



inquisitive

Arizona Standards for Science Crosswalk

89% Inquisitive Alignment & Coverage



What does it mean to be Inquisitive?

Our mission is for teachers to enjoy teaching and for students to learn with purpose and depth. Inquisitive lessons inspire wonder, curiosity and engagement by introducing science and engineering through real world phenomena and relevant focus questions.

Inquisitive x Arizona Crosswalk

This document maps Inquisitive 89% Content Coverage to the NGSS for Arizona. We have included the relevant NGSS Performance Expectations and Inquisitive lesson learning targets, for ease of use and reference to the content statements.

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Arizona Science Standards				NGSS Code (s)	Inquisitive Lessons (Learning Targets)
Grade Level	Domain	Arizona Science Standard	Learning Progressions, Key Terms, and Crosscutting Concepts		
K	Earth and Space Science	K.E1U1.3 Observe, record, and ask questions about temperature, precipitation, and other weather data to identify patterns or changes in local weather.	There is air all around the Earth's surface, but there is less and less further away from the surface (higher in the sky). Weather is determined by the conditions and movement of the air. The temperature, pressure, direction, speed of movement and the amount of water vapor in the air combine to create the weather. Measuring these properties over time enables patterns to be found that can be used to predict the weather a short time ahead.	<u>K-ESS2-1</u> Use and share observations of local weather conditions to describe patterns over time.	<u>K-ESS2-1</u> <u>What is Weather?</u> ● Observe the current local weather. ● Describe the weather as a combination of different conditions at a particular time. <u>Watching the Weather</u> ● Recognize the symbols used to depict weather. ● Understand that the weather changes daily. ● Record weather over time and look for patterns.
		K.E1U1.4 Observe, describe, ask questions, and predict seasonal weather patterns; and how those patterns impact plants and animals (including humans).	Crosscutting Concepts: patterns; cause and effect; stability and change		<i>Inquisitive does not currently have content for this Arizona Science Standard.</i>

		K.E2U1.5 Observe and ask questions about patterns of the motion of the sun, moon, and stars in the sky.	Patterns of the motion of the sun, moon, and stars in the sky can be observed, described, and predicted. At night one can see the light coming from many stars with the naked eye, but telescopes make it possible to see many more and to observe them and the moon and planets in greater detail. Crosscutting Concepts: patterns; cause and effect; structure and function; stability and change.	<u>1-ESS1-1</u> Use observations of the sun, moon and stars to describe patterns that can be predicted.	<i>The below Inquisitive lessons partially address this Arizona Science Standard.</i> <u>1-ESS1-1</u> <u>The Sun Is Out</u> ● Identify that when the sun appears in the sky, it is daylight. ● Observe, describe, and predict the pattern of motion of the sun as it appears in the sky. <u>Bright Moon</u> ● Identify that the moon appears brighter when it is nighttime. ● Identify that the moon can appear at different times during the day and night. ● Observe and describe that the moon's position in the sky appears to move. <u>Starry, Starry Night</u> ● Understand that the appearance of stars in the sky can be observed and predicted. ● Identify that stars (other than our own sun) are visible at night but not during the day.
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Arizona Science Standards				NGSS Code (s)	Inquisitive Lessons (Learning Targets)
Grade Level	Domain	Arizona Science Standard	Learning Progressions, Key Terms, and Crosscutting Concepts		
K	Physical Science	K.P2U1.1 Investigate how senses can detect light, sound, and vibrations even when they come from far away; use the collected evidence to develop and support an explanation.	People use their senses to learn about the world around them. Their eyes detect light, their ears detect sound, and they can feel vibrations by touch. People also use a variety of devices to communicate (send and receive information) over long distances. 4 (p. 137) Objects can have an effect on other objects even when they are not in contact with them. For instance, light affects the objects it reaches, including our eyes. Objects that are seen either give out or reflect light that human eyes can detect. Sound comes from things that vibrate and can be detected at a distance from the source because the air or other material around is made to vibrate.		<i>Inquisitive does not currently have content for this Arizona Science Standard.</i>
		K.P2U2.2 Design and evaluate a tool that helps people extend their senses.	Sounds are heard when the vibrations in the air enter our ears.2 (p. 21) Designs can be conveyed through sketches, drawings, or physical models. 4 (p.207) Because there is always more than one possible solution to a problem, it is useful to compare designs, test them, and discuss their strengths and weaknesses.(p. 209) Crosscutting Concepts: patterns; cause and effect; structure and function4		<i>Inquisitive does not currently have content for this Arizona Science Standard.</i>

Arizona Science Standards				NGSS Code (s)	Inquisitive Lessons (Learning Targets)
Grade Level	Domain	Arizona Science Standard	Learning Progressions, Key Terms, and Crosscutting Concepts		
K	Life Science	K.L1U1.6 Obtain, evaluate, and communicate information about how organisms use different body parts for survival.	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, grow, and produce more plants. Animals have body parts that capture and convey different kinds of information needed for growth and survival—for example, eyes for light, ears for sounds, and skin for temperature or touch. Animals respond to these inputs with behaviors that help them survive (e.g., find food, run from a predator).	PK-LS1-3 Identify and describe external body parts of animals and how they help them survive.	<i>The below Inquisitive lessons partially address this Arizona Science Standard.</i> PK-LS1-3 Body Parts of Animals ● Identify external body parts of animals. ● Describe external body parts of animals. Animals on the Move ● Identify and describe external body parts of animals that help them move. Animal Ears ● Identify ears on different animals. ● Describe what ears do.
		K.L1U1.7 Observe, ask questions, and explain how specialized structures found on a variety of plants and animals (including humans) help them sense and respond to their environment.	Crosscutting Concepts: patterns; cause and effect; structure and function		

		K.L2U1.8 Observe, ask questions, and explain the differences between the characteristics of living and non-living things.	There is a wide variety of living things (organisms), including plants and animals. They are distinguished from non-living things by their ability to move, reproduce, and react to certain stimuli. 2 (p. 26) Crosscutting Concepts: patterns; structure and function	<u>K-LS1-1</u> Use observations to describe patterns of what plants and animals (including humans) need to survive.	<u>K-LS1-1</u> <u>Staying Alive</u> ● Identify living things and nonliving things. ● State that animals need food and water to survive. ● Describe the foods that different animals eat. <u>What do Plants Need?</u> ● Identify the needs of plants to live and grow.
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Arizona Science Standards				NGSS Code (s)	Inquisitive Lessons (Learning Targets)
Grade Level	Domain	Arizona Science Standard	Learning Progressions, Key Terms, and Crosscutting Concepts		
1	Physical Science	1.P2U1.1 Plan and carry out investigations demonstrating the effect of placing objects made with different materials in the path of a beam of light and predict how objects with similar properties will affect the beam of light.	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 (i.e., on the other side from the light source), where the light cannot reach. Mirrors and prisms can be used to redirect a light beam. 4 (p. 134-135) Light and sound are wavelike phenomena. Sound can make matter vibrate, and vibrating matter can make sound. Crosscutting Concepts: cause and effect; systems and system models; energy and matter; stability and change	<u>1-PS4-2</u> Make observations to construct an evidence-based account that objects can be seen only when illuminated. <u>1-PS4-3</u> Plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam of light.	<u>1-PS4-2</u> <u>Turn on the Light!</u> ● Identify that light can cause objects to be seen. ● Investigate what happens to the appearance of objects when they are illuminated. ● Determine that some objects give off their own light, and some objects can be seen if there is a light source available. <u>1-PS4-3</u> <u>Beam of Light</u> ● Identify that a beam of light shines in one direction. ● Investigate what effects a beam of light has on objects made from different materials. ● Determine that some objects allow all light to pass through, some allow a portion of the light to pass through, and some block light and create shadows. <u>Mirror, Mirror</u> ● Identify how a beam of light can reflect off objects. ● Investigate what effects a beam of light has on objects made from different materials. ● Determine that some objects allow light to bounce off them and light their surrounding space.
		1.P2U1.2 Use models to provide evidence that vibrating matter creates sound and sound can make matter vibrate.		<u>1-PS4-4</u> Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.	<u>1-PS4-1</u> <u>Good Vibrations</u> ● Identify what happens when materials vibrate. ● Investigate materials and their relationship with sound. ● Determine that vibrating materials make sound. <u>Move to the Sound</u> ● Identify what happens to materials when sound is played. ● Investigate sound and its relationship to materials. ● Determine that sound can make materials vibrate.

