

Unit 2: The Forces of Wind and Water

WEEK 7 Lesson 2

Science and Engineering: Earth's Systems

Testing Approaches to Slowing and Preventing Erosion: Walls, Windbreaks, and Terracing

Big Ideas	Wind and water can change the shape of the land. The changing shape of the land impacts people. Changes happen over time.
S & E Guiding Question	What resources can we use to understand changes in the shape of the land?
Content Objective	I can test the effectiveness of an approach to slowing erosion.
Language Objective	I can discuss my observations.
Vocabulary	approach: a way of doing something force: great strength impact: to influence terracing: sloping land that has been formed into a number of level flat areas resembling steps windbreak: a row of trees or a fence, wall, or screen that provides protection from the wind
Materials and Preparation	Assign children to stable, small groups (about four children each) to work together during this pair of lessons. ● Erosion Slides ● Science and Engineering packets, one for demonstration ● writing tools ● each group's aluminum trays with chosen materials, from Lesson 1 Add to each tray: ● sand, 1 cup ● soil, 1 cup

	• straws, one for each child in the group • containers for pouring water Plan to keep the trays intact until Week 7, Lesson 3
Opening 10 minutes	Gather children in the meeting area in the groups formed in Lesson 1. Distribute aluminum trays to each group. <i>Yesterday you planned investigations in groups to test approaches to slowing erosion. Today you will carry out your investigations.</i> <i>Take a moment with your group to review your plan and predictions.</i> Show the Slowing Erosion Investigation page in a packet. <i>This is the page you will use to record the results of your investigation. The first line says “Approach.” Here you will write which approach you are testing.</i> <i>The next part says “Circle one or more force.” Your choices are “waves,” “strong wind,” and “soft wind.” Think about which force or forces you want to use in your investigation. If you create waves, circle “waves.” If you create waves and use a strong wind, circle both. If you are testing windbreaks, it makes sense to use wind first, before the land is wet.</i> <i>After conducting the investigation, draw and write about the impact of the water or wind force on the land.</i> <i>We’re going to set up the investigations together, and then your group will conduct the investigation you planned. After you conduct your investigation, talk with your group about how you will share your data with other scientist classmates tomorrow.</i> Send the children to the tables with their aluminum trays, writing tools, and Science and Engineering packets.
Investigation 20 minutes	Use the steps below to guide the set up of the investigation. 1. <i>Using sand and soil, build an island in the middle of the tray.</i> 2. <i>Pour water in the tray until it surrounds the island.</i> 3. <i>Referring to your planning sketch, set up your approach.</i> <i>Now talk to your group. What force or forces did you plan to test?</i> <i>Use your plan to conduct the investigation. Remember to discuss and record what happens to the island. If you decide to conduct</i>

	<i>more than one investigation using different forces, be sure to use a new recording page.</i>
Discussion	<i>Discussion about this experience will happen in Lesson 3.</i>
Closing	<i>Take a moment to reflect on the investigation. Ask yourself these questions:</i> <i>Did I use my five senses to gather information about an object or something that happened?</i> <i>Did I draw or write what I thought or observed?</i> <i>Tomorrow we will discuss our investigations.</i> To prepare for Lesson 3, review children’s investigations from Weeks 6 and 7. Review the plans and observations recorded in Science and Engineering packets as well as the trays. Choose one group from each approach to share their work. (Because children have worked in different groups across these two weeks, each should be able to be part of a presenting group.) Let children know which work they will be presenting to classmates in the next lesson. For each of these groups, set aside the appropriate Science and Engineering packet(s) and tray (or prepare slides with photographs of the trays).
Standards	2-ESS2-1. Investigate and compare the effectiveness of multiple solutions designed to slow or prevent wind or water from changing the shape of the land.* Clarification Statements: • Solutions to be compared could include different designs of dikes and windbreaks to hold back wind and water, and different designs for using shrubs, grass, and trees to hold back the land. • Solutions can be generated or provided. 2-ESS2-2. 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.
Ongoing assessment	Observe and take notes as the children conduct investigations. What do the children observe? Are their observations accurate? How effective are their investigations?