

Mystery Science Alignment with the Virginia Science Standards of Learning (2018)

Mystery Science - Virginia Alignment
Mystery Science aligns to the new Virginia Science Standards of Learning (2018). The core lesson (exploration & activity) is designed to take one hour per week. To view each lesson's alignment to 3 dimensional learning (disciplinary core ideas, science and engineering practices, and crosscutting concepts) view our NGSS Alignment document. Mini-lessons are 5-minute videos that answer K-5 student questions and can be used as a jumping off point to engage learners for a full lesson planned by the teacher.

> ***Lesson Extensions.*** Extensions are available for each lesson and offer an opportunity for students to continue their science content learning. They include assessments and a curated collection of additional activity suggestions, online resources, project ideas, and readings to help extend the learning.

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MYSTERY science

Kindergarten

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Strand	Topic	Virginia Standard *Students will investigate and understand that...*	Mystery Science Unit	Mystery Science Lessons
Life Science	*Living Systems & Processes*	**K.5** Senses allow humans to seek, find, take in, and react or respond to different information. Key ideas include: (a) the five basic senses correspond to specific human body structures; and (b) senses are used in our daily lives.		*Virginia Specific Standard*
		K.6 There are differences between living organisms and non-living objects. Key ideas include: (a) all things can be classified as living or non-living; and (b) living organisms have certain characteristics that distinguish them from nonliving objects.		*Virginia Specific Standard*
		K.7 Plants and animals have basic needs and life processes. Key ideas include: (a) living things need adequate food, water, shelter, air, and space to survive; (b) plants and animals have life cycles; and (c) offspring of plants and animals are similar but not identical to their parents or to one another.	Plant & Animal Secrets Plant & Animal Superpowers	**Lesson 1:** Why do woodpeckers peck wood? **Lesson 2, Read Along:** Where do animals live? **Lesson 3:** How can you find animals in the woods? **Lesson 4, Read Along:** How do animals make their homes in the forest? **Lesson 5:** How do plants and trees grow? **Lesson 6, Read Along:** Why would you want an old log in your backyard? **Lesson 4:** Why do family members look alike?



MYSTERY science

Kindergarten, continued

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Strand	Topic	Virginia Standard *Students will investigate and understand that...*	Mystery Science Unit	Mystery Science Lessons
Earth & Space Science	*Earth & Space Systems*	**K.8** Light influences temperature on Earth's surfaces and can cause shadows. Key ideas include: (a) the sun provides light and warms Earth's surfaces; (b) shadows can be produced when sunlight or artificial light is blocked by an object; and (c) objects in shadows and objects in sunlight have different temperatures.	Weather Watching	**Lesson 5:** How could you warm up a frozen playground? **Lesson 6, Read Along:** How could you walk barefoot across hot pavement without burning your feet?
		K.9 There are patterns in nature. Key patterns include: (a) daily weather; (b) seasonal changes; and (c) day and night.	Weather Watching	**Lesson 1:** Have you ever watched a storm? **Lesson 2, Read Along:** How can you get ready for a big storm? **Lesson 3:** What will the weather be like on your birthday? **Lesson 4:** How do you know what to wear for the weather?
		K.10 Change occurs over time. Key ideas include: (a) natural and human-made things change over time; (b) living and non-living things change over time; (c) changes can be observed and measured; and (d) changes may be fast or slow.		
	Earth's Resources	**K.11** Humans use resources. Key ideas include: (a) some materials and objects can be used over and over again; (b) materials can be recycled; and (c) choices we make impact the air, water, land, and living things.		



