATION	5.2.4.	<p>Investigate, through the use of models, how water acts as a solvent and as it passes through the water cycle it dissolves minerals, gases, and pollutants and carries them to surface water and ground water supplies.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill • 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 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 • Teacher Resource CD: Air, Water, and Soils • Teacher Resource CD: Environmental Issues • Virtual Laboratory: The Effect of Temperature on Dissolved Oxygen
GRADE LEVEL EXPECTATION	5.2.5.	<p>Conduct investigations and use the data to describe the extent to which the permeability and porosity of a soil sample affect the rate of water percolation.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill • 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

		<ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 3 Lab 11 Activity 1: Calculating a Biodiversity Index for Leaf Litter Ecosystems Teacher Resource CD: Air, Water, and Soils
GRADE LEVEL EXPECTATION	5.2.6.	<p>Describe the role of wetlands and streamside forests (riparian) in filtering water as it runs off into local streams, rivers, and bays or seeps into ground water.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization
CONTENT STANDARD	DE.5.	Earth's Dynamic Systems
PERFORMANCE INDICATOR / GLE	5.3.	Enduring Understanding: Technology enables us to better understand Earth's systems. It also allows us to analyze the impact of human activities on Earth's systems and the impact of Earth's systems on human activity.
GRADE LEVEL EXPECTATION	5.3.2.	<p>Conduct tests including temperature, pH, salinity, dissolved oxygen, turbidity, nitrate, and phosphate to determine the potability of local water samples.</p> <ul style="list-style-type: none"> 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 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 Teacher Resource CD: Air, Water, and Soils Teacher Resource CD: Environmental Issues Virtual Laboratory: The Effect of Temperature on Dissolved Oxygen
GRADE LEVEL EXPECTATION	5.3.3.	<p>Identify macro-invertebrates in a local stream and apply this identification in determining the stream's ecological health.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 2 Lab 6 Activity 2: Observing Air Pollution Indicators - Lichens Environmental Issues and Solutions: Unit 2 Lab 8 Activity 2: Water Analysis Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem Teacher Resource CD: Air, Water, and Soils Virtual Laboratory: The Effect of Temperature on Dissolved Oxygen
GRADE LEVEL EXPECTATION	5.3.4.	<p>Explain the impact of human activities (e.g., building roads, fertilizing golf courses, etc.) on the quality of Delaware's waters.</p>

		<ul style="list-style-type: none"> • 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 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 • Teacher Resource CD: Air, Water, and Soils • Teacher Resource CD: Environmental Issues • Virtual Laboratory: The Effect of Temperature on Dissolved Oxygen
<p>GRADE LEVEL EXPECTATION</p>	<p>5.3.5.</p>	<p>Research and report on the processes used by municipalities to ensure water taken from local reservoirs is safe to return to the environment.</p> <ul style="list-style-type: none"> • 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 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 • Teacher Resource CD: Air, Water, and Soils • Teacher Resource CD: Environmental Issues • Virtual Laboratory: The Effect of Temperature on Dissolved Oxygen
<p>GRADE LEVEL EXPECTATION</p>	<p>5.3.7.</p>	<p>List ways in which human intervention can help maintain an adequate supply of fresh water for human consumption. Apply knowledge and skills learned about water as a resource to study local sources of drinking water and devise a water quality stewardship plan.</p> <ul style="list-style-type: none"> • 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

		<p>Plants</p> <ul style="list-style-type: none"> • 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 • Teacher Resource CD: Air, Water, and Soils • Teacher Resource CD: Environmental Issues • Virtual Laboratory: The Effect of Temperature on Dissolved Oxygen
CONTENT STANDARD	DE.6.	Life Processes
PERFORMANCE INDICATOR / GLE	6.1.	Enduring Understanding: Living systems, from the organismic to the cellular level, demonstrate the complementary nature of structure and function.
GRADE LEVEL EXPECTATION	6.1.2.	<p>Classify organisms based on shared characteristics into currently recognized kingdoms and justify their placement. Give examples of organisms from each kingdom.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill • Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey • Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population • Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem
GRADE LEVEL EXPECTATION	6.1.3.	<p>Explain that individual cells are able to carry out basic life functions that are similar in organisms; however, explain that in multi-cellular organisms, cells become specialized, interdependent upon one another, and unable to survive independently.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population • Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem
GRADE LEVEL EXPECTATION	6.1.4.	<p>Describe the hierarchical organization of multi-cellular organisms. Recognize that multi-celled organisms are organized as specialized cells within tissues that make up organs within organ systems, which work together to carry out life processes for the entire organism.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem
GRADE LEVEL EXPECTATION	6.1.6.	<p>Research the sequence of events that led to the formation of the cell theory and correlate these events with technological advancements (e.g., hand lens, microscopes, and staining techniques).</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill • 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:

		<p>Cleaning Up Shore Environments</p> <ul style="list-style-type: none"> • 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 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem
CONTENT STANDARD	DE.6.	Life Processes
PERFORMANCE INDICATOR / GLE	6.2.	Enduring Understanding: All organisms transfer matter and convert energy from one form to another. Both matter and energy are necessary to build and maintain structures within the organism.
GRADE LEVEL EXPECTATION	6.2.1.	<p>Recognize that the process of photosynthesis occurs in the chloroplasts of producers. Summarize the basic process in which energy from sunlight is used to make sugars from carbon dioxide and water (photosynthesis). Indicate that this food can be used immediately, stored for later use, or used by other organisms.</p> <ul style="list-style-type: none"> • 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 9 Activity 1: Food Web Organization • Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids • Teacher Resource CD: Air, Water, and Soils • Teacher Resource CD: Ecosystems, Energy, and Biodiversity
GRADE LEVEL EXPECTATION	6.2.2.	<p>Recognize that the process of cellular respiration in the mitochondria of both plants and animals releases energy from food. Indicate that this food provides the energy and materials for repair and growth of cells. Explain the complementary nature between photosynthesis and cellular respiration.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization • Teacher Resource CD: Air, Water, and Soils • Teacher Resource CD: Ecosystems, Energy, and Biodiversity
CONTENT STANDARD	DE.6.	Life Processes
PERFORMANCE INDICATOR / GLE	6.3.	Enduring Understanding: Organisms respond to internal and external cues, which allow them to survive.
GRADE LEVEL EXPECTATION	6.3.1.	<p>Research external conditions needed by a variety of organisms for survival such as temperature, turbidity, pH, salinity, and amount of dissolved oxygen, phosphates, and nitrates. Predict how organisms may respond to changes in these external conditions based on research findings.</p> <ul style="list-style-type: none"> • 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 2 Lab 6 Activity 2:

		<p>Observing Air Pollution Indicators - Lichens</p> <ul style="list-style-type: none"> • 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 11 Activity 2: Determining the Carrying Capacity of a Population • Teacher Resource CD: Ecosystems, Energy, and Biodiversity
CONTENT STANDARD	DE.6.	Life Processes
PERFORMANCE INDICATOR / GLE	6.4.	Enduring Understanding: The life processes of organisms are affected by their interactions with each other and their environment, and may be altered by human manipulation.
GRADE LEVEL EXPECTATION	6.4.1.	<p>Use various indicators (pH, turbidity, nitrates, phosphates, salinity, and macro-invertebrate surveys) to establish the health and potential potability of local bodies of water.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 2 Lab 6 Activity 2: Observing Air Pollution Indicators - Lichens • 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 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 • Teacher Resource CD: Air, Water, and Soils • Teacher Resource CD: Environmental Issues • Virtual Laboratory: The Effect of Temperature on Dissolved Oxygen
CONTENT STANDARD	DE.7.	Diversity and Continuity of Living Things
PERFORMANCE INDICATOR / GLE	7.1.	Enduring Understanding: Organisms reproduce, develop, have predictable life cycles, and pass on heritable traits to their offspring.
GRADE LEVEL EXPECTATION	7.1.1.	<p>Recognize that reproduction is a process that occurs in all living systems and is essential to the continuation of the species. Use models or diagrams to identify the structures of a flowering plant that produce eggs and sperm and explain that plants, as well as, animals can reproduce sexually.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants • Environmental Issues and Solutions: Unit 2 Lab 8 Activity 4: Observing the Effects of Acid Rain and Other Pollutants on Plants

