Scope and Sequence

The Gizmos library is not defined by a set scope and sequence following a systematic and cumulative design. As a supplemental instructional resource that supports effective standards-based instruction, Gizmos is intentionally created to promote instructional flexibility. Simulations are searchable by standard and topic so that educators can select lessons and simulations that support their standards-based instruction.

Each individual Gizmos simulation does have systematic and cumulative instruction built into the lesson framework. Each teacher guide enumerates optional activities for the start of class, before the simulation, during the simulation, and after the simulation. This lesson sequence is structured to activate prior knowledge, build understanding incrementally, and monitor understanding. Similarly, Student Exploration sheets are divided into activities that increase in complexity and depth of content, starting with an activity that helps students understand the concept. Then, students are prompted to make predictions about new situations based on their prior experiments and analyze the results of their data to confirm or refine their understanding of the concept. Lessons end with a cumulative embedded quiz that assesses student understanding of the key concepts related to the Gizmos simulation.

- Gizmos STEM Cases and Gizmos Investigations (fully guided lessons with multiple learning activities) are more extensive, often covering multiple days of instruction. Each learning component builds on the last, guiding students to make connections and analyze data.

To simplify planning, educators can browse Gizmos organized by grade level and topic. After selecting a grade span and science topic—like Life Science, Biology, or Physical Science—teachers can view all Gizmos and filter by additional subtopics. Teachers can also browse correlations to the Mississippi College- and Career-Readiness Standards or to their Core Curriculum. Gizmos lists all correlated simulations with each standard, unit, or lesson, with a lesson preview and direct links to the material.

Gizmos Lists organize and group related simulations for specific topics, skills, or content area courses. Teachers can create lists, or they can use the recommended lists designed by ExploreLearning. Example science lists include AP Biology, AP Physics, Elementary Science Literacy Connection, and Gizmos with Writing Prompts. The lists for AP group Gizmos by sequenced unit, and all curated lists are organized by grade span when applicable. By using existing or custom lists, teachers can easily plan how to integrate Gizmos inquiry-based learning into instruction and collaborate with colleagues.

ExploreLearning Gizmos®

Correlations for Mississippi- Science College and Career Readiness Standards

Adopted: 2018

Explorelearning®

Grade Three: Interactions within an Environment

L.3: Life Science
DCI.L.3.1: Hierarchical Organization
1.1.1: Plants and animals have physical characteristics and features that allow them to receive information from the environment. Structural adaptations within groups of plants and animals allow them to better survive and reproduce in an environment.
L.3.1: Students will demonstrate an understanding of internal and external structures in plants and animals and how they relate to their growth, survival, behavior, and reproduction within an environment.
L.3.1.1: Examine evidence to communicate information that the internal and external structures of animals (e.g., heart, stomach, bone, lung, brain, skin, ears, appendages) function to support survival, growth, and behavior.
Circulatory System
Comparing Climates (Customary)
Comparing Climates (Metric)
Honeybee Hive

L.3.1.2: Examine evidence to communicate information that the internal and external structures of plant (e.g., thorns, leaves, stems, roots, or colored petals) function to support survival, growth, behavior, and reproduction.
Comparing Climates (Customary)
Comparing Climates (Metric)
Flower Pollination

L.3.1.3: Obtain and communicate examples of physical features or behaviors of vertebrates and invertebrates and how these characteristics help them survive in particular environments, (e.g., animals hibernate, migrate, or estivate to stay alive when food is scarce or temperatures are not favorable).
Comparing Climates (Customary)
Comparing Climates (Metric)
Honeybee Hive

DCI.L.3.2: Reproduction and Heredity
1.2.1: Scientists have identified and classified many types of plants and animals. Some characteristics and traits that organisms have are inherited, and some result from interactions with the environment.
L.3.2: Students will demonstrate an understanding that through reproduction, the survival and physical features of plants and animals are inherited traits from parent organisms but can also be influenced by the environment.
L.3.2.4: Obtain and communicate data to provide evidence that plants and animals have traits inherited from both parent organisms and that variations of these traits exist in groups of similar organisms (e.g., flower colors in pea plants or fur color and pattern in animal offspring).
Inheritance

L.3.2.5: Research to justify the concept that traits can be influenced by the environment (e.g., stunted growth in normally tall plants due to insufficient water, changes in an arctic fox's fur color due to light and/or temperature, or flamingo plumage).
Effect of Environment on New Life Form
Growing Plants
Inheritance
Measuring Trees

DCI.L.3.4: Adaptations and Diversity
1.3.1: When the environment or habitat changes, some plants and animals survive and reproduce, some move to new locations, and some die. Scientists can obtain historical information from fossils to provide evidence of both the organism and environments in which they lived.
L.3.4: Students will demonstrate an understanding of how adaptations allow animals to satisfy life needs and respond both physically and behaviorally to their environment.
L.3.4.1: Obtain data from informational text to explain how changes in habitats (both those that occur naturally and those caused by organisms) can be beneficial or harmful to the organisms that live there.
Pond Ecosystem
Prairie Ecosystem