		1.P3U1.3 Plan and carry out investigations which demonstrate how equal forces can balance objects and how unequal forces can push, pull, or twist objects, making them change their speed, direction, or shape.	Forces can push, pull or twist objects, making them change their motion or shape. Forces act in particular directions. Equal forces acting in opposite directions in the same line cancel each other and are described as being in balance. The movement of objects is changed if the forces acting on them are not in balance. Crosscutting Concepts: cause and effect; systems and system models; energy and matter; stability and change.	<u>K-PS2-1</u> 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.	<i>The below Inquisitive lessons partially address this Arizona Science Standard.</i> <u>K-PS2-1</u> <u>Push and Pull</u> ● Understand that pushes and pulls are used to start and stop the motion of objects. ● Identify and classify pushes and pulls. <u>Speed It Up! Slow It Down!</u> ● Demonstrate how pushes and pulls of different strengths can cause the speed of objects to change. <u>Which Way?</u> ● Demonstrate how pushes and pulls can cause the direction of objects to change. ● Explain that when objects collide, objects will move in different directions.
		1.P4U2.4 Design and evaluate ways to increase or reduce heat from friction between two objects.	When two objects rub against each other, this interaction is called friction. Friction between two surfaces can warm both of them (e.g., rubbing hands together). There are ways to reduce the friction between two objects.⁴ (p. 129) Designs can be conveyed through sketches, drawings, or physical models. Because there is always more than one possible solution to a problem, it is useful to compare designs, test them, and discuss their strengths and weaknesses. Crosscutting Concepts: cause and effect; systems and system models; energy and matter; stability and change.		<i>Inquisitive does not currently have content for this Arizona Science Standard.</i>

Arizona Science Standards				NGSS Code (s)	Inquisitive Lessons (Learning Targets)
Grade Level	Domain	Arizona Science Standard	Learning Progressions, Key Terms, and Crosscutting Concepts		
1	Earth and Space Science	1.E1U1.5 Obtain, evaluate, and communicate information about the properties of Earth materials and investigate how humans use natural resources in everyday life.	Wind and water can change the shape of the land. The resulting landforms, together with the materials on the land, provide homes for living things. 4 (p. 180) Humans use natural resources for everything they do: for example, they use soil and water to grow food, wood to burn to provide heat or to build shelters, and materials such as iron or copper (minerals) extracted from Earth to make cooking pans.4 (p. 192) Crosscutting Concepts: cause and effect; systems and system models; energy and matter; stability and change		<i>Inquisitive does not currently have content for this Arizona Science Standard.</i>

Arizona Science Standards				NGSS Code (s)	Inquisitive Lessons (Learning Targets)
Grade Level	Domain	Arizona Science Standard	Learning Progressions, Key Terms, and Crosscutting Concepts		
1	Life Science	1.1U1.6 Observe, describe, and predict life cycles of animals and plants.	Plants and animals have predictable characteristics at different stages of development. Plants and animals grow and change. Adult plants and animals can have young. Crosscutting Concepts: cause and effect; structure and function; stability and change.	<u>3-LS1-1</u> Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.	<i>The below Inquisitive lessons partially address this Arizona Science Standard.</i> <u>3-LS1-1</u> <u>Plant Life-From Seed to Seed</u> - Produce an informative model that shows the key stages in the life cycle of a plant. <u>Animal Life Cycles</u> - Produce an informative model that shows the key stages in the life cycle of a chosen animal.
		1.1U2.7 Develop and use models about how living things use resources to grow and survive; design and evaluate habitats for organisms using earth materials.	Animals depend on their surroundings to get what they need, including food, water, shelter, and a favorable temperature. Animals depend on plants or other animals for food. They use their senses to find food and water, and they use their body parts to gather, catch, eat, and chew the food. Plants depend on air, water, minerals (in the soil), and light to grow. Animals can move around, but plants cannot, and they often depend on animals for pollination or to move their seeds around. Different plants survive better in different settings because they have varied needs for water, minerals, and sunlight 4 (. 151) Animals need food that they can break down, which comes either directly by eating plants (herbivores) or by eating animals (carnivores) which have eaten plants or other animals. Designs can be conveyed through sketches, drawings, or physical models.	<u>2-LS4-1</u> Make observations of plants and animals to compare the diversity of life in different habitats.	<i>The below Inquisitive lesson partially addresses this Arizona Science Standard.</i> <u>2-LS4-1</u> <u>Whose Habitat Is This?</u> - Identify and describe different habitats. - Describe living things in a certain habitat. - Compare the different plants and animals that live in a certain habitat.
		1.1U1.8 Construct an explanation describing how organisms obtain resources from the environment including materials that are used again by other organisms.	Because there is always more than one possible solution to a problem, it is useful to compare designs, test them, and discuss their strengths and weaknesses.	<u>K-ESS3-1</u> Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live.	<i>The below Inquisitive lesson partially addresses this Arizona Science Standard.</i> <u>K-ESS3-1</u> <u>This Is Home</u> - Describe the relationships among living things, the resources they need to survive, and where those things live. - Use a model to describe how the needs of living things are met by the places in which they live and the resources found in those places.

