Grade 5 Science

Unit Title: Earth and Space Systems: September (MP 1)

Big Idea: Systems of matter and energy are present around Earth and across space. Interactions within and between these systems produce observable and predictable patterns—night and day, seasons, tides, weather and climate.

Investigation Questions	NGSS/ PA Core Standards	Objectives/ Lab Activities	Key Vocabulary	Reading Wonders Connection
LESSON 1: Earth's Place in Space What do we know about Earth and Space Systems? Can I describe planets in our Solar System? How do the sun, earth, and moon make a system?	**S5.A.1.1.2:** Explain how observations and/or experimental results are used to support inferences and claims about an investigation or relationship (e.g., make a claim based on information on a graph). **(Lessons 1-4)** **S6.A.1.1.2:** Use evidence to support inferences and claims about an investigation or relationship (e.g., common usage of simple machines). **(Lessons 1-4)** S5.A.1.1.3 Describe how explanations, predictions, and models are developed using evidence **(Lesson 1-4)**. **S6.A.1.1.3:** Predict the outcome of an experiment based on previously collected data. **(Lessons 1-4)** S5.A.2.1.2 Describe relationships between variables through interpretation of data and observations (i.e., make predictions for the outcome of a controlled experiment using data tables and graphs). **(Lessons 1-4)** **S5.A.3.1.1:** Make predictions based on patterns in natural systems (e.g., phases of the Moon, time [day, month, and year], weather, seasons). **(Lessons 1-4)** **S5.A.3.2.1:** Describe how models are used to better understand the relationships in natural systems (e.g., water cycle, Sun-Earth-Moon system, ecosystems, observe and draw a diagram to show the effects of flowing water in a watershed). **(Lessons 1-4)** **3.1.5.B6:** Developing and Using Models; Engaging in Argument From Evidence CCC: Cause and Effect; Scale, Proportion, and quantity; Systems and System Models **(Lesson 1 ONLY)** **S4.D.3.1.1:** Describe motions of the Sun - Earth - Moon system. **(Lesson 2-3)**	Begin building an age-appropriate understanding about Earth's roles in space systems. Compare the sizes of the planets in our solar system and the distances of those planets from the Sun and from each other. Explain how the pull of gravity impacts Earth's shape and path around the Sun. Construct an argument to support concepts related to gravity.	● Galaxy ● Gravity ● Model ● Planet ● Revolution ● Scale Model ● Solar System ● Star ● Sun ● System ● Universe	● Unit 3: Week 3; Finding patterns in nature. ● Unit 5: Week 4: How can scientific change over time? *When is a Planet not a Planet? "* New Moon"
LESSON 2: Stars What can I learn from the brightness of a star? Can patterns in the nighttime sky tell me more about Earth?		Use a model to investigate the apparent brightness of stars. Construct an argument to compare the apparent brightness of stars. Investigate patterns in the nighttime sky to describe	● Axis ● Constellation ● Daytime ● Nighttime ● Rotation ● Shadow	