L.3.4.2: Ask questions to predict how natural or man-made changes in a habitat cause plants and animals to respond in different ways, including hibernating, migrating, responding to light, death, or extinction (e.g., sea turtles, the dodo bird, or nocturnal species).
Comparing Climates (Customary)
Comparing Climates (Metric)

L.3.4.3: Analyze and interpret data to explain how variations in characteristics among organisms of the same species may provide advantages in surviving, finding mates, and reproducing (e.g., plants with larger thorns being less likely to be eaten by predators or animals with better camouflage colorations being more likely to survive and bear offspring).
Natural Selection

L.3.4.5: Construct scientific argument using evidence from fossils of plants and animals that lived long ago to infer the characteristics of early environments (e.g., marine fossils on dry land, tropical plant fossils in arctic areas, or fossils of extinct organisms in any environment).
Building Pangaea

P.3: Physical Science
DCI.P.3.5: Organization of Matter and Chemical Interactions
2.1.1: Matter is made up of particles that are too small to be seen. Even though the particles are very small, the movement and spacing of these particles determine the basic properties of matter. Matter exists in several different states and is classified based on observable and measurable properties. Matter can be changed from one state to another when heat (i.e., thermal energy) is added or removed.

P.3.5: Students will demonstrate an understanding of the physical properties of matter to explain why matter can change states between a solid, liquid, or gas dependent upon the addition or removal of heat.
P.3.5.1: Plan and conduct scientific investigations to determine how changes in heat (i.e., an increase or decrease) change matter from one state to another (e.g., melting, freezing, condensing, boiling, or evaporating).
Phases of Water

P.3.5.2: Develop and use models to communicate the concept that matter is made of particles too small to be seen that move freely around in space (e.g., inflation and shape of a balloon, wind blowing leaves, or dust suspended in the air).
Phases of Water

P.3.5.3: Plan and conduct investigations that particles speed up or slow down with addition or removal of heat.
Phases of Water

DCI.P.3.6: Motions, Forces, and Energy
2.2.1: Magnets are a specific type of solid that can attract and repel certain other kinds of materials, including other magnets. There are some materials that are neither attracted to nor repelled by magnets. Because of their special properties, magnets are used in various ways. Magnets can exert forces—a push or a pull—on other magnets or magnetic materials, causing energy transfer between them, even when the objects are not touching.
P.3.6: Students will demonstrate an understanding of magnets and the effects of pushes, pulls, and friction on the motion of objects.
P.3.6.1: Compare and contrast the effects of different strengths and directions of forces on the motion of an object (e.g., gravity, polarity, attraction, repulsion, or strength).
Magnetism
Force and Fan Carts

P.3.6.2: Plan an experiment to investigate the relationship between a force applied to an object (e.g., friction, gravity) and resulting motion of the object.
Force and Fan Carts

E.3: Earth and Space Science
DCI.E.3.7: Earth's Structure and History
3.1.1: Since its formation, the Earth has undergone a great deal of geological change driven by its composition and systems. Scientists use many methods to learn more about the history and age of Earth. Earth materials include rocks, soils, water, and gases. Rock is composed of different combinations of minerals. Smaller rocks come from the breakage and weathering of bedrock and larger rocks. Soil is made partly from weathered rock, partly from plant remains, and contains many living organisms.
E.3.7A: Students will demonstrate an understanding of the various processes involved in the rock cycle, superposition of rock layers, and fossil formation.

E.3.7A.1: Plan and conduct controlled scientific investigations to identify the processes involved in forming the three major types of rock, and investigate common techniques used to identify them.
Rock Classification
Rock Cycle

E.3.7A.2: Develop and use models to demonstrate the processes involved in the development of various rock formations, including superposition, and how those formations can fracture and move over time.
Rock Cycle
Weathering

3.1.2: Earth has an active mantle, which interacts with the Earth's crust to drive plate tectonics and form new rocks. Resulting surface features change through interactions with water, air, and living things. Waves, wind, water, and ice shape and reshape the Earth's land surface by eroding rock and soil in some areas and depositing them in other areas. Scientists use many methods to learn more about the history and age of Earth.
E.3.7B: Students will demonstrate an understanding of the composition of Earth and the processes which change Earth's landforms.
E.3.7B.3: Develop and use models of weathering, erosion, and deposition processes which explain the appearance of various Earth features (e.g., the Grand Canyon, Arches National Park in Utah, Plymouth Bluff in Columbus, or Red Bluff in Marion County, Mississippi).
Weathering

DCI.E.3.9: Earth's Systems and Cycles
3.2.1: The Earth's land can be situated above or submerged below water. Water in the atmosphere changes states according to energy levels driven by the sun and its interactions with various Earth components, both living and non-living. The downhill movement of water as it flows to the ocean shapes the appearance of the land.
E.3.9: Students will demonstrate an understanding of how the Earth's systems (i.e., geosphere, hydrosphere, atmosphere, and biosphere) interact in multiple ways to affect Earth's surface materials and processes.
E.3.9.3: Use graphical representations to communicate the distribution of freshwater and saltwater on Earth (e.g., oceans, lakes, rivers, glaciers, groundwater, or polar ice caps).
Water Cycle

