Mystery Science Alignment with Texas Essential Knowledge and Skills

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4th Grade Planning Guide

Kindergarten Planning Guide | Grade 1 Planning Guide | Grade 2 Planning Guide
Grade 3 Planning Guide | Grade 4 Planning Guide | Grade 5 Planning Guide

Mystery Science aligns to the Texas Essential Knowledge and Skills (TEKS) for Science. Each lesson (exploration & hands-on lab) is designed to take one hour. 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. 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. Each TEKS statement is color-coded to indicate the following:

Identified by TEA as a Readiness Standard of the assessed curriculum
Identified by TEA as a Supporting Standard of the assessed curriculum
Not identified by TEA as part of the assessed curriculum

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4th Grade: Force, Motion, & Energy

Sounds & Energy Transfer Unit (Waves of Sound)

	Topic & Guiding Question	Student Objectives	TEKS Process Standards	TEKS Readiness & Supporting Standards
Lesson 1 	**Sound, Vibration, & Engineering** How far can a whisper travel?	Students investigate sound energy using paper cup telephones. Students figure out that sound is a vibration that can travel through a medium.	**4.2B** Plan and implement descriptive investigations, including asking well defined questions, making inferences, and selecting and using appropriate equipment or technology to answer his/her questions.	**4.6A** Differentiate among forms of energy, including mechanical, sound, electrical, light, and thermal.
Lesson 2 	**Sound & Vibrations** What would happen if you screamed in outer space?	Students construct a model of sound vibrations to explain how air is a medium that sound vibrations travel through.	**4.3B** Represent the natural world using models and identify their limitations, including accuracy and size.	**4.6A** Differentiate among forms of energy, including mechanical, sound, electrical, light, and thermal.
Lesson 3 	**Sound Waves & Wavelength** Why are some sounds high and some sounds low?	Students make observations of vibrations and sound waves to discover that high pitch sounds vibrate faster and have short wavelengths and low pitch sounds vibrate slower and have long wavelengths.	**4.2D** Analyze data and interpret patterns to construct reasonable explanations from data that can be observed and measured.	**4.6A** Differentiate among forms of energy, including mechanical, sound, electrical, light, and thermal.
Lesson 4 	**Energy Transfer & Engineering** Could you knock down a building using only dominoes?	Students experiment with ways to store and release energy, creating the beginning of a chain reaction machine with a lever and a ramp. Students figure out that a domino standing on end is storing energy, only requiring a small amount of energy (a tiny push) to release the stored energy.	**4.2A** Plan and implement descriptive investigations, including asking well defined questions, making inferences, and selecting and using appropriate equipment or technology to answer his/her questions.	**4.6A** Differentiate among forms of energy, including mechanical, sound, electrical, light, and thermal. **4.6D** Design a descriptive investigation to explore the effect of force on an object such as a push or a pull, gravity, friction, or magnetism.
Lesson 5 	**Energy Transfer & Engineering** Can you build a chain reaction machine?	Students continue to build a chain reaction machine — identifying a goal, brainstorming and testing multiple ideas, and determining an optimal solution. The chain reaction machine uses multiple components to transfer energy from one part to the next.	**4.2A** Plan and implement descriptive investigations, including asking well defined questions, making inferences, and selecting and using appropriate equipment or technology to answer his/her questions.	**4.6A** Differentiate among forms of energy, including mechanical, sound, electrical, light, and thermal. **4.6D** Design a descriptive investigation to explore the effect of force on an object such as a push or a pull, gravity, friction, or magnetism.

