Performance Expectation *and Louisiana Connectors*
1-PS4-1 Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate. ***LC-1-PS4-1a Through collaborative investigations, recognize that sounds can cause materials to vibrate.*** ***LC-1-PS4-1b Through collaborative investigations, recognize that vibrating materials can make sound.*** ***LC-1-PS4-1c Use evidence to describe that vibrating materials can make sound.*** ***LC-1-PS4-1d Use evidence to describe that sound can make matter vibrate.***

Science and Engineering Practice	Disciplinary Core Idea	Crosscutting Concept
Planning and carrying out investigations: Planning and carrying out investigations to answer questions (science) or test solutions (engineering) 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. • Plan and conduct investigations collaboratively to produce data to serve as the basis for evidence to answer a question. ***Plan investigations collaboratively to produce data to answer a question.*** ***Conduct investigations collaboratively to produce data to answer a question.***	**WAVE PROPERTIES** Sound can make matter vibrate, and vibrating matter can make sound. (LE.PS4A.a) ***Sound can make materials vibrate.*** ***When materials vibrate, they can make a sound.***	**CAUSE AND EFFECT** Simple tests can be designed to gather evidence to support or refute student ideas about causes. ***Simple tests can be designed to gather evidence about cause and effect relationships.*** ***Evidence from simple tests can support ideas about causes.*** ***Evidence from simple tests can refute ideas about causes.***

Clarification Statement
Examples of vibrating materials that make sound could include tuning forks or plucking a stretched string. Examples of how sound can make matter vibrate could include holding a piece of paper near a speaker making sound or holding an object near a vibrating tuning fork.

Performance Expectation *and Louisiana Connectors*
1-PS4-2 Make observations to construct an evidence-based account that objects can be seen only when illuminated. ***LC-1-PS4-2a Through observations, recognize that objects can be seen only when illuminated by an external light source or when they give off their own light.***

Science and Engineering Practice	Disciplinary Core Idea	Crosscutting Concept
Constructing explanations and designing solutions: Constructing explanations (science) and designing solutions (engineering) 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. • Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena. ***Making observations can be used to gather information.*** ***Make observations to describe natural phenomena.*** ***Observational evidence can be used to describe natural phenomena.*** ***Observational evidence can be used to explain natural phenomena.***	**ELECTROMAGNETIC RADIATION** Objects can be seen if light is available to illuminate them or if they give off their own light. Some objects give off their own light. (LE.PS4B.a) ***Darkness is the partial or total absence of light.*** ***Light is necessary for objects to be seen.*** ***Objects cannot be seen if there is no light to illuminate them.*** ***Objects can be seen if they give off their own light.*** ***Things that give off light are known as light sources including: stars, flashlights, street lamps, house lamps, and the sun.***	**CAUSE AND EFFECT** Events have causes that generate observable patterns. ***One event can cause another event to occur. Sometimes this produces a pattern of events.***

Clarification Statement
Examples of observations could include those made in a completely dark room, a pinhole box, or a video of a cave explorer with a flashlight. Illumination could be from an external light source or by an object giving off its own light. This can be explored with light tables, 3-way mirrors, overhead projectors, or flashlights.

Performance Expectation *and Louisiana Connectors*
1-PS4-3 Plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam of light. ***LC-1-PS4-3a Through collaborative investigations, recognize that some materials allow light to pass through them.*** ***LC-1-PS4-3b Through collaborative investigations, recognize that some materials allow only some light to pass through them.*** ***LC-1-PS4-3c Through collaborative investigations, recognize that some materials block all the light.***

Science and Engineering Practice	Disciplinary Core Idea	Crosscutting Concept
Planning and carrying out investigations: 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. • Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question. ***Plan investigations collaboratively to produce data to answer a question.*** ***Conduct investigations collaboratively to produce data to answer a question.***	**ELECTROMAGNETIC RADIATION** Some materials allow light to pass through them, others allow only some light through and others block all the light and create a dark shadow on any surface beyond them, where the light cannot reach. Mirrors can be used to redirect a light beam. (The idea that light travels from place to place is developed through experiences with light sources, mirrors, and shadows, but no attempt is made to discuss the speed of light.) (LE.PS4B.b) ***The material that an object is made of impacts if light can or cannot pass through it.*** ***Some materials allow light to pass through them.*** ***A material that allows all light through (e.g., clear plastic, clear glass) results in the background lighting up.*** ***Some materials allow only some light to pass through them.*** ***A material that allows only some light through (e.g., wax paper, clouded plastic) results in the background lighting up, but not as bright as when the material allows all light in.*** ***Some materials block all the light.*** ***A material that blocks all of the light (e.g., cardboard, wood) will create a shadow.*** ***Different materials respond to light in different ways.*** ***Mirrors can be used to redirect light.*** ***A material that changes the direction of the light (e.g., mirror, aluminum foil) will light up the surrounding space in a different direction.***	**CAUSE AND EFFECT** Simple tests can be designed to gather evidence to support or refute student ideas about causes. ***Simple tests can be designed to gather evidence about cause and effect relationships.*** ***Evidence from simple tests can support ideas about causes.*** ***Evidence from simple tests can refute ideas about causes.***