Can patterns in the daytime tell me more about Earth?	**S4.D.3.1.2:** Explain how the motion of the Sun - Earth - Moon system relates to time (e.g., days, months, years) .**(Lessons 2-3)** **S5.D.3.1.1:** Describe the patterns of Earth's rotation and revolution in relation to the Sun and Moon (i.e., solar eclipse, phases of the Moon, and time). **(Lessons 2-3)** **S5.A.2.2.1:** Describe the appropriate use of instruments and scales to accurately measure time, mass, distance, volume, and temperature safely under a variety of conditions (e.g., use a thermometer to observe and compare the interaction of food coloring in water at different temperatures). **(Lessons 2 & 4)** **3.1.5.B6:** Developing and Using Models; Analyzing and Interpreting Data; Engaging in Argument From Evidence CCC: Patterns; Scale, Proportion, and Quantity **(Lessons 2 ONLY)** **S4.D.3.1.3:** Describe the causes of seasonal change as they relate to the revolution of Earth and the tilt of Earth's axis. **(Lesson 3 ONLY)** **S4.D.3.1.3:** Describe the causes of seasonal change as they relate to the revolution of Earth and the tilt of Earth's axis. **(Lesson 3 ONLY)** **3.3.5.B1:** Provide evidence that the earth revolves around (orbits) the sun in a year's time and that the earth rotates on its axis once approximately every 24 hours. **(Lesson 3 ONLY)** **S5.C.2.1.2:** Describe how heat energy is usually a byproduct of an energy transformation. **(Lesson 3 ONLY)** **S5.A.1.1.1, S6.A.1.1.1:** Explain how certain questions can be answered through scientific inquiry and/or technological design (e.g., investigate to find out if all clay or foil boats designs react the same when filled with paperclips). **(Lesson 3 ONLY)** **3.1.5.B6:** Developing and Using Models; Analyzing and Interpreting Data; Engaging in Argument From Evidence CCC: Patterns; Scale, Proportion, and Quantity **(Lesson 3 ONLY)**	patterns in the rotation and revolution of Earth. Describe the rotation and revolution of Earth by investigating patterns in the daytime and nighttime skies. Collect and analyze data to provide evidence for the Sun's apparent movement across the sky.		
LESSON 3: Sun, Earth, and Moon How do the Sun, Earth, and Moon interact? How does the Moon appear to change? How can the Moon affect patterns on Earth?		Construct models to demonstrate the connections in the Sun-Earth-Moon system. Model how Earth's revolution contributes to seasons. Graph and analyze data to provide evidence for seasonal changes in daylight. Construct a model of the phases of the Moon based on the movement of the Moon around Earth and the location of the Sun. Identify patterns, such as Moon phases and tides, to provide evidence for the interaction of the Earth-Moon system.	● Equator ● Hemisphere ● Moon ● Moon Phase ● Neap Tide ● Season ● Spring Tide ● Tide ● Waning ● Waxing	

LESSON 4: Earth's Systems How do Earth's systems interact? Can I model and graph the distribution of Earth's water?	**S4.D.1.2.3:** Recognize ways that humans benefit from the use of water resources (e.g., agriculture, energy, recreation). **(Lesson 4 ONLY)** **S4.D.1.3.1:** Describe types of freshwater and saltwater bodies (e.g., lakes, rivers, wetlands, oceans). **(Lesson 4 ONLY)** **S4.D.1.3.2:** Explain how water goes through phase changes (i.e., evaporation, condensation, freezing, and melting). **(Lesson 4 ONLY)** **S5.C.1.2.1:** Describe how water changes from one state to another. **(Lesson 4 ONLY)** **S4.C.1.1.1:** Use physical properties [e.g., mass, shape, size, volume, color, texture, magnetism, state (i.e., solid, liquid, and gas), conductivity (i.e., electrical and heat)] to describe matter. **(Lesson 4 ONLY)** **3.4.5.D3:** Determine if the human use of a product or system creates positive or negative results. **(Lesson 5 ONLY)** **3.1.5.B6:** Constructing Explanations and Designing Solutions; Obtaining, Evaluating, and Communicating Information CCC: Patterns; Cause and Effect; Scale, Proportion, and Quantity; Systems and System Models **(Lesson 5 ONLY)**	Identify Earth's major systems and the characteristics of each. Create a model to describe how Earth's systems interact. Use a model and create a graph to illustrate the distribution of water on Earth.	● Atmosphere ● Biosphere ● Condensation ● Evaporation ● Geosphere ● Glacier ● Groundwater ● Hydrosphere ● Infiltration ● Precipitation ● Runoff ● Water Cycle	
LESSON 5: Protecting Earth's Systems How can communities use science to protect Earth's resources and environments? What have we learned about Earth and Space Systems?		Describe how people affect Earth's systems and how people work to protect them. Discuss ways that communities use science ideas and knowledge to help protect Earth's resources and environments. Review unit content by developing questions to assess peers.	● Environment natural resource (All vocabulary from previous lessons)	