CONTENT STANDARD	DE.7.	Diversity and Continuity of Living Things
PERFORMANCE INDICATOR / GLE	7.2.	Enduring Understanding: The diversity and changing of life forms over many generations is the result of natural selection, in which organisms with adaptive traits survive, reproduce, and pass those traits to offspring.
GRADE LEVEL EXPECTATION	7.2.2.	Identify 'kingdom' as the first main level of the standard classification system. Observe a variety of living organisms and determine into which kingdom they would be classified. <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey
CONTENT STANDARD	DE.8.	Ecology
PERFORMANCE INDICATOR / GLE	8.3.	Enduring Understanding: Humans can alter the living and non-living factors within an ecosystem, thereby creating changes to the overall system.
GRADE LEVEL EXPECTATION	8.3.1.	Explain how sanitation measures such as sewers, landfills, and water treatment are important in controlling the spread of organisms that contaminate water and cause disease. <ul style="list-style-type: none"> 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 Teacher Resource CD: Environmental Issues

**Delaware Standards and Curricula
Science
Grade 8**

CONTENT STANDARD	DE.1.	Nature and Application of Science and Technology
PERFORMANCE INDICATOR / GLE	1.1.	Enduring Understanding: Scientific inquiry involves asking scientifically-oriented questions, collecting evidence, forming explanations, connecting explanations to scientific knowledge and theory, and communicating and justifying the explanation.
GRADE LEVEL EXPECTATION	1.1.1.	Frame and refine questions that can be investigated scientifically, and generate testable hypotheses. <ul style="list-style-type: none"> 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:

		<p>Observing Air Pollution Indicators - Lichens</p> <ul style="list-style-type: none"> • 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
<p>GRADE LEVEL EXPECTATION</p>	<p>1.1.2.</p>	<p>Design and conduct investigations with controlled variables to test hypotheses.</p> <ul style="list-style-type: none"> • 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

		<ul style="list-style-type: none"> • 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
<p>GRADE LEVEL EXPECTATION</p>	<p>1.1.3.</p>	<p>Accurately collect data through the selection and use of tools and techniques appropriate to the investigation. Construct tables, diagrams and graphs, showing relationships between two variables, to display and facilitate analysis of data. Compare and question results with and from other students.</p> <ul style="list-style-type: none"> • 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:

		<p>Examining Oil-Degrading Microbes</p> <ul style="list-style-type: none"> • 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
<p>GRADE LEVEL EXPECTATION</p>	<p>1.1.4.</p>	<p>Form explanations based on accurate and logical analysis of evidence. Revise the explanation using alternative descriptions, predictions, models and knowledge from other sources as well as results of further investigation.</p> <ul style="list-style-type: none"> • 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:

		<p>Biodegrading a Simulated Oil Spill</p> <ul style="list-style-type: none"> • 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
<p>GRADE LEVEL EXPECTATION</p>	<p>1.1.5.</p>	<p>Communicate scientific procedures, data, and explanations to enable the replication of results. Use computer technology to assist in communicating these results. Critical review is important in the analysis of these results.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1:

		<p>Biodegradation in a Landfill</p> <ul style="list-style-type: none"> • 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
GRADE LEVEL	1.1.6.	Use mathematics, reading, writing, and technology in conducting scientific

<p>EXPECTATION</p>	<p>inquiries.</p> <ul style="list-style-type: none"> • 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
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		Oxygen
GRADE LEVEL EXPECTATION	1.1.7.	<p>Conduct simple investigations in which a variety of materials (sand, water, light colored materials, dark colored materials) are exposed to light and heat energy. Measure the change in temperature of the material and describe any changes that occur in terms of the physical properties of the material.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming • Teacher Resource CD: Air, Water, and Soils
GRADE LEVEL EXPECTATION	1.1.13.	<p>Describe how the motion of water particles in a glass of cold water is different from the motion of water particles in a glass of hot water.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge
GRADE LEVEL EXPECTATION	1.1.16.	<p>Explain that heat energy and sound energy both make the particles of a substance move. Use models to explain how the particles respond differently to these types of energy. Use models to explain why sound travels much faster through substances than heat energy does.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming
GRADE LEVEL EXPECTATION	1.1.25.	<p>Use the Particle Model to describe the difference between heat energy transfer in solids and heat energy transfer in liquids and gases (i.e., the differences between conduction and convection).</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming
GRADE LEVEL EXPECTATION	1.1.26.	<p>Conduct simple investigations to demonstrate that heat energy is transferred from one material to another in predictable ways (from materials at higher temperatures to materials at lower temperatures), until both materials reach the same temperature.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming
GRADE LEVEL EXPECTATION	1.1.27.	<p>Explain how the addition or removal of heat energy can change an object's temperature or its physical state. Conduct simple investigations involving changes of physical state and temperature. Relate that there is no change in temperature when a substance is changing state.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming
GRADE LEVEL EXPECTATION	1.1.28.	<p>Explain that energy transformation and energy transfer are different processes and that energy transformations can take place during an energy transfer. Give examples of energy transformations that take place during an energy transfer. Give examples of energy transfers that do not include energy transformations. Give examples of energy transformations that take place without any energy transfer.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1:

		The Greenhouse Effect and Global Warming
GRADE LEVEL EXPECTATION	1.1.32.	<p>Use this selective absorption process to explain how objects obtain their color, how materials like sunscreen can serve to protect us from harmful electromagnetic waves and how selective absorption contributes to the Greenhouse Effect.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming • Teacher Resource CD: Air, Water, and Soils
GRADE LEVEL EXPECTATION	1.1.33.	<p>Trace what happens to the energy from the Sun when it reaches Earth and encounters various materials, such as, atmosphere, oceans, soil, rocks, plants, and animals. Recognize that these materials absorb, reflect and transmit the electromagnetic waves coming from the sun differently.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming • Teacher Resource CD: Air, Water, and Soils
GRADE LEVEL EXPECTATION	1.1.35.	<p>Use the properties of water and soil to explain how uneven heating of Earth's surface can occur. Conduct an investigation that shows how water and soil are heated unequally by sunlight.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming • Teacher Resource CD: Air, Water, and Soils
GRADE LEVEL EXPECTATION	1.1.36.	<p>Describe how this can be used to explain unequal heating of the Earth's surface, producing atmospheric movements that influence weather.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming • Teacher Resource CD: Air, Water, and Soils
GRADE LEVEL EXPECTATION	1.1.37.	<p>Use models to describe how the relative positions of the Sun, Moon, and Earth account for Moon phases, eclipses, and tides.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 3 Lab 10 Activity 3: Constructing a Predator-Prey Food Web • 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 • Teacher Resource CD: Ecosystems, Energy, and Biodiversity
GRADE LEVEL EXPECTATION	1.1.42.	<p>Observe, measure, and predict changes in weather using atmospheric properties (wind speed and direction, cloud cover and type, temperature, dew point, air pressure, and relative humidity). Describe how air pressure and temperature change with increasing altitude and/or latitude.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming • Teacher Resource CD: Air, Water, and Soils
GRADE LEVEL	1.1.44.	Investigate the rate at which different Earth materials absorb heat. Explain how

EXPECTATION		<p>these differences in heat absorption causes air pressure differences that result in convection currents (i.e., local land and sea breezes).</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming • Teacher Resource CD: Air, Water, and Soils
GRADE LEVEL EXPECTATION	1.1.45.	<p>Use a variety of models, charts, diagrams, or simple investigations to explain how the Sun's energy drives the cycling of water through the Earth's crust, oceans, and atmosphere.</p> <ul style="list-style-type: none"> • Teacher Resource CD: Air, Water, and Soils
GRADE LEVEL EXPECTATION	1.1.53.	<p>Conduct a natural selection simulation to demonstrate how physical adaptations (i.e., protective camouflage, long neck for food gathering, muscular legs for running, heavy beak for nut cracking, etc...) have selective advantages for an organism. Research and report on beneficial physical adaptations of a variety of organisms.</p> <ul style="list-style-type: none"> • 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
GRADE LEVEL EXPECTATION	1.1.55.	<p>Conduct simulations to investigate how organisms fulfill basic needs (i.e., food, shelter, air, space light/dark, and water) in a competitive environment. Relate how competition for resources can determine survival.</p> <ul style="list-style-type: none"> • 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 2 Lab 6 Activity 2: Observing Air Pollution Indicators - Lichens • 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 11 Activity 2: Determining the Carrying Capacity of a Population
GRADE LEVEL EXPECTATION	1.1.56.	<p>Examine an assortment of plants and animals and use simple classification keys, based on observable features, to sort and group the organisms.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey
GRADE LEVEL EXPECTATION	1.1.58.	<p>Survey the diversity of organisms in a local or model ecosystem. Recognizing that a population consists of all individuals of a species that occur together at a given place and time, describe how to estimate and then calculate the size of a large</p>