MYSTERY science

Kindergarten, continued

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Strand	Topic	Virginia Standard *Students will investigate and understand that...*	Mystery Science Unit	Mystery Science Lessons
Physical Science	*Force, Motion, & Energy*	**K.2** Pushes and pulls affect the motion of objects. Key ideas include: (a) pushes and pulls cause an object to move; (b) pushes and pulls can change the direction of an object; and (c) changes in motion are related to the strength of the push or pull.	Force Olympics	**Lesson 1:** What's the biggest excavator? **Lesson 2, Read Along:** Why do builders need so many big machines? **Lesson 3:** How can you knock down a wall made of concrete? **Lesson 4, Read Along:** How can you knock down the most bowling pins? **Lesson 5:** How can we protect a mountain town from falling rocks? **Lesson 6, Read Along:** How could you invent a trap?
	Matter	**K.3** Physical properties of an object can be described. Properties include (a) colors; (b) shapes and forms; (c) textures and feels; and (d) relative sizes and weights of objects.		*Virginia specific standard*
		K.4 Water is important in our daily lives and has properties. Key ideas include: (a) water has many uses; (b) water can be found in many places; (c) water occurs in different phases; and (d) water flows downhill.		*Virginia specific standard*



MYSTERY science

Grade 1

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Strand	Topic	Virginia Standard *Students will investigate and understand that...*	Mystery Science Unit	Mystery Science Lessons
Life Science	*Living Systems & Processes*	**1.4** Plants have basic life needs and functional parts that allow them to survive. Key ideas include: (a) plants need nutrients, air, water, light, and a place to grow; (b) structures of plants perform basic functions; and (c) plants can be classified based on a variety of characteristics.	Plant & Animal Superpowers Plant Adventures	**Lesson 5:** Why don't trees blow down in the wind? **Lesson 6, Read Along:** What do sunflowers do when you're not looking? **Lesson 1:** How did a tree travel halfway around the world? **Lesson 2:** Could a plant survive without light? **Lesson 3:** Why do trees grow so tall? **Lesson 4:** Should you water a cactus? **Lesson 5:** Where do plants grow best?
		1.5 Animals, including humans, have basic life needs that allow them to survive. Key ideas include: (a) animals need air, food, water, shelter, and space (habitat); (b) animals have different physical characteristics that perform specific functions; and (c) animals can be classified based on a variety of characteristics.	Plant & Animal Superpowers Animal Adventures	**Lesson 1:** Why do birds have beaks? **Lesson 2, Read Along:** Why do baby ducks follow their mother? **Lesson 3:** Why are polar bears white? **Lesson 1:** How many different kinds of animals are there?
Earth & Space Science	*Earth & Space Systems*	**1.6** There is a relationship between the Sun and Earth. Key ideas include: (a) the Sun is the source of energy and light that warms the Earth's land, air, and water; and (b) the sun's relative position changes in the Earth's sky throughout the day.	Spinning Sky	**Lesson 1:** Could a statue's shadow move? **Lesson 2, Read Along:** What does your shadow do when you're not looking? **Lesson 3:** How can the sun help you if you're lost?



MYSTERY science

Grade 1, continued

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Strand	Topic	Virginia Standard *Students will investigate and understand that...*	Mystery Science Unit	Mystery Science Lessons
Earth & Space Science (*Cont.*)	*Earth & Space Systems*	**1.7** There are weather and seasonal changes. Key ideas include: (a) changes in temperature, light, and precipitation occur over time; (b) there are relationships between daily weather and the season; and (c) changes in temperature, light, and precipitation affect plants and animals, including humans.	Spinning Sky	**Lesson 4, Read Along:** Why do you have to go to bed early in the summer? **Lesson 5:** Why do the stars come out at night? **Lesson 6, Read Along:** How can the stars help you if you get lost?
	Earth's Resources	**1.8** Natural resources can be used responsibly. Key ideas include: (a) most natural resources are limited; (b) human actions can affect the availability of natural resources; and (c) reducing, reusing, and recycling are ways to conserve natural resources.	Mini-lessons	**Mini-lessons:** How is plastic made?
Physical Science	*Force, Motion, & Energy*	**1.2** Objects can move in different ways. Key ideas include: (a) objects may have straight, circular, spinning, and back-and-forth motions; and (b) objects may vibrate and produce sound.	Lights & Sounds	**Lesson 1:** How do they make silly sounds in cartoons? **Lesson 2, Read Along:** Where do sounds come from?
	Matter	**1.3** Objects are made from materials that can be described by their physical properties. Key ideas include: (a) objects are made of one or more materials with different physical properties and can be used for a variety of purposes; (b) when a material is changed in size most physical properties remain the same; and (c) the type and amount of material determine how much light can pass through an object.	Lights & Sounds	**Lesson 3:** What if there were no windows? **Lesson 4, Read Along:** Can you see in the dark? **Lesson 5:** How could you send a secret message to someone far away? **Lesson 6, Read Along:** How do boats find their way in the fog?



