

<b>Grade: 4</b> <b>Subject: Science</b>	<b>Unit 1: Land and Water</b>
<b>Big Idea/Rationale</b>	<ul style="list-style-type: none"> <li>• There is a unique relationship between land and water.</li> <li>• Water changes the shape of land.</li> <li>• Features in the land affect the flow of water.</li> <li>• There is a cause and effect between the flow of water over and through land and the effects of various land features on the flow of water.</li> <li>• Glaciers have a great effect upon land.</li> <li>• Models can be used to study the interaction of land and water in various conditions.</li> </ul>
<b>Enduring Understanding (Mastery Objective)</b>	<ul style="list-style-type: none"> <li>• Water has an important role in shaping the land on earth.</li> <li>• Soil is composed of weathered materials and organic matter at the earth’s surface.</li> <li>• Soil components include sand, silt, clay, gravel, and humus each unique properties.</li> <li>• The weathering away and moving of the soil and rock is erosion: the settling of eroded materials is deposition.</li> <li>• The water cycle includes the processes of evaporation, condensation, and precipitation and the passage of water over and through land. These processes affect the shape of the land.</li> <li>• Both the flow of water and the slope of the land affect erosion and deposition.</li> <li>• Tributaries are branches of streams that converge to form the trunk of a larger stream, or river. Together, they act as a system that drains the land.</li> <li>• Landforms, such as canyons and deltas, result from the action of flowing water.</li> <li>• Humans can affect erosion and deposition in various ways, including clearing the land, planting vegetation, and building dams.</li> <li>• Hills, rocks, plants and dams may change the direction and flow of water</li> </ul>
<b>Essential Questions (Instructional Objective)</b>	<ul style="list-style-type: none"> <li>• How does the interaction of land and water help shape the earth?</li> <li>• What other forms can water take? What conditions allows this to happen?</li> <li>• How do rainwater and its runoff change the land through stream formation?</li> <li>• What are some properties of soil when water passes over it slowly on a flat surface?</li> <li>• Do different soil components, gravel, sand, clay and humus react differently to water, (sink, float, dissolve)? Do they appear, feel differently?</li> <li>• Do different soil components “hold” more water in the pore spaces?</li> <li>• What factors affect the speed of water?</li> <li>• What do bodies of water look like in an aerial drawing?</li> </ul>

	<ul style="list-style-type: none"> <li>• How do tributaries come together to form a larger water source?</li> <li>• How does a large source of water affect the land as it passes over it?</li> <li>• How do natural features, hills, mountains, large rocks affect the direction of water?</li> <li>• How do man-made features, dams, levies, affect the direction of water?</li> <li>• How does a slope affect the speed and direction of water?</li> <li>• How does vegetation affect the flow and direction of water?</li> </ul>
<p><b>Content (Subject Matter)</b></p>	<p>Lesson - 1: Thinking about Land and Water</p> <ul style="list-style-type: none"> <li>• Students will focus on land and water and understand its important role in shaping the land on earth.</li> </ul> <p>Lesson - 2: The Water Cycle: Modeling Land and Water</p> <ul style="list-style-type: none"> <li>• Students are introduced to the concept that water changes its physical form by allowing them to see how water moves in the air and returns to earth as precipitation.</li> </ul> <p>Lesson 3: Modeling Rain on Land</p> <ul style="list-style-type: none"> <li>• Students investigate the basic effects of rainwater on land and observe one way in which runoff from rain changes the land through stream formation.</li> </ul> <p>Lesson 4: Investigating Streams</p> <ul style="list-style-type: none"> <li>• Students examine the properties of soil and examine the process by which water flows over and through the land.</li> </ul> <p>Lesson 5: Examining Earth Materials</p> <ul style="list-style-type: none"> <li>• Students will Observe and compare four soil components.</li> </ul> <p>Lesson 6: Where Does the Water Go?</p> <ul style="list-style-type: none"> <li>• Students investigate Ground water and Runoff.</li> </ul> <p>Lesson 7: Where Does the Soil Go? Looking at Erosion and Deposition</p> <ul style="list-style-type: none"> <li>• Students will apply strategies to track the speed and runoff of the movement of soil.</li> </ul> <p>Lesson 8: Bird's-Eye View: Looking at Parts of a Stream</p> <ul style="list-style-type: none"> <li>• Students will be introduced to new skill of making and labeling aerial drawings.</li> </ul> <p>Lesson 9: When Streams Join: Modeling Tributaries</p> <ul style="list-style-type: none"> <li>• Students use a multiple stream source to model the simultaneous formation of three streams.</li> </ul> <p>Lesson 10: Rushing Rivers: Exploring Flow</p>

