Hands-On Activity
Water Power!

In this activity, students will demonstrate the following Inquiry Skills:

- Design Investigations
  - Make or use models that:
    - simulate a real thing that cannot easily be studied or manipulated
- Gather data
  - Use senses to observe:
    - seeing (color, shape, size, texture, motion)

Use the appropriate format to record data:
- Graph or chart
- Photograph/image
- Video recording

Materials:

For each group:
- four plastic containers
- laboratory aprons
- Chemical splash goggles
- sand (enough to half-fill the bowls)
- a beaker
- a graduated cylinder
- tap water
- a meter stick or metric ruler
- a metric tape measure
- funnel
- science notebooks
- digital or video camera

* Students should wear safety goggles and aprons to protect themselves and their clothing during the activity. Students should also know the location and correct operating procedure of the eye wash station.

Divide the class into groups of two to three students each and provide each group with four plastic containers, each filled half-full with sand, and a graduated cylinder. Give them a digital or video camera to have them record their procedures. Students should also have access to tap water. Have each group test the effects of erosion by water and gravity by pouring water into the sand from four different heights.
First, have students use the graduated cylinder to fill a beaker with 250 ml of water. Students should pour the 250 ml of water through the funnel (controls the angle and speed of the water flow) over the sand from a height of five cm above the first bowl of surface of the sand (students should measure this using the metric measuring tape). Students should then measure the width of the crater that develops and record this measurement in a data table in their notebooks (students should measure the width using the meter stick or metric ruler). Students should also record their observations in the data table (such as the one shown below). Students should repeat this process for a variety of drop heights of their choosing.

<table>
<thead>
<tr>
<th>Bowl</th>
<th>Water Drop Height (cm)</th>
<th>Crater width (cm)</th>
<th>Observations</th>
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<tbody>
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Circulate among the groups as they are working to make sure they are making careful observations and accurate measurements. One student of every group should be using the group’s camera to document what the others are doing. Group members may alternate at this duty. As you circulate, have students explain what they are observing in the bowls of sand. This activity is designed to encourage students to observe the role that gravity plays in erosion and to understand that increased height allows the water to accelerate to a faster speed, thus providing it with increased erosional power. Students should be able to articulate their observations. You may wish to take notes regarding students’ mastery of the observation process.

After all of the groups have filled out their data tables, have students use the Scientific Explanation document to answer the question, What factors caused the difference in the power of the water to erode the sand? After students have formulated their own scientific explanation for the question, have them critique and evaluate the explanation of a classmate. Finally have students analyze the effects of erosion on the ecoregions of their local area and/or state.