

## Unit 2: The Forces of Wind and Water

### WEEK 4 Lesson 1

#### Science and Engineering: Earth's Systems

##### The Forces of Water on Land

Note: This lesson requires a stream table set up, similar to Week 3.  
Tables should be kept intact for discussion in Lesson 2.

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| <b>S &amp; E Big Ideas</b>        | Wind and water can change the shape of the land.<br>Changes happen over time.                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>S &amp; E Guiding Question</b> | What resources can we use to understand changes in the shape of the land?                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Content Objectives</b>         | I can conduct an investigation to model and observe water's effects on land. (Practice 2, Science 2-ESS2-4(MA))<br>I can write and draw what I observed during an investigation about the force of water on Earth's materials. (Practice 4, 2-ESS2-2)<br>I can draw and write about the effects of water on land, based on my observations. (W.3.2)                                                                                                                      |
| <b>Language Objective</b>         | I can discuss my observations with my peers while we conduct an investigation by listening and adding onto what they say. (SL.1.2.b)                                                                                                                                                                                                                                                                                                                                     |
| <b>Vocabulary</b>                 | <b>earth materials:</b> the natural materials found on Earth, including minerals, rocks, soil, and water<br><b>fertile:</b> able to produce farm crops or other plants<br><b>plateau:</b> a raised landform with a flat surface on top<br><b>runoff:</b> water that runs off the surface instead of soaking in the soil<br><b>stream table:</b> a tray or table use to model the way water flows like a stream<br><b>topsoil:</b> the layer of soil in which plants grow |
| <b>Materials and Preparation</b>  | <ul style="list-style-type: none"><li>stream table, one for each group</li></ul> Prepare one stream table for each group as for Week 3, but with topsoil instead of sand. It may be useful to have some children help set up the stream tables before the lesson.                                                                                                                                                                                                        |

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|                                      | <p>For additional help with setup, watch the Stream Table setup for topsoil <a href="#">video</a>.</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p style="text-align: center;">Stream Table Preparation</p> <p><b>Materials:</b></p> <ul style="list-style-type: none"> <li>• 2 aluminum foil trays, one with a hole at one end and one without, from Lesson 3</li> <li>• topsoil, 3 cups</li> <li>• spray bottle with water</li> <li>• spoon to mix the topsoil</li> <li>• 12 inch ruler</li> <li>• duct or packaging tape</li> <li>• 8 oz paper cup, from Lesson 3</li> </ul> <p><b>Steps:</b></p> <ol style="list-style-type: none"> <li>1. Pour topsoil into the tray with a hole.</li> <li>2. Spray the topsoil with water and mix it until it is evenly moist but not soggy.</li> <li>3. Pack the topsoil to cover one third of the tray, forming a plateau about 1½ - 2 inches high. Make sure the topsoil is well-packed and flat on top.</li> <li>4. Place the ruler across the tray, above the topsoil, 1½ inches from the edge of the tray.</li> <li>5. Tape the ruler to the tray on both ends.</li> <li>6. Place the cup on the ruler so the hole sits between the ruler and the edge of the tray.</li> <li>7. Place the second tray on a chair or other surface below the hole in the stream table to catch water.</li> </ol> </div> <ul style="list-style-type: none"> <li>• 16 oz bottle filled with water, one for each group</li> <li>• writing tools</li> <li>• Science and Engineering packets</li> </ul> <p>Identify a new recorder from each group and gather those children's packets.</p> |
| <p><b>Opening</b><br/>10 minutes</p> | <p><i>Last week we saw how water eroded the sand plateau. Today we will conduct the same investigation, but we will use a different kind of earth material called topsoil. <b>Topsoil</b> is the top layer of soil we find on the ground. It is a very fertile layer of soil, meaning it is rich in nutrients for plants. When we conduct our investigation, let's pretend that the topsoil is a field where there are no crops planted yet.</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