		<p>population of a variety of organisms. Chart the diversity of the organisms in the ecosystem.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill • 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 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 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 • Teacher Resource CD: Ecosystems, Energy, and Biodiversity • Teacher Resource CD: Environmental Issues
<p>GRADE LEVEL EXPECTATION</p>	<p>1.1.59.</p>	<p>Categorize populations of organisms according to the roles (producers, consumers, and decomposers) they play in an ecosystem.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill • Environmental Issues and Solutions: Unit 1 Lab 3 Activity 1: Biodegrading a Simulated Oil Spill

		<ul style="list-style-type: none"> • 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 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 9 Activity 1: Food Web Organization • Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids • Teacher Resource CD: Ecosystems, Energy, and Biodiversity • Teacher Resource CD: Environmental Issues
GRADE LEVEL EXPECTATION	1.1.60.	<p>Describe and explain how factors (i.e., space, food, water, disease) limit the number of organisms an ecosystem can support.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population • Teacher Resource CD: Ecosystems, Energy, and Biodiversity
GRADE LEVEL EXPECTATION	1.1.61.	<p>Construct a data table or line graph to show population changes of a selected species over time. Describe the population changes portrayed by the graph.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 2 Lab 6 Activity 2: Observing Air Pollution Indicators - Lichens • Environmental Issues and Solutions: Unit 2 Lab 8 Activity 3: Determining the LD50 of a Water Pollutant • Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population • Environmental Issues and Solutions: Unit 4 Lab 12 Activity 2: Biological Treatment of Pollution • Teacher Resource CD: Ecosystems, Energy, and Biodiversity • Teacher Resource CD: Environmental Issues
GRADE LEVEL EXPECTATION	1.1.62.	<p>Observe graphs or data tables showing both the population growth of a species and the consequences of resource depletion on the population. Analyze the data and explain the effect that may occur from exponential growth of a population (given finite resources).</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 2 Lab 6 Activity 2: Observing Air Pollution Indicators - Lichens • Environmental Issues and Solutions: Unit 2 Lab 8 Activity 3: Determining the LD50 of a Water Pollutant • Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population • Environmental Issues and Solutions: Unit 4 Lab 12 Activity 2: Biological Treatment of Pollution • Teacher Resource CD: Ecosystems, Energy, and Biodiversity • Teacher Resource CD: Environmental Issues
GRADE LEVEL EXPECTATION	1.1.66.	<p>Construct food webs and identify the relationships among producers, consumers,</p>

		<p>and decomposers.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill • 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 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 9 Activity 1: Food Web Organization • Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids • Teacher Resource CD: Ecosystems, Energy, and Biodiversity • Teacher Resource CD: Environmental Issues
GRADE LEVEL EXPECTATION	1.1.67.	<p>Design food webs and trace the flow of matter and energy (beginning with the Sun) through the food web.</p> <ul style="list-style-type: none"> • 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 9 Activity 1: Food Web Organization • Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids • Teacher Resource CD: Ecosystems, Energy, and Biodiversity
CONTENT STANDARD	DE.1.	Nature and Application of Science and Technology
PERFORMANCE INDICATOR / GLE	1.2.	Enduring Understanding: The development of technology and advancement in science influence and drive each other forward.
GRADE LEVEL EXPECTATION	1.2.5.	<p>Recognize that spin offs are products which have undergone a technology transfer process from research to public use. Research spin-offs from the space program that have affected our everyday lives (i.e., Velcro, smoke detectors, cordless tools).</p> <ul style="list-style-type: none"> • 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
GRADE LEVEL EXPECTATION	1.2.6.	<p>Discuss the origin and identify characteristics (i.e., air circulation pattern, wind speed, temperature and dew point, and air pressure) of storm systems including hurricanes, Nor'easters, tornadoes, thunderstorms, and mid-latitude cyclones. Explain how these weather events can transfer heat. Describe the environmental, economic, and human impact of these storms.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill
GRADE LEVEL EXPECTATION	1.2.8.	<p>Record and interpret daily weather measurements over an extended period of time using a variety of instruments (i.e., barometer, anemometer, sling psychrometer, rain gauge, and thermometer) in order to predict and to identify weather patterns.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming • 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 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
GRADE LEVEL EXPECTATION	1.2.10.	<p>Examine satellite imagery pictures and use these images to identify cloud patterns and storm systems.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill
GRADE LEVEL EXPECTATION	1.2.12.	<p>Research and analyze data on human population changes that have occurred in a specific Delaware ecosystem. Discuss reasons for changes in human population and explain how these changes have affected the biodiversity of local organisms and availability of natural resources in the given ecosystem (e.g., habitat loss, water quality, preservation/concentration efforts).</p> <ul style="list-style-type: none"> • 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

		<ul style="list-style-type: none"> • 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 • Teacher Resource CD: Environmental Issues • Virtual Laboratory: The Effect of Temperature on Dissolved Oxygen
CONTENT STANDARD	DE.2.	Materials and Their Properties
PERFORMANCE INDICATOR / GLE	2.1.	Enduring Understanding: The structures of materials determine their properties.
GRADE LEVEL EXPECTATION	2.1.1.	<p>Conduct simple investigations in which a variety of materials (sand, water, light colored materials, dark colored materials) are exposed to light and heat energy. Measure the change in temperature of the material and describe any changes that occur in terms of the physical properties of the material.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming • Teacher Resource CD: Air, Water, and Soils
CONTENT STANDARD	DE.3.	Energy and Its Effects
PERFORMANCE INDICATOR / GLE	3.1.	Enduring Understanding: Energy takes many forms. These forms can be grouped into types of energy that are associated with the motion of

		mass (kinetic energy) and types of energy associated with the position of mass and energy fields (potential energy).
GRADE LEVEL EXPECTATION	3.1.7.	Use the particle model to explain heat energy as the combined random kinetic energy of particles that make up an object and while the heat energy and temperature of an object are related, they are different quantities. <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming
GRADE LEVEL EXPECTATION	3.1.11.	Explain that heat energy and sound energy both make the particles of a substance move. Use models to explain how the particles respond differently to these types of energy. Use models to explain why sound travels much faster through substances than heat energy does. <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming
CONTENT STANDARD	DE.3.	Energy and Its Effects
PERFORMANCE INDICATOR / GLE	3.2.	Enduring Understanding: Changes take place because of the transfer of energy. Energy is transferred to matter through the action of forces. Different forces are responsible for the different forms of energy.
GRADE LEVEL EXPECTATION	3.2.2.	Explain that the transfer of energy from one object to another is caused by the exertion of a force. Create an energy chain to show how forces can change the mechanical energy of an object. Describe how the distance over which the forces act will influence the amount of energy transferred (and when appropriate, the amount of energy transformed). <ul style="list-style-type: none"> Teacher Resource CD: Environmental Issues
GRADE LEVEL EXPECTATION	3.2.9.	Use the particle model to describe the difference between heat energy transfer in solids and heat energy transfer in liquids and gases (i.e., the differences between conduction and convection). <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming
GRADE LEVEL EXPECTATION	3.2.10.	Use the particle model to explain why heat energy is always transferred from materials at higher temperatures to materials at lower temperatures. Explain why heat energy transfer ceases when the equilibrium temperature is reached. Explain that when this temperature is reached, the materials are in thermal equilibrium. <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming
GRADE LEVEL EXPECTATION	3.2.11.	Conduct simple investigations to demonstrate that heat energy is transferred from one material to another in predictable ways (from materials at higher temperatures to materials at lower temperatures), until both materials reach the same temperature. <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming
GRADE LEVEL EXPECTATION	3.2.12.	Explain how the addition or removal of heat energy can change an object's temperature or its physical state. Conduct simple investigations involving changes of physical state and temperature. Relate that there is no change in temperature when a substance is changing state.