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Unit Title: Structure and Properties of Matter: December/February (MP 2 & 3)				
Big Idea: Matter makes up everything around us, but students may struggle to understand this given that they cannot see certain types of matter, like gases, and that they may not recognize when matter is a mixture or a solution.				
Investigation Questions	**NGSS/ PA Core Standards**	**Objectives/ Lab Activities**	**Key Vocabulary**	**Reading Wonders Connection**
LESSON 1: Matter All Around Us Why does Matter matter? Can you find an object's mass and calculate its volume? How can you prove that gases have mass and volume?	**S5.C.1.1.2:** Differentiate between volume and mass. **(Lesson 1 only)** **S5.A.2.2.1:** Describe the appropriate use of instruments and scales to accurately measure time, mass, distance, volume, and temperature safely under a variety of conditions (e.g., use a thermometer to observe and compare the interaction of food coloring in water at different temperatures). **(Lesson 1 only)** **3.1.5.B6:** Analyzing and Interpreting Data; Using Mathematics and Computational Thinking; Engaging in Argument From Evidence CCC: Cause and Effect; Scale, Proportion, and Quantity **(Lesson 1 only)** **3.2.4.A1:** Identify and classify objects based on their observable and measurable physical properties. Compare and contrast solids, liquids, and gases based on their properties. **(Lessons 1-3)** **S4.C.1.1.1:** Use physical properties [e.g., mass, shape, size, volume, color, texture, magnetism, state (i.e., solid, liquid, and gas), conductivity (i.e., electrical and heat)] to describe matter. **(Lessons 1-3)** **S4.C.1.1.2:** Categorize/group objects using physical characteristics. **(Lessons 1-3)** **S5.A.2.2.2:** Explain how technology extends and enhances human abilities for specific purposes (e.g., use hand lens to examine crystals in evaporating dishes; use graduated cylinders to measure the amount of water used in a controlled plant experiment). **(Lessons 1, 2, & 4)** **3.2.4.A2:** Demonstrate that materials are composed of parts that are too small to be seen without magnification. **(Lesson 2)**	Develop a working definition of the term "matter." Make observations to differentiate between solids, liquids, and gases. Construct an argument about the properties of each state of matter. Determine the best method for determining the mass and volume of objects. Analyze data to prove that matter takes up space and has mass.	● Gas ● Liquid ● Mass ● Matter ● Solid ● Volume	Unit 1: Week 4: Investigate a solution to determine how well it performs under likely conditions.
LESSON 2: Energy and States of Matter How do particles of matter behave? Are evaporation and condensation observable? Is matter conserved when it changes states?		Make observations to gather evidence that the movement of and attraction between particles change as energy is added to matter. Develop a model to explain the movement of particles in each state of matter. Identify phase changes as physical properties of matter,	● Boiling Point ● Condensation ● Density ● Evaporation ● Freezing Point ● Melting Point	