4th Grade: Earth & Space

Earth's Natural Resources Unit (Water & Weathering)

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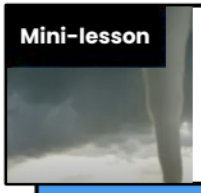
	Topic & Guiding Question	Student Objectives	TEKS Process Standards	TEKS Readiness & Supporting Standards
Lesson 1 	**Hydrosphere & The Roles of Water** How much water is in the world?	Students analyze and interpret data from world maps to determine the relative amounts of fresh, salt, and frozen water. Students figure out that while the Earth has a lot of water, most of Earth's water is not fresh or accessible.	**4.2C** Construct simple tables, charts, bar graphs, and maps using tools and current technology to organize, examine, and evaluate data.	**4.7C** Identify and classify Earth's renewable resources, including air, plants, water, and animals, and nonrenewable resources, including coal, oil, and natural gas, and the importance of conservation.
Lesson 2 	**Groundwater as a Natural Resource** When you turn on the faucet, where does the water come from?	Students learn most people get fresh water from underground sources. Students determine the best place to settle a town by considering features of the landscape & the characteristics of the plants that thrive there.	**4.2B** Collect and record data by observing and measuring, using the metric system, and using descriptive words and numerals such as labeled drawings, writing, and concept maps.	**4.7C** Identify and classify Earth's renewable resources, including air, plants, water, and animals, and nonrenewable resources, including coal, oil, and natural gas, and the importance of conservation.
Lesson 3 	**Weathering & Erosion** Will a mountain last forever?	Students make observations of the effects of weathering to discover that rocks will become rounded and break into small pieces when they tumble down a mountain.	**4.2A** Plan and implement descriptive investigations, including asking well defined questions, making inferences, and selecting and using appropriate equipment or technology to answer his/her questions.	**4.7B** Observe and identify slow changes to Earth's surface caused by weathering, erosion, and deposition from water, wind, and ice.
Lesson 4 	**Renewable Energy & Natural Resources** Where does energy come from?	Students evaluate the advantages and disadvantages of wind, water, and solar energy to power a town. Students obtain and evaluate information about the needs of each source of energy and analyze and interpret data about the town's resources.	**4.3A** Analyze, evaluate, and critique scientific explanations by using evidence, logical reasoning, and experimental and observational testing.	**4.7C** Identify and classify Earth's renewable resources, including air, plants, water, and animals, and nonrenewable resources, including coal, oil, and natural gas, and the importance of conservation.

4th Grade: Earth & Space

Weather & Storms Unit (Stormy Skies)

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	Topic & Guiding Question	Student Objectives	TEKS Process Standards	TEKS Readiness & Supporting Standards
 **Lesson 1**	**Water Cycle & Phases of Matter** Where do clouds come from?	Students obtain and combine information that water can change from liquid to gas, but that it is always made of tiny drops. Clouds are made of water that has evaporated.	**4.2A** Plan and implement descriptive investigations, including asking well defined questions, making inferences, and selecting and using appropriate equipment or technology to answer his/her questions.	**4.8B** Describe and illustrate the continuous movement of water above and on the surface of Earth through the water cycle and explain the role of the Sun as a major source of energy in this process.
 **Lesson 2**	**Local Weather Patterns & Weather Prediction** How can we predict when it's going to storm?	Students make observations of clouds and develop a tool to make predictions about what kind of weather might happen next.	**4.2D** Analyze data and interpret patterns to construct reasonable explanations from data that can be observed and measured.	**4.8A** Measure, record, and predict changes in weather.
 **Lesson 3**	✨New!✨ **Mapping & Severe Weather** Where do flash floods happen?	Students use a model (i.e. a map) to examine the different factors, including the shapes and kinds of land, that contribute to flash floods. They use this to predict where flash floods are most likely to happen.	**4.2C** Construct simple tables, charts, bar graphs, and maps using tools and current technology to organize, examine, and evaluate data.	**4.8A** Measure, record, and predict changes in weather.
 **Lesson 4**	**Natural Hazards & Engineering** How can you keep a house from blowing away in a windstorm?	Students design and build solutions that reduce the hazards associated with strong winds that could damage buildings.	**4.2E** Perform repeated investigations to increase the reliability of results.	**4.8A** Measure, record, and predict changes in weather.



TEKS 4.8A

Why are tornadoes so hard to predict?



TEKS 4.8A

What makes hurricanes so dangerous?