			4 (p. 209) Crosscutting Concepts: cause and effect; systems and system models; energy and matter; structure and function; stability and change		
		1.L3U1.9 Obtain, evaluate, and communicate information to support an evidence-based explanation that plants and animals produce offspring of the same kind, but offspring are generally not identical to each other or their parents.	Living things produce offspring of the same kind, but offspring are not identical with each other or with their parents. Plants and animals, including humans, resemble their parents in many features because information is passed from one generation to the next. ² (p. 22) Organisms have characteristics that can be similar or different. Young animals are very much, but not exactly, like their parents and also resemble other animals of the same kind. Plants also are very much, but not exactly, like their parents and resemble other plants of the same kind. ⁴ (p. 158) Crosscutting Concepts: cause and effect; structure and function; stability and change	3-LS3-1 Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.	<i>The below Inquisitive lessons partially address this Arizona Science Standard.</i> 3-LS3-1 <u>Variation of Traits</u> - Analyze and interpret data to provide evidence of the shared traits and variations in traits that occur in a species. <u>Inherited Traits</u> - Identify and use evidence to support the idea that offspring inherit traits from their parents. - Identify and use evidence to support the idea that siblings with the same parents will have variations in their traits.
		1.L4U1.10 Develop a model to describe how animals and plants are classified into groups and subgroups according to their similarities.	There are many different kinds of plants and animals in the world today and many kinds that once lived but are now extinct. We know about these from fossils. Animals and plants are classified into groups and subgroups according to their similarities. Some kinds of plants and animals that once lived on Earth (e.g., dinosaurs) are no longer found anywhere, although others now living (e.g., lizards) resemble them in some ways. Crosscutting Concepts: cause and effect; systems and system models; energy and matter; structure and function; stability and change		

		1.L4U3.11 Ask questions and explain how factors can cause species to go extinct.		<u>3-LS4-1</u> Analyze and interpret data from fossils to provide evidence of the organisms and environments in which they lived long ago.	<i>The below Inquisitive lessons partially address this Arizona Science Standard.</i> <u>3-LS4-1</u> <u>Fossil Stories</u> ● Describe what a fossil is and name an example of one. ● Give a simple explanation of how fossils are formed. ● Give an example of the type of information we can obtain from a fossil. ● Explain how the locations of fossils can tell us about changes to the environment over time. <u>3-LS4-3</u> <u>Happy in My Habitat</u> ● Describe what a habitat is and give some examples of different habitats. ● Describe the features an animal has that enable it to survive in its habitat. ● Explain why an animal could not live in a different habitat
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Grade Level	Domain	Arizona Science Standard	Learning Progressions, Key Terms, and Crosscutting Concepts		
2	Physical Science	2.P1U1.1 Plan and carry out an investigation to determine that matter has mass, takes up space, and is recognized by its observable properties; use the collected evidence to develop and support an explanation.	All the ‘stuff’ encountered in everyday life, including air, water and different kinds of solid substances, is called matter because it has mass, and therefore weight on Earth, and takes up space. Different materials are recognizable by their properties, some of which are used to classify them as being in the solid, liquid or gas state. Different kinds of matter exist (e.g., wood, metal, water), and many of them can be either solid or liquid, depending on temperature. Crosscutting Concepts: cause and effect; scale, proportion, and quantity; system and system models; energy and matter; stability and change	2-PS1-1 Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.	2-PS1-1 What IS This Stuff? • Understand that matter is all of the substances we can see and feel. • Investigate the differences between solids and liquids. • Understand that solids keep their shape while liquids take the shape of their container. Sorting Our Stuff • Explain that matter has properties. • Classify matter by its properties. • Observe that the properties of matter can change when heated or cooled.
		2.P1U1.2 Plan and carry out investigations to gather evidence to support an explanation on how heating or cooling can cause a phase change in matter.		2-PS1-4 Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.	2-PS1-4 Changes from Heating and Cooling • Explain that heating and cooling can change matter. • Compare and contrast changes that can be undone and cannot be undone.

		2.P4U1.3 Obtain, evaluate and communicate information about ways heat energy can cause change in objects or materials.	There are various ways of causing an event or bringing about change in objects or materials. Heating can cause change, as in cooking, melting solids or changing water to vapor. Crosscutting Concepts: cause and effect; scale, proportion, and quantity; system and system models; energy and matter; stability and change.		
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Grade Level	Domain	Arizona Science Standard	Learning Progressions, Key Terms, and Crosscutting Concepts		
2	Earth and Space Science	2.E1U1.4 Observe and investigate how wind and water change the shape of the land resulting in a variety of landforms.	Wind and water can change the shape of the land. The resulting landforms, together with the materials on the land, provide homes for living things. Water is found in the ocean, rivers, lakes, and ponds. Water exists as solid ice and in liquid form. It carries soil and rocks from one place to another and determines the variety of life forms that can live in a particular location. Crosscutting Concepts: patterns; cause and effect; scale, proportion, and quantity; system and system models; stability and change	<u>2-ESS2-1</u> Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.	<u>2-ESS2-1</u> <u>The Power of Wind and Water</u> - Understand that sudden and slow changes caused by wind and water can change the shape of the land. - Examine and discuss solutions that engineers and scientists have designed to prevent this damage from happening. - Compare solutions designed to slow or prevent wind or water from changing the shape of the land.
		2.E1U1.5 Develop and use models to represent that water can exist in different states and is found in oceans, glaciers, lakes, rivers, ponds, and the atmosphere.		<u>2-ESS2-2</u> Develop a model to represent the shapes and kinds of land and bodies of water in an area.	<u>2-ESS2-2</u> <u>Map It!</u> - Develop a model that identifies natural landforms and bodies of water. - Understand that maps can be used to represent many types of areas. <u>2-ESS2-3</u> <u>Water, Water Everywhere!</u> - Identify where water is found on Earth. - Understand that water can be found in liquid or solid (ice) form.

		2.E1U2.6 Analyze patterns in weather conditions of various regions of the world and design, test, and refine solutions to protect humans from severe weather conditions.	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 over time.4 (p. 188) Designs can be conveyed through sketches, drawings, or physical models. Because there is always more than one possible solution to a problem, it is useful to compare designs, test them, and discuss their strengths and weaknesses. Crosscutting Concepts: patterns; cause and effect; scale, proportion, and quantity; system and system models; structure and function; stability and change.	<u>K-ESS3-2</u> Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to severe weather.	<i>The below Inquisitive lesson partially addresses this Arizona Science Standard.</i> <u>K-ESS3-2</u> <u>Weather Warning!</u> ● Ask questions about severe weather in their local area. ● Describe how people plan and prepare for severe weather.
		2.E1U3.7 Construct an argument from evidence regarding positive and negative changes in water and land systems that impact humans and the environment.	Plants and animals (including humans) depend on the land, water, and air to live and grow. They in turn can change their environment (e.g., the shape of land, the flow of water). Crosscutting Concepts: cause and effect; scale, proportion, and quantity; system and system models; structure and function; stability and change		<i>Inquisitive does not currently have content for this Arizona Science Standard.</i>