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	3.2.4.A3: Demonstrate the conservation of mass during physical changes such as melting or freezing. **(Lesson 2)** **3.2.5.A1:** Describe how water can be changed from one state to another by adding or taking away heat. **(Lesson 2)** **S5.C.1.2.1:** Describe how water changes from one state to another. **(Lesson 2)** **3.1.5.B6:** Developing and Using Models; Using Mathematics and Computational Thinking; Engaging in Argument From Evidence CCC: Cause and Effect; Scale, Proportion, and Quantity **(Lesson 2)**	specifically using evaporation and condensation. Use data to graph quantities and provide support for concepts related to matter conservation. Develop a scenario to describe matter conservation.		
LESSON 3: Physical Properties of Matter How can I use physical properties to identify objects? How do properties of liquids vary?	**S5.A.2.1.2:** Describe relationships between variables through interpretation of data and observations (i.e., make predictions for the outcome of a controlled experiment using data tables and graphs). **(Lessons 2, 3)** **S5.C.1.1.1:** Identify characteristic properties of matter that are independent of mass and volume. **(Lesson 3)** **3.1.5.B6:** Planning and Carrying Out Investigations; Analyzing and Interpreting Data; Engaging in Argument From Evidence CCC: Cause and Effect **(Lesson 3)** **S5.A.1.1.2:** Explain how observations and/or experimental results are used to support inferences and claims about an investigation or relationship (e.g., make a claim based on information on a graph). **(Lessons 3-5)** **S6.A.1.1.2:** Use evidence to support inferences and claims about an investigation or relationship (e.g., common usage of simple machines). **(Lesson 3-6)** **S5.A.1.1.3:** Describe how explanations, predictions, and models are developed using evidence. **(Lessons 3-6)** **3.1.5.B6:** Planning and Carrying Out Investigations; Analyzing and Interpreting Data; Using Mathematics and Computational Thinking CCC: Cause and Effect; Scale, Proportion, and Quantity **(Lesson 4)** **S5.A.1.1.1, S6.A.1.1.1:** Explain how certain questions can be answered through scientific inquiry and/or technological design (e.g., investigate to find out if all clay or foil boats designs react the same when filled with paperclips). **(Lessons 4, 6)**	Identify additional physical properties of matter, including buoyancy, hardness, magnetism, and viscosity. Plan an investigation for testing buoyancy, hardness, and magnetism, and use collected data to make connections between a material and its uses. Determine the density of a liquid by testing the rate at which it flows. Define “density” by making connections to the behavior of matter particles.	● Buoyancy ● Density ● Hardness ● Magnetism ● Physical Property ● Viscosity	

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LESSON 4: Making Mixtures and Solutions How can you separate a mixture of solids? What will results when two substances are mixed? Can a mixture be separated into its original materials?	**S5.A.3.2.1:** Describe how models are used to better understand the relationships in natural systems (e.g., water cycle, Sun-Earth- Moon system, ecosystems, observe and draw a diagram to show the effects of flowing water in a watershed). **(Lesson 4-6)** **3.2.4.A4:** Recognize that combining two or more substances may make new materials with different properties **(Lesson 5)** **S5.C.1.2.2:** Identify differences between chemical and physical changes of matter. **(Lesson 5)** **S5.A.3.1.1:** Make predictions based on patterns in natural systems (e.g., phases of the Moon, time [day, month, and year], weather, seasons). **(Lesson 5)** **3.1.5.B6:** Engaging in Argument From Evidence CCC: Cause and Effect; Scale, Proportion, and Quantity **(Lesson 5)** **S6.A.1.1.3:** Predict the outcome of an experiment based on previously collected data. **(Lessons 5, 6)** **3.4.5.C2:** Describe how design, as a dynamic process of steps, can be performed in different sequences and repeated. **(Lesson 6)** **3.4.5.D1:** Identify ways to improve a design solution. **(Lesson 6)** **3.1.5.B6:** Asking Questions and Defining problems; Developing and Using Models; Planning and Carrying Out Investigations CCC: Cause and Effect; Scale, Proportion, and Quantity **(Lesson 6)**	Use measurements to provide evidence that matter is conserved when it is mixed. Identify the connection between mixtures and solutions. Compare the behaviors of solids and liquids when they are mixed. Understand solubility as a property used to describe matter. Plan an investigation to separate mixtures based on their properties.	● Dissolve ● Filter ● Mesh ● Mixture ● Separate ● Sieve ● Solubility ● Solute ● Solution ● Solvent	
LESSON 5: Physical and Chemical Changes What evidence indicates a chemical change? How is evidence of chemical changes observable?		Distinguish between physical and chemical changes using evidence. Provide evidence that mixing substances results in physical or chemical changes. Observe chemical reactions to draw conclusions about identity changes. Demonstrate that the total mass of materials mixed together will not change regardless of chemical or physical changes.	● Chemical Change ● Constant ● Physical Change	

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LESSON 6: Separating Matter How is contaminated water cleaned? How does a filtration system remove contaminants from water? How can our water filtration system be optimized? What have we learned about Matter?		Identify methods to separate mixtures based on the properties of the matter in the mixture. Plan, build, test, and evaluate a model of a water purification system. Self-assess comprehension of unit content. Develop a quiz about the content from the unit.	● Filtration (All vocabulary from previous lessons)	Unit 4: Week 4: Investigate the qualities of a healthy ecosystem.

