K-PS3-1 Energy

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ Developing and using models ❸ **Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions.** **• Make observations (firsthand or from media) to collect data that an be used to make comparisons.** ❹ Analyzing and interpreting data ❺ Using mathematics and computational thinking ⊙ Constructing explanations (for science) and designing solutions (for engineering) ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**Conservation of Energy and Energy Transfer:** • Sunlight warms Earth's surface.	**K-PS3-1** *Students who demonstrate understanding can:* **Make observations to determine the effect of sunlight on Earth's surface.** **Clarification Statement:** Examples of Earth's surface could include sand, soil, rocks, and water. Examples can extend beyond natural objects on Earth's surface to include man-made objects such as plastics, asphalt, or concrete. **Assessment Boundary:** Assessment of temperature is limited to relative measures such as warmer/ cooler.

Crosscutting Concepts: Cause and Effect
• Events have causes that generate observable patterns.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to PASS Coming Soon

Resources
- Thermometer
- Graphic Organizer
- National Geographic Exploring Science
  - The Sun Warms Earth
  - Investigate: Warmth from the Sun

Academic Vocabulary
Observation, cause/effect, warm, cold, cool, warmer, cooler

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.

K-PS3-2 Energy

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ Developing and using models ❸ Planning and carrying out investigations ❹ Analyzing and interpreting data ❺ Using mathematics and computational thinking ⊙ **Constructing explanations (for science) and designing solutions (for engineering)** **Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions.** • **Use tools and materials provided to design and build a device that solves a specific problem or a solution to a specific problem.** ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**Conservation of Energy and Energy Transfer:** • Sunlight warms Earth's surface.	**K-PS3-2** *Students who demonstrate understanding can:* **Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area.*** **Clarification Statement:** Examples of structures could include umbrellas, canopies, and tents that minimize the warming effect of the sun. **Assessment Boundary:** N/A

Crosscutting Concepts: Cause and Effect

• Events have causes that generate observable patterns.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to PASS Coming Soon

Resources

- National Geographic Exploring Science
  - The Sun Warms Earth
  - Investigate: Warmth from the Sun
  - Design a Structure

Academic Vocabulary

Design, structure, build, create, awning, reduce, protect

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.

K-PS2-1 Motion and Stability: Forces and Interactions

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ Developing and using models ❸ **Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions.** **• With guidance, plan and conduct an investigation in collaboration with peers.** ❹ Analyzing and interpreting data ❺ Using mathematics and computational thinking ⊙ Constructing explanations (for science) and designing solutions (for engineering) ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**Forces and Motion:** • Pushes and pulls can have different strengths and directions. • Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it. **Types of Interactions:** • When objects touch or collide, they push on one another and can change motion. **Relationship Between Energy and Forces:** • A bigger push or pull makes things speed up or slow down more quickly.	**K-PS2-1** *Students who demonstrate understanding can:* **Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.** **Clarification Statement:** Examples of pushes or pulls could include a string attached to an object being pulled, a person pushing an object, a person stopping a rolling ball, and two objects colliding and pushing on each other (e.g. ramps such as blocks or wooden moldings with cars and balls; paper towel threaded on rope or string across the classroom). **Assessment Boundary:** Assessment is limited to different relative strengths or different directions, but not both at the same time. Assessment does not include non-contact pushes or pulls such as those produced by magnets.

Crosscutting Concepts: Cause and Effect

• Simple tests can be designed to gather evidence to support or refute student ideas about causes.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to PASS Coming Soon

Resources

- Graphic organizer
- Motor lab
- National Geographic Exploring Science--

Academic Vocabulary

Push, pull, strength, direction, prediction, motion

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.