Clarification Statement
Examples of materials could include those that are transparent (such as clear plastic), translucent (such as wax paper), opaque (such as cardboard), or reflective (such as a mirror).

Performance Expectation *and Louisiana Connectors*
1-PS4-4 Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance. ***LC-1-PS4-4a When using tools and materials to design and build a device, identify features of devices that people use to send and receive information over long distances.***

Science and Engineering Practice	Disciplinary Core Idea	Crosscutting Concept
Constructing explanations and designing solutions: Constructing explanations (science) and designing solutions (engineering) 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/or materials to design and/or build a device that solves a specific problem or a solution to a specific problem. ***Tools and materials can be used to design a device that solves a specific problem.*** ***Tools and materials can be used to design a device that can be a solution to a specific problem.*** ***Tools and materials can be used to build a device that solves a specific problem.*** ***Tools and materials can be used to***	**INFORMATION TECHNOLOGIES AND INSTRUMENTATION** People also use a variety of devices to communicate (send and receive information) over long distances. (LE.PS4C.a) ***Communication occurs when people share information with one another through the use of words, sounds, or signals.*** ***Light and sound can be used to communicate over long distances.*** ***A device can use light or sound to send or receive information over a given distance (e.g., cell phones, lighthouses).*** ***People use devices like telephones to communicate (send and receive information) over a distance.*** **DEVELOPING POSSIBLE SOLUTIONS** A situation that people want to change or create can be approached as a problem to be solved through engineering. (LE.ETS1A.a) ***People can make plans to solve a problem.*** ***Tools or objects can be used to solve a simple problem.*** ***Engineers use technology to help people solve problems or develop solutions to problems.*** ***Engineers design devices or other items to help people solve problems.***	**SYSTEMS AND SYSTEM MODELS** Systems in the natural and designed world have parts that work together. ***Systems and system models have many parts.*** ***Systems and system models can be used to understand the relationship between parts that work together.***

Science and Engineering Practice	Disciplinary Core Idea	Crosscutting Concept
build a device that can be a solution to a specific problem.		

Clarification Statement
Examples of devices could include a light source to send signals, paper cup and string “telephones,” or a pattern of drumbeats.

Performance Expectation *and Louisiana Connectors*
1-LS1-1 Use tools and materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs. ***LC-1-LS1-1a Identify how animals use their external parts to help them survive, grow, and meet their needs.*** ***LC-1-LS1-1b Identify how plants use their external parts to help them survive, grow, and meet their needs.*** ***LC-1-LS1-1c Identify a design solution to a human problem which is similar to how a plant or animal uses its external parts to help it survive, grow, and meet its needs.***

Science and Engineering Practice	Disciplinary Core Idea	Crosscutting Concept
Constructing explanations and designing solutions: Constructing explanations (science) and designing solutions (engineering) 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/or materials to design and/or build a device that solves a specific problem or a solution to a specific problem. ***Tools and materials can be used to design a device that solves a specific problem.*** ***Tools and materials can be used to design a device that can be a solution to a specific problem.*** ***Tools and materials can be used to build a device that solves a specific problem.*** ***Tools and materials can be used to***	**STRUCTURE AND FUNCTION** All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water, and air. Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow. (LE.LS1A.a) ***Plants and animals are similar to and different from each other in observable structures and behavior.*** ***Plants and animals have external parts that help them survive.*** ***Animals use their body parts in different ways (see, hear, grasp objects, protection, movement, and seek, find, and take in food, water, and air).*** ***Plants have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow.*** **INFORMATION PROCESSING** Animals have body parts that capture and convey different kinds of information needed for growth and survival. Animals respond to these inputs with behaviors that help them survive. Plants also respond to some external inputs. (LE.LS1D.a) ***Plants and animals take in information so they can respond to situations.*** ***Animals use external structures to capture and convey different kinds of information they need.*** ***Animals respond to the information they receive from one another or the environment.*** ***Different external structures help protect plants and animals and help them respond to***	**STRUCTURE AND FUNCTION** The shape and stability of structures of natural and designed objects are related to their function(s). ***The shape of structures in the world (natural and human-designed) are related to their function(s).*** ***The stability of structures in the world (natural and human-designed) are related to their function(s).*** ***Shape and stability are related for a variety of structures.***