DCI.E.3.10: Earth's Resources
3.3.1: Earth is made of materials that provide resources for human activities, and their use affects the environment in multiple ways. Some resources are renewable and others are not.
E.3.10: Students will demonstrate an understanding that all materials, energy, and fuels that humans use are derived from natural sources.
E.3.10.1: Identify some of Earth's resources that are used in everyday life such as water, wind, soil, forests, oil, natural gas, and minerals and classify as renewable or nonrenewable.
Energy Conversions

E.3.10.2: Obtain and communicate information to exemplify how humans attain, use, and protect renewable and nonrenewable Earth resources.
Energy Conversions

Grade Four: Energy and Systems

L.4: Life Science
DCI.L.4.1: Hierarchical Organization
1.1.1: All organisms need energy for growth and development. Animals have specialized structures and systems for obtaining and processing energy. These structures and systems cannot function properly without adequate nourishment. Living organisms can be adversely affected by environmental conditions or disease.
L.4.1: Students will demonstrate an understanding of the organization, functions, and interconnections of the major human body systems.
L.4.1.2: Obtain and communicate data to describe patterns that indicate the nature of relationships between human organ systems, which interact with one another to control digestion, respiration, circulation, excretion, movement, coordination, and protection from infection.
Circulatory System
Digestive System

L.4.1.3: Construct models of organ systems (e.g., circulatory, digestive, respiratory, muscular, skeletal, nervous) to demonstrate both the unique function of the system and how multiple organs and organ systems work together to accomplish more complex functions.
Circulatory System
Digestive System
Senses

DCI.L.4.2: Reproduction and Heredity
1.2.1: Scientists have identified and classified many types of plants and animals. Each plant or animal has a unique pattern of growth and development called a life cycle. All of Earth's cycles are driven by energy which can be traced back to the sun.
L.4.2: Students will demonstrate an understanding of life cycles, including familiar plants and animals (e.g., reptiles, amphibians, or birds).
L.4.2.2: Develop and use models to explain the unique and diverse life cycles of organisms other than humans (e.g., flowering plants, frogs, or butterflies) including commonalities (e.g., birth, growth, reproduction, or death).
Flower Pollination
Honeybee Hive

P.4: Physical Science
DCI.P.4.6: Motions, Forces, and Energy
2.1.1: As different forms of energy, heat and electricity can be produced in different ways and are transferred and conducted from one form or object to another. Some materials can be conductors or insulators of heat energy. Electricity can be transferred from place to place by electric currents to produce motion, sound, heat, or light.
P.4.6A: Students will demonstrate an understanding of the common sources and uses of heat and electric energy and the materials used to transfer heat and electricity.
P.4.6A.2: Plan and conduct scientific investigations to classify different materials as either an insulator or conductor of electricity.
Circuit Builder

P.4.6A.3: Develop models demonstrating how heat and electrical energy can be transformed into other forms of energy (e.g., motion, sound, heat, or light).
Circuit Builder
Energy Conversions

P.4.6A.4: Develop models that demonstrate the path of an electric current in a complete, simple circuit (e.g., lighting a light bulb or making a sound).
Circuit Builder

P.4.6A.6: Design a device that converts any form of energy from one form to another form (e.g., construct a musical instrument that will convert vibrations to sound by controlling varying pitches, a solar oven that will convert energy from the sun to heat energy, or a simple circuit that can be used to complete a task). Use an engineering design process to define the problem, design, construct, evaluate, and improve the device.
Circuit Builder

2.1.2: Light, as a form of energy, has specific properties, including brightness. Light travels in a straight line until it strikes an object. The way light behaves when it strikes an object depends on the object's properties.
P.4.6B: Students will demonstrate an understanding of the properties of light as forms of energy.
P.4.6B.2: Obtain and communicate information to explain how the visibility of an object is related to light.
Eyes and Vision 1 - Seeing Color
Eyes and Vision 2 - Focusing Light
Eyes and Vision 3 - Sensing Light

P.4.6B.3: Develop and use models to communicate how light travels and behaves when it strikes an object, including reflection, refraction, and absorption.
Color Absorption
Eyes and Vision 1 - Seeing Color
Eyes and Vision 2 - Focusing Light
Heat Absorption

E.4: Earth and Space Science
DCI.E.4.9: Earth's Systems and Cycles
3.1.1: Earth's atmosphere is a mixture of gases, including water vapor and oxygen. Water, which is found almost everywhere on Earth, including the atmosphere, changes form and cycles between Earth's surface to the air and back again. This cycling of water is driven by energy from the sun. The movement of water in the water cycle is a major process that influences weather conditions. Clouds form during this cycle and various types of precipitation result.
E.4.9A: Students will demonstrate an understanding of how the water cycle is propelled by the sun's energy.
E.4.9A.1: Develop and use models to explain how the sun's energy drives the water cycle. (e.g., evaporation, condensation, precipitation, transpiration, runoff, and groundwater).
Water Cycle