MYSTERY science

Grade 2

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Strand	Topic	Virginia Standard *Students will investigate and understand that...*	Mystery Science Unit	Mystery Science Lessons
Life Science	*Living Systems & Processes*	**2.5** Living things are a part of a system. Key ideas include (a) plants and animals are interdependent with their living and nonliving surroundings; (b) an animal's habitat provides all of its basic needs; and (c) habitat change over time due to many influences.	Animal Adventures Mini-lessons	**Lesson 2:** Why do frogs say "ribbit"? **Lesson 3:** How could you get more birds to visit a bird feeder? **Mini-lesson:** Why do animals come back after going to warm places in the winter? **Mini-lesson:** Why can't fish breathe on land? **Mini-lesson:** Where do bugs go in winter?
		2.4 Plants and animals undergo a series of orderly changes as they grow and develop. Key ideas include: (a) animals have life cycles; and (b) plants have life cycles.	Power of Flowers* Mini-lessons	**Lesson 1:** Why do plants grow flowers? **Lesson 2:** Why do plants give us fruit? **Lesson 3:** Why are some apples red and some green? **Lesson 4:** How could you make the biggest fruit in the world? **Mini-lesson:** How do flowers bloom in the spring?** **Mini-lesson:** Why do leaves change color in the fall?** **Mini-lesson:** Why do birds lay eggs in the spring?
Earth & Space Science	*Earth & Space Systems*	**2.6** There are different types of weather on Earth. Key ideas include: (a) different types of weather have specific characteristics; (b) measuring, recording, and interpreting weather data allows for identification of weather patterns; and (c) tracking weather allows us to prepare for the weather and storms.	Stormy Skies	**Lesson 1:** Where do clouds come from? **Lesson 2:** How can we predict when it's going to storm? **Lesson 4:** How can you keep a house from blowing away in a windstorm?
		2.7 Weather patterns and seasonal changes affect plants, animals, and their surroundings. Key ideas include: (a) weather and seasonal changes affect the growth and behavior of living things; (b) wind and weather can change the land; and (c) changes can happen quickly or slowly over time.	Work of Water	**Lesson 1:** If you floated down a river, where would you end up? **Lesson 2:** Why is there sand at the beach? **Lesson 3:** What's strong enough to make a canyon? **Lesson 4:** How can you stop a landslide?

* Power of Flowers picks up where Plant Adventures (Virginia Grade 1) leaves off. If your students haven't learned about what plants need for survival, or need a refresher, we suggest you teach Plant Adventures first.
** Indicates a mini-lesson with an included hands-on STEAM activity from Mystery Science.



MYSTERY science

Grade 2, continued

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Strand	Topic	Virginia Standard *Students will investigate and understand that...*	Mystery Science Unit	Mystery Science Lessons
Earth & Space Science (*Cont.*)	*Earth Resources*	**2.8** Plants are important natural resources. Key ideas include: (a) the availability of plant products affects the development of a geographical area; (b) plants provide oxygen, homes, and food for many animals; and (c) plants can help reduce the impact of wind and water.		*Virginia specific standard*
Physical Science	*Force, Motion, & Energy*	**2.2** Different types of forces may cause an object's motion to change. Key ideas include: (a) forces from direct contact can cause an object to move; (b) some forces, including gravity can cause an object to move; and (c) forces have applications in our lives.	Mini-lessons	**Mini-lesson:** Why can't airplanes fly to space?**
	Matter	**2.3** Matter can exist in different phases. Key ideas include: (a) matter has mass and takes up space; (b) solids, liquids, and gases have different characteristics; and (c) heating and cooling can change the phases of matter.	Material Magic Stormy Skies Mini-lessons	**Lesson 1:** Why do we wear clothes? **Lesson 2:** Can you really fry an egg on a hot sidewalk? **Lesson 3:** Why are so many toys made out of plastic? **Lesson 4:** What materials might be invented in the future? **Lesson 5:** Could you build a house out of paper? **Lesson 1:** Where do clouds come from? **Mini-lesson:** How is glass made? **Mini-lesson:** How are diamonds made?