		<ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming
CONTENT STANDARD	DE.3.	Energy and Its Effects
PERFORMANCE INDICATOR / GLE	3.3.	Enduring Understanding: Energy readily transforms from one form to another, but these transformations are not always reversible. The details of these transformations depend upon the initial form of the energy and the properties of the materials involved. Energy may transfer into or out of a system and it may change forms, but the total energy cannot change.
GRADE LEVEL EXPECTATION	3.3.3.	<p>Give examples of energy transfers that do not include energy transformations. Give examples of energy transformations that take place without any energy transfer.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming
GRADE LEVEL EXPECTATION	3.3.4.	<p>Use energy chains to trace the flow of energy through physical systems. Indicate the energy transfers and the energy transformations that are involved in the processes (e.g., the lighting of an electric lamp in a region serviced by a hydroelectric (or coal fueled) electric power plant, or the sediment that clouds a stream after a heavy rainfall).</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming Teacher Resource CD: Air, Water, and Soils
GRADE LEVEL EXPECTATION	3.3.7.	<p>Conduct investigations to show that materials can absorb some frequencies of electromagnetic waves, but reflect others or allow them to transmit through the material. Use this selective absorption process to explain how objects obtain their color, how materials like sunscreen can serve to protect us from harmful electromagnetic waves, and how selective absorption contributes to the Greenhouse Effect.</p> <ul style="list-style-type: none"> Teacher Resource CD: Air, Water, and Soils
GRADE LEVEL EXPECTATION	3.3.8.	<p>Trace what happens to the energy from the Sun when it reaches Earth and encounters various materials, such as, atmosphere, oceans, soil, rocks, plants, and animals. Recognize that these materials absorb, reflect and transmit the electromagnetic waves coming from the sun differently.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming Teacher Resource CD: Air, Water, and Soils
GRADE LEVEL EXPECTATION	3.3.10.	<p>Use the properties of water and soil to explain how uneven heating of Earth's surface can occur. Conduct an investigation that shows how water and soil are heated unequally by sunlight. Describe how this can be used to explain unequal heating of the Earth's surface, producing atmospheric movements that influence weather.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming Teacher Resource CD: Air, Water, and Soils
CONTENT STANDARD	DE.4.	Earth in Space

PERFORMANCE INDICATOR / GLE	4.1.	Enduring Understanding: Observable, predictable patterns of movement in the Sun, Earth, Moon system occur because of gravitational interaction and energy from the Sun.
GRADE LEVEL EXPECTATION	4.1.4.	Use models to describe how the relative positions of the Sun, Moon, and Earth account for Moon phases, eclipses, and tides. <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 3 Lab 10 Activity 3: Constructing a Predator-Prey Food Web • 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 • Teacher Resource CD: Ecosystems, Energy, and Biodiversity
CONTENT STANDARD	DE.5.	Earth's Dynamic Systems
PERFORMANCE INDICATOR / GLE	5.2.	Enduring Understanding: Earth's components form systems. These systems continually interact at different rates of time, affecting the Earth locally and globally.
GRADE LEVEL EXPECTATION	5.2.1.	Observe, measure, and predict changes in weather using atmospheric properties (wind speed and direction, cloud cover and type, temperature, dew point, air pressure, and relative humidity). Describe how air pressure and temperature change with increasing altitude and/or latitude. <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming • Teacher Resource CD: Air, Water, and Soils
GRADE LEVEL EXPECTATION	5.2.2.	Explain how uneven heating of Earth's components - water, land, air - produce local and global atmospheric and oceanic movement. Describe how these local and global patterns of movement influence weather and climate. <ul style="list-style-type: none"> • Teacher Resource CD: Air, Water, and Soils
GRADE LEVEL EXPECTATION	5.2.3.	Investigate the rate at which different Earth materials absorb heat. Explain how these differences in heat absorption causes air pressure differences that result in convection currents (i.e., local land and sea breezes). <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming • Teacher Resource CD: Air, Water, and Soils
GRADE LEVEL EXPECTATION	5.2.4.	Use a variety of models, charts, diagrams, or simple investigations to explain how the Sun's energy drives the cycling of water through the Earth's crust, oceans, and atmosphere. <ul style="list-style-type: none"> • Teacher Resource CD: Air, Water, and Soils
GRADE LEVEL EXPECTATION	5.2.6.	Differentiate between weather, which is the condition of the atmosphere at a given time, and climate, which is the weather averaged over a long period of time. <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming • Teacher Resource CD: Air, Water, and Soils

		<ul style="list-style-type: none"> Teacher Resource CD: Environmental Issues
GRADE LEVEL EXPECTATION	5.2.7.	<p>Discuss the origin and identify characteristics (i.e., air circulation pattern, wind speed, temperature and dew point, and air pressure) of storm systems including hurricanes, Nor'easters, tornadoes, thunderstorms, and mid-latitude cyclones. Explain how these weather events can transfer heat. Describe the environmental, economic, and human impact of these storms.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill
CONTENT STANDARD	DE.5.	Earth's Dynamic Systems
PERFORMANCE INDICATOR / GLE	5.3.	Enduring Understanding: Technology enables us to better understand Earth's systems. It also allows us to analyze the impact of human activities on Earth's systems and the impact of Earth's systems on human activity.
GRADE LEVEL EXPECTATION	5.3.1.	<p>Examine isobars on weather maps to describe how wind (moving air) travels from a region of high pressure to a region of low pressure. Apply this knowledge to explain the cause of wind.</p> <ul style="list-style-type: none"> Teacher Resource CD: Air, Water, and Soils
GRADE LEVEL EXPECTATION	5.3.2.	<p>Record and interpret daily weather measurements over an extended period of time using a variety of instruments (i.e., barometer, anemometer, sling psychrometer, rain gauge, and thermometer) in order to predict and to identify weather patterns.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming 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 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
GRADE LEVEL EXPECTATION	5.3.4.	<p>Examine satellite imagery pictures and use these images to identify cloud patterns and storm systems.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill
CONTENT STANDARD	DE.7.	Diversity and Continuity of Living Things
PERFORMANCE INDICATOR / GLE	7.2.	Enduring Understanding: The diversity and changing of life forms over many generations is the result of natural selection, in which organisms with adaptive traits survive, reproduce, and pass those traits to offspring.
GRADE LEVEL EXPECTATION	7.2.1.	<p>Recognize that species acquire many of their unique characteristics through biological adaptations, which involve the selection of naturally occurring variations in populations.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1:

		<p>Food Web Organization</p> <ul style="list-style-type: none"> • 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
GRADE LEVEL EXPECTATION	7.2.4.	<p>Conduct a natural selection simulation to demonstrate how physical adaptations (i.e., protective camouflage, long neck for food gathering, muscular legs for running, heavy beak for nut cracking, etc.) have selective advantages for an organism. Research and report on beneficial physical adaptations of a variety of organisms.</p> <ul style="list-style-type: none"> • 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
GRADE LEVEL EXPECTATION	7.2.6.	<p>Conduct simulations to investigate how organisms fulfill basic needs (i.e., food, shelter, air, space light/dark, and water) in a competitive environment. Relate how competition for resources can determine survival.</p> <ul style="list-style-type: none"> • 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 2 Lab 6 Activity 2: Observing Air Pollution Indicators - Lichens • 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 11 Activity 2: Determining the Carrying Capacity of a Population
GRADE LEVEL EXPECTATION	7.2.7.	<p>Examine an assortment of plants and animals and use simple classification keys, based on observable features, to sort and group the organisms.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey
CONTENT STANDARD	DE.8.	Ecology
PERFORMANCE INDICATOR / GLE	8.1.	Enduring Understanding: Organisms and their environments are interconnected. Changes in one part of the system will affect other parts of the system.
GRADE LEVEL	8.1.1.	Survey the diversity of organisms in a local or model ecosystem. Recognizing that