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Unit Title: Matter and Energy in Ecosystems: April / May (MP 4)				
Big Idea: Ecosystems on Earth contain diverse forms of life and have unique needs to sustain these life-forms. An ecosystem is composed habitats, each made up of biotic and abiotic factors.				
Investigation Questions	**NGSS/ PA Core Standards**	**Objectives/ Lab Activities**	**Key Vocabulary**	**Reading Wonders Connection**
LESSON 1: Biotic and Abiotic Factors What are biotic and abiotic factors? Why are plants important in an Ecosystem? What do plants need to grow?	**3.1.5.A2:** Describe how life on earth depends on energy from the sun. **(Lessons 1-3)** **3.1.6.A2:** Describe how energy derived from the sun is used by plants to produce sugars (photosynthesis)and is transferred within a food chain from producers (plants) to consumers to decomposers. **(Lessons 1-3)** **4.4.5.C.:** Investigate the factors influencing plant and animal growth. (e.g., soil, water, nutrients, and light) **(Lessons 1-3)** **S4.A.3.1.3:** Categorize the parts of an ecosystem as either living or nonliving and describe their roles in the system. **(Lessons 1-4)** **S4.B.1.1.1:** Identify life processes of living things (e.g., growth, digestion, respiration). **(Lesson 1 ONLY)** **S4.B.1.1.3:** Describe basic needs of plants and animals (e.g., air, water, food). **(Lessons 1-3)** **S4.C.1.1.2:** Categorize/group objects using physical characteristics. **(Lesson 1 ONLY)**	Differentiate between biotic and abiotic factors. Identify different habitats as part of an ecosystem. Develop a model of the plant life cycle. Explain the importance of the Sun in photosynthesis. Plan an investigation using a control and variables to determine what plants need to grow.	● Abiotic Factor ● Biotic Factor ● Control ● Ecosystem ● Energy ● Environment ● Germination ● Habitat ● Leaf ● Photosynthesis ● Pollination ● Region ● Reproduction ● Root ● Seed ● Seed Dispersal ● Stem ● Variable	Unit 6: Week 3: Adaptations. How are living things adapted to their environment?
LESSON 2: Independence of Biotic Factors How do animal depend on plants? What's in my owl pellet?	**S4.A.1.3.1:** Observe and record change by using time and measurement. **(Lesson 1 ONLY)** **S5.A.1.1.2:** Explain how observations and/or experimental results are used to support inferences and claims about an investigation or relationship (e.g., make a claim based on information on a graph). **(Lessons 1, 4, 5)** **S6.A.1.1.2:** Use evidence to support inferences and claims about an investigation or relationship (e.g., common usage of simple machines). **(Lessons 1, 4, 5)** **S5.A.1.1.3:** Describe how explanations, predictions, and models are developed using evidence. **(Lessons 1, 4, 5)** **S6.A.1.1.3:** Predict the outcome of an experiment based on previously collected data. **(Lessons 1 & 6)** **S5.A.2.1.1:** Design a simple, controlled experiment (fair test) identifying the independent and dependent variables, how the dependent variable will be measured and which variables will be held constant (e.g., relate the effect of variables [mass, release height, length of string] to number of swings of a pendulum, investigate the relationships	Define "interdependence" and provide examples of interdependence that are related to ecosystems. Develop a food chain model to demonstrate the flow of energy in a specific habitat. Use owl pellets to draw conclusions about an owl's diet. Construct a food pyramid to illustrate energy transfers from the Sun to a tertiary consumer.	● Consumer ● Dissect ● Food Chain ● Food Pyramid ● Interdependence ● Owl Pellet ● Primary Consumer ● Producer ● Secondary Consumer ● Tertiary Consumer	Unit 3: Week 2: Explain how the food for any kind of animal can be traced back to plants."Plants with a Purpose"

