4-ESS1-1 Earth's Place in the Universe

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 3-5 builds on K-2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems.** • **Identify the evidence that supports particular points in an explanation.** ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**The History of Planet Earth:** • Local, regional, and global patterns of rock formations reveal changes over time due to earth forces, such as earthquakes. • The presence and location of certain fossil types indicate the order in which rock layers were formed.	**4-ESS1-1** *Students who demonstrate understanding can:* **Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.** **Clarification Statement:** Examples of evidence from patterns could include rock layers with marine shell fossils above rock layers with plant fossils and no shells, indicating a change from land to water over time; and, a canyon with different rock layers in the walls and a river in the bottom, indicating that over time a river cut through the rock. **Assessment Boundary:** Assessment does not include specific knowledge of the mechanism of rock formation or memorization of specific rock formations and layers. Assessment is limited to relative time.

Crosscutting Concepts: Patterns

- Patterns can be used as evidence to support an explanation.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

Resources

- Flocabulary
- Rock Cycle song
- Do you feel the Earth moving?
- Rocks just don't sit there
- Galileo mission to Jupiter
- Edible Science experiments
- Playdough/crayon conglomeration
- Imprinting
- OERB: fossils to fuels
- Star burst
- Pearson Interactive Science—Chapter 6. Lesson 4: How can Earth's Surface Change rapidly?, Lesson 2: How Rocks are Classified

Academic Vocabulary

Conglomerate, mineral, igneous rock, sedimentary rock, metamorphic rock, relative age, rock cycle, imprint, mold, cast, amber, mummies, petrified, tar pit, decay, evidence

4-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 Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used.** • **Analyze and interpret data to make sense of phenomena using logical reasoning.** 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	**Plate Tectonics and Large-Scale System Interactions:** • The locations of mountain ranges, deep ocean trenches, ocean floor structures, earthquakes, and volcanoes occur in patterns. • Most earthquakes and volcanoes occur in bands that are often along the boundaries between continents and oceans. • Major mountain chains form inside continents or near their edges. • Maps can help locate the different land and water features areas of Earth.	**4-ESS2-2** *Students who demonstrate understanding can:* **Analyze and interpret data from maps to describe patterns of Earth's features.** **Clarification Statement:** Maps can include topographic maps of Earth's land and ocean floor, as well as maps of the locations of mountains, continental boundaries, volcanoes, and earthquakes. **Assessment Boundary:** N/A

3-5

Crosscutting Concepts: Patterns

- Patterns can be used as evidence to support an explanation.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

Resources

- Maps
- Pearson Interactive Science—Chapter 6. Lesson 4: How can Earth's Surface Change Rapidly?

Academic Vocabulary

Plate tectonics, ocean trenches, structures, continents, mountain chain, topographic map, volcanoes, earthquakes, seismic waves, inner core, crust, mantle, primary waves, secondary waves, fault, Richter scale

4-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** **Planning and carrying out investigations to answer questions or test solutions to problems in 3–5 builds on K–2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions.** **• With guidance, plan and conduct an investigation 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	**Earth Materials and Systems:** • Rainfall helps to shape the land and affects the types of living things found in a region. Water, ice, wind, living organisms, and gravity break rocks, soils, and sediments into smaller particles and move them around.	**4-ESS2-1** *Students who demonstrate understanding can:* **Plan and conduct investigations on the effects of water, ice, wind, and vegetation on the relative rate of weathering and erosion.** **Clarification Statement:** Examples of variables to test could include angle of slope in the downhill movement of water, amount of vegetation, speed of wind, relative rate of deposition, cycles of freezing and thawing of water, cycles of heating and cooling, and volume of water flow. **Assessment Boundary:** Assessment is limited to a single form of weathering or erosion.

Crosscutting Concepts: Cause and Effect

• Cause and effect relationships are routinely identified, tested, and used to explain change.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

Resources

- Erosion investigation
- Pearson Interactive Science—Chapter 6. Lesson 5: Where is Earth's Water?, Lesson 6: What is the Water Cycle?

