SCIENCE
Fifth Grade

Unit 1
Living Things and Ecosystems

Essential Question
This question guides the student experience throughout the unit and is open-ended and enduring.
How do living things interact within ecosystems, and how do those systems change over time due to nature and human impact?

Unit Summary
This summary provides high-level information about the main learning outcomes within this unit.
Students are introduced to the unit's anchoring phenomenon of large organisms. In this unit, students explore how certain trees, animals, and fungi grow to extremes. Students examine the ways organisms interact with their ecosystems, including the roles of producers, consumers, and decomposers. Students understand how matter and energy move in an ecosystem, what makes ecosystems healthy, how ecosystems change, and in what ways humans change ecosystems. Last, students act as a segment producer for a TV show's episode featuring big organisms and their ecosystems. Using their knowledge, can students determine what factors cause some organisms to grow really big?

Guiding Questions
At the end of this unit, students should be able to respond to these questions as they demonstrate understanding of key concepts, skills and relevance to their own lives.

Content

- What are the roles of producers, consumers, and decomposers in an ecosystem?
- How do matter and energy move through a food chain or food web?
- What characteristics make an ecosystem healthy or unhealthy?

Process

- How can you tell what role an organism plays in an ecosystem, like the Humongous Fungus?
- What tools or models can you use to show how energy flows in an ecosystem?

- How might you investigate the effects of environmental or human changes on an ecosystem?

Reflective

- What surprised you about the size and role of the Humongous Fungus in its ecosystem?
- Why do you think it's important to understand how ecosystems work and change?
- What would happen if one part of an ecosystem, like a decomposer, disappeared?

Power Standards

These state standards have been identified as critical to students' long-term learning progression in this discipline. They are assessed within the scope of this unit.

- 5-LS1-1 Support an argument that plants get the materials they need for growth chiefly from air and water.
- 5-LS2-1 Develop a model to describe the movement of matter among plants, animals, decomposers and the environment.
- 5-PS3-1 Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.
- 3-5-ETS1-1 Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials,time, or cost.
- 3-5-ETS1-2 Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

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Unit 2
Earth Systems

Essential Question
This question guides the student experience throughout the unit and is open-ended and enduring.
How do Earth's systems interact with one another, and how do natural events and human activities affect those systems over time?

Unit Summary
This summary provides high-level information about the main learning outcomes within this unit.
Students are introduced to the unit's anchoring phenomenon of California's droughts. In this unit, students explore Earth's four systems, including how Earth's systems produce weather and climate and how Earth's systems change its surface. Students will assess the anchoring phenomenon and write an article about how Earth's four systems interact during a drought. Students also investigate human interactions on the Earth's systems including how farming, industry, and everyday life affect Earth's systems. Students discover what people can do to protect Earth's systems and create a public service announcement about the water in their communities in the final performance assessment. Using the knowledge they gain on the interactions of Earth's system, can students explain what is causing the California drought?

Guiding Questions
At the end of this unit, students should be able to respond to these questions as they demonstrate understanding of key concepts, skills and relevance to their own lives.

Content

- What are the four Earth systems, and how do they interact with one another?
- How does weather and climate form through the interaction of Earth's systems?
- How do human activities like farming and industry impact Earth's systems?

Process

- How can you use evidence from Earth's systems to explain a natural event like a drought?

- What tools or models can help you understand how Earth's systems affect one another?
- What steps would you take to evaluate how everyday choices affect water availability?

Reflective

- What did you learn about the drought in California that changed how you think about water use?
- Why do you think it's important for people to understand how Earth's systems work together?
- What is one thing you or your community could do to help protect Earth's systems?

Power Standards

These state standards have been identified as critical to students' long-term learning progression in this discipline. They are assessed within the scope of this unit.