<p>EXPECTATION</p>		<p>a population consists of all individuals of a species that occur together at a given place and time, describe how to estimate and then calculate the size of a large population of a variety of organisms. Chart the diversity of the organisms in the ecosystem.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill • 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 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 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 • Teacher Resource CD: Ecosystems, Energy, and Biodiversity • Teacher Resource CD: Environmental Issues
<p>GRADE LEVEL EXPECTATION</p>	<p>8.1.2.</p>	<p>Categorize populations of organisms according to the roles (producers, consumers, and decomposers) they play in an ecosystem.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill

		<ul style="list-style-type: none"> • 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 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 9 Activity 1: Food Web Organization • Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids • Teacher Resource CD: Ecosystems, Energy, and Biodiversity • Teacher Resource CD: Environmental Issues
GRADE LEVEL EXPECTATION	8.1.3.	<p>Describe and explain how factors (i.e., space, food, water, disease) limit the number of organisms an ecosystem can support.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population • Teacher Resource CD: Ecosystems, Energy, and Biodiversity
GRADE LEVEL EXPECTATION	8.1.4.	<p>Construct a data table or line graph to show population changes of a selected species over time. Describe the population changes portrayed by the graph.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 2 Lab 6 Activity 2: Observing Air Pollution Indicators - Lichens • Environmental Issues and Solutions: Unit 2 Lab 8 Activity 3: Determining the LD50 of a Water Pollutant • Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population • Environmental Issues and Solutions: Unit 4 Lab 12 Activity 2: Biological Treatment of Pollution • Teacher Resource CD: Ecosystems, Energy, and Biodiversity • Teacher Resource CD: Environmental Issues
GRADE LEVEL EXPECTATION	8.1.5.	<p>Observe graphs or data tables showing both the population growth of a species and the consequences of resource depletion on the population. Analyze the data and explain the effect that may occur from exponential growth of a population (given finite resources).</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 2 Lab 6 Activity 2: Observing Air Pollution Indicators - Lichens • Environmental Issues and Solutions: Unit 2 Lab 8 Activity 3: Determining the LD50 of a Water Pollutant • Environmental Issues and Solutions: Unit 3 Lab 11 Activity 2: Determining the Carrying Capacity of a Population • Environmental Issues and Solutions: Unit 4 Lab 12 Activity 2: Biological Treatment of Pollution • Teacher Resource CD: Ecosystems, Energy, and Biodiversity • Teacher Resource CD: Environmental Issues

CONTENT STANDARD	DE.8.	Ecology
PERFORMANCE INDICATOR / GLE	8.2.	Enduring Understanding: Matter needed to sustain life is continually recycled among and between organisms and the environment. Energy from the sun flows irreversibly through ecosystems and is conserved as organisms use and transform it.
GRADE LEVEL EXPECTATION	8.2.1.	<p>Construct food webs and identify the relationships among producers, consumers, and decomposers.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill • 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 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 9 Activity 1: Food Web Organization • Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids • Teacher Resource CD: Ecosystems, Energy, and Biodiversity • Teacher Resource CD: Environmental Issues
GRADE LEVEL EXPECTATION	8.2.2.	<p>Design food webs and trace the flow of matter and energy (beginning with the Sun) through the food web.</p> <ul style="list-style-type: none"> • 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 9 Activity 1: Food Web Organization • Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids • Teacher Resource CD: Ecosystems, Energy, and Biodiversity
CONTENT STANDARD	DE.8.	Ecology
PERFORMANCE INDICATOR / GLE	8.3.	Enduring Understanding: Humans can alter the living and non-living factors within an ecosystem, thereby creating changes to the overall system.
GRADE LEVEL EXPECTATION	8.3.1.	<p>Research and analyze data on human population changes that have occurred in a specific Delaware ecosystem. Discuss reasons for changes in human population and explain how these changes have affected the biodiversity of local organisms and availability of natural resources in the given ecosystem (e.g., habitat loss, water quality, preservation/conservation efforts).</p> <ul style="list-style-type: none"> • 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
- Teacher Resource CD: Environmental Issues
- Virtual Laboratory: The Effect of Temperature on Dissolved Oxygen

Delaware Standards and Curricula
Science
Grade 9

CONTENT STANDARD	DE.1.	Nature and Application of Science and Technology
PERFORMANCE INDICATOR / GLE	1.1.	Enduring Understanding: Scientific inquiry involves asking scientifically-oriented questions, collecting evidence, forming explanations, connecting explanations to scientific knowledge and theory, and communicating and justifying the explanation.
GRADE LEVEL EXPECTATION	1.1.1.	<p>Identify and form questions that generate a specific testable hypothesis that guide the design and breadth of the scientific investigation.</p> <ul style="list-style-type: none"> • 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

		<ul style="list-style-type: none"> • 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
<p>GRADE LEVEL EXPECTATION</p>	<p>1.1.2.</p>	<p>Design and conduct valid scientific investigations to control all but the testable variable in order to test a specific hypothesis.</p> <ul style="list-style-type: none"> • 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

		<ul style="list-style-type: none"> • 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
<p>GRADE LEVEL EXPECTATION</p>	<p>1.1.3.</p>	<p>Collect accurate and precise data through the selection and use of tools and technologies appropriate to the investigations. Display and organize data through the use of tables, diagrams, graphs, and other organizers that allow analysis and comparison with known information and allow for replication of results.</p> <ul style="list-style-type: none"> • 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

		<ul style="list-style-type: none"> • 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
<p>GRADE LEVEL EXPECTATION</p>	<p>1.1.4.</p>	<p>Construct logical scientific explanations and present arguments which defend proposed explanations through the use of closely examined evidence.</p> <ul style="list-style-type: none"> • 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

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<p>GRADE LEVEL EXPECTATION</p>	<p>1.1.6.</p>	<p>Use mathematics, reading, writing and technology when conducting scientific inquiries.</p> <ul style="list-style-type: none"> • 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

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GRADE LEVEL EXPECTATION	1.1.8.	<p>Classify matter as mixtures (which are either homogeneous or heterogeneous) or pure substances (which are either compounds or elements.)</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant
GRADE LEVEL EXPECTATION	1.1.9.	<p>Classify various common materials as an element, compound or mixture.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant
GRADE LEVEL EXPECTATION	1.1.12.	<p>Investigate differences between the properties of various elements in order to predict the element's location on the Periodic Table.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming Teacher Resource CD: Air, Water, and Soils
GRADE LEVEL EXPECTATION	1.1.16.	<p>Conduct investigations to determine the effect of heat energy on the change of state (change of phase) of water. Sketch and interpret graphs representing the melting, freezing, evaporation and condensation of water. Recognize that molecular and ionic compounds are electrically neutral.</p> <ul style="list-style-type: none"> 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
GRADE LEVEL EXPECTATION	1.1.17.	<p>Use a model or a diagram to explain water's properties (e.g., density, polarity, hydrogen bonding, boiling point, cohesion, and adhesion) in the three states of matter. Cite specific examples of how water's properties are important (i.e., water as the 'universal').</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge

		<ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 2 Lab 7 Activity 2: Soil Porosity and Permeability • 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 4 Lab 12 Activity 1: Modeling a Water Treatment Plant
GRADE LEVEL EXPECTATION	1.1.18.	<p>Separate mixtures into their component parts according to their physical properties such as melting point, boiling point, magnetism, solubility and particle size.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant
GRADE LEVEL EXPECTATION	1.1.19.	<p>Explain how the properties of the components of the mixture determine the physical separation techniques used.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant
GRADE LEVEL EXPECTATION	1.1.22.	<p>Measure the pH of a solution using chemical indicators to determine the relative acidity or alkalinity of the solution. Identify the physical properties of acids and bases.</p> <ul style="list-style-type: none"> • 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 2: Water Analysis • 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 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
GRADE LEVEL EXPECTATION	1.1.37.	<p>Describe the role that forces play when energy is transferred between interacting objects and explain how the amount of energy transferred can be calculated from measurable quantities.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming
GRADE LEVEL EXPECTATION	1.1.42.	<p>Use energy chains to trace the flow of energy through physical systems. Indicate the source of the energy in each example and trace the energy until it leaves the system or adopts a form in the system that neither changes nor is transferred. Make qualitative estimates all the forms of the energy involved and reflect on the</p>