Academic Vocabulary

Erosion, vegetation, variables, volume, rock cycle, weathering, slope, deposition, sediments, soil, glacier, erratic

4-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 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** **Obtaining, evaluating, and communicating information in 3–5 builds on K–2 experiences and progresses to evaluate the merit and accuracy of ideas and methods.** • **Obtain and combine information from books and other reliable media to explain phenomena.**	**Natural Resources:** • Energy and fuels that humans use are derived from natural sources, and their use affects the environment in multiple ways. • Some resources are renewable over time, and others are not.	**4-ESS3-1** *Students who demonstrate understanding can:* **Obtain and combine information to describe that energy and fuels are derived from renewable and non-renewable resources and how their uses affect the environment.** **Clarification Statement:** Examples of renewable energy resources could include wind energy, water behind dams, and sunlight; non-renewable energy resources are fossil fuels and fissile materials. Examples of environmental effects could include loss of habitat due to dams, loss of habitat due to surface mining, and air pollution from burning of fossil fuels. **Assessment Boundary:** N/A

Crosscutting Concepts: Cause and Effect

• Cause and effect relationships are routinely identified and used to explain change.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

Resources

- OERB fossils to fuel
- Solar energy investigations
- Pearson Interactive Science—Chapter 5.
  - Lesson 1: What are Ecosystems?
  - Lesson 2: How do Living Things Affect Environments?
  - Lesson 3: What are Natural Resources?
  - Lesson 4: What are Fossils?
  - Lesson 5: What Can Fossils Tell Us?

Academic Vocabulary

Renewable, non-renewable, natural sources, fuel, wind energy, hydroelectric energy, water energy, solar energy, fossil fuels, fissile materials, habitat, surface mining, air pollution

4-ESS3-2 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 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 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems.** • **Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design solution.** ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**Natural Hazards:** • A variety of hazards result from natural processes (e.g., earthquakes, tsunamis, volcanic eruptions). • Humans cannot eliminate the hazards but can take steps to reduce their impacts. **Designing Solutions to Engineering Problems:** • Testing a solution involves investigating how well it performs under a range of likely conditions. (secondary to 4-ESS3-2) * *Connections to Engineering, Technology, and Application of Science* **Influence of Engineering, Technology, and Science on Society and the Natural World:** • Engineers improve existing technologies or develop new ones to increase their benefits, to decrease known risks, and to meet societal demands.	**4-ESS3-2** *Students who demonstrate understanding can:* **Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.*** **Clarification Statement:** Examples of solutions could include designing an earthquake resistant building and improving monitoring of volcanic activity. **Assessment Boundary:** Assessment is limited to earthquakes, floods, tsunamis, and volcanic eruptions.

3–5

Crosscutting Concepts: Cause and Effect
• Cause and effect relationships are routinely identified and used to explain change.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

Resources
- Pearson Interactive Science—Chapter 6
  - Lesson 1: How are Minerals Classified?
  - Lesson 2: How are Rocks Classified
  - Lesson 3: What are Weathering and Erosion?
  - Lesson 4: How can Earth's surface Change Rapidly?
  - Lesson 5: Where is Earth's Water?
  - Lesson 6: What is the Water Cycle?

Academic Vocabulary
Hazards, tsunamis

4-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 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 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems.** • **Use evidence (e.g., measurements, observations, patterns) to construct an explanation.** ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**Definitions of Energy:** • The faster a given object is moving, the more energy it possesses.	**4-PS3-1** *Students who demonstrate understanding can:* **Use evidence to construct an explanation relating the speed of an object to the energy of that object.** **Clarification Statement:** Energy can be moved from place to place by moving objects or through sound, light, or electric currents. At this grade level, no attempt is made to give a precise or complete definition of energy. **Assessment Boundary:** Assessment does not include quantitative measures of changes in the speed of an object or on any precise or quantitative definition of energy.

Crosscutting Concepts: Energy and Matter
• Energy can be transferred in various ways and between objects.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

Resources
- Pearson Interactive Science—Chapter 2
  - Lesson 1: What is Motion?

Academic Vocabulary
Vibration, speed, sound wave, force, friction, inertia, work, frequency, pitch, amplitude, wave length, spectrum, reflection, refraction, potential energy, kinetic energy, transferred

4-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 to answer questions or test solutions to problems in 3–5 builds on K– 2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions.** • **Make observations to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution.** 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	**Definitions of Energy:** • Energy can be moved from place to place by moving objects or through sound, light, or electric currents. **Conservation of Energy and Energy Transfer:** • Energy is present whenever there are moving objects, sound, light, or heat. • When objects collide, energy can be transferred from one object to another, thereby changing their motion. • In such collisions, some energy is typically also transferred to the surrounding air; as a result, the air gets heated and sound is produced. • Light also transfers energy from place to place. • Energy can also be transferred from place to place by electric currents, which can then be used locally to produce motion, sound, heat, or light. • The currents may have been produced to begin with by transforming the energy of motion into electrical energy.	**4-PS3-2** *Students who demonstrate understanding can:* **Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.** **Clarification Statement:** When energy is transferred it can stay in the same form, change forms, or both. Examples of this can include a moving arm throwing a baseball, the light from the sun warming a window-pane, and two moving objects colliding and changing their motion. **Assessment Boundary:** Assessment does not include quantitative measurements of energy.