		2.E2U1.8 Observe and explain the Sun's position at different times during a twenty-four-hour period and changes in the apparent shape of the Moon from one night to another.	There are patterns in the position of the Sun seen at different times of the day and in the shape of the Moon from one night to another. Crosscutting Concepts: patterns; cause and effect; system and system models; stability and change.	<u>1-ESS1-1</u> Use observations of the sun, moon and stars to describe patterns that can be predicted.	<i>The below Inquisitive lessons partially address this Arizona Science Standard.</i> <u>1-ESS1-1</u> <u>The Sun Is Out</u> ● Identify that when the sun appears in the sky, it is daylight. ● Observe, describe, and predict the pattern of motion of the sun as it appears in the sky. <u>Bright Moon</u> ● Identify that the moon appears brighter when it is nighttime. ● Identify that the moon can appear at different times during the day and night. ● Observe and describe that the moon's position in the sky appears to move.
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Grade Level	Domain	Arizona Science Standard	Learning Progressions, Key Terms, and Crosscutting Concepts		
2	Life Science	2.L2U1.9 Obtain, analyze, and communicate evidence that organisms need a source of energy, air, water, and certain temperature conditions to survive.	All living things need food as their source of energy as well as air, water, and certain temperature conditions. Plants containing chlorophyll can use sunlight to make the food they need and can store food that they do not immediately use. Animals need food that they can break down, which comes either directly by eating plants (herbivores) or by eating animals (carnivores) which have eaten plants or other animals. Animals are ultimately dependent on plants for their survival. The relationships among organisms can be represented as food chains and food webs.	<u>K-LS1-1</u> Use observations to describe patterns of what plants and animals (including humans) need to survive.	<i>The below Inquisitive lessons partially address this Arizona Science Standard.</i> <u>K-LS1-1</u> <u>Staying Alive</u> ● Identify living things and nonliving things. ● State that animals need food and water to survive. ● Describe the foods that different animals eat. <u>What do Plants Need?</u> ● Identify the needs of plants to live and grow.
		2.L2U1.10 Develop a model representing how life on Earth depends on energy from the Sun and energy from other organisms.	All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow. Crosscutting Concepts: cause and effect; system and system models; energy and matter; structure and function; stability and change.	<u>5-PS3-1</u> Use models to describe that energy in animals' food (used for body repair, growth, and motion and to maintain body warmth) was once energy from the sun.	

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Grade Level	Domain	Arizona Science Standard	Learning Progressions, Key Terms, and Crosscutting Concepts		
3	Physical Science	3.P2U1.1 Ask questions and investigate the relationship between light, objects, and the human eye.	Light is seen because it affects the objects it reaches, including our eyes. Sources give out light, which travels from them in various directions and is detected when it reaches and enters our eyes. Objects that are seen either give out or reflect light that human eyes can detect. Sound comes from things that vibrate and can be detected at a distance from the source because the air or other material around is made to vibrate. Sounds are heard when the vibrations in the air enter our ears. An object can be seen when light reflected from its surface enters the eyes; the color people see depends on the color of the available light sources as well as the properties of the surface. Because lenses bend light beams, they can be used, singly or in combination, to provide magnified images of objects too small or too far away to be seen with the naked eye.4 (p. 135) Waves of the same type can differ in amplitude (height of the wave) and wavelength (spacing between wave peaks). Waves can add or cancel one another as they cross, depending on their relative phase (i.e., relative position of peaks and troughs of the waves), but they emerge unaffected by each other. (Boundary: The discussion at this grade level is qualitative only; it can be based on the fact that two different sounds can pass a location in different directions without getting mixed up.) Crosscutting Concepts: patterns; cause and effect; system and system models; energy and matter; structure and function.	<u>4-PS4-2</u> Develop a model to describe that light reflecting from objects and entering the eyes allows objects to be seen.	<i>The below Inquisitive lesson partially addresses this Arizona Science Standard.</i> <u>4-PS4-2</u> <u>Eye, Eye!</u> • State that light travels in straight lines called rays. • Explain that we see objects when light rays reflect off them and into our eyes. • Describe how mirrors change the path of light and help us to see things we cannot look at directly.
		3.P2U1.2 Plan and carry out an investigation to explore how sound waves affect objects at varying distances.		<u>4-PS4-1</u> Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move.	<i>The below Inquisitive lessons partially address this Arizona Science Standard.</i> <u>4-PS4-1</u> <u>Catch the Wave</u> • Describe wave patterns found in nature. • Describe differences in wave patterns in terms of their wavelength and amplitude. <u>Modeling Waves</u> • Use a physical model to observe and analyze the natural phenomenon of wave motion. • Develop a model to explain that waves can cause objects to move

		3.P4U1.3 Develop and use models to describe how light and sound waves transfer energy.	The faster a given object is moving, the more energy it possesses. Energy can be moved from place to place by moving objects or through sound or light. (Boundary: At this grade level, no attempt is made to give a precise or complete definition of energy.)⁴ (p. 122) 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. For example, energy radiated from the sun is transferred to Earth by light. When this light is absorbed, it warms Earth's land, air, and water and facilitates plant growth. Crosscutting Concepts: cause and effect; scale, proportion, and quantity; system and system models; energy and matter; stability and change.	4-PS3-2 Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents. 4-PS3-3 Ask questions and predict outcomes about the changes in energy that occur when objects collide.	<i>The below Inquisitive lessons partially address this Arizona Science Standard.</i> 4-PS3-2 <u>Sound Moves</u> ● Explain how sound is produced. ● State that sound travels from one place to another, and cite practical observations as evidence. <u>Heat Moves</u> ● Use their measurements and observations to explain how heat moves. ● Identify how heat moves from one object to another in familiar, real-life contexts. <u>Switch the Light On!</u> ● Describe how light energy travels from one place to another. ● Describe how to build a circuit that changes electrical energy into light energy. 4-PS3-3 <u>When Objects Collide</u> ● Identify and give examples of instances of how motion energy is transferred through collisions. ● Explain that some of the motion energy in a collision is transformed into sound and heat.
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Arizona Science Standards				NGSS Code (s)	Inquisitive Lessons (Learning Targets)
Grade Level	Domain	Arizona Science Standard	Learning Progressions, Key Terms, and Crosscutting Concepts		
3	Earth and Space Science	3.E1U1.4 Construct an explanation describing how the Sun is the primary source of energy impacting Earth systems.	All Earth processes are the result of energy flowing and matter cycling within and among Earth's systems. This energy originates from the sun and from Earth's interior. 4 (179-180) Earth's major systems are the geosphere (solid and molten rock, soil, and sediments), the hydrosphere (water and ice), the atmosphere (air), and the biosphere (living things, including humans). These systems interact in multiple ways to affect Earth's surface materials and processes. Crosscutting Concepts: cause and effect; system and system models; energy and matter; stability and change.	<u>5-ESS1-1</u> Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from Earth.	<i>The below Inquisitive lesson partially addresses this Arizona Science Standard.</i> <u>5-ESS1-1</u> <u>Hello Sun!</u> ● State that the sun is a star. ● Explain why the sun appears to be the biggest and brightest object in the sky.