- 5-ESS2-1 Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.
- 5-ESS2-2 Describe and graph the amounts of saltwater and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.
- 5-ESS3-1 Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.
- 3-5-ETS1-1 Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

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Unit 3
Changes in Matter

Essential Question
This question guides the student experience throughout the unit and is open-ended and enduring.
How do the properties and interactions of materials help us understand and control how matter changes in everyday situations?

Unit Summary
This summary provides high-level information about the main learning outcomes within this unit.
Students are introduced to the unit's anchoring phenomenon of transforming gooey batter into fluffy pancakes. In this unit, students explore what matter is made of and why materials are different. Students identify substances, and examine what causes them to change, how those changes affect a substance's weight, and how scientists know when substances change. Students also find out how engineers improve materials. Last, students test pancake batter's properties to identify each ingredient. Using their knowledge on changes in matter, can students identify mystery ingredients by their properties to make improvements to pancake batter before it hits the griddle?

Guiding Questions
At the end of this unit, students should be able to respond to these questions as they demonstrate understanding of key concepts, skills and relevance to their own lives.

Content
- What is matter, and what are all materials made of?
- How can you tell when a substance has changed into something new?
- Why do different materials have different properties?

Process
- How can you use your senses and observations to identify ingredients in a mixture like pancake batter?
- What steps can you take to test if a chemical change occurred during cooking?
- How would you measure and compare the weight of substances before and after a change?

Reflective

- What surprised you about how pancake batter changes when it is cooked?
- Why is it useful to understand how materials change in cooking or other real-life situations?
- What would you change or improve in your pancake recipe to make it better, and why?

Power Standards

These state standards have been identified as critical to students' long-term learning progression in this discipline. They are assessed within the scope of this unit.

- 5-PS1-1 Develop a model to describe that matter is made of particles too small to be seen.
- 5-PS1-2 Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.
- 5-PS1-3 Make observations and measurements to identify materials based on their properties.
- 5-PS1-4 Conduct an investigation to determine whether the mixing of two or more substances results in new substances.
- 3-5-ETS1-1 Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials,time, or cost.
- 3-5-ETS1-3 Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

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Unit 4
Earth, the Moon, and the Stars

Essential Question
This question guides the student experience throughout the unit and is open-ended and enduring.
How do Earth's movements and the tools we use help us understand patterns we see in the sky, including the Sun, Moon, and stars?

Unit Summary
This summary provides high-level information about the main learning outcomes within this unit.
Students are introduced to the unit's anchoring phenomenon of life being different on a space station than it is on Earth. In this unit, students first investigate the effect of gravity. Next, students examine why distance plays a role in the brightness of the sun compared to other stars, and how Earth's rotation causes day and night. Students observe how shadows change during the day and year and how stars seem to move during the night and year, as well as how the moon seems to move and change shape. Last, students find out about what tools scientists use to observe space and how astronauts are trained for the ISS. What differences between life on a space station and life on Earth will students discover?

Guiding Questions
At the end of this unit, students should be able to respond to these questions as they demonstrate understanding of key concepts, skills and relevance to their own lives.

Content

- What causes day and night on Earth?
- Why does the Moon appear to change shape throughout the month?
- Why is the Sun brighter than other stars we see in the sky?

Process

- How can you observe and record changes in shadows throughout the day?
- What tools do scientists use to study space, and how do they help us learn more?
- How would you explain the difference between how stars appear to move from Earth versus the space station?

Reflective

- How did learning about Earth's rotation change the way you think about day and night?
- What do you wonder about space after learning how scientists observe it?
- What would you be most excited to observe if you were on the space station, and why?

Power Standards

These state standards have been identified as critical to students' long-term learning progression in this discipline. They are assessed within the scope of this unit.

- 5-ESS1-1 Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from Earth.
- 5-ESS1-2 Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.
- 5-PS2-1 Support an argument that the gravitational force exerted by Earth on objects is directed down.
- 3-5-ETS1-1 Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials,time, or cost.
- 3-5-ETS1-2 Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
- 3-5-ETS1-3 Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.