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MYSTERY science

Grade 3

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Strand	Topic	Virginia Standard *Students will investigate and understand that...*	Mystery Science Unit	Mystery Science Lessons
Life Science	*Living Systems & Processes*	**3.4** Adaptations allow organisms to satisfy life needs and respond to the environment. Key ideas include: (a) populations may adapt over time; (b) adaptations may be behavioral or physical; and (c) fossils provide evidence about the types of organisms that lived long ago as well as the nature of their environments.	Animals Through Time Mini-lessons	**Lesson 1:** Where can you find whales in a desert? **Lesson 2:** How do we know what dinosaurs looked like? **Lesson 3:** Can you outrun a dinosaur? **Lesson 4:** What kinds of animals might there be in the future? **Lesson 5:** Can selection happen without people? **Lesson 6:** Why do dogs wag their tails? **Lesson 7:** What's the best way to get rid of mosquitoes? **Lesson 8:** How long can people (and animals) live in outer space? **Mini-lesson:** What is the biggest spider in the world?** **Mini-lesson:** Why are butterflies so colorful?** **Mini-lesson:** Why do baby animals look so cute? **Mini-lesson:** Why do zebras have stripes? **Mini-lesson:** Where do bugs go in winter? **Mini-lesson:** Why do we have eyebrows?
		3.5 Aquatic and terrestrial ecosystems support a diversity of organisms. Key ideas include: (a) ecosystems are made up of living and nonliving components of the environment; and (b) relationships exist among organisms in an ecosystem.		
Earth & Space Science	*Earth & Space Systems*	**3.6** Soil is important in ecosystems. Key ideas include: (a) soil, with its different components, is important to organisms; and (b) soil provides support and nutrients necessary for plant growth.		*Virginia specific standard*
		3.7 There is a water cycle and water is important to life on Earth. Key ideas include: (a) there are many reservoirs of water on Earth; (b) the energy from the sun drives the water cycle; and (c) the water cycle involves specific processes.	Watery Planet*	**Lesson 1:** How much water is in the world? **Lesson 2:** When you turn on the faucet, where does the water come from? **Lesson 3:** Can we make it rain?

* Watery Planet was designed for Grade 5 NGSS, but can be taught in Grade 3 with modifications. Expect aspects of this unit to be challenging for Grade 3.
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MYSTERY science

Grade 3, continued

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Earth & Space Science (*Cont.*)	*Earth Resources*	**3.8** Natural events and humans influence ecosystems. Key ideas include: (a) human activity affects the quality of air, water, and habitats; (b) water is limited and needs to be conserved; (c) fire, flood, disease, and erosion affect ecosystems; and (d) soil is a natural resource and should be conserved.	Watery Planet* Mini-lessons	**Lesson 4:** How can you save a town from a hurricane? **Mini-lesson:** Why is it so hard for firefighters to put out wildfires?
Physical Science	*Force, Motion, & Energy*	**3.2** The direction and size of force affects the motion of an object. Key ideas include: (a) multiple forces many act on an object; (b) the net force of an object determines how an object moves; (c) simple machines increase or change the direction of a force; and (d) simple and compound machines have many applications.	Invisible Forces	**Lesson 1:** How could you win a tug-of-war against a bunch of adults? **Lesson 2:** What makes bridges so strong? **Lesson 3:** How can you go faster down a slide? **Lesson 4:** What can magnets do? **Lesson 5:** How can you unlock a door using a magnet?
	Matter	**3.3** Materials interact with water. Key ideas include: (a) solids and liquids mix with water in different ways; and (b) many solids dissolve more easily in hot water than in cold water.		*Virginia specific standard*