3.1.2: Scientists record patterns in weather conditions over time and across the globe to make predictions about what kind of weather might occur next. Climate describes the range of an area's typical weather conditions and the extent to which those conditions vary over long periods of time.
E.4.9B: Students will demonstrate an understanding of weather and climate patterns.
E.4.9B.1: Analyze and interpret data (e.g., temperature, precipitation, wind speed/direction, relative humidity, or cloud types) to predict changes in weather over time.
Observing Weather (Customary)
Observing Weather (Metric)

E.4.9B.2: Construct explanations about regional climate differences using maps and long-term data from various regions.
Comparing Climates (Customary)
Comparing Climates (Metric)

3.1.3: Earth's oceans and landforms can be affected in various ways by natural processes in one or more of Earth's spheres (i.e., atmosphere, biosphere, geosphere, and hydrosphere). Humans cannot eliminate natural hazards caused by these processes but can take steps to reduce their impacts. Human activities can affect the land and oceans in positive and negative ways.
E.4.9C: Students will demonstrate an understanding of how natural processes and human activities affect the features of Earth's landforms and oceans.
E.4.9C.1: Analyze and interpret data to describe and predict how natural processes (e.g., weathering, erosion, deposition, earthquakes, tsunamis, hurricanes, or storms) affect Earth's surface.
Erosion Rates
River Erosion
Weathering

E.4.9C.3: Construct scientific arguments from evidence to support claims that human activities, such as conservation efforts or pollution, affect the land, oceans, and atmosphere of Earth.
Pond Ecosystem
Water Pollution
Fruit Production - Elementary**STEM Case**

E.4.9C.4: Research and explain how systems (i.e., the atmosphere, geosphere, and/or hydrosphere), interact and support life in the biosphere.
Carbon Cycle
Water Cycle

Grade Five: Interdependence of Systems

L.5: Life Science
DCI.L.5.3: Ecology and Interdependence
1.1.1: All organisms need energy to live and grow. Energy is obtained from the sun. Cells transform the energy that organisms need to perform essential life functions through a complex sequence of reactions in which chemical energy is transferred from one system of interacting molecules to another.
L.5.3A: Students will demonstrate an understanding of photosynthesis and the transfer of energy from the sun into chemical energy necessary for plant growth and survival.
L.5.3A.1: Research and communicate the basic process of photosynthesis that is used by plants to convert light energy into chemical energy that can be stored and released to fuel an organism's activities.
Plants and Snails
Pond Ecosystem

1.1.2: A major role an organism serves in an ecosystem can be described by the way in which it obtains its energy. Energy is transferred within an ecosystem by producers, consumers, or decomposers. A healthy ecosystem is one in which a diverse population of life forms can meet their needs in a relatively stable web of life.
L.5.3B: Students will demonstrate an understanding of a healthy ecosystem with a stable web of life and the roles of living things within a food chain and/or food web, including producers, primary and secondary consumers, and decomposers.
L.5.3B.1: Obtain and evaluate scientific information regarding the characteristics of different ecosystems and the organisms they support (e.g., salt and fresh water, deserts, grasslands, forests, rain forests, or polar tundra lands).
Forest Ecosystem
Prairie Ecosystem

L.5.3B.2: Develop and use a food chain model to classify organisms as producers, consumers, or decomposers. Trace the energy flow to explain how each group of organisms obtains energy.
Forest Ecosystem
Prairie Ecosystem
Ecosystems - Elementary**STEM Case**

L.5.3B.3: Design and interpret models of food webs to justify what effects the removal or the addition of a species (i.e., introduced or invasive) would have on a specific population and/or the ecosystem as a whole.
Forest Ecosystem
Prairie Ecosystem
Ecosystems - Elementary**STEM Case**

P.5: Physical Science
DCI.P.5.5: Organization of Matter and Chemical Interactions
2.1.1: Matter can be segregated into tiny particles that are too small to see, but can be detected by other methods. These tiny particles are referred to as atoms, which can be combined to form molecules. Substances exhibit specific properties that can be observed and measured.
P.5.5A: Students will demonstrate an understanding of the physical properties of matter.
P.5.5A.1: Obtain and evaluate scientific information to describe basic physical properties of atoms and molecules.
Element Builder

P.5.5A.2: Collect, analyze, and interpret data from measurements of the physical properties of solids, liquids, and gases (e.g., volume, shape, movement, and spacing of particles.
Measuring Volume
Phases of Water
Properties of Matter - Elementary**STEM Case**

P.5.5A.3: Analyze matter through observations and measurements to classify materials (e.g., powders, metals, minerals, or liquids) based on their properties (e.g., color, hardness, reflectivity, electrical conductivity, thermal conductivity, response to magnetic forces, solubility, or density).
Chemical Changes
Circuit Builder
Density
Density Laboratory
Magnetism
Mineral Identification
Mystery Powder Analysis
Solubility and Temperature
Properties of Matter - Elementary**STEM Case**
Water Contamination - Elementary**STEM Case**

P.5.5A.4: Make and test predictions about how the density of an object affects whether the object sinks or floats when placed in a liquid.
Density
Density Laboratory