K-PS2-2 Motion and Stability: Forces and Interactions

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ Developing and using models ❸ Planning and carrying out investigations ❹ Analyzing and interpreting data **Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations.** • **Analyze data from tests of an object or tool to determine if it works as intended.** ❺ Using mathematics and computational thinking ⊙ Constructing explanations (for science) and designing solutions (for engineering) ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**Forces and Motion:** • Pushes and pulls can have different strengths and directions. • Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it. **Defining Engineering Problems:** (secondary to K-PS2-2) • A situation that people want to change or create can be approached as a problem to be solved through engineering. • Such problems may have many acceptable solutions.	**K-PS2-2** *Students who demonstrate understanding can:* **Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull.*** **Clarification Statement:** Examples of problems requiring a solution could include having a marble or other object move a certain distance, follow a particular path, and knock down other objects. Examples of solutions could include tools such as a ramp to increase the speed of the object and a structure that would cause an object such as a marble or ball to turn and using a rope or string to pull an object. **Assessment Boundary:** Assessment does not include friction as a mechanism for change in speed.

Crosscutting Concepts: Cause and Effect

• Simple tests can be designed to gather evidence to support or refute student ideas about causes.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to PASS Coming Soon

Resources

- **Graph**
- **Chart**
- **Science journal**
-

Academic Vocabulary

Measure, prediction, data, cause/effect, design, solution, motion, analyze, observe, interpret

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.

K-ESS2-1 Earth's Systems

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ Developing and using models ❸ Planning and carrying out investigations ❹ **Analyzing and interpreting data** **Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations.** • **Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions.** ❺ Using mathematics and computational thinking ⊙ Constructing explanations (for science) and designing solutions (for engineering) ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**Weather and Climate:** • Weather is the combination of sunlight, wind, snow or rain, and temperature in a particular region at a particular time. • People measure these conditions to describe and record the weather and to notice patterns overtime.	**K-ESS2-1** *Students who demonstrate understanding can:* **Use and share observations of local weather conditions to describe patterns over time.** **Clarification Statement:** Examples of qualitative observations could include descriptions of the weather (such as sunny, cloudy, rainy, and warm); examples of quantitative observations could include numbers of sunny, windy, and rainy days in a month. Examples of patterns could include that it is usually cooler in the morning than in the afternoon and the number of sunny days versus cloudy days in different months. **Assessment Boundary:** Assessment of quantitative observations limited to whole numbers and relative measures such as warmer/cooler.

Crosscutting Concepts: Patterns

- Patterns in the natural and human designed world can be observed and used as evidence.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to PASS Coming Soon

Resources

- Graphic Organizer
- National Geographic Exploring Science
  - The Weather
  - Sunny & Cloudy
  - Windy Weather
  - Wet Weather
  - Investigate: Weather
  - Weather Patterns
  - Investigate: Weather Patterns

Academic Vocabulary

Weather, temperature, sunny, cloudy, rain/rainy, warm, windy, snow/snowy, compare, contrast, thermometer, pattern, describe, description, hot, cold, cool, month

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.

K-ESS3-2 Earth and Human Activity

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ **Asking questions (for science) and defining problems (for engineering) Asking questions and defining problems in grades K–2 builds on prior experiences and progresses to simple descriptive questions that can be tested.** **• Ask questions based on observations to find more information about the designed world.** ❷ Developing and using models ❸ Planning and carrying out investigations ❹ Analyzing and interpreting data ❺ Using mathematics and computational thinking ⊙ Constructing explanations (for science) and designing solutions (for engineering) ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**Natural Hazards:** • Some kinds of severe weather are more likely than others in a given region. • Weather scientists forecast severe weather so that the communities can prepare for and respond to these events. **Defining and Delimiting an Engineering Problem:** • Asking questions, making observations, and gathering information are helpful in thinking about problems. ** Connections to Engineering, Technology, and Application of Science* **Interdependence of Science, Engineering, and Technology:** • People encounter questions about the natural world every day. **Influence of Engineering, Technology, and Science on Society and the Natural World:** • People depend on various technologies in their lives; human life would be very different without technology.	**K-ESS3-2** *Students who demonstrate understanding can:* **Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.*** **Clarification Statement:** Emphasis is on local forms of severe weather and safety precautions associated with that severe weather. **Assessment Boundary:** N/A

Crosscutting Concepts: Cause and Effect
- Events have causes that generate observable patterns.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to PASS Coming Soon

Resources
- National Geographic Exploring Science
  - Thunderstorms & Tornadoes
  - Hurricanes & Blizzards
  - Predicting Weather
  - Science Career: Weather Expert

Academic Vocabulary
Severe weather, forecast, tornado, twister, funnel cloud, storm, thunderstorm, siren, tornado drill, lightening, flood, hail, ice storm, blizzard, icy, procedures, prediction, safe place

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.