3-5

Crosscutting Concepts: Energy and Matter

• Energy can be transferred in various ways and between objects.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

Resources

- OERB fossil to fuels
- Pearson Interactive Science—Chapter 1
  - Lesson 1: What are Forms of Energy?
  - Lesson 2: What is Sound Energy?
  - Lesson 3: What is Light Energy?
  - Lesson 4: What is Heat?

Academic Vocabulary

Heat, conduction, convection, radiation, sound, colliding, conservation of energy, mechanical energy, thermal energy, solar energy, chemical energy

4-PS3-3 Energy

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 3–5 builds on grades K–2 experiences and progresses to specifying qualitative relationships.** **• Ask questions that can be investigated and predict reasonable outcomes based on patterns such as cause and effect relationships.** 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	**Definitions of Energy:** • Energy can be moved from place to place by moving objects or through sound, light, or electric currents. **Conservation of Energy and Energy Transfer:** • Energy is present whenever there are moving objects, sound, light, or heat. • When objects collide, energy can be transferred from one object to another, thereby changing their motion. • In such collisions, some energy is typically also transferred to the surrounding air; as a result, the air gets heated and sound is produced. **Relationship Between Energy and Forces:** • When objects collide, the contact forces transfer energy so as to change the objects' motions.	**4-PS3-3** *Students who demonstrate understanding can:* **Ask questions and predict outcomes about the changes in energy that occur when objects collide.** **Clarification Statement:** Emphasis is on the change in the energy due to the change in speed, not on the forces, as objects interact. **Assessment Boundary:** Assessment does not include quantitative measurements of energy.

Crosscutting Concepts: Energy and Matter

• Energy can be transferred in various ways and between objects.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

Resources

- Pearson Interactive Science—Chapter 1
  - Lesson 1: What are Forms of Energy?
  - Lesson 2: What is Sound Energy?
  - Lesson 3: What is Light Energy?
  - Lesson 4: What is Heat?
- Pearson Interactive Science—Chapter2
  - Lesson 1: What is Motion?
  - Lesson 2: What is Speed?

Academic Vocabulary

4-PS3-4 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 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems.** **• Apply scientific ideas to solve design problems.** ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**Conservation of Energy and Energy Transfer:** • Energy can also be transferred from place to place by electric currents, which can then be used locally to produce motion, sound, heat, or light. The currents may have been produced to begin with by transforming the energy of motion into electrical energy. **Energy in Chemical Processes and Everyday Life:** • The expression "produce energy" typically refers to the conversion of stored energy into a desired form for practical use. **Defining Engineering Problems** (secondary to 4-PS3-4) • Possible solutions to a problem are limited by available materials and resources (constraints). • The success of a designed solution is determined by considering the desired features of a solution (criteria). • Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account. * *Connections to Engineering, Technology, and Application of Science* **Influence of Engineering, Technology, and Science on Society and the Natural World:** • Engineers improve existing technologies or develop new ones.	**4-PS3-4** *Students who demonstrate understanding can:* **Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.*** **Clarification Statement:** Examples of devices could include electric circuits that convert electrical energy into motion energy of a vehicle, light, or sound; and, a passive solar heater that converts light into heat, mousetrap cars, rubber band-powered vehicles. Examples of constraints could include the materials, cost, or time to design the device. **Assessment Boundary:** N/A

Crosscutting Concepts: Energy and Matter
• Energy can be transferred in various ways and between objects.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Resources
• Electric Popcorn Popper
• Wind chimes
• OERB fossils to fuel
• Newton's Cradle
• Pearson Interactive Science—Chapter 3
  ○ Lesson 1: How do Electric Charges Flow in a Current?
	Connection to *PASS* Coming Soon
	
	Resources, con't
	• Pearson Interactive Science—Chapter 3
	  ○ Lesson 2: How can Energy Change?
	
	Academic Vocabulary

4- PS4-1 Waves and Their Applications in Technologies for Information Transfer

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 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions.** • **Develop a model using an analogy, example, or abstract representation to describe a scientific principle.** 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	**Wave Properties:** • Waves, which are regular patterns of motion, can be made in water by disturbing the surface. • When waves move across the surface of deep water, the water goes up and down in place; there is no net motion in the direction of the wave except when the water meets a beach. • Waves of the same type can differ in amplitude (height of the wave) and wavelength (spacing between wave peaks).	**4-PS4-1** *Students who demonstrate understanding can:* **Develop a model of waves to describe patterns in terms of amplitude and wavelength and to show that waves can cause objects to move.** **Clarification Statement:** Examples of models could include diagrams, analogies, and physical models using wire to illustrate wavelength and amplitude of waves. Examples of wave patterns could include the vibrating patterns associated with sound; the vibrating patterns of seismic waves produced by earthquakes. **Assessment Boundary:** Assessment does not include interference effects, electromagnetic waves, non-periodic waves, or quantitative models of amplitude and wavelength.