2.1.2: Substances of the same type can be classified by their similar, observable properties. Substances can be combined in a variety of ways. A mixture is formed when two or more kinds of matter are physically combined. Solutions are a special type of mixture in which one substance is distributed evenly into another substance. When the physical properties of the components in a mixture are not changed, they can be separated in different physical ways.
P.5.5B: Students will demonstrate an understanding of mixtures and solutions.
P.5.5B.1: Obtain and evaluate scientific information to describe what happens to the properties of substances in mixtures and solutions.
Properties of Matter - Elementary**STEM Case**

P.5.5B.2: Analyze and interpret data to communicate that the concentration of a solution is determined by the relative amount of solute versus solvent in various mixtures.
Solubility and Temperature

P.5.5B.3: Investigate how different variables (e.g., temperature change, stirring, particle size, or surface area) affect the rate at which a solute will dissolve.
Solubility and Temperature

2.1.3: Physical properties can be observed and measured without changing the composition of matter. A physical change occurs when the matter's physical appearance is altered while leaving the composition of the matter unchanged. When two or more substances are mixed together, a new substance with different properties can sometimes be formed, but the total amount (i.e., mass) of the substances is conserved (i.e., total mass stays the same). In a chemical change, the composition of the original matter is altered to create a new substance. A different compound is present at the completion of the chemical change.
P.5.5C: Students will demonstrate an understanding of the difference between physical and chemical changes.
P.5.5C.1: Analyze and communicate the results of chemical changes that result in the formation of new materials (e.g., decaying, burning, rusting, or cooking).
Chemical Changes

P.5.5C.2: Analyze and communicate the results of physical changes to a substance that results in a reversible change (e.g., changes in states of matter with the addition or removal of energy, changes in size or shape, or combining/separating mixtures or solutions).
Phases of Water

P.5.5C.3: Analyze and interpret data to support claims that when two substances are mixed, the total weight of matter is conserved.
Chemical Changes

DCI.P.5.6: Motions, Forces, and Energy
2.2.1: Gravity is a force that draws objects to Earth. This force acting on an object near Earth's surface pulls that object toward the planet's center. The motion of an object can be described in terms of its position, direction, and speed. Multiple factors determine the rate and motion of an object. Other than

Earth, any celestial objects will exert varying gravitational pulls on other objects according to their mass and density.
P.5.6: Students will demonstrate an understanding of the factors that affect the motion of an object through a study of Newton's Laws of Motion.
P.5.6.1: Obtain and communicate information describing gravity's effect on an object.
Free Fall Tower
Gravity Pitch

P.5.6.2: Predict the future motion of various objects based on past observation and measurement of position, direction, and speed.
Force and Fan Carts

P.5.6.3: Develop and use models to explain how the amount or type of force, both contact and non-contact, affects the motion of an object.
Force and Fan Carts

P.5.6.4: Plan and conduct scientific investigations to test the effects of balanced and unbalanced forces on the speed and/or direction of objects in motion.
Force and Fan Carts

P.5.6.6: Design a system to increase the effects of friction on the motion of an object (e.g., non-slip surfaces or vehicle braking systems or flaps on aircraft wings). Use an engineering design process to define the problem, design, construct, evaluate, and improve the system.
Force and Fan Carts

E.5: Earth and Space Science
DCI.E.5.8: Earth and the Universe
3.1.1: Astronomy is the study of celestial objects in our solar system and beyond. A solar system includes one or more suns (stars) and all other objects orbiting in that system. Planets in our night sky change positions and are not always visible from Earth as they orbit our sun. Stars that can be seen in the night sky lie beyond our solar system and appear in patterns called constellations. Constellations can be used for navigation and appear to move together across the sky because of Earth's rotation and revolution around the sun.
E.5.8A: Students will demonstrate an understanding of the locations of objects in the universe.
E.5.8A.1: Develop and use scaled models of Earth's solar system to demonstrate the size, composition (i.e., rock or gas), location, and order of the planets as they orbit the Sun.
Solar System

3.1.2: Earth orbits around the sun as the moon orbits around Earth. The revolution and rotation of Earth on a tilted axis provide evidence of patterns that can be observed, studied, and predicted.
E.5.8B: Students will demonstrate an understanding of the principles that govern moon phases, day and night, appearance of objects in the sky, and seasonal changes.
E.5.8B.2: Develop and use a model of the Earth-Sun-Moon system to analyze the cyclic patterns of lunar phases, solar and lunar eclipses, and seasons.
Eclipse
Phases of the Moon
Seasons: Earth, Moon, and Sun

E.5.8B.3: Develop and use models to explain the factors (e.g., tilt, revolution, and angle of sunlight) that result in Earth's seasonal changes.
Seasons: Earth, Moon, and Sun
Summer and Winter