		<p>consequences of the energy transfers and transformations that take place.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming • Teacher Resource CD: Air, Water, and Soils
GRADE LEVEL EXPECTATION	1.1.43.	<p>For example, trace the flow of the radiant energy carried by sunlight that strikes the roof of a home. Reflect on how the color of the roof (light vs. dark) will have an impact on the ability to heat and cool the house and possibly the functional lifetime of the roofing materials themselves.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming • Teacher Resource CD: Air, Water, and Soils
GRADE LEVEL EXPECTATION	1.1.46.	<p>Use energy chains to trace the flow of energy in a selective absorption process (for example sunburn, Greenhouse Effect, microwave cooking).</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming • Teacher Resource CD: Air, Water, and Soils
GRADE LEVEL EXPECTATION	1.1.48.	<p>Research the factors that contribute to the energy efficiency of cars and trucks.</p> <ul style="list-style-type: none"> • Teacher Resource CD: Environmental Issues
GRADE LEVEL EXPECTATION	1.1.49.	<p>Examine the role that the power of the engine, and the weight and physical size and shape of the vehicle have on the fuel efficiency of the vehicle. Identify and report on the sources of the fuels currently used by vehicles and alternative fuels being developed.</p> <ul style="list-style-type: none"> • Teacher Resource CD: Environmental Issues
GRADE LEVEL EXPECTATION	1.1.52.	<p>Identify a few of the most common elements in the Earth's crust, oceans, and atmosphere and confirm their location on the periodic table (example: Si, O, C, N, H, Al). Compare the relative abundance of elements found in the Earth's crust, oceans, and atmosphere. Trace carbon as it cycles through the crust, ocean, and atmosphere.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming • Teacher Resource CD: Ecosystems, Energy, and Biodiversity
GRADE LEVEL EXPECTATION	1.1.63.	<p>Investigate how thermal convection relates to movement of materials. Apply this knowledge in explaining the cause of movement of the Earth's plates.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming • Teacher Resource CD: Air, Water, and Soils
CONTENT STANDARD	DE.2.	Materials and Their Properties
PERFORMANCE INDICATOR / GLE	2.1.	Enduring Understanding: The structures of materials determine their properties.
GRADE LEVEL EXPECTATION	2.1.3.	Classify matter as mixtures (which are either homogeneous or heterogeneous) or

		<p>pure substances (which are either compounds or elements.)</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant
GRADE LEVEL EXPECTATION	2.1.5.	<p>Classify various common materials as an element, compound or mixture.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant
GRADE LEVEL EXPECTATION	2.1.9.	<p>Investigate differences between the properties of various elements in order to predict the element's location on the Periodic Table.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming Teacher Resource CD: Air, Water, and Soils
GRADE LEVEL EXPECTATION	2.1.15.	<p>Recognize that physical changes alter some physical properties of a substance but do not alter the chemical composition of the substance.</p> <ul style="list-style-type: none"> 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
GRADE LEVEL EXPECTATION	2.1.16.	<p>Conduct investigations to determine the effect of heat energy on the change of state (change of phase) of water. Sketch and interpret graphs representing the melting, freezing, evaporation and condensation of water.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge
GRADE LEVEL EXPECTATION	2.1.19.	<p>Use a model or a diagram to explain water's properties (e.g., density, polarity, hydrogen bonding, boiling point, cohesion, and adhesion) in the three states of matter. Cite specific examples of how water's properties are important (i.e., water as the 'universal').</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge Environmental Issues and Solutions: Unit 2 Lab 7 Activity 2: Soil Porosity and Permeability 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 4 Lab 12 Activity 1: Modeling a Water Treatment Plant

CONTENT STANDARD	DE.2.	Materials and Their Properties
PERFORMANCE INDICATOR / GLE	2.2.	Enduring Understanding: The properties of the mixture are based on the properties of its components.
GRADE LEVEL EXPECTATION	2.2.1.	Recognize that mixtures can be separated by physical means into pure substances. <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant
GRADE LEVEL EXPECTATION	2.2.2.	Explain the effect of water's polarity on the solubility of substances (e.g., alcohol, salt, oil). <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge
GRADE LEVEL EXPECTATION	2.2.3.	Separate mixtures into their component parts according to their physical properties such as melting point, boiling point, magnetism, solubility and particle size. Explain how the properties of the components of the mixture determine the physical separation techniques used. <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 4 Lab 12 Activity 1: Modeling a Water Treatment Plant
GRADE LEVEL EXPECTATION	2.2.6.	Measure the pH of a solution using chemical indicators to determine the relative acidity or alkalinity of the solution. Identify the physical properties of acids and bases. <ul style="list-style-type: none"> 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 2: Water Analysis 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 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
CONTENT STANDARD	DE.2.	Materials and Their Properties
PERFORMANCE INDICATOR / GLE	2.4.	Enduring Understanding: There are several ways in which elements and/or compounds react to form new substances and each reaction involves energy.
GRADE LEVEL EXPECTATION	2.4.1.	Recognize that chemical changes alter the chemical composition of a substance forming one or more new substances. The new substance may be a solid, liquid, or gas. <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 2 Lab 8 Activity 2: Water Analysis
CONTENT STANDARD	DE.3.	Energy and Its Effects
PERFORMANCE INDICATOR / GLE	3.1.	Enduring Understanding: Energy takes many forms. These forms can be grouped into types of energy that are associated with the motion of mass

		(kinetic energy) and types of energy associated with the position of mass and energy fields (potential energy).
GRADE LEVEL EXPECTATION	3.1.7.	<p>Explain that heat energy represents the total random kinetic energy of molecules of a substance.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming
CONTENT STANDARD	DE.3.	Energy and Its Effects
PERFORMANCE INDICATOR / GLE	3.2.	Enduring Understanding: Changes take place because of the transfer of energy. Energy is transferred to matter through the action of forces. Different forces are responsible for the different forms of energy.
GRADE LEVEL EXPECTATION	3.2.11.	<p>Describe the role that forces play when energy is transferred between interacting objects and explain how the amount of energy transferred can be calculated from measurable quantities.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming
CONTENT STANDARD	DE.3.	Energy and Its Effects
PERFORMANCE INDICATOR / GLE	3.3.	Enduring Understanding: Energy readily transforms from one form to another, but these transformations are not always reversible. The details of these transformations depend upon the initial form of the energy and the properties of the materials involved. Energy may transfer into or out of a system and it may change forms, but the total energy cannot change.
GRADE LEVEL EXPECTATION	3.3.2.	<p>Give examples that illustrate the transfer of energy from one object (or substance) to another, and examples of energy being transformed from one to another.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming
GRADE LEVEL EXPECTATION	3.3.3.	<p>Use energy chains to trace the flow of energy through physical systems. Indicate the source of the energy in each example, and trace the energy until it leaves the system or adopts a form in the system that neither changes nor is transferred. Make qualitative estimates of all the forms of the energy involved and reflect on the consequences of the energy transfers and transformations that take place. For example, trace the flow of the radiant energy carried by sunlight that strikes the roof of a home. Reflect on how the color of the roof (light vs. dark) will have an impact on the ability to heat and cool the house, and possibly the functional lifetime of the roofing materials themselves.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming Teacher Resource CD: Air, Water, and Soils
GRADE LEVEL EXPECTATION	3.3.7.	<p>Use energy chains to trace the flow of energy in a selective absorption process (e.g., sunburn, Greenhouse Effect, microwave cooking).</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming Teacher Resource CD: Air, Water, and Soils
CONTENT STANDARD	DE.3.	Energy and Its Effects

