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 Mystery (exploration & activity) is designed to take one hour per week. Optional Extras can extend each lesson. To view each Mystery'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.

Have extra time? "Optional Extras" are extensions to each Mystery. We recommend you use them during your unit or to extend the length of each unit. They include an informational text reading that builds on the Mystery's topic, assessments, and suggestions for supplemental activities.

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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	**Mystery 1:** Why do woodpeckers peck wood? **Mystery 2, Read Along:** Where do animals live? **Mystery 3:** How can you find animals in the woods? **Mystery 4, Read Along:** How do animals make their homes in the forest? **Mystery 5:** How do plants and trees grow? **Mystery 6, Read Along:** Why would you want an old log in your backyard? **Mystery 4:** Why do family members look alike?

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	**Mystery 5:** How could you warm up a frozen playground? **Mystery 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	**Mystery 1:** Have you ever watched a storm? **Mystery 2, Read Along:** How can you get ready for a big storm? **Mystery 3:** What will the weather be like on your birthday? **Mystery 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.		

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	**Mystery 1:** What's the biggest excavator? **Mystery 2, Read Along:** Why do builders need so many big machines? **Mystery 3:** How can you knock down a wall made of concrete? **Mystery 4, Read Along:** How can you knock down the most bowling pins? **Mystery 5:** How can we protect a mountain town from falling rocks? **Mystery 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*

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	**Mystery 5:** Why don't trees blow down in the wind? **Mystery 6, Read Along:** What do sunflowers do when you're not looking? **Mystery 1:** How did a tree travel halfway around the world? **Mystery 2:** Do plants eat dirt? **Mystery 3:** Why do trees grow so tall? **Mystery 4:** Should you water a cactus? **Mystery 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	**Mystery 1:** Why do birds have beaks? **Mystery 2, Read Along:** Why do baby ducks follow their mother? **Mystery 3:** Why are polar bears white? **Mystery 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	**Mystery 1:** Could a statue's shadow move? **Mystery 2, Read Along:** What does your shadow do when you're not looking? **Mystery 3:** How can the sun help you if you're lost?

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	**Mystery 4, Read Along:** Why do you have to go to bed early in the summer? **Mystery 5:** Why do the stars come out at night? **Mystery 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	**Mystery 1:** How do they make silly sounds in cartoons? **Mystery 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	**Mystery 3:** What if there were no windows? **Mystery 4, Read Along:** Can you see in the dark? **Mystery 5:** How could you send a secret message to someone far away? **Mystery 6, Read Along:** How do boats find their way in the fog?

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	**Mystery 2:** Why do frogs say "ribbit"? **Mystery 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	**Mystery 1:** Why do plants grow flowers? **Mystery 2:** Why do plants give us fruit? **Mystery 3:** Why are some apples red and some green? **Mystery 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	**Mystery 1:** Where do clouds come from? **Mystery 2:** How can we predict when it's going to storm? **Mystery 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	**Mystery 1:** If you floated down a river, where would you end up? **Mystery 2:** Why is there sand at the beach? **Mystery 3:** What's strong enough to make a canyon? **Mystery 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.
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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	**Mystery 1:** Why do we wear clothes? **Mystery 2:** Can you really fry an egg on a hot sidewalk? **Mystery 3:** Why are so many toys made out of plastic? **Mystery 4:** What materials might be invented in the future? **Mystery 5:** Could you build a house out of paper? **Mystery 1:** Where do clouds come from? **Mini-Lessons:** How is glass made? **Mini-Lessons:** How are diamonds made?

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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	**Mystery 1:** Where can you find whales in a desert? **Mystery 2:** How do we know what dinosaurs looked like? **Mystery 3:** Can you outrun a dinosaur? **Mystery 4:** What kinds of animals might there be in the future? **Mystery 5:** Can selection happen without people? **Mystery 6:** Why do dogs wag their tails? **Mystery 7:** What's the best way to get rid of mosquitoes? **Mystery 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*	**Mystery 1:** How much water is in the world? **Mystery 2:** When you turn on the faucet, where does the water come from? **Mystery 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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Grade 3, 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*	**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	**Mystery 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	**Mystery 1:** How could you win a tug-of-war against a bunch of adults? **Mystery 2:** What makes bridges so strong? **Mystery 3:** How can you go faster down a slide? **Mystery 4:** What can magnets do? **Mystery 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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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	**Mystery 1:** Why do your biceps bulge? **Mystery 2:** What do people who are blind see? **Mystery 3:** How can some animals see in the dark? **Mystery 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	**Mystery 1:** Why would a hawk move to New York City? **Mystery 2:** What do plants eat? **Mystery 3:** Where do fallen leaves go? **Mystery 4:** Do worms really eat dirt? **Mystery 5:** Why do you have to clean a fish tank but not a pond? **Mystery 6:** Why did the dinosaurs go extinct?

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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	**Mystery 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	**Mystery 1:** How fast does the Earth spin? **Mystery 2:** Who set the first clock? **Mystery 3:** How can the Sun tell you the season? **Mystery 4:** Why do the stars change with the seasons? **Mystery 5:** Why does the Moon change shape? **Mystery 6:** What are the wandering stars? **Mystery 7:** Why is gravity different on other planets? **Mystery 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*

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	**Mystery 1:** Could a volcano pop up where you live? **Mystery 2:** Why do some volcanoes explode? **Mystery 3:** Will a mountain last forever? **Mystery 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	**Mystery 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	**Mystery 1:** How is your body similar to a car? **Mystery 2:** What makes roller coasters go so fast? **Mystery 3:** Why is the first hill of a roller coaster always the highest? **Mystery 4:** Could you knock down a building using only dominoes? **Mystery 5:** Can you build a chain reaction machine? **Mystery 6:** What if there were no electricity? **Mystery 7:** How long did it take to travel across the country before cars and planes? **Mystery 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.		

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	**Mystery 1:** How far can a whisper travel? **Mystery 2:** What would happen if you screamed in outer space? **Mystery 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	**Mystery 1:** Are magic potions real? **Mystery 2:** Could you transform something worthless into gold? **Mystery 3:** What would happen if you drank a glass of acid? **Mystery 4:** What do fireworks, rubber, and silly putty have in common? **Mystery 5:** Why do some things explode?

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