Science and Engineering Practice	Disciplinary Core Idea	Crosscutting Concept
build a device that can be a solution to a specific problem.	***things around them.*** **DEVELOPING POSSIBLE SOLUTIONS** Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for solutions to a problem. (LE.ETS1B.a) ***Design solutions can be shared with others as sketches or drawings.*** ***Design solutions can be shared with others as models.*** ***It is important to communicate information about solutions with others.*** **OPTIMIZING THE DESIGN SOLUTION** Because there is always more than one possible solution to a problem, it is useful to compare and test designs. (LE.ETS1C.a) ***There is often more than one way to solve a problem.*** ***It is useful to compare and test designs.***	

Clarification Statement
Examples of human problems that can be solved by mimicking plant or animal solutions could include designing clothing or equipment to protect bicyclists by mimicking turtle shells, acorn shells or animal scales; stabilizing structures by mimicking animal tails or roots on plants; keeping out intruders by mimicking thorns on branches or animal quills; and detecting intruders by mimicking eyes or ears.

Performance Expectation *and Louisiana Connectors*
1-LS1-2 Read grade-appropriate texts and use media to determine patterns in behavior of parents and offspring that help offspring survive. ***LC-1-LS1-2a Use texts or media to identify behaviors of offspring that help them survive.*** ***LC-1-LS1-2b Use texts or media to identify behaviors between parents and offspring that help the offspring survive.*** ***LC-1-LS1-2c Use texts or media to identify patterns in behavior between parents and offspring that help the offspring survive.***

Science and Engineering Practice	Disciplinary Core Idea	Crosscutting Concept
Obtaining, evaluating, and communicating information: Obtaining, evaluating, and communicating information in K-2 builds on prior experiences and uses observations and texts to communicate new information. • Read grade-appropriate texts and/or use media to obtain scientific and/or technical information to determine patterns in and/or evidence about the natural and designed world(s). ***Gather evidence from grade-appropriate texts to determine patterns in the world (natural and human-designed).*** ***Gather evidence from grade-appropriate texts to determine evidence about the world (natural and human-designed).*** ***Gather evidence from media to determine patterns in the world (natural and human-designed).***	**GROWTH AND DEVELOPMENT OF ORGANISMS** Adult plants and animals can have offspring. In many kinds of animals, parents and the offspring themselves engage in behaviors that help the offspring to survive. (LE.LS1B.a) ***Plants and animals have offspring.*** ***Animals often help their offspring to survive.*** ***Parents and their offspring exhibit certain behaviors to ensure that the offspring survive.***	**PATTERNS** Patterns in the natural and human-designed world can be observed, used to describe phenomena, and used as evidence. ***Patterns in the world (natural and human-designed) can be observed.*** ***Patterns in the world (natural and human-designed) can be used to describe phenomena.*** ***Patterns in the world (natural and human-designed) can be used as evidence.***

Science and Engineering Practice	Disciplinary Core Idea	Crosscutting Concept
Gather evidence from media to determine evidence about the world (natural and human-designed).		

Clarification Statement
Examples of patterns of behaviors could include the signals that offspring make (such as crying, cheeping, and other vocalizations) and the responses of the parents (such as feeding, comforting, and protecting the offspring).

Performance Expectation *and Louisiana Connectors*
1-LS3-1 Make observations to construct an evidence-based account that young plants and animals are similar, but not exactly like, their parents. ***LC-1-LS3-1a Make observations to identify a similarity or a difference in an external feature (e.g., shape of ears) between young animals and their parents.*** ***LC-1-LS3-1b Make observations to identify a similarity or a difference in an external feature (e.g., shape of leaves) between young plants and their parents.***