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MYSTERY science

Grade 4

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Strand	Topic	Virginia Standard *Students will investigate and understand that...*	Mystery Science Unit	Mystery Science Lessons
Life Science	*Living Systems & Processes*	**4.2** Plants and animals have structures that distinguish them from one another and play vital roles in their ability to survive. Key ideas include: (a) the survival of plants and animals depends on photosynthesis; (b) plants and animals have different structures and processes for obtaining energy; and (c) plants and animals have different structures and processes for creating offspring.	Human Machine Mini-lessons	**Lesson 1:** Why do your biceps bulge? **Lesson 2:** What do people who are blind see? **Lesson 3:** How can some animals see in the dark? **Lesson 4:** How does your brain control your body? **Mini-lesson:** How does your heart pump blood?** **Mini-lesson:** Why do our skeletons have so many bones?**
		4.3 Organisms, including humans, interact with one another and with the nonliving components in the ecosystem. Key ideas include: (a) interrelationships exist in populations, communities, and ecosystems; (b) food webs show the flow of energy within an ecosystem; (c) changes in an organism's niche and habitat may occur at various stages in its life cycle; and (d) classification can be used to identify organisms.	Web of Life	**Lesson 1:** Why would a hawk move to New York City? **Lesson 2:** What do plants eat? **Lesson 3:** Where do fallen leaves go? **Lesson 4:** Do worms really eat dirt? **Lesson 5:** Why do you have to clean a fish tank but not a pond? **Lesson 6:** Why did the dinosaurs go extinct?

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MYSTERY science

Grade 4, continued

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Earth & Space Science	*Earth & Space Systems*	**4.4** Weather conditions and phenomena affect ecosystems and can be predicted. Key ideas include: (a) weather measurements create a record that can be used to make weather predictions; (b) common and extreme weather events affect ecosystems; and (c) long term seasonal weather trends determine the climate of the region.	Stormy Skies Mini-lessons	**Lesson 3:** Why are some places always hot? **Mini-lesson:** What's worse: a hurricane or a tornado? **Mini-lesson:** What makes hurricanes so dangerous? **Mini-lesson:** Why are tornadoes so hard to predict?
		4.5 The planets have characteristics and a specific place in the solar system. Key ideas include: (a) planets rotate on their axes and revolve around the sun; (b) planets have characteristics and a specific order in the solar system; and (c) the sizes of the sun and planets can be compared to one another.	Spaceship Earth	**Lesson 1:** How fast does the Earth spin? **Lesson 2:** Who set the first clock? **Lesson 3:** How can the Sun tell you the season? **Lesson 4:** Why do the stars change with the seasons? **Lesson 5:** Why does the Moon change shape? **Lesson 6:** What are the wandering stars? **Lesson 7:** Why is gravity different on other planets? **Lesson 8:** Could there be life on other planets?
		4.6 There are relationships among Earth, the moon, and the sun. Key relationships include: (a) the motions of Earth, the moon, and the sun; (b) the causes for Earth's seasons; (c) the causes for the four major phases of the moon and the relationship to the tide cycles; and (d) the relative size, position, age, and makeup of Earth, the moon, and the sun.	Mini-lessons	**Mini-lesson:** How often do eclipses happen? **Mini-lesson:** Why are people making such a big deal about the solar eclipse? **Mini-lesson:** Why does the moon turn blood red during a lunar eclipse?
		4.7 The ocean environment has characteristics. Key characteristics include: (a) geology of the ocean floor; (b) physical properties and movement of ocean water; and (c) interaction of organisms in the ocean.	Mini-lessons	**MIni-Lesson:** How deep does the ocean go? **Mini-lesson:** Why is the ocean salty?
	Earth Resources	**4.8** Virginia has important natural resources. Key resources include: (a) watersheds and water; (b) plants and animals; (c) minerals, rocks, and ores; and (d) forests, soil, and land.		*Virginia specific standard*