	<ul style="list-style-type: none"> <li>• Students test how land affects the direction and flow of water.</li> </ul> <p>Lesson 11:Hills and Rocks: How Nature Changes the Direction and Flow of Water</p> <ul style="list-style-type: none"> <li>• Students explore how natural land features affect the direction and flow of water.</li> </ul> <p>Lesson 12:Dams: How Humans Change the Direction and Flow of Water</p> <ul style="list-style-type: none"> <li>• Students explore ways humans control flowing water.</li> </ul> <p>Lesson 13:Exploring Slope</p> <ul style="list-style-type: none"> <li>• Students will examine the effects of sloped land on erosion as well as vegetation. Students will make predictions how slope affects direction and flow of water on land.</li> </ul> <p>Lesson 14:Plants: Protecting Sloped Land from Erosion</p> <ul style="list-style-type: none"> <li>• Students build on all previous lessons by planning and creating a landscape.</li> </ul> <p>Lesson 15:Planning Our Homesites:</p> <ul style="list-style-type: none"> <li>• Designing and Building a Landscape</li> <li>• Students are to test their predictions by conducting a final investigation.</li> </ul>
<p><b>Skills/ Benchmarks (CCSS Standards)</b></p>	<ul style="list-style-type: none"> <li>• <b>5.1.4.A.1:</b> Demonstrate understanding of the interrelationships among fundamental physical, life, and Earth systems sciences.</li> <li>• <b>5.1.4.A.2:</b> Use outcomes of investigations to build and refine questions, models, and evidence.</li> <li>• <b>5.1.4.A.2:</b> Use scientific facts, measurements, observations, and patterns in nature to build and critique scientific arguments</li> <li>• <b>5.1.4.B.2:</b> Measure, gather, evaluate, and share evidence using tools and technologies.</li> <li>• <b>5.1.4.B.3:</b> Formulate explanations from evidence.</li> <li>• <b>5.1.4.C.2:</b> Revise predictions or explanations on the basis of learning new information.</li> <li>• <b>5.1.4.C.3:</b> Present evidence to interpret and/or predict cause-and-effect outcomes of investigations.</li> <li>• <b>5.1.4.D.1:</b> Actively participate in discussions about student data, questions, and understandings.</li> <li>• <b>5.1.4.D.2:</b> Work collaboratively to pose, refine, and evaluate questions, investigations, models, and theories.</li> <li>• <b>5.1.4.D.3:</b> Demonstrate how to safely use tools, instruments, and supplies.</li> <li>• <b>5.1.4.D.4:</b> Handle and treat organisms humanely, responsibly, and ethically.</li> <li>• <b>5.2.4.B.1:</b> Predict and explain what happens when a common substance, such as shortening or candle wax, is heated to melting and then cooled to solidify.</li> </ul>

	<p>a solid.</p> <ul style="list-style-type: none"> <li>• <b>5.3.4.C.2:</b> Explain the consequences of rapid ecosystem change (e.g., flooding, wind storms, snowfall, volcanic eruptions), and compare them to consequences of gradual ecosystem change (e.g., gradual increase or decrease in daily temperatures, change in yearly rainfall).</li> <li>• <b>5.2.4.C.4</b> Illustrate and explain what happens when light travels from air into water.</li> <li>• <b>5.4.4.A.3:</b> Generate a model with explanatory value that explains both why objects roll down ramps as well as why the Moon orbits Earth.</li> <li>• <b>5.4.4.C.1:</b> Create a model to represent how soil is formed.</li> <li>• <b>5.4.4.C.2:</b> -Categorize unknown samples as either rocks or minerals.</li> <li>• <b>5.4.4.E.1:</b> Develop a general set of rules to predict temperature changes of Earth materials, such as water, soil, and sand, when placed in the Sun and in the shade.</li> <li>• <b>5.4.4.G.1:</b> Explain how clouds form.</li> <li>• <b>5.4.4.G.3:</b> Trace a path a drop of water might follow through the water cycle.</li> <li>• <b>5.4.4.G.4:</b> Model how the properties of water can change as water moves through the water cycle.</li> </ul>
<b>Materials and Resources</b>	<ul style="list-style-type: none"> <li>• Motion and Design - Science and Technology for Students (STC), National Science Resources Center, Washington, D.C. 1997</li> <li>• Copy of Student Binder (SB), pages, vocabulary quizzes</li> </ul>
<b>Notes</b>	