Science and Engineering Practice	Disciplinary Core Idea	Crosscutting Concept
Constructing explanations and designing solutions: Constructing explanations (science) and designing solutions (engineering) 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. • Make observations to construct an evidence-based account for natural phenomena. ***Making observations can be used to gather information.*** ***Make observations to describe natural phenomena.*** ***Observational evidence can be used to describe natural phenomena.*** ***Observational evidence can be used to explain natural phenomena.***	**INHERITANCE OF TRAITS** Young animals are very much, but not exactly like, their parents. Plants also are very much, but not exactly like, their parents. (LE.LS3A.a) ***The offspring of some plants and animals resemble the parents.*** ***Young animals are like their parents, but not exactly the same.*** ***Young plants are like their parents, but not exactly the same.*** ***The offspring of some plants and animals do not resemble the parents.*** ***Similarities between parents and their offspring become more apparent as their life cycle continues.*** **VARIATION OF TRAITS** Individuals of the same kind of plant or animal are recognizable as similar but can also vary in many ways. (LE.LS3B.a) ***Animals of the same kind can have similar characteristics.*** ***Animals of the same kind can have major differences from each other.*** ***Plants of the same kind can have similar characteristics.*** ***Plants of the same kind can have major differences from each other.***	**PATTERNS** Patterns in the natural and human-designed world can be observed, used to describe phenomena, and used as evidence. ***Patterns in the world (natural and human-designed) can be observed.*** ***Patterns in the world (natural and human-designed) can be used to describe phenomena.*** ***Patterns in the world (natural and human-designed) can be used as evidence.***

Clarification Statement
Examples of observations could include: leaves from the same kind of plant are similar in shape but can differ in size, or a particular breed of dog looks like its parents but is not exactly the same. Examples of patterns could include features that plants or animals share.

Performance Expectation *and Louisiana Connectors*
1-ESS1-1 Use observations of the sun, moon, and stars to describe patterns that can be predicted. ***LC-1-ESS1-1a Use observations to describe patterns of movement of the sun, moon, and stars as seen from Earth.*** ***LC-1-ESS1-1b Use observations of patterns of movement to predict appearances of the sun or moon.***

Science and Engineering Practice	Disciplinary Core Idea	Crosscutting Concept
Analyzing and interpreting data: Analyzing and interpreting data in K-2 builds on prior experiences and progresses to collecting, recording, and sharing observations. • Use observations to describe patterns in the natural world in order to answer scientific questions. ***Use observations to determine patterns in the world.*** ***Use observations to answer scientific questions.***	**THE UNIVERSE AND ITS STARS** Patterns of the motion of the sun, moon, and stars in the sky can be observed, described, and predicted. (LE.ESS1A.a) ***Some objects are visible in the sky during the day (i.e., sun, moon, stars).*** ***Some objects are visible in the sky at night (i.e., sun, moon, stars).*** ***The sun and moon appear to move slowly across the sky.*** ***People can observe patterns of where the sun, moon, and stars are in the sky.*** ***Patterns in the motion of the sun, moon, and stars in the sky can be observed (i.e., the sun and moon can be seen at different positions during the day and night).*** ***Patterns in the motion of the sun, moon, and stars in the sky can be predicted.***	**PATTERNS** Patterns in the natural and human-designed world can be observed, used to describe phenomena, and used as evidence. ***Patterns in the world (natural and human-designed) can be observed.*** ***Patterns in the world (natural and human-designed) can be used to describe phenomena.*** ***Patterns in the world (natural and human-designed) can be used as evidence.***

Clarification Statement
Examples of patterns could include that the sun and moon appear to rise in one part of the sky, move across the sky, and set; and stars other than our sun are visible at night but not during the day.

Performance Expectation *and Louisiana Connectors*
1-ESS1-2 Make observations at different times of year to relate the amount of daylight to the time of year. ***LC-1-ESS1-2a Use observations to make relative comparisons between the amount of daylight in the winter to the amount of daylight in the spring or fall.***

Science and Engineering Practice	Disciplinary Core Idea	Crosscutting Concept
Planning and carrying out investigations: Planning and carrying out investigations to answer questions or test solutions to problems in K-2 build on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions. • Make observations to collect data that can be used to make comparisons. ***Make observations to collect data.*** ***Use data to make comparisons.***	**EARTH AND THE SOLAR SYSTEM** Seasonal patterns of sunrise and sunset can be observed, described, and predicted. (LE.ESS1B.a) ***Seasonal changes of sunrise and sunset can be observed.*** ***Seasonal changes can be described by observing patterns in the sunrise and sunset.*** ***Seasonal changes can be predicted by observing patterns in the sunrise and sunset.***	**PATTERNS** Patterns in the natural and human-designed world can be observed, used to describe phenomena, and used as evidence. ***Patterns in the world (natural and human-designed) can be observed.*** ***Patterns in the world (natural and human-designed) can be used to describe phenomena.*** ***Patterns in the world (natural and human-designed) can be used as evidence.***

Clarification Statement
Emphasis is on relative comparisons of the amount of daylight in the winter to the amount in the spring, fall, or summer.