MYSTERY science

Grade 5

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Strand	Topic	Virginia Standard *Students will investigate and understand that...*	Mystery Science Unit	Mystery Science Lessons
Earth & Space Science	*Earth & Space Systems*	**5.8** Earth constantly changes. Key ideas include: (a) Earth's internal energy causes movement of material within the Earth; (b) plate tectonics describe movement of the crust; (c) the rock cycle models the transformation of rocks; (d) processes such as weathering, erosion, and deposition change the surface of the Earth; and (e) fossils and geologic patterns provide evidence of Earth's change.	The Birth of Rocks Mini-lessons	**Lesson 1:** Could a volcano pop up where you live? **Lesson 2:** Why do some volcanoes explode? **Lesson 3:** Will a mountain last forever? **Lesson 4:** How could you survive a landslide? **Mini-lesson:** How do earthquakes happen? **Mini-lesson:** Can you make lava?'
	Earth Resources	**5.9** The conversion of energy resources is important. Key ideas include: (a) some sources of energy are considered renewable and others are not; (b) individuals and communities have means of conserving both energy and matter; and (c) advances in technology improve the ability to transfer and transform energy.	Energizing Everything	**Lesson 8:** Where does energy come from?
Physical Science	*Force, Motion, & Energy*	**5.2** Energy can take many forms. Key ideas include: (a) energy is the ability to do work or to cause change; (b) there are many different forms of energy; (c) energy can be transformed; and (d) energy is conserved.	Energizing Everything	**Lesson 1:** How is your body similar to a car? **Lesson 2:** What makes roller coasters go so fast? **Lesson 3:** Why is the first hill of a roller coaster always the highest? **Lesson 4:** Could you knock down a building using only dominoes? **Lesson 5:** Can you build a chain reaction machine? **Lesson 6:** What if there were no electricity? **Lesson 7:** How long did it take to travel across the country before cars and planes? **Lesson 8:** Where does energy come from?
		5.3 There is a relationship between force and energy of moving objects. Key ideas include: (a) moving objects have kinetic energy; (b) motion is described by an object's direction and speed; (c) changes in motion are related to net force and mass; (d) when objects collide, the contact forces transfer energy and can change; and (e) friction is a force that opposes motion.		
		5.4 Electricity is transmitted and used in daily life. Key ideas include: (a) electricity flows easily through conductors but not insulators; (b) electricity flows through closed circuits; (c) static electricity can be generated by rubbing certain materials together; (d) electrical energy can be transformed into radiant, mechanical, and thermal energy; and (e) a current flowing through a wire creates a magnetic field.		



MYSTERY science

Grade 5, continued

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Physical Science ***(Cont.)***	*Force, Motion, & Energy* *(Continued)*	**5.5** Sound can be produced and transmitted. Key ideas include: (a) sound is produced when an object or substance vibrates; (b) sound is the transfer of energy; (c) different media transmit sound differently; (d) sound waves have many uses and applications.	Waves of Sound	**Lesson 1:** How far can a whisper travel? **Lesson 2:** What would happen if you screamed in outer space? **Lesson 3:** Why are some sounds high and some sounds low?
		5.6 Visible light has certain characteristics and behaves in predictable ways. Key ideas include: (a) visible light is radiant energy that moves in transverse waves; (b) the visible spectrum includes light with different wavelengths; (c) matter influences the path of light; and (d) radiant energy can be transformed into thermal, mechanical, and electrical energy.	Mini-lessons	**Mini-lesson:** How is a rainbow made?** **Mini-lesson:** Why is the sky blue?
	Matter	**5.7** Matter has properties and interactions. Key ideas include: (a) matter is composed of atoms; substances can be mixed together without changes to their physical properties; and (c) energy has an effect on the phases of matter.	Chemical Magic	**Lesson 1:** Are magic potions real? **Lesson 2:** Could you transform something worthless into gold? **Lesson 3:** What would happen if you drank a glass of acid? **Lesson 4:** What do fireworks, rubber, and silly putty have in common? **Lesson 5:** Why do some things explode?

** Indicates a mini-lesson with an included hands-on STEAM activity from Mystery Science.