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|                                            | <p><i>Before we get started, let's make a prediction. Do you think the flowing water will have the same effect on the topsoil as it did on the sand? What makes you say that?</i></p> <p><i>Your group will have a new recorder this week.</i></p> <p>Distribute packets to children who will record the group's investigation. Remind children of the other roles they might take. Send children to their tables.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <p><b>Investigation</b><br/>20 minutes</p> | <p>Give directions to the whole group simultaneously for preparing and conducting the investigation; use the steps below and pace directions according to children's activity.</p> <ol style="list-style-type: none"> <li>Set up<br/><i>Place the stream table (the tray with the hole) on the desk, with the hole hanging over the side of the desk. Set the tray without a hole on a chair underneath the hole in the stream table.</i></li> <li>Record<br/><i>If you are the recorder, sketch a map of the topsoil in the stream table. You can make this map as if you are mapping a farm field that is waiting to be planted.</i></li> <li>Predict<br/><i>Talk to your group. What might happen when the water falls on the topsoil? Recorder, write your prediction in your packet.</i></li> <li>Investigate<br/><i>If you are in charge of the cup, place it in the middle of the ruler. Make sure the hole is not blocked.</i><br/><br/><i>If you are in charge of the water, slowly pour it into the cup until it is full. When the cup is empty, fill it again with the remaining water.</i></li> <li>Observe and talk<br/><i>As the water flows, observe what is happening and talk to your partner.</i></li> <li>Talk<br/><i>After all of the water has been poured, talk about your observations.</i></li> </ol> |

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|                                | <p>7. Record<br/><i>Record your observations. Sketch a map of the topsoil now. Label any landforms you recognize.</i></p> <p>8. Clean up<br/><i>When you finish, label your stream table with your names. Leave the topsoil in place and put the stream table [in the designated area]. Then, clean up the rest of the materials.</i></p> <p>As the children work and between each step of the investigation, circulate to support them. Direct their attention to the landforms being formed by the water, and encourage them to use specific vocabulary to name what happens.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Discussion</b>              | <i>Discussion about this experience will happen in Lesson 2.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Closing</b>                 | <p>Note: Stream tables should be kept intact for discussion in Lesson 2.</p> <p><i>Take a moment to reflect on the investigation. Ask yourself these questions:</i><br/> <i>Did I use my five senses to gather information about an object or something that happened?</i><br/> <i>Did I draw or write what I thought or observed?</i></p> <p><i>Today you investigated to see how flowing water affects topsoil. Tomorrow we will discuss your observations and questions.</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Standards and Practices</b> | <p><b>SL.1.2.b</b> Build on others' talk in conversations by linking their comments to the remarks of others.</p> <p><b>W.3.2</b> Use a combination of drawing and writing to communicate a topic with a beginning, middle (including details), and an end.</p> <p><b>2-ESS2-2.</b> Map the shapes and types of landforms and bodies of water in an area. Clarification Statements: • Examples of types of landforms can include hills, valleys, riverbanks, and dunes. • Examples of water bodies can include streams, ponds, bays, and rivers. • Quantitative scaling in models or contour mapping is not expected.</p> <p><b>2-ESS2-4(MA).</b> Observe how blowing wind and flowing water can move Earth materials from one place to another and change the shape of a landform. Clarification Statement: • Examples of types of landforms can include hills, valleys, riverbanks, and dunes.</p> <p><b>Practice 2.</b> Developing and using models</p> <p><b>Practice 4.</b> Analyzing Data &amp; Interpreting Data</p> |

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| <b>Ongoing assessment</b> | <p>Observe and take notes as the children conduct the investigation.</p> <p>Do children recognize and identify landforms as they form in the stream table?</p> <p>Do they sketch their maps with care and accuracy?</p> <p>How do children record their observations?</p> <p>What comparisons do they make to the previous investigation?</p> <p>Review the children's packet entries in preparation for the next day's discussion.</p> |
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| <p><b>Notes</b></p> |
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