Option 2 Lab: Weathering and Erosion: Glaciers Model

4-ESS2-1. Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.

Objectives:
Students will:
1) Identify and describe glaciers.
2) Demonstrate how glaciers can change a landscape.

Vocabulary:

<table>
<thead>
<tr>
<th>Canyon</th>
<th>A deep, narrow valley that often has steep sides</th>
<th>Context: Cut by the Colorado River over millions of years, the Grand Canyon is a spectacular example of natural forces carving the Earth.</th>
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</thead>
<tbody>
<tr>
<td>Erosion</td>
<td>The wearing away of the land by flowing water, the movement of glaciers, or by wind.</td>
<td>Context: Flowing water and strong winds are responsible for much erosion of the land.</td>
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<tr>
<td>Glacier</td>
<td>A large body of ice slowly moving across the land, pushing sand and rocks as it moves.</td>
<td>Context: The movement of glaciers is responsible for the formation of Long Island in New York</td>
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<tr>
<td>Landform</td>
<td>A feature of Earth’s surface that emerged as a result of natural causes.</td>
<td>Context: Mountains, canyons, and valleys are examples of landforms that occurred as a result of natural forces.</td>
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<tr>
<td>Natural forces</td>
<td>Occurrences on Earth attributable to nature, not caused by the actions of people.</td>
<td>Context: Earthquakes and volcanoes are destructive natural forces that can cause extensive damage to buildings and can injure people caught in their path</td>
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</table>

Materials:
Wax paper
Markers
Water
Two plastic cups/Dixie cups per group
Paper towels
Cafeteria Tray or other tray
Ice cube tray
Sand
Teaspoon
Top soil or dirt

Note: Before beginning the lesson, prepare the ice trays for the student activity. Make enough ice so that each group has one clear ice cube and one ice cube that has been frozen with sand on the bottom. Then put the other materials in a central place so students are ready to begin immediately following the opening discussion.
**Station #1:**

Sandy bottom ice cubes with dixie or plastic cups. You could even use wax paper - rub the sandy bottom on the substances and write or type out your observations on the student worksheet of what the sand does to the surface of the cup/wax paper.

*Answer the question:* What did the side of the cup/or wax paper look like before and after you rub it with the sandy ice cubes?

**Station #2:**

Regular ice cubes with dixie or plastic cups. You could even use wax paper - rub the ice cube on the substances and write or type out your observations on the student worksheet of what the regular ice cube does to the surface of the cup/wax paper.

*Answer the question:* What did the side of the cup/wax paper look like before and after you rub it with the plain ice cubes?

**Station #3:** Video demo: Glacier Science Experiment (to use as reference for your set up)

Using a cafeteria tray, cover the tray with wax paper. Then place soil or dirt, and some pebbles over the wax paper. Tilt the tray and take a “glacier” and push it down the tray and make your observations of what the glacier does to the land. (Glacier is a large ice cube - or frozen water with a sandy bottom removed from a plastic cup).

*Answer the question:* Did the dirt stay where we put it or did it move? Explain.