K-LS1-1 From Molecules to Organisms: Structure and Processes

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ Developing and using models ❸ Planning and carrying out investigations ❹ **Analyzing and interpreting data** **Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations.** • **Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions.** ❺ Using mathematics and computational thinking ⊙ Constructing explanations (for science) and designing solutions (for engineering) ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**Organization for Matter and Energy Flow in Organisms:** • All animals need food in order to live and grow. • Animals obtain their food from plants or from other animals. • Plants need water and light to live and grow.	**K-LS1-1** *Students who demonstrate understanding can:* **Use observations to describe patterns of what plants and animals (including humans) need to survive.** **Clarification Statement:** Examples of patterns could include that plants make their own food while animals do not; the different kinds of food needed by different types of animals; the requirement of plants to have light; and, that all living things need water. **Assessment Boundary:** Students are not expected to understand the mechanisms of photosynthesis.

Crosscutting Concepts: Patterns

• Patterns in the natural and human designed world can be observed and used as evidence.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics
Connection to PASS Coming Soon	

Resources

- Graphic Organizer
- Chart
- National Geographic Exploring Science—Life Science
  - Lesson 1: Living Things
  - Lesson 2: Plants are Living Things
  - Lesson 3: What Plants Need
  - Lesson 4: Animals are Living Things
  - Lesson 5: What Animals Need

Academic Vocabulary

Survive, observation

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.

K-ESS3-1 Earth and Human Activity

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ **Developing and using models Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, storyboard) that represent concrete events or design solutions.** **• Use a model to represent relationships in the natural world.** ❸ Planning and carrying out investigations ❹ Analyzing and interpreting data ❺ Using mathematics and computational thinking ⊙ Constructing explanations (for science) and designing solutions (for engineering) ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**Natural Resources:** • Living things need water, air, and resources from the land, and they live in places that have the things they need. • Humans use natural resources for everything they do.	**K-ESS3-1** *Students who demonstrate understanding can:* **Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live.** **Clarification Statement:** Examples of relationships could include that deer eat buds and leaves, therefore, they usually live in forested areas; and, grasses need sunlight so they often grow in meadows. Plants, animals, and their surroundings make up a system. **Assessment Boundary:** N/A

Crosscutting Concepts: Systems and System Models

• Systems in the natural and designed world have parts that work together.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to PASS Coming Soon

Resources

- Graphic Organizer
- Collaborate with grade that studies habitats
- National Geographic Exploring Science
  - Living Things
  - Plants are Living Things
  - What Plants Need
  - Animals are Living Things
  - What Animals Need

Academic Vocabulary

Resources, food, clothing, shelter, relationship, habitat

on 5th too

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.

K-ESS2-2 Earth's Systems

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ Developing and using models ❸ Planning and carrying out investigations ❹ Analyzing and interpreting data ❺ Using mathematics and computational thinking ⊙ Constructing explanations (for science) and designing solutions (for engineering) ❼ **Engaging in argument from evidence in K–2 builds on prior experiences and progresses to comparing ideas and representations about the natural and designed world(s).** **• Construct an argument with evidence to support a claim.** ❽ Obtaining, evaluating, and communicating information	**Biogeology:** • Plants and animals can change their environment. **Human Impacts on Earth Systems:** • Things that people do to live comfortably can affect the world around them.	**K-ESS2-2** *Students who demonstrate understanding can:* **Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.** **Clarification Statement:** Examples of plants and animals changing their environment could include a squirrel digs in the ground to hide its food and tree roots can break concrete, or a dandelion spreading seeds to generate more dandelions. **Assessment Boundary:** Arguments should be based on qualitative not quantitative evidence.

Crosscutting Concepts: Systems and System Models

• Systems in the natural and designed world have parts that work together.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to PASS Coming Soon

Resources

- OSU Extension Office

Academic Vocabulary

environment

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.