DCI.E.5.10: Earth's Resources
3.2.1: Human activities can impact natural processes and availability of resources. To reduce impacts on the environment (including humans), various best practices can be used. New and improved conservation practices are constantly being developed and tested.
E.5.10: Students will demonstrate an understanding of the effects of human interaction with Earth and how Earth's natural resources can be protected and conserved.
E.5.10.1: Collect and organize scientific ideas that individuals and communities can use to conserve Earth's natural resources and systems (e.g., implementing watershed management practices to conserve water resources, utilizing no-till farming to improve soil fertility, reducing emissions to abate air pollution, or recycling to reduce landfill waste).
Water Pollution
Fruit Production - Elementary**STEM Case**

E.5.10.2: Design a process for better preparing communities to withstand manmade or natural disasters (e.g., removing oil from water or soil, systems that reduce the impact of floods, structures that resist hurricane forces). Use an engineering design process to define the problem, design, construct, evaluate, and improve the disaster plan.
Earthquake-Proof Homes
Flood and Storm-Proof Homes

Features and Benefits Brochure

Submitted for review in the Grade 3–5 Complementary Science category of the Mississippi 2025 Instructional Materials Adoption, Gizmos enables students in grades 3–12 to experience the real work of scientists in STEM fields while supporting teachers' instructional flexibility.

Gizmos Overview

Interactive STEM Simulations

Student Centered	Teacher Friendly
• Inquiry-based learning • Real-time data analysis • Critical thinking • Real-world contexts	• Blended learning model • Flexible materials • Ready to use • Standards aligned

Digital Components and Supplementary Materials

ExploreLearning solutions are fully online, eliminating shipping costs. All downloadable Gizmos resources are included in the product price, with no additional materials required. System updates are automatic and applied directly to users. Gizmos site licenses include the following in the cost:

- Full Access to 550+ STEM Simulations for one year
- Anytime, anywhere access (with an internet connection) for students, teachers, and administrators
- Ready-to-use lesson plans, teaching guides, and student activities with answer keys and customizable content for whole-class, small group, or 1:1 instruction
- Graphing, data analysis, and visualization features to help students explore and interpret results
- Embedded formative assessments and real-time data heatmaps to track student progress
- Free phone, email, and online technical support

Professional Learning

Gizmos professional development offers a structured path for integrating technology into instruction, beginning with introductory workshops and advancing to pedagogy-focused courses and ongoing implementation support. Teachers collaborate with experienced instructors to model Gizmos lessons, align with content standards and district pacing guides, and apply inquiry-based strategies in math and science. Courses cover topics such as the Standards for Mathematical Practice, NGSS, the 5E Model, CER framework, and differentiation techniques. Educators also learn to facilitate STEM Cases, monitor progress, and customize instruction using Gizmos features. An implementation manager is available to schedule professional learning and implementation support to ensure long-term success.

Connections to the Science of Reading

Gizmos supports cross-curricular skills and literacy development, connecting with Science of Reading principles. Through interactive simulations paired with writing prompts and vocabulary-rich lessons, Gizmos helps students build academic and content-area vocabulary, critical thinking skills, and background knowledge. Some Elementary lessons also provide suggested books and literacy-focused extensions that can be paired with the science content, and most lessons include additional reference links that students can read. While Gizmos doesn't directly teach foundational reading skills, it reinforces literacy skills in alignment with the language comprehension strand of the Science of Reading framework.

Implementation Guide

MDE receives support from an implementation manager. The implementation manager is assigned to schedule professional learning and to provide implementation support. The support includes, but is not limited to, the following:

Implementation planning and goal-setting: The implementation manager collaborates with MDE leadership to establish implementation goals and a plan for meeting those goals. The implementation plan is reviewed periodically to monitor progress and adjust as needed. The key objectives are to get ExploreLearning instructional solutions into the hands of teachers and ensure that they have the knowledge and skills they need for successful implementation in their classrooms.

Initial training and account distribution: Initial workshops are offered for new MDE teachers or teachers who are new to implementing ExploreLearning Gizmos. Professional development is delivered onsite or via live or recorded webinar as appropriate for each teaching and learning scenario. Additional opportunities for higher-level workshops are available following initial workshop delivery.

Communication with district administrators: Implementation meetings are held periodically to inform the MDE district team of the implementation status and professional development activities.

Periodic usage report distribution and evaluation: The implementation manager provides regular usage reports to MDE district leaders and other stakeholders, works with district leaders to identify teachers and schools needing assistance, and collaborates with MDE school administrators to schedule the appropriate support.

The chart below outlines initial implementation activities and corresponding timeline, providing a clear overview of each phase and its intended outcomes

Timeline	Activity	Expected Outcomes
0–2 weeks	• Collaborative implementation planning with all stakeholders • Initial program set up • Develop roster protocol • Finalize integration	• Customized implementation plan • System readiness confirmed
2–4 weeks	• Access educator and administrator professional learning requirements • Establish professional development logistics • Organize training assets • Assist with product-specific administration and access	• Resources prepared • District ready to launch immediately following initial professional learning