PERFORMANCE INDICATOR / GLE	3.4.	Enduring Understanding: People utilize a variety of resources to meet the basic and specific needs of life. Some of these resources cannot be replaced. Other resources can be replenished or exist in such vast quantities they are in no danger of becoming depleted. Often the energy stored in resources must be transformed into more useful forms and transported over great distances before it can be helpful to us.
GRADE LEVEL EXPECTATION	3.4.1	<p>Research the factors that contribute to the energy efficiency of cars and trucks. Examine the role that the power of the engine and the weight and physical size and shape of the vehicle have on the fuel efficiency of the vehicle. Identify and report on the sources of the fuels currently used by vehicles and alternative fuels being developed.</p> <ul style="list-style-type: none"> • 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 • Teacher Resource CD: Environmental Issues
CONTENT STANDARD	DE.5.	Earth's Dynamic Systems
PERFORMANCE INDICATOR / GLE	5.1.	Enduring Understanding: Earth's systems can be broken down into individual components which have observable measurable properties.
GRADE LEVEL EXPECTATION	5.1.2.	<p>Identify a few of the most common elements in the Earth's crust, oceans, and atmosphere and confirm their location on the periodic table. (Example: Si, O, C, N, H, Al). Compare the relative abundance of elements found in the Earth's crust, oceans, and atmosphere. Trace carbon as it cycles through the crust, ocean, and atmosphere.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming • Teacher Resource CD: Ecosystems, Energy, and Biodiversity
CONTENT STANDARD	DE.5.	Earth's Dynamic Systems
PERFORMANCE INDICATOR / GLE	5.2.	Enduring Understanding: Earth's components form systems. These systems continually interact at different rates of time, affecting the Earth locally and globally.
GRADE LEVEL EXPECTATION	5.2.7.	<p>Investigate how thermal convection relates to movement of materials. Apply this knowledge in explaining the cause of movement of the Earth's plates.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 4 Activity 1: The Greenhouse Effect and Global Warming • Teacher Resource CD: Air, Water, and Soils

Delaware Standards and Curricula
Science
Grade 10

CONTENT STANDARD	DE.1.	Nature and Application of Science and Technology
PERFORMANCE INDICATOR / GLE	1.1.	Enduring Understanding: Scientific inquiry involves asking scientifically-oriented questions, collecting evidence, forming explanations, connecting explanations to scientific knowledge and theory, and communicating and justifying the explanation.
GRADE LEVEL EXPECTATION	1.1.1.	Identify and form questions that generate a specific testable hypothesis that guide the design and breadth of the scientific investigation.

- 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
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- Environmental Issues and Solutions: Unit 2 Lab 7 Activity 1: Soil Analysis
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- Environmental Issues and Solutions: Unit 3 Lab 11 Activity 1: Calculating a Biodiversity Index for Leaf Litter Ecosystems
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- 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

<p>GRADE LEVEL EXPECTATION</p>	<p>1.1.2.</p>	<p>Design and conduct valid scientific investigations to control all but the testable variable in order to test a specific hypothesis.</p> <ul style="list-style-type: none"> • 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
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		<ul style="list-style-type: none"> Virtual Laboratory: The Effect of Temperature on Dissolved Oxygen
GRADE LEVEL EXPECTATION	1.1.3.	<p>Collect accurate and precise data through the selection and use of tools and technologies appropriate to the investigations. Display and organize data through the use of tables, diagrams, graphs, and other organizers that allow analysis and comparison with known information and allow for replication of results.</p> <ul style="list-style-type: none"> 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

		<p>1: Modeling a Water Treatment Plant</p> <ul style="list-style-type: none"> • 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
<p>GRADE LEVEL EXPECTATION</p>	<p>1.1.4.</p>	<p>Construct logical scientific explanations and present arguments which defend proposed explanations through the use of closely examined evidence.</p> <ul style="list-style-type: none"> • 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

		<ul style="list-style-type: none"> • 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
<p>GRADE LEVEL EXPECTATION</p>	<p>1.1.6.</p>	<p>Use mathematics, reading, writing and technology when conducting scientific inquiries.</p> <ul style="list-style-type: none"> • 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

		<p>2: Determining the Carrying Capacity of a Population</p> <ul style="list-style-type: none"> • 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
GRADE LEVEL EXPECTATION	1.1.7.	<p>Use microscopes to identify similarities and differences among a variety of cells (e.g., muscle, nerve, epithelial, blood, adipose), and explain how structural variations relate to the function that each of the cells performs.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill • 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 3 Lab 11 Activity 1: Calculating a Biodiversity Index for Leaf Litter Ecosystems • Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem
GRADE LEVEL EXPECTATION	1.1.11.	<p>Construct cell models (e.g., phenolphthalein-agar cubes, potato-iodine cubes) to investigate the relationship among cell size, surface area to volume ratio and the rates of diffusion into and out of the cell. Explain why large organisms have developed from many cells rather than one large cell.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem
GRADE LEVEL EXPECTATION	1.1.14.	<p>Observe and recognize that unicellular organisms take in food from their environment and chemically digest it (if needed) within their cell body.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem
GRADE LEVEL EXPECTATION	1.1.16.	<p>Explain the processes used by autotrophs to transform light energy into chemical energy in the form of simple sugars. Give examples of how these compounds are used by living things as sources of matter and energy.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization • Teacher Resource CD: Air, Water, and Soils • Teacher Resource CD: Ecosystems, Energy, and Biodiversity
GRADE LEVEL EXPECTATION	1.1.18.	<p>Describe photosynthesis as an energy storing process and explain how environmental factors such as temperature, light intensity, and the amount of water available can affect photosynthesis.</p>

		<ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization Teacher Resource CD: Air, Water, and Soils Teacher Resource CD: Ecosystems, Energy, and Biodiversity
GRADE LEVEL EXPECTATION	1.1.19.	<p>Investigate and describe the complementary relationship (cycling of matter and the flow of energy) between photosynthesis and cellular respiration.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization Teacher Resource CD: Air, Water, and Soils Teacher Resource CD: Ecosystems, Energy, and Biodiversity
GRADE LEVEL EXPECTATION	1.1.20.	<p>Compare the amount of chemical potential energy stored in chemical bonds of a variety of foods (calorimetry). Recognize that equal amounts of different types of food contain different amounts of energy.</p> <ul style="list-style-type: none"> 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
GRADE LEVEL EXPECTATION	1.1.26.	<p>Describe the relationship between DNA, genes, chromosomes and proteins.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants
GRADE LEVEL EXPECTATION	1.1.28.	<p>Demonstrate that when DNA replicates, the complementary strands separate and the old strands serve as a template for the new complementary strands.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants
GRADE LEVEL EXPECTATION	1.1.29.	<p>Recognize that this results in two identical strands of DNA that are exact copies of the original.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants
GRADE LEVEL EXPECTATION	1.1.33.	<p>Describe how exposure to radiation, chemicals and pathogens can increase mutations. Predict the possible consequences of a somatic cell mutation.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants
CONTENT STANDARD	DE.5.	Earth's Dynamic Systems
PERFORMANCE INDICATOR / GLE	5.3.	Enduring Understanding: Technology enables us to better understand Earth's systems. It also allows us to analyze the impact of human activities on Earth's systems and the impact of Earth's systems on human activity.
GRADE LEVEL EXPECTATION	6.1.1.	Enduring Understanding: Living systems, from the organismic to the cellular level,

		<p>demonstrate the complementary nature of structure and function.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants • 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 2: Determining the Carrying Capacity of a Population • Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem
CONTENT STANDARD	DE.6.	Life Processes
PERFORMANCE INDICATOR / GLE	5.3.	Enduring Understanding: Technology enables us to better understand Earth's systems. It also allows us to analyze the impact of human activities on Earth's systems and the impact of Earth's systems on human activity.
GRADE LEVEL EXPECTATION	6.1.2.	<p>Use microscopes to identify similarities and differences among a variety of cells (e.g., muscle, nerve, epithelial, blood, adipose), and explain how structural variations relate to the function that each of the cells performs.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill • 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 3 Lab 11 Activity 1: Calculating a Biodiversity Index for Leaf Litter Ecosystems • Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem
GRADE LEVEL EXPECTATION	6.1.10.	<p>Construct cell models (e.g., phenolphthalein-agar cubes, potato-iodine cubes) to investigate the relationship among cell size, surface area to volume ratio and the rates of diffusion into and out of the cell. Explain why large organisms have developed from many cells rather than one large cell.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem
GRADE LEVEL EXPECTATION	6.1.12.	<p>Explain how the cells of a multi-cellular organisms work together for the benefit of the colonial or singular organism.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem
CONTENT STANDARD	DE.6.	Life Processes
PERFORMANCE	6.2.	Enduring Understanding: All organisms transfer matter and convert

