

Wright City Science Curriculum

Unit 2 - 2nd grade

Grade	2
Unit of Study	Earth Events and Properties of Matter
Length of Unit	10 days; 30 minutes per day
Sample Essential Questions	Sample Corresponding Big Ideas
changes in states of matter water cycle	Which materials will be observed at different temperature, and how those temperatures will be determined (e.g., using ice to cool and a lamp to warm) and measured (e.g., qualitatively or quantitatively)
melting chocolate, freezing water	Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature (A.1)
	Matter can be described and classified by its observable properties (A.1): Observations could include color, texture, hardness, and flexibility. Patterns could include the similar properties that different materials share
	Different properties are suited to different purposes (A.2): Examples of properties could include, strength, flexibility, hardness, texture, and absorbency
	Examples of events and timescales could include volcanic explosions and earthquakes, which happen quickly and erosion of rocks, which occurs slowly; Some events happen very quickly; others occur very slowly, over a time period much longer than one can observe (2.ESS1.C.1)

Missouri Learning Standards	
Priority Standards	Supporting Standards
2.PS1.A.1 Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties	2.W.3.A Gather, analyze, evaluate, and use information from a variety of sources to apply the research process
2.PS1.A.2 Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose	2.R.1.A Develop and demonstrate reading skills in response to text

2.ESS1.C.1 Use information from several sources to provide evidence that Earth events can occur quickly or slowly	2.DS.A.3 Draw a picture graph or a bar graph to represent a data set with up to four categories)
2.ESS2.A.1 Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land	2.DS.A.4 Solve problems using information presented in line plots, picture graphs and bar graphs
2.ESS2.B.1 Develop a model to represent the shapes and kinds of land and bodies of water in an area	2.DS.A.5 Draw conclusions from line plots, picture graphs and bar graphs
2.ESS2.C.1 Obtain information to identify where water is found on Earth and that it can be solid or liquid	

Unit 2 Sequence			
MLS	Topic(s)	Learning Targets	Academic Vocabulary
			matter, texture, hardness, flexibility, temperature, classify, patterns, natural, human designed, absorbancy, solid, liquid
			earthquake, volcanic eruption, erosion, weathering, windbreak, melting, flood, landslide, hurricane, deposition

MLS	Learning Activities	
2.PS1.A.1 Plan/ conduct investigation to describe/ classify different kinds of materials by their observable properties	Key Experiments and Investigations ● Sink or Float? Little Bins for Little Hands Test various classroom objects (paperclip, eraser, crayon) to categorize them by density and observe if they float or sink. ● Magnet Hunt Little Bins for Little Hands Use magnets to identify which objects (iron, nickel, plastic, wood) are attracted to them. ● Dissolving Station Investigate which substances (salt, sugar, sand, gravel) dissolve in warm water. ● Baking Soda and Vinegar Reaction TPT Combine a solid and liquid to observe the creation of a gas (bubbles). ● Material Scavenger Hunt & Sort Collect items and sort them by properties: soft/hard, flexible/rigid, smooth/rough. ● Oil and Water Density Tower Kids Science Labs Explore layering liquids and solids with different densities. ● Oobleck (Non-Newtonian Fluid) Kids Science Labs Mix cornstarch and water to study a material that acts as both a solid and a liquid.	Must Do
2.PS1.A.2 Analyze data obtained from testing different materials to determine which materials have the properties	Key Experiments and Investigations ● Waterproofing Test: Students test various materials (e.g., paper towels, aluminum foil, wax paper) to determine which is best at keeping an item dry. ● Strength and Stability Testing: Testing different materials (wood, plastic, paper) to build a structure and analyzing which is best suited to hold weight.	Option Level

that are best suited for an intended purpose	● Flexibility Investigation: Sorting materials by how much they bend or stretch (e.g., rubber bands vs. pipe cleaners vs. wooden sticks) to determine their best use. ● Absorbency Experiment: Comparing paper, fabric, and plastic to see which absorbs water the fastest for cleaning up spills. ● Friction & Motion Test: Using small, handmade propeller cars to see how different surfaces (rough vs. smooth) affect the car's movement, testing which material is best for speed.	
2.ESS1.C.1 Use information from several sources to provide evidence that Earth events can occur quickly or slowly	Key Experiments and Investigations ● Hillside Erosion Simulation: Students build a sand "hillside" and use water (watering can) and wind (straws/fan) to observe how quickly or slowly material moves. ● Sugar Cube Weathering: Place sugar cubes in a container and shake them to simulate the slow breaking down of rocks (weathering) by wind or water. ● Baking Soda Volcano: Mix vinegar and baking soda to model a rapid, violent change to the Earth's surface, contrasting with slow erosion. ● Soil Erosion Experiment: Use trays of soil, some with grass and some without, to observe how vegetation helps slow down the erosion process during a "rain" event. ● Tornado in a Bottle: Create a vortex in a jar with water and dish soap to visualize rapid weather events.	Option Level
2.ESS2.A.1 Compare multiple solutions designed to slow or prevent wind or	Here are specific experiments for the 2.ESS2.A.1 standard: ● Hillside Erosion Experiment: Students create a "hill" of sand or soil in a tray. They simulate rain using a watering can or spray bottle and observe how the soil erodes. They then test solutions like adding popsicle stick "retaining walls," small rocks, or grass (plants) to see which best slows down the erosion.	Option Level