Arizona Science Standards				NGSS Code (s)	Inquisitive Lessons (Learning Targets)
Grade Level	Domain	Arizona Science Standard	Learning Progressions, Key Terms, and Crosscutting Concepts		
3	Life Science	3.L1U1.5 Develop and use models to explain that plants and animals (including humans) have internal and external structures that serve various functions that aid in growth, survival, behavior, and reproduction.	Animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction. (Boundary: Stress at this grade level focus is on understanding the macroscale systems and their function, not microscopic processes.) Crosscutting Concepts: scale, proportion and quantity; system and system models; structure and function; stability and change.	4-LS1-1 Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.	<i>The below Inquisitive lessons partially address this Arizona Science Standard.</i> 4-LS1-1 Plantific! ● Identify important external structures of a plant and describe their function. ● Identify an important internal structure of a plant and describe its function. ● Understand that plant structures work together as a connected system. Survivors ● Identify different external structures of a variety of animals. ● Explain how an external structure helps an animal to survive. The Inside Story! ● Identify the position and the function of the heart, lungs, and brain in their body. ● Explain how these structures, along with the nerves, work together to aid growth and survival. ● Give examples of animals that have internal structures similar to and different from those in humans.
		3.L2U1.6 Plan and carry out investigations to demonstrate ways plants and animals react to stimuli.		1-LS1-1 Use 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.	<i>The below Inquisitive lesson partially addresses this Arizona Science Standard.</i> 1-LS1-1 Scaredy-Cat! ● Identify that animals have body parts that capture and convey different kinds of information needed for growth and survival. ● Identify that animals respond to these stimuli with behaviors that help them survive. ● Identify that plants also respond to some external stimuli.

		3.L2U1.7 Develop and use system models to describe the flow of energy from the Sun to and among living organisms.	Different sense receptors are specialized for particular kinds of information, which may then be processed and integrated by an animal's brain, with some information stored as memories. Animals are able to use their perceptions and memories to guide their actions. Some responses to information are instinctive—that is, animals' brains are organized so that they do not have to think about how to respond to certain stimuli. Plants also respond to some external inputs (e.g., turn leaves toward the sun). Crosscutting Concepts: patterns; cause and effect; system and system models; structure and function; stability and change.	2-LS2-1 Plan and conduct an investigation to determine if plants need sunlight and water to grow.	<i>The below Inquisitive lessons partially address this Arizona Science Standard.</i> 2-LS2-1 Growing Plants ● Plan and conduct an investigation. ● Collect and interpret data about plant growth. ● Understand that plants need water and sunlight to grow. 5-PS3-1 Energy for Living Things ● State reasons as to why animals need to eat food. ● Create an accurate model of a food chain. ● Identify that energy in animals' food was once energy from the sun.
		3.L2U1.8 Construct an argument from evidence that organisms are interdependent.	Animals and plants alike generally need to take in air and water, animals must take in food, and plants need light and minerals; anaerobic life, such as bacteria in the gut, functions without air. Food provides animals with the materials they need for body repair and growth and is digested to release the energy they need to maintain body warmth and for motion. Plants acquire their material for growth chiefly from air and water and process matter they have formed to maintain their internal conditions (e.g., at night). 4 (p. 148) Animals need food that they can break down, which comes either directly by eating plants (herbivores) or by eating animals (carnivores) which have eaten plants or other animals. Animals are ultimately dependent on plants for their survival. The relationships among organisms can be represented as food chains and food webs. Some animals are dependent on plants in other ways as well as for food, for example for shelter and, in the case of human beings, for clothing and fuel. Plants also depend on animals in various ways. For example, many flowering plants depend on insects for pollination and on	3-LS2-1 Construct an argument that some animals form groups that help members survive.	3-LS2-1 Animal Groups ● Identify animals that live in or form groups. ● Understand that some animals form large groups and that others live in small groups. ● Give an example of an animal that lives in a large group and an animal that lives in a small group. Group Work ● Construct an argument with evidence that animals form groups for different reasons. ● Understand that being part of a group helps animals survive.

			other animals for dispersing their seeds. (p. 27) Crosscutting Concepts: cause and effect; system and system models; energy and matter; structure and function; stability and change.		
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Arizona Science Standards				NGSS Code (s)	Inquisitive Lessons (Learning Targets)
Grade Level	Domain	Arizona Science Standard	Learning Progressions, Key Terms, and Crosscutting Concepts		
4	Physical Science	4.P4U1.1 Develop and use a model to demonstrate how a system transfers energy from one object to another even when the objects are not touching.	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. For example, energy radiated from the sun is transferred to Earth by light. When this light is absorbed, it warms Earth's land, air, and water and facilitates plant growth. 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 (e.g., moving water driving a spinning turbine which generates electric currents). 4 (p. 125) The faster a given object is moving, the more energy it possesses. Energy can be moved from place to place by moving objects or through sound or light. (Boundary: At this grade level, no attempt is made to give a precise or complete definition of energy.)4 (p. 122) For example, energy radiated from the sun is transferred to Earth by light. When this light is absorbed, it warms Earth's land, air, and water and facilitates plant growth. 4 (p. 125) The expression "produce energy" typically refers to the conversion of stored energy into a desired form for practical use—for example, the stored energy of water behind a dam is released so that it flows downhill and drives a turbine generator to produce electricity. Food and fuel also release energy when they are digested or burned. When machines or animals "use" energy	<u>3-LS2-1</u> Construct an argument that some animals form groups that help members survive.	<i>The below Inquisitive lessons partially address this Arizona Science Standard.</i> <u>3-LS2-1</u> <u>Animal Groups</u> - Identify animals that live in or form groups. - Understand that some animals form large groups and that others live in small groups. - Give an example of an animal that lives in a large group and an animal that lives in a small group. <u>Group Work</u> - Construct an argument with evidence that animals form groups for different reasons. - Understand that being part of a group helps animals survive.
		4.P4U1.2 Develop and use a model that explains how energy is moved from place to place through electric currents.		<u>4-PS3-2</u> Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.	<u>4-PS3-2</u> <u>Switch the Light On!</u> - Describe how light energy travels from one place to another. - Describe how to build a circuit that changes electrical energy into light energy. <u>4-PS3-4</u> <u>Converting Energy</u> - Explain, with an example, how energy can be converted from one form into another. - Describe the criteria and constraints associated with the design of a solution to a problem. - Use the engineering process in collaboration with others to design, build, test, and refine a solution to a problem.
		4.P2U1.3 Develop and use a model to demonstrate magnetic forces.		<u>3-PS2-3</u> Ask questions to determine cause and effect relationships of electrical or magnetic interactions between two objects not in contact with each other.	<i>The below Inquisitive lessons partially address this Arizona Science Standard.</i> <u>3-PS2-3</u> <u>Hair Raising!</u> - Identify electrostatic force as a non-contact force. - Describe the interaction between two charged objects in terms of a cause and effect relationship. <u>It's Magnetic!</u> - Identify when a magnetic force is at work and what types of materials are magnetic. - Describe the interaction between two magnetic objects in terms of a cause and effect relationship.