4th Grade: Earth & Space

Patterns in Space Unit (Space Patterns)

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	Topic & Guiding Question	Student Objectives	TEKS Process Standards	TEKS Readiness & Supporting Standards
 Lesson 1	**Seasonal Changes & Shadow Length** How can the Sun tell you the season?	Students examine photos taken at different times of year and figure out the time of year that each photo was taken. Students discover that the Sun's path changes with the seasons, as does the time of sunrise and sunset. The Sun is always highest in the sky at noon, but that height changes with the season.	**4.2D** Analyze data and interpret patterns to construct reasonable explanations from data that can be observed and measured.	**4.8C** Collect and analyze data to identify sequences and predict patterns of change in shadows, seasons, and the observable appearance of the Moon over time.
 Lesson 2	**Seasonal Patterns & Earth's Orbit** Why do the stars change with the seasons?	Students build a model of the universe and use it to explain why different stars are visible at different times of year. Using evidence from this model, students make an argument that supports the claim that the Earth orbits the Sun.	**4.3B** Represent the natural world using models and identify their limitations, including accuracy and size.	**4.8C** Collect and analyze data to identify sequences and predict patterns of change in shadows, seasons, and the observable appearance of the Moon over time.
 Lesson 3	**Moon Phases, Lunar Cycle** Why does the Moon change shape?	Students use a physical model of the Sun and Moon to investigate how the Moon's phase relates to its position relative to the Sun. Students notice that the Moon's phases repeat in a predictable pattern.	**4.3B** Represent the natural world using models and identify their limitations, including accuracy and size.	**4.8C** Collect and analyze data to identify sequences and predict patterns of change in shadows, seasons, and the observable appearance of the Moon over time.
 Lesson 4	**Gravity** Why is gravity different on other planets?	Using mathematics and computational thinking, students calculate how high they could jump on planets and moons that have stronger or weaker gravity than Earth. Students analyze and interpret this data to construct an explanation for why the amount of gravity is different on other planets.	**4.2A** Plan and implement descriptive investigations, including asking well defined questions, making inferences, and selecting and using appropriate equipment or technology to answer his/her questions. **4.2B** Collect and record data by observing and measuring, using the metric system, and using descriptive words and numerals such as labeled drawings, writing, and concept maps.	**4.6D** Design a descriptive investigation to explore the effect of force on an object such as a push or a pull, gravity, friction, or magnetism.

4th Grade: Organisms & Environments

Plant Traits & Needs Unit (Power of Plants)

	Topic & Guiding Question	Student Objectives	TEKS Process Standards	TEKS Readiness & Supporting Standards
 Lesson 1	**Plant Needs: Air & Water** What do plants eat?	Students conduct an investigation and interpret data and figure out that water and air account for a plant's weight.	**4.2A** Plan and implement descriptive investigations, including asking well defined questions, making inferences, and selecting and using appropriate equipment or technology to answer his/her questions.	**4.9A** Investigate that most producers need sunlight, water, and carbon dioxide to make their own food, while consumers are dependent on other organisms for food.
 Lesson 2	**Trait Variation, Inheritance, & Artificial Selection** How could you make the biggest fruit in the world?	Students investigate how human beings have modified plants based on our knowledge of how plants change from generation to generation.	**4.3A** Analyze, evaluate, and critique scientific explanations by using evidence, logical reasoning, and experimental and observational testing.	**4.10B** Explore and describe examples of traits that are inherited from parents to offspring such as eye color and shapes of leaves and behaviors that are learned such as reading a book and a wolf pack teaching their pups to hunt effectively.
 Lesson 3	**Trait Variation, Inheritance, & Artificial Selection** Why are some apples red and some green?	Students explore how human beings have developed fruits with specific traits through selection.	**4.2B** Collect and record data by observing and measuring, using the metric system, and using descriptive words and numerals such as labeled drawings, writing, and concept maps.	**4.10B** Explore and describe examples of traits that are inherited from parents to offspring such as eye color and shapes of leaves and behaviors that are learned such as reading a book and a wolf pack teaching their pups to hunt effectively.