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LESSON 3: Energy Flow in an Ecosystem What can we conclude from Food Webs? How does competition affect an Ecosystem?	between variables in paper airplane designs). **(Lessons 1 & 6)** **S5.A.2.1.2:** Describe relationships between variables through interpretation of data and observations (i.e., make predictions for the outcome of a controlled experiment using data tables and graphs). **(Lessons 1-5)** **S4.A.2.1.3:** Observe a natural phenomenon (e.g., weather changes, length of daylight/night, movement of shadows, animal migrations, growth of plants), record observations, and then make a prediction based on those observations. **(Lessons 1-5)** **S5.A.3.1.1:** Make predictions based on patterns in natural systems (e.g., phases of the Moon, time [day, month, and year], weather, seasons). **(Lessons 1-5)** **3.1.5.B6:** Developing and Using Models; Engaging in Argument From Evidence CCC: Cause and Effect; Energy and Matter; System and System Models **(Lesson 1 ONLY)** **S4.A.3.1.2:** Explain a relationship between the living and nonliving components in a system (e.g., food web, terrarium). **(Lessons 2-4)** **S5.B.3.1.2:** Describe the relationships between organisms in different food webs. **(Lessons 2 & 3)** **S4.C.2.1.1:** Identify energy forms, energy transfer, and energy examples (e.g., light, heat, electrical). **(lessons 2 & 3)** **S4.C.2.1.2:** Describe the flow of energy through an object or system (e.g., feeling radiant heat from a light bulb, eating food to get energy, using a battery to light a bulb or run a fan). **(Lessons 2 & 3)** **S5.C.2.1.2:** Describe how heat energy is usually a byproduct of an energy transformation. **(Lessons 2 & 3)** **S5.A.2.2.1:** Describe the appropriate use of instruments and scales to accurately measure time, mass, distance, volume, and temperature safely under a variety of conditions (e.g., use a thermometer to observe and compare the interaction of food coloring in water at different temperatures). **(Lesson 2 ONLY)** **S5.A.2.2.2:** Explain how technology extends and enhances human abilities for specific purposes (e.g., use hand lens to examine crystals in evaporating dishes; use graduated cylinders to measure the amount of water used in a controlled plant experiment). **(Lesson 2 ONLY)** **3.1.5.B6:** Developing and Using Models; Analyzing and Interpreting Data; Engaging in Argument From Evidence	Construct food webs to explain the cycling of energy in an ecosystem. Identify how biotic factors use energy. Describe the effects of competition on the transfer of energy in an ecosystem. Make predictions about the effects of removing a biotic factor from a habitat.	● Bacteria ● Competition ● Decomposer ● Food Web ● Fungi ● Organic ● Predator ● Prey	Unit 2: Week 3: How do we investigate questions about nature? *Thomas Moran, Landscape Painter*
LESSON 4: Interactions on Earth What are the four spheres of Earth? Why is the Water Cycle important? What is an Ecocolumn?		Recognize the biotic and abiotic factors that make up the atmosphere, biosphere, geosphere, and hydrosphere . Make a claim about the interactions between the four spheres of Earth. Use the water cycle as a model to describe the interdependence of Earth's spheres. Construct an ecocolumn to model an ecosystem that contains terrestrial and aquatic habitats. Analyze and draw conclusions about the cycling of energy in an ecosystem that includes terrestrial and aquatic habitats.	● Atmosphere ● Biosphere ● Condensation ● Evaporation ● Geosphere ● Hydrosphere ● Precipitation ● Runoff ● Water Cycle	Unit 5: Week 3: Our Changing Earth. What changes in the environment affect living things?