		4.P4U3.4 Engage in argument from evidence on the use and impact of renewable and nonrenewable resources to generate electricity.	(e.g., to move around), most often the energy is transferred to heat the surrounding environment. The energy released by burning fuel or digesting food was once energy from the sun that was captured by plants in the chemical process that forms plant matter (from air and water). (Boundary: The fact that plants capture energy from sunlight is introduced at this grade level, but details of photosynthesis are not.) It is important to be able to concentrate energy so that it is available for use where and when it is needed. For example, batteries are physically transportable energy storage devices, whereas electricity generated by power plants is transferred from place to place through distribution systems. Crosscutting Concepts: cause and effect; system and system models; energy and Matter.	<u>4-ESS3-1</u> Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.	<u>4-ESS3-1</u> <u>Energy Resources</u> ● Explain the difference between a renewable and a nonrenewable energy resource. ● Describe the effects of a particular energy resource on the environment.
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Arizona Science Standards				NGSS Code (s)	Inquisitive Lessons (Learning Targets)
Grade Level	Domain	Arizona Science Standard	Learning Progressions, Key Terms, and Crosscutting Concepts		
4	Earth and Space Science	4.E1U1.5 Use models to explain seismic waves and their effect on the Earth.	Waves of the same type can differ in amplitude (height of the wave) and wavelength (spacing between wave peaks). Waves can add or cancel one another as they cross, depending on their relative phase (i.e., relative position of peaks and troughs of the waves), but they emerge unaffected by each other. (Boundary: The discussion at this grade level is qualitative only; it can be based on the fact that two different sounds can pass a location in different directions without getting mixed up.) Earthquakes cause seismic waves, which are waves of motion in Earth's crust. Earth's major systems are the geosphere (solid and molten rock, soil, and sediments), the hydrosphere (water and ice), the atmosphere (air), and the biosphere (living things, including humans). These systems interact in multiple ways to affect Earth's surface materials and processes. The ocean supports a variety of ecosystems and organisms, shapes landforms, and influences climate. Winds and clouds in the atmosphere interact with the landforms to determine patterns of weather. Rainfall helps 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. Human activities affect Earth's systems and their interactions at its surface. (p. 181) Earth has changed over time. Understanding how landforms develop, are weathered (broken down into smaller pieces), and erode (get transported elsewhere) can help infer the history of the current landscape. Local, regional, and global patterns of rock formations reveal changes over time due to Earth	<u>2-ESS1-1</u> Use information from several sources to provide evidence that Earth events can occur quickly or slowly.	<i>The below Inquisitive lessons partially address this Arizona Science Standard.</i> <u>2-ESS1-1</u> Earth Changes Fast! ● Understand that elements and features on Earth (soil, sand, rocks, hills, mountains, rivers, lakes, and seas) change over time. ● Recognize that volcanic eruptions, earthquakes, and floods are examples of changes that happen quickly, and transform Earth's surface suddenly. <u>4-ESS2-2</u> Mapping Patterns ● Describe the positions of Earth's mountain ranges on the continents and the position of the ocean trenches. ● Describe the locations of volcanoes and earthquake activity and note that they are similar.
		4.E1U1.6 Plan and carry out an investigation to explore and explain the interactions between Earth's major systems and the impact on Earth's surface materials and processes.		<u>5-ESS2-1</u> Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact. <u>5-ESS2-2</u> Describe and graph the amounts of salt water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.	<i>The below Inquisitive lessons partially address this Arizona Science Standard.</i> <u>5-ESS2-1</u> Earth's Spheres ● Describe each of the four systems that combine to make up Earth. ● Give examples of things that form part of each system. <u>5-ESS2-2</u> Interacting Systems ● Describe how water evaporating and condensing in the atmosphere results in rainfall. ● Develop a model to explain how changes in one of Earth's systems (spheres) results in a change to one (or more) of the other systems.

		4.E1U1.7 Develop and/or revise a model using various rock types, fossil location, and landforms to show evidence that Earth's surface has changed over time.	forces, such as earthquakes. The presence and location of certain fossil types indicate the order in which rock layers were formed. (p. 178) Weather is the minute-by-minute to day-by-day variation of the atmosphere's condition on a local scale. Scientists record the patterns of the weather across different times and areas so that they can make predictions about what kind of weather might happen next. Climate describes the ranges of an area's typical weather	4-ESS1-1 Identify evidence from patterns in rock formations and fossils in rocks to support an explanation for changes in a landscape over time.	4-ESS1-1 Has the Earth Changed? ● Describe how Earth's surface changes over time. ● Use rock layers and the fossils found in them as evidence of Earth's changes.
		4.E1U1.8 Collect, analyze, and interpret data to explain weather and climate patterns.	conditions and the extent to which those conditions vary over years to centuries	3-ESS2-2 Obtain and combine information to describe climates in different regions of the world.	<i>The below Inquisitive lesson partially addresses this Arizona Science Standard.</i> 3-ESS2-2 What's Your Climate? ● Differentiate between the terms "weather" and "climate." ● Describe some of the climates found around the world.
		4.E1U3.9 Construct and support an evidence-based argument about the availability of water and its impact on life. Vertical Alignment: 2.E1U1.5, 2.E1U3.7	Water is found almost everywhere on Earth: as vapor; as fog or clouds in the atmosphere; as rain or snow falling from clouds; as ice, snow, and running water on land and in the ocean; and as groundwater beneath the surface. The downhill movement of water as it flows to the ocean shapes the appearance of the land. Nearly all of Earth's available water is in the ocean. Most freshwater is in glaciers or underground; only a tiny fraction is in streams, lakes, wetlands, and the atmosphere. 4 (p. 185) A variety of hazards result from natural processes (e.g., earthquakes, tsunamis, volcanic eruptions, severe weather, floods, coastal erosion). Humans cannot eliminate natural hazards but can take steps to reduce their impacts.	5-ESS3-1 Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.	<i>The below Inquisitive lesson partially addresses this Arizona Science Standard.</i> 5-ESS3-1 Water World ● Describe the relative amounts of salt water and freshwater found on Earth as well as the main sources of each. ● Represent the actual amounts of Earth's salt water and freshwater in a graphical way.

		4.E1U2.10 Define problem(s) and design solution(s) to minimize the effects of natural hazards.	Crosscutting Concepts: cause and effect; system and system models; energy and matter; stability and change	<u>5-ESS3-1</u> Obtain and combine information about ways individual communities use science ideas to protect the Earth’s resources and environment.	<i>The below Inquisitive lesson partially addresses this Arizona Science Standard.</i> <u>5-ESS3-1</u> Science to the Rescue! ● Describe the harmful effects on the environment of certain human activities. ● Give an example of a science-based action that has repaired or protected the environment.
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Arizona Science Standards				NGSS Code (s)	Inquisitive Lessons (Learning Targets)
Grade Level	Domain	Arizona Science Standard	Learning Progressions, Key Terms, and Crosscutting Concepts		
4	Life Science	4.L4U1.11 Analyze and interpret environmental data to demonstrate that species either adapt and survive, or go extinct over time.	When the environment changes in ways that affect a place's physical characteristics, temperature, or availability of resources, some organisms survive and reproduce, others move to new locations, yet others move into the transformed environment, and some die. 4 (p. 155) Fossils provide evidence about the types of organisms (both visible and microscopic) that lived long ago and also about the nature of their environments. Fossils can be compared with one another and to living organisms according to their similarities and differences. Changes in an organism's habitat are sometimes beneficial to it and sometimes harmful. For any particular environment, some kinds of organisms survive well, some survive less well, and some cannot survive at all. 4 (p. 165) Crosscutting Concepts: patterns; cause and effect; system and system models; energy and matter; stability and change	<u>3-LS4-1</u> Analyze and interpret data from fossils to provide evidence of the organisms and environments in which they lived long ago. <u>4-LS1-1</u> Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction. <u>4-LS1-2</u> 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.	<i>The below Inquisitive lessons partially address this Arizona Science Standard.</i> <u>3-LS4-1</u> <u>Fossil Stories</u> • Describe what a fossil is and name an example of one. • Give a simple explanation of how fossils are formed. • Give an example of the type of information we can obtain from a fossil. • Explain how the locations of fossils can tell us about changes to the environment over time. <u>4-LS1-1</u> <u>Plantific!</u> • Identify important external structures of a plant and describe their function. • Identify an important internal structure of a plant and describe its function. • Understand that plant structures work together as a connected system. <u>Survivors</u> • Identify different external structures of a variety of animals. • Explain how an external structure helps an animal to survive. <u>The Inside Story!</u> • Identify the position and the function of the heart, lungs, and brain in their body. • Explain how these structures, along with the nerves, work together to aid growth and survival. • Give examples of animals that have internal structures similar to and different from those in humans. <u>4-LS1-2</u> <u>Sensing Information</u> • Describe the senses as the ways in which an animal's brain receives information about the environment. • Use a model to identify each stage in the sequence of events, that begins with a change in an animal's environment, and ends with the brain directing the body to respond.