water from changing the shape of the land	• Coastal Erosion Simulation: Using a plastic container, students build a beach with sand next to a "sea" of water. They use a piece of cardboard to create waves, observing how the water shapes the land. They then test methods to protect the beach, such as placing rocks (breakwaters) in the water. • Wind Erosion Model: Using a hair dryer or straw to simulate wind, students blow across a tray of sand to observe erosion. They can test solutions such as covering the sand with pebbles or moistening it to see how this prevents the sand from blowing away. • Water Flow Investigation: Students pour water over different surfaces (e.g., bare soil, soil with grass, gravel) in a tilted tray to compare how fast the water moves and how much material is carried away.	
2.ESS2.B.1 Develop a model to represent the shapes and kinds of land and bodies of water in an area	Key Experiments for 2.ESS2.B.1 (Earth Materials & Systems) • "Canyon Erosion Simulator" (Water Erosion): Students build a large, packed sand pile in a bin and slowly pour water over it to observe how water creates canyons, sea stacks, or horseshoe bends over time. • "Beach Erosion Protection" (Design Solution): In a sand-filled tray, students create a "beach" and use a cup with holes to simulate rain or a pitcher for waves. They then test materials like popsicle sticks, pebbles, or plants to protect the beach from washing away. • "Windbreak Challenge" (Wind Erosion): Using a hair dryer (low setting) or a fan, students create "wind" over dry soil or sand. They then design and test barriers (small sticks, index cards, rocks) to prevent the soil from blowing away. • "Vegetation vs. Soil Erosion" (Soil Stability): Place soil in two tray sections—one covered in grass (or moss/plants) and one bare. Tip the tray and spray with water to compare which side erodes faster, highlighting the role of plant roots.	Option Level

	• "Designing a Retaining Wall" (Engineering): Students build a steep hill of wet sand and design a retaining wall using materials like popsicle sticks, aluminum foil, or small rocks to hold back the land against a "downpour" (water spray).	
2.ESS2.C.1 Obtain information to identify where water is found on Earth and that it can be solid or liquid	Top Experiments for 2.ESS2.C.1 (Slow & Fast Changes to Earth's Surface) • Sand Hillside Erosion Challenge (Engineering Solution) ◦ Activity: Students build a sand "hill" in a tray, then pour water on it to simulate rain, observing how the sand washes away. ◦ Goal: Students design and test structures (using toothpicks, small rocks, fake leaves) to prevent the sand from washing away, comparing which designs work best. • Sugar Cube Weathering Simulation (Slow Change) ◦ Activity: Place sugar cubes in a container and shake them to simulate rocks tumbling in a riverbed. ◦ Goal: Observe how the sharp corners break off, showing how rocks become smaller and smoother over time. • The "River" Erosion Model (Slow/Fast Change) ◦ Activity: Create a long, tilted pan filled with soil and sand. Pour water at the top to create a river. ◦ Goal: Observe how water moves soil (erosion) and deposits it elsewhere, creating new landforms. • Cookie Excavation/Plate Tectonics (Slow Change) ◦ Activity: Use chocolate sandwich cookies to represent the Earth's crust (top cookie), mantle (cream), and base (bottom cookie). Move the "plates" to simulate fast and slow changes.	Option Level

	○ Goal: Demonstrate how landforms like mountains are formed by shifting plates. ● Sugar Ice "Glacier" Movement (Slow Change) ○ Activity: Freeze a mixture of sand and water to create a "glacier." Place it on a tray of soil, and as it melts, observe how the sand cuts into the soil beneath. ○ Goal: Model how glaciers carve out valleys.	
	Ada Twist, Scientist	Option Level

Assessments		
MLS	Description or Location	Rubric/Location

Additional Resources	
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