Crosscutting Concepts: Patterns

• Similarities and differences in patterns can be used to sort and classify natural phenomena.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

Resources

- Pearson Interactive Science—Chapter 1
  - Lesson 2: What is Sound Energy?

Academic Vocabulary

Trough, amplitude, wave length, seismic waves, crest, breaker, tide

4-PS4-2 Waves and Their Applications in Technologies for Information Transfer

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 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions.** **• Develop a model to describe phenomena.** 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	**Electromagnetic Radiation:** • An object can be seen when light reflected from its surface enters the eyes.	**4-PS4-2** *Students who demonstrate understanding can:* Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen. **Clarification Statement:** N/A **Assessment Boundary:** Assessment does not include knowledge of specific colors reflected and seen, the cellular mechanisms of vision, or how the retina works.

3-5

Crosscutting Concepts: Cause and Effect
• Cause and effect relationships are routinely identified.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

Resources
- Pearson Interactive Science—Chapter 1
  - Lesson 3: What is Light Energy?

Academic Vocabulary
Electromagnetic radiation

4-PS4-3 Waves and Their Applications in Technologies for Information Transfer

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 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems.** • **Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design solution.** ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**Information Technologies and Instrumentation:** • Digitized information can be transmitted over long distances without significant degradation. • High-tech devices, such as computers or cell phones, can receive and decode information—convert it from digitized form to voice—and vice versa. **Optimizing The Design Solution** (secondary to 4-PS4-3) • Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints.	**4-PS4-3** *Students who demonstrate understanding can:* **Generate and compare multiple solutions that use patterns to transfer information.*** **Clarification Statement:** Examples of solutions could include drums sending coded information through sound waves, using a grid of 1's and 0's representing black and white to send information about a picture, QR codes, barcodes, and using Morse code to send text. **Assessment Boundary:** N/A

Crosscutting Concepts: Patterns

• Similarities and differences in patterns can be used to sort and classify designed products.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

Resources

- Pearson Interactive Science—Part 2
  - Lesson 1: What is Technology?

Academic Vocabulary

Digitized information, decode

4-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 ❺ Using mathematics and computational thinking ⊙ Constructing explanations (for science) and designing solutions (for engineering) ❼ **Engaging in argument from evidence** **Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s).** **• Construct an argument with evidence, data, and/or a model.** ❽ Obtaining, evaluating, and communicating information	**Structure and Function:** • Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction.	**4-LS1-1** *Students who demonstrate understanding can:* **Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.** **Clarification Statement:** Examples of structures could include thorns, stems, roots, colored petals, heart, stomach, lung, brain, and skin. **Assessment Boundary:** Assessment is limited to macroscopic structures within plant and animal systems.

Crosscutting Concepts: Systems and System Models

• A system can be described in terms of its components and their interactions.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

Resources

- Pearson Interactive Science—Chapter 4
  - Lesson 1: How are Plants & Animals classified?
  - Lesson 2: How do Plants reproduce?
  - Lesson 3: How do Plants make Food?
  - Lesson 4: What are adaptations?
  - Lesson 5: What Plant and Animal Characteristics are inherited?
  - Lesson 6: How do Animals respond to the Environment?

Academic Vocabulary

Internal, external, camouflage

4-LS1-2 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 Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions.** • **Use a model to test interactions concerning the functioning of a natural system.** 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	**Information Processing:** • Different sense receptors are specialized for particular kinds of information, which may be then processed by the animal's brain. • Animals are able to use their perceptions and memories to guide their actions.	**4-LS1-2** *Students who demonstrate understanding can:* Use a model to describe that animals' receive different types of information through their senses, process the information in their brain, and respond to the information in different ways. **Clarification Statement:** Emphasis is on systems of information transfer. Examples of response to stimuli include animals running from predators and plant leaves turning toward the sun. **Assessment Boundary:** Assessment does not include the mechanisms by which the brain stores and recalls information or the mechanisms of how sensory receptors function.

Crosscutting Concepts: Systems and System Models

• A system can be described in terms of its components and their interactions.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

Resources

- Five senses
- Pearson Interactive Science—Chapter 4
  - Lesson 6: How do Animals respond to the Environment?

Academic Vocabulary

Perceptions, sense receptors