INDICATOR / GLE		energy from one form to another. Both matter and energy are necessary to build and maintain structures within the organism.
GRADE LEVEL EXPECTATION	6.2.4.	<p>Observe and recognize that unicellular organisms take in food from their environment and chemically digest it (if needed) within their cell body.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 4 Lab 12 Activity 3: Evaluating the Health of an Ecosystem
GRADE LEVEL EXPECTATION	6.2.6.	<p>Explain the processes used by autotrophs to transform light energy into chemical energy in the form of simple sugars. Give examples of how these compounds are used by living things as sources of matter and energy.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization Teacher Resource CD: Air, Water, and Soils Teacher Resource CD: Ecosystems, Energy, and Biodiversity
GRADE LEVEL EXPECTATION	6.2.7.	<p>Describe the process by which water is removed from sugar molecules (dehydration synthesis) to form carbohydrates and is added to break them down (hydrolysis).</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants
GRADE LEVEL EXPECTATION	6.2.8.	<p>Describe photosynthesis as an energy storing process and explain how environmental factors such as temperature, light intensity, and the amount of water available can affect photosynthesis.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization Teacher Resource CD: Air, Water, and Soils Teacher Resource CD: Ecosystems, Energy, and Biodiversity
GRADE LEVEL EXPECTATION	6.2.9.	<p>Identify the reactants and the products in equations that represent photosynthesis and cellular respiration. Explain how the equations demonstrate the Law of Conservation of Matter and Energy in terms of balanced equations.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization Teacher Resource CD: Air, Water, and Soils Teacher Resource CD: Ecosystems, Energy, and Biodiversity
GRADE LEVEL EXPECTATION	6.2.10.	<p>Investigate and describe the complementary relationship (cycling of matter and the flow of energy) between photosynthesis and cellular respiration.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization Teacher Resource CD: Air, Water, and Soils Teacher Resource CD: Ecosystems, Energy, and Biodiversity
GRADE LEVEL EXPECTATION	6.2.11.	<p>Recognize that during photosynthesis, plants use energy from the sun and elements from the atmosphere and the soil to make specific compounds. Recognize that these compounds are used by living things as sources of matter and energy.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1:

		<p>Food Web Organization</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 3 Lab 9 Activity 2: A Closer Look at Energy Pyramids • Teacher Resource CD: Air, Water, and Soils • Teacher Resource CD: Ecosystems, Energy, and Biodiversity
GRADE LEVEL EXPECTATION	6.2.12.	<p>Compare the amount of chemical potential energy stored in chemical bonds of a variety of foods (calorimetry). Recognize that equal amounts of different types of food contain different amounts of energy.</p> <ul style="list-style-type: none"> • 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
CONTENT STANDARD	DE.6.	Life Processes
PERFORMANCE INDICATOR / GLE	6.3.	Enduring Understanding: All organisms transfer matter and convert energy from one form to another. Both matter and energy are necessary to build and maintain structures within the organism (cont'd).
GRADE LEVEL EXPECTATION	6.3.1.	<p>Recognize that during cellular respiration, chemical bonds between food molecules are broken (hydrolysis), and energy is transferred to ADP to create ATP (the energy storage molecule that fuels cellular processes). Acknowledge that all organisms must break the high energy chemical bonds in food molecules during cellular respiration to obtain the energy needed for life processes.</p> <ul style="list-style-type: none"> • 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
GRADE LEVEL EXPECTATION	6.3.2.	<p>Recognize that in general, synthesis reactions (i.e. photosynthesis) require energy while decomposition reactions (i.e. cellular respiration) usually release energy.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 5 Activity 1: Modeling Salt Runoff Discharge • Environmental Issues and Solutions: Unit 3 Lab 9 Activity 1: Food Web Organization • Teacher Resource CD: Air, Water, and Soils • Teacher Resource CD: Ecosystems, Energy, and Biodiversity
CONTENT STANDARD	DE.6.	Life Processes
PERFORMANCE INDICATOR / GLE	6.5.	Enduring Understanding: The health of humans and other organisms is affected by their interactions with each other and their environment, and may be altered by human manipulation.
GRADE LEVEL EXPECTATION	6.5.2.	<p>Investigate how drugs can affect neurotransmission.</p> <ul style="list-style-type: none"> • 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
GRADE LEVEL EXPECTATION	6.5.3.	<p>Explain how antibiotics (e.g., penicillin, tetracycline) kill bacterial cells without harming human cells due to differences between prokaryotic and eukaryotic cell structure.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill • 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 4 Lab 12 Activity 2: Biological Treatment of Pollution • Teacher Resource CD: Environmental Issues
CONTENT STANDARD	DE.7.	Diversity and Continuity of Living Things
PERFORMANCE INDICATOR / GLE	7.1.	Enduring Understanding: Organisms reproduce, develop, have predictable life cycles, and pass on heritable traits to their offspring.
GRADE LEVEL EXPECTATION	7.1.1.	<p>Describe the relationship between DNA, genes, chromosomes and proteins.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants
GRADE LEVEL EXPECTATION	7.1.4.	<p>Demonstrate that when DNA replicates, the complementary strands separate and the old strands serve as a template for the new complementary strands. Recognize that this results in two identical strands of DNA that are exact copies of the original.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants
GRADE LEVEL EXPECTATION	7.1.9.	<p>Describe how exposure to radiation, chemicals and pathogens can increase mutations.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants
GRADE LEVEL EXPECTATION	7.1.10.	<p>Explain that mutations in the DNA sequence of a gene may or may not affect the expression of the gene. Recognize that mutations may be harmful, beneficial, or have no impact on the survival of the organism.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants
GRADE LEVEL EXPECTATION	7.1.11.	<p>Explain how the type of cell (gamete or somatic) in which a mutation occurs determines heritability of the mutation.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants

GRADE LEVEL EXPECTATION	7.1.12.	<p>Predict the possible consequences of a somatic cell mutation.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 2 Activity 1: Observing Radiation Effects on Plants
CONTENT STANDARD	DE.7.	Diversity and Continuity of Living Things
PERFORMANCE INDICATOR / GLE	7.2.	Enduring Understanding: The diversity and changing of life forms over many generations is the result of natural selection, in which organisms with advantageous traits survive, reproduce, and pass those traits to offspring.
GRADE LEVEL EXPECTATION	7.2.8.	<p>Relate a population's survival to the reproductive success of adapted individuals in that population.</p> <ul style="list-style-type: none"> Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill 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 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 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

		<p>3: Evaluating the Health of an Ecosystem</p> <ul style="list-style-type: none"> • Teacher Resource CD: Ecosystems, Energy, and Biodiversity • Teacher Resource CD: Environmental Issues
GRADE LEVEL EXPECTATION	7.2.11.	<p>Explain why homogeneous populations may be more vulnerable to environmental changes than heterogeneous populations.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill • 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 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 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 • Teacher Resource CD: Ecosystems, Energy, and Biodiversity • Teacher Resource CD: Environmental Issues
GRADE LEVEL EXPECTATION	7.2.12.	<p>Explain how evolutionary relationships between species are used to group</p>

		<p>organisms together.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 3 Lab 10 Activity 2: Identifying Owl Prey
<p>GRADE LEVEL EXPECTATION</p>	<p>7.2.13.</p>	<p>Explain how antibiotic resistance populations evolve from common bacterial populations.</p> <ul style="list-style-type: none"> • Environmental Issues and Solutions: Unit 1 Lab 1 Activity 1: Biodegradation in a Landfill • 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 4 Lab 12 Activity 2: Biological Treatment of Pollution • Teacher Resource CD: Environmental Issues

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