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LESSON 5: Human Impact How do humans impact Ecosystems? How do humans disrupt natural cycles? Can we model the effects of human impact?	CCC: Patterns; Cause and Effect; Energy and Matter **(Lesson 2 ONLY)** **S4.A.1.3.4:** Explain what happens to a living organism when its food supply, access to water, shelter, or space is changed (e.g., it might die, migrate, change behavior, eat something else) **(Lessons 3, 5, 6)** **S5.B.3.1.1:** Describe the roles of producers, consumers, and decomposers within a local ecosystem. **(Lesson 3 ONLY)** **S5.C.2.1.1:** Describe how energy exists in many forms (e.g., electrical, mechanical, chemical, heat, light, sound) and can be transformed within a system. **(Lesson 3 ONLY)** **S4.D.1.1.3:** Describe the composition of soil as weathered rock and decomposed organic remains. **(Lesson 3 & 4)** **S5.A.3.2.1:** Describe how models are used to better understand the relationships in natural systems (e.g., water cycle, Sun-Earth- Moon system, ecosystems, observe and draw a diagram to show the effects of flowing water in a watershed). **(Lessons 3, 4, 6)** **3.1.5.B6:** Developing and Using Models; Analyzing and Interpreting Data; Constructing Explanations and Designing Solutions; Engaging in Argument From Evidence CCC: Patterns; Cause and Effect; Energy and Matter **(Lesson 3 ONLY)** **S4.A.3.1.1:** Categorize systems as either natural or human-made (e.g., ballpoint pens, simple electrical circuits, plant anatomy, water cycle). **(Lesson 4 ONLY)** **S4.C.1.1.1:** Use physical properties [e.g., mass, shape, size, volume, color, texture, magnetism, state (i.e., solid, liquid, and gas), conductivity (i.e., electrical and heat)] to describe matter. **(Lesson 4 ONLY)** **3.1.5.B6:** Developing and Using Models; Analyzing and Interpreting Data; Engaging in Argument From Evidence CCC: Cause and Effect; Energy and Matter; System and System Models **(Lesson 4 ONLY)** **S4.A.1.3.5:** Provide examples, predict, or describe how everyday human activities (e.g., solid waste production, food production and consumption, transportation, water consumption, energy production and use) may change the environment. **(Lesson 5 & 6)** **S5.B.2.1.4:** Identify changes in environmental conditions that can affect the survival of populations and entire species. **(Lesson 5 & 6)** **S5.A.1.1.1, S6.A.1.1.1:** Explain how certain questions can be answered through scientific inquiry and/or technological	Identify human needs and human actions used to meet those needs. Use readings to investigate human impact, and draw conclusions about the effect of human behaviors on the cycling of energy in an ecosystem. Analyze images for evidence of human impact. Make connections between human impact and the water cycle. Simulate water pollution by using ecocolumns to draw conclusions about the effects of pollution on an ecosystem.	● Agriculture ● Deforestation ● Fossil Fuel ● Pollution ● Technology	Unit 5: Week 5: Scientific Viewpoints. How do natural events and human activities affect the environment?
LESSON 6: Protecting the Ecosystem Can we develop solutions to decrease human impact? Can I communicate solutions for human impact?		Analyze patterns of human behavior to identify negative effects on the ecosystem. Develop and organize potential solutions to decrease harmful human impact. Present ideas to classmates and evaluate the effectiveness of solutions.	● All vocabulary from previous lessons	

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	design (e.g., investigate to find out if all clay or foil boats designs react the same when filled with paperclips). **(Lessons 5 & 6)** **3.4.5.C2:** Describe how design, as a dynamic process of steps, can be performed in different sequences and repeated. **(Lessons 5 & 6)** **3.4.5.D3:** Determine if the human use of a product or system creates positive or negative results. **(Lessons 5 & 6)** **3.1.5.B6:** Developing and Using Models; Analyzing and Interpreting Data; Engaging in Argument From Evidence CCC: Patterns; Cause and Effect; Energy and Matter; System and System Models **(Lesson 5 ONLY)** **3.1.5.B6:** Constructing Explanations and Designing Solutions; Obtaining, Evaluating, and Communicating Information CCC: Patterns; Cause and Effect; Energy and Matter **(Lesson 6 ONLY)**			