Timeline	Activity	Expected Outcomes
2–5 weeks	• Coordinate professional learning availability and timeline • Determine whether resource customization is needed based on the district's needs and goals • Determine attendee feedback procedure • Communicate results and status of next steps to district stakeholders	• Teachers and administrators receive comprehensive training using cutting-edge, relevant materials to ensure an optimal learning experience and maximize the effectiveness of the program • Students prepared to engage with ExploreLearning digital solutions
8–12 weeks	• Enhance instructional planning and strategy through higher-level professional learning opportunities. • Provide opportunities for implementation feedback • Hold an Implementation Meeting to discuss implementation progress and updates	• Teachers and administrators have demonstrated proficiency in utilizing program features effectively within instruction, leading to improved student learning in math and science • Educators provided opportunities to ask clarifying questions about implementing with fidelity • All stakeholders will be aligned on where the implementation stands and united in planning next steps
12+ weeks	• Regular usage evaluation and implementation monitoring • Adjust implementation plan to reflect areas of focus and/or changes in district initiatives • Collaboration with the district to assess the impact on student learning using qualitative and quantitative measures	• Strategic intervention and focus informed by data-driven insights • All stakeholders remain aligned on where the implementation stands and united in planning next steps • Student learning is enhanced with the prescribed use of ExploreLearning programs

ExploreLearning offers many tools that help teachers and administrators support strong implementations of our products. ExploreLearning provides a Setting the Foundations overview for participants to learn the basics of our products, how the solutions are best incorporated into a blended classroom, and what they can help teachers accomplish. This is provided through introductory workshops and annual refresher workshops for teachers who need help getting started with ExploreLearning Gizmos.

Training Opportunities

- Complimentary on-demand videos and webinars within each product
- Educator Insights Series features strategies from innovators in math, science, and professional development

Information Toolkits and User Guides

- Teacher Resource Hub includes how-to videos and resources, course catalogues, and ideas for extending instruction
- Administrator Resource Hub provides videos and resources made for administrators

Social Media Accounts

- X (formerly Twitter): @ExploreLearning
- Facebook: ExploreLearningK12STEMSolutions; ExploreLearningGizmos
- Instagram: @elgizmos
- Youtube: @ELGizmos

Additionally, our blog highlights implementation ideas, teacher spotlights, case studies, and more.

Services Provided Within United States

The publisher or vendor must deliver all services associated with this contract from an office in the United States. Please confirm your acceptance of this requirement and specify any locations outside the State of Mississippi where you plan to offer the services outlined in this contract solicitation.

ExploreLearning implements its instructional resources and professional development in all 50 states and across 80 countries worldwide. Our online products are all contained in a Tier IV enterprise data center located in the United States. Customer education records will be stored in a Tier IV data center in Texas with a backup site in Michigan. We have several current processes and policies for host site security.

Technology Supporting Document

Technology Supporting Document includes the Learning Management System (LMS) and its hardware and software capabilities.

a. The document should include the following information:

i. Thin Common Cartridge 1.3 – IEDTECH Global Standards

We do not support Common Cartridge (CC), Thin Common Cartridge (TCC), or Question and Test Interoperability (QTI). Our solutions are designed as standalone systems, but we do support content linking with LTI or external access to Gizmos.

ii. School rostering

Based on purchasing volume, ExploreLearning can work with large clients to implement provisioning through regular OneRoster v1.1 CSV uploads or OneRoster API upload through Classlink or Clever upload.

Gizmos classroom management functionality allows teachers to set up a class, enroll students in it, and assign specific Gizmos to the students in the class. From the class page, the teacher can manage the class roster for one or more classes. Teachers can use two methods to enroll students: Self-enroll or manual enrollment. Please see our online help center for documentation about Classes & Rosters.

Students may be rostered to multiple schools, provided that all schools are within the same subscription. Teachers are rostered to a single school. Multiple teachers may be assigned to a single course.

iii. PDF and/or ePUB format

Gizmos provides several resources in PDF format, particularly the lesson and supplementary materials provided for each simulation. Each Gizmo simulation typically includes:

- Teacher Guide: This guide contains lesson objectives, vocabulary, background info, discussion questions, and more. It is available in PDF and Word formats.
- Student Exploration Sheet: This sheet guides students through the simulation with warm-up activities, investigations, and questions. It is available in PDF, Word, and Google Docs formats.
- Vocabulary Sheets: This student resource lists key terms and definitions related to the simulation. It is available in PDF and Word formats.

Many Gizmos also include supplementary materials, which are often offered in PDF format. Some can be downloaded to Word and converted to PDF. These additional lesson materials are designed to extend learning or differentiate instruction, so the type of resource varies between simulations. Examples include:

- Task Cards
- Constructed Response Prompts

- Graphic Organizers
- STEM Challenges
- Mini Student Exploration Sheets (for younger students)

> **iv. Alternative text (image), captions and subtitles (videos), read-alouds, and other accessibility functions**

At ExploreLearning, we believe all students can have success in math and science—and have fun along the way! This commitment inspires us to work continuously toward enhancing the accessibility of our products to serve the needs of learners with disabilities or accessibility needs.