Arizona Science Standards				NGSS Code (s)	Inquisitive Lessons (Learning Targets)
Grade Level	Domain	Arizona Science Standard	Learning Progressions, Key Terms, and Crosscutting Concepts		
5	Physical Science	5.P1U1.1 Analyze and interpret data to explain that matter of any type can be subdivided into particles too small to see and, in a closed system, if properties change or chemical reactions occur, the amount of matter stays the same.	Matter of any type can be subdivided into particles that are too small to see, but even then, the matter still exists and can be detected by other means (e.g., by weighing or by its effects on other objects). For example, a model showing that gases are made from matter particles that are too small to see and are moving freely around in space can explain many observations, including the inflation and shape of a balloon; the effects of air on larger particles or objects (e.g., leaves in wind, dust suspended in air); and the appearance of visible scale water droplets in condensation, fog, and, by extension, also in clouds or the contrails of a jet. The amount (weight) of matter is conserved when it changes form, even in transitions in which it seems to vanish (e.g., sugar in solution, evaporation in a closed container).	<u>5-PS1-1</u> Develop a model to describe that matter is made of particles too small to be seen. <u>5-PS1-2</u> 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.	<u>5-PS1-1</u> <u>Too Small to Be Seen</u> - State that all matter is made of particles too small to see. - Describe differences among the particles in solids, liquids, and gases. - Use the movement of particles to explain observations of matter. <u>5-PS1-2</u> <u>Weighing Matter</u> - Understand that the weight of matter is always conserved, even when that matter undergoes change. - Use their own observations and measurements as evidence to support a claim.
		5.P1U1.2 Plan and carry out investigations to demonstrate that some substances combine to form new substances with different properties and others can be mixed without taking on new properties.	Measurements of a variety of properties (e.g., hardness, reflectivity) can be used to identify particular materials. (Boundary: At this grade level, mass and weight are not distinguished, and no attempt is made to define the unseen particles or explain the atomic-scale mechanism of evaporation and condensation.) When two or more different substances are mixed, a new substance with different properties may be formed; such occurrences depend on the substances and the temperature. No matter what reaction or change in properties occurs, the total weight of the substances does not change. (Boundary: Mass and weight are not distinguished at this grade level.) Other substances simply mix without changing permanently and can often be separated again. At room temperature, some substances are in the solid state, some in the	<u>5-PS1-4</u> Conduct an investigation to determine whether the mixing of two or more substances results in new substances.	<u>5-PS1-4</u> <u>Mixing Matter</u> - Use experimental observations to determine whether mixing substances has produced a new substance. - Identify variables that are changed or kept the same so that an experiment can be a fair test.

			liquid state and some in the gas state. The state of many substances can be changed by heating or cooling them. The amount of matter does not change when a solid melts or a liquid evaporates. Crosscutting Concepts: patterns; scale, proportion and quantity; energy and matter.		
5	Physical Science	5.P2U1.3 Construct an explanation using evidence to demonstrate that objects can affect other objects even when they are not touching.	Gravity is the universal attraction between all objects, however large or small, although it is only apparent when one of the objects is very large. This gravitational attraction keeps the planets in orbit around the Sun, the Moon round the Earth and their moons round other planets. On the Earth it results in everything being pulled down towards the center of the Earth. We call this downward attraction the weight of an object. Objects in contact exert forces on each other (friction, elastic pushes and pulls). Electric, magnetic, and gravitational forces between a pair of objects do not require that the objects be in contact-for example, magnets push pull at a distance. Crosscutting Concepts: cause and effect; scale, proportion and quantity; system and system models.	<u>3-PS2-1</u> Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.	<i>The below Inquisitive lessons partially address this Arizona Science Standard.</i> <u>3-PS2-1</u> <u>Move It!</u> ● Identify a force as a push or a pull. ● Use arrows to represent the magnitude and direction of a force. <u>Falling With Style!</u> ● Describe the forces of gravity and air resistance. ● Use arrows to accurately represent gravity and air resistance in a specific situation. ● Explain how the shape of an object affects the amount of air resistance it experiences.

5	Physical Science	5.P3U1.4 Obtain, analyze, and communicate evidence of the effects that balanced and unbalanced forces have on the motion of objects.	Each force acts on one particular object and has both a strength and a direction. An object at rest typically has multiple forces acting on it, but they add to give zero net force on the object. Forces that do not sum to zero can cause changes in the object's speed or direction of motion. (Boundary: Qualitative and conceptual, but not quantitative addition of forces are used at this level.) The patterns of an object's motion in various situations can be observed and measured; when past motion exhibits a regular pattern, future motion can be predicted from it. (Boundary: Technical terms, such as magnitude, velocity, momentum, and vector quantity, are not introduced at this level, but the concept that some quantities need both size and direction to be described is developed.) How quickly an object's motion is changed depends on the force acting and the object's mass. The greater the mass of an object, the longer it takes to speed it up or slow it down, a property of mass described as inertia.	3-PS2-1 Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.	<i>The below Inquisitive lessons partially address this Arizona Science Standard.</i> 3-PS2-1 Balancing Forces ● Identify when the forces on an object are balanced or unbalanced. ● Explain how balanced and unbalanced forces affect an object's motion. ● Use arrows to represent balanced and unbalanced forces. Forceful Friction ● Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object. ● Describe and represent how friction affects the motion of an object. ● Use force concepts, including friction, to explain experimental observations.
		5.P3U2.5 Define problems and design solutions pertaining to force and motion.	Crosscutting Concepts: cause and effect; energy and matter	3-PS2-1 Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.	<i>The below Inquisitive lesson partially addresses this Arizona Science Standard.</i> 3-PS2-1 Balancing Forces ● Identify when the forces on an object are balanced or unbalanced. ● Explain how balanced and unbalanced forces affect an object's motion. ● Use arrows to represent balanced and unbalanced forces.