ExploreLearning strives to make Gizmos an accessible learning solution that helps all students feel successful. Key accessibility features are listed below:

- Gizmos includes keyboard accessible features, such as using 'Tab' to move forward, ‘Spacebar’ to toggle, or arrows to navigate dropdown options and sliders.
- Gizmos simulations use minimal text and automatically resize to the best fit for a screen, making most text easy to read.
- Gizmos does not use repeated flashes.
- Many parts of Gizmos, but not all, have contrasting colors.
- Time-based responses are rarely used in Gizmos, and users can repeat and try again.
- A number of Spanish- and French-language lessons and supporting lesson materials are available. Schools may customize lesson materials by using translation tools available online.
- With detailed graphics, vocabulary sheets, and customizable student lessons and activities, Gizmos is designed to support all learners.
- Gizmos has rich visuals and virtual models to support student understanding, allowing for multiple modes of representation, discussion, pictures, graphs, and writing.

As with all educational technology services and providers, some criteria in some accessibility standards may not be applicable to or currently supported within all of our educational products and services. Some of our actions to enhance accessibility include:

- Establishing an ExploreLearning governance group that is responsible for fostering alignment with accessibility standards and best practices.
- Adding to existing product reviews and design roadmaps to amplify focus on accessibility.
- Engaging with respected industry partners to better understand and prioritize development needs.
- Ongoing testing and review of our curriculum products.

> **v. 508 compliant platform**

ExploreLearning is taking concrete steps toward the goal of achieving alignment of our products and services with accessibility standards, including Section 508 and WCAG 2.0 and 2.1 A and AA criteria. Technologies and requirements are continually evolving, and compliance with accessibility standards is an ongoing process—not a simple, static, one-and-done exercise.

ExploreLearning's internal product design, development, and enhancement process incorporates considerations around accessibility throughout the product life cycle. We are committed to continued support of evolving WCAG standards and Section 508 of the Rehabilitation Act of 1973 as part of our product road maps.

We are committed to the continued support of evolving WCAG standards and Section 508 of the Rehabilitation Act of 1973 as part of our road map. ExploreLearning's internal product design, development, and enhancement process incorporates considerations around accessibility throughout the product lifecycle. As we implement product changes and enhancements, we take a careful approach to avoid unanticipated negative impacts on the effectiveness and functionality that our customers rely on.

We passionately support the ultimate goal of making all products as accessible as possible and look forward to sharing more information as additional enhancements and/or new features are implemented.

Visit the following link for an overview of accessibility features: Accessibility Features in Gizmos.

vi. Privacy-data security specifications

We are committed to enabling the accessibility of our services and protecting the privacy of website visitors. We collect a minimal amount of personally identifiable information (PII) for students and educators. We do not share PII or any aggregate information with third parties. We do not use PII for any commercial purpose except to support the school or school system in its efforts to educate its students. Our staff is not authorized to disclose student login information or usage information, and information regarding student login credentials is strictly controlled by the teachers.

- See ExploreLearning’s complete policy: Privacy Statement

ExploreLearning products require a unique username/password combination for access to the system via the Internet. The application and back-end systems are protected by various firewalls and VLAN implementations to protect the user data.

vii. Browser and OS support

ExploreLearning products run on devices with the following recommended settings:

- **Devices:** ExploreLearning products are accessible via a web browser on most Chromebooks, Macs, PCs, and mobile devices
- **Web Browser:** The latest versions of Chrome, Microsoft Edge, Firefox, or Safari
- **Sound capability:** Speaker or headphones available
- **Display Size:** 1024 x 768 or higher
- **Memory:** Due to the graphics-intensive nature of the systems, we recommend 4 GB of RAM for devices and a minimum of 2 GB.
- **Video Card:** Support for WebGL. WebGL will not run on certain Chromebooks (about ten 3D Gizmos use WebGL). Use this link to check if your system supports WebGL: https://get.webgl.org/.

- **Display Size:** 1024 x 768 or higher. Due to the detailed, interactive design of Gizmos, we recommend a tablet screen size or greater for the optimal experience.

> **b. LMS is a generic term for platforms like Canvas, Google, and Schoology. A software platform designed to manage, deliver, and track educational courses, training programs, or learning and development initiatives. It provides educators with tools to create and organize content, manage student enrollments, track progress, assess performance, and facilitate communication between instructors and learners. LMSs often include discussion forums, assignment submissions, quizzes, grading, and reporting.**

ExploreLearning products can be accessed via an LMS link, which allows users to access specific products. ExploreLearning provides LTI-based Single Sign-On (SSO) through which Canvas users may directly access the ExploreLearning site without additional logins.

> **c. ClassGather offers customers access to their digital instructional materials through direct integrations with publisher platforms. As a certified integration partner, ClassGather supports roster exchange with publishers via OneRoster (CSV or API) and SSO access via SAML, oAuth, or LTI. Through automated resource assignment, access to digital titles is provisioned at the time of purchase, so student and teacher access "just works" without additional content or integration configuration.**

ExploreLearning products integrate with many LMS via LTI and also offer ADFS-Based SAML SSO or Clever InstantLogin. We can also process OneRoster v1.1 .csv roster uploads or OneRoster API uploads through Classlink or Clever to automatically upload teachers, students, and classes.