5	Physical Science	5.P4U1.6 Analyze and interpret data to determine how and where energy is transferred when objects move.	The faster a given object is moving, the more energy it possesses. Energy can be moved from place to place by moving objects or through sound, light, or electric currents. (Boundary: At this grade level, no attempt is made to give a precise or complete definition of energy.) 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. For example, energy radiated from the sun is transferred to Earth by light. When this light is absorbed, it warms Earth's land, air, and water and facilitates plant growth. 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 (e.g., moving water driving a spinning turbine which generates electric currents). Crosscutting Concepts: patterns; cause and effect; energy and matter.	4-PS3-3 Ask questions and predict outcomes about the changes in energy that occur when objects collide.	<i>The below Inquisitive lesson partially addresses this Arizona Science Standard.</i> 4-PS3-3 When Objects Collide ● Identify and give examples of instances of how motion energy is transferred through collisions. ● Explain that some of the motion energy in a collision is transformed into sound and heat.
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Arizona Science Standards				NGSS Code (s)	Inquisitive Lessons (Learning Targets)
Grade Level	Domain	Arizona Science Standard	Learning Progressions, Key Terms, and Crosscutting Concepts		
5	Earth and Space Science	5.E2U1.7 Develop, revise, and use models based on evidence to construct explanations about the movement of the Earth and Moon within our solar system.	The Earth moves round the Sun taking about a year for one orbit. The Moon orbits the Earth taking about four weeks to complete an orbit. The Sun, at the center of the solar system, is the only object in the solar system that is a source of visible light. The Moon reflects light from the Sun and as it moves round the Earth only those parts illuminated by the Sun are seen. The Earth rotates about an axis lying north to south and this motion makes it appear that the Sun, Moon and stars are moving round the Earth. The orbits of Earth around the sun and of the moon around Earth, together with the rotation of Earth about an axis between its North and South poles, cause observable patterns. Some objects in the solar system can be seen with the naked eye. Planets in the night sky change positions and are not always visible from Earth as they orbit the sun. Stars appear in patterns called constellations, which can be used for navigation and appear to move together across the sky because of Earth's rotation. Crosscutting Concepts: patterns; system and system models		<i>Inquisitive does not currently have content for this Arizona Science Standard.</i>

		5.E2U1.8 Obtain, analyze, and communicate evidence to support an explanation that the gravitational force of Earth on objects is directed toward the planet's center.	Gravity is the universal attraction between all objects, however large or small, although it is only apparent when one of the objects is very large. On the Earth it results in everything being pulled down towards the center of the Earth. We call this downward attraction the weight of an object. The gravitational force of Earth acting on an object near Earth's surface pulls that object toward the planet's center. Crosscutting Concepts: cause and effect; scale, proportion, and quantity.	5-PS2-1 Support an argument that the gravitational force exerted by Earth on objects is directed down.	5-PS2-1 Goin' Down! ● Explain that objects near Earth's surface fall downward because the force of gravity is pulling them toward the planet's center. ● Carry out an investigation and record observations. ● Make a claim and use evidence and reasoning to support it. ● Evaluate the validity of a claim based on evidence presented.
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Arizona Science Standards				NGSS Code (s)	Inquisitive Lessons (Learning Targets)
Grade Level	Domain	Arizona Science Standard	Learning Progressions, Key Terms, and Crosscutting Concepts		
5	Life Science	5.L3U1.9 Obtain, evaluate, and communicate information about patterns between the offspring of plants, and the offspring of animals (including humans); construct an explanation of how genetic information is passed from one generation to the next.	Many characteristics of organisms are inherited from their parents. Other characteristics result from individuals' interactions with the environment, which can range from diet to learning. Many characteristics involve both inheritance and environment. The environment also affects the traits that an organism develops—differences in where they grow or in the food they consume may cause organisms that are related to end up looking or behaving differently. When the environment changes in ways that affect a place's physical characteristics, temperature, or availability of resources, some organisms survive and reproduce, others move to new locations, yet others move into the transformed environment, and some die. Offspring acquire a mix of traits from their biological parents. Different organisms vary in how they look and function because they have different inherited information. In each kind of organism there is variation in the traits themselves, and different kinds of organisms may have different versions of the trait. The environment also affects the traits that an organism develops—differences in where they grow or in the food they consume may cause organisms that are related to end up looking or behaving differently. Crosscutting Concepts: patterns; cause and effect; structure and function; stability and change	<u>3-LS3-1</u> Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.	<i>The below Inquisitive lessons partially address this Arizona Science Standard.</i> <u>3-LS3-1</u> <u>Variation of Traits</u> - Analyze and interpret data to provide evidence of the shared traits and variations in traits that occur in a species. <u>Inherited Traits</u> - Identify and use evidence to support the idea that offspring inherit traits from their parents. - Identify and use evidence to support the idea that siblings with the same parents will have variations in their traits.

		5.L3U1.10 Construct an explanation based on evidence that the changes in an environment can affect the development of the traits in a population of organisms.		<u>3-LS3-2</u> Use evidence to support the explanation that traits can be influenced by the environment.	<i>The below Inquisitive lesson partially addresses this Arizona Science Standard.</i> <u>3-LS3-2</u> <u>Can the Environment Affect Traits?</u> ● Identify and use evidence to support the idea that the environment of a living thing can affect both its physical and behavioral traits.
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5	Life Science	5.L4U3.11 Obtain, evaluate, and communicate evidence about how natural and human-caused changes to habitats or climate can impact populations.	Changes in an organism's habitat are sometimes beneficial to it and sometimes harmful. For any particular environment, some kinds of organisms survive well, some survive less well, and some cannot survive at all. Scientists have identified and classified many plants and animals. Populations of organisms live in a variety of habitats and change in those habitats affects the organisms living there. Humans, like all other organisms, obtain living and nonliving resources from their environments. Crosscutting Concepts: patterns; cause and effect; stability and change.	<u>K-ESS3-3</u> Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment. <u>5-ESS3-1</u> Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.	<u>K-ESS3-3</u> <u>Helping Earth</u> ● Describe how people affect the land, water, air, and other living things in the local environment in positive and negative ways. ● Communicate solutions that will reduce the impact of humans on the land, water, air, and other living things in the local community. <u>5-ESS3-1</u> <u>Science to the Rescue!</u> ● Describe the harmful effects on the environment of certain human activities. ● Give an example of a science-based action that has repaired or protected the environment.
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		5.L4U3.12 Construct an argument based on evidence that inherited characteristics can be affected by behavior and/or environmental conditions.	Sometimes the differences in characteristics between individuals of the same species provide advantages in surviving, finding mates, and reproducing. Many characteristics of organisms are inherited from their parents. Other characteristics result from individuals' interactions with the environment, which can range from diet to learning. Many characteristics involve both inheritance and environment. Crosscutting Concepts: patterns; cause and effect; stability and change.	3-LS3-2 Use evidence to support the explanation that traits can be influenced by the environment. 3-LS4-2 Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates and reproducing.	<i>The below Inquisitive lessons partially address this Arizona Science Standard.</i> 3-LS3-2 Can the Environment Affect Traits? ● Identify and use evidence to support the idea that the environment of a living thing can affect both its physical and behavioral traits. 3-LS4-2 What's My Advantage ● Use evidence to construct an explanation for why a variation in a trait gives certain individuals in a species a survival advantage.
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