Lab 1 Option: Investigating Weathering and Erosion

This lesson is best done in stations: Day 1- (7) weathering stations and Day 2- (7) erosion stations. Students will visit one station, make and record their observations and share with the rest of the group. Additionally, teachers can select stations and have students rotate them or do them as a demonstration with student engagement.

**Materials:**
*Teacher provided*
- Carbonated water*
- Tap water *
- 8 ounce plastic containers with lids
- Rock samples
- Overhead markers
- Steel wool
- Sugar cubes
- Mortar and Pestle
- Sand

*Plastic glasses
- Chalk
- Pennies
- Vinegar
- Antacid tablet
- Zip lock bags
- Shallow aluminum pan
- Ice Cubes*
- Gravel

**Note to the teacher:**
Not all of the weathering stations or all of the erosion stations are of equal difficulty. They have been identified as such because it may require longer to perform the action, it may require more careful observation to see the effect, or it may involve a more elaborate procedure. The stations can be a way to differentiate your class by ability levels, giving the easier stations to those students who may need more assistance and the harder stations to your challenge students. The stations have been identified as Easy (E); Medium (M); and Hard (H) on the charts.

**Part I. Weathering Stations - Student lab sheets** (page 1)

<table>
<thead>
<tr>
<th>Station 1: (H)</th>
<th>Test rock samples in carbonated water vs. tap water. Observations are taken initially, at 20 minutes, and after 24 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Station 2: (E)</td>
<td>Test to show that water expands as it freezes. Mark on a cup the water level before freezing and after freezing. Be sure to include a way to identify the owner(s) of the cup when placing the cup in the freezer.</td>
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<tr>
<td>Station 3: (M)</td>
<td>Test the effects of vinegar (acid rain) on copper (pennies). Here you should record initial observations, after 5 minutes, and after 24 hours.</td>
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<tr>
<td>Station 4: (E/M)</td>
<td>Compare and record the reaction of antacid tablets in water. The comparison is of a whole tablet vs. a crushed tablet. Record initial observations</td>
</tr>
<tr>
<td>Station 5: (H)</td>
<td>Compare and test the reactions of chalk (limestone) in water and vinegar. Record initial observations.</td>
</tr>
</tbody>
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Station 6: (E) Test and record the effect of water on steel wool initially and after 24 hours.

Station 7: (H) Test and record the effect of sugar cubes and gravel shaken together in a jar. Shake the jar for 1 minute. Record observations. Shake the jar for two more minutes. Record observations.

Part II. Erosion Stations - Student lab sheets (page 2)
Introduce and review types of erosion and how different forces cause erosion. Discuss the differences between weathering and erosion. Show pictures of examples of erosion.

Station 1: (E) Demonstrate beach erosion. Using a pan, make a sand pile at one end and pour water at the other end. Slide the pan back and forth to create wave movement. Record observations.

Station 2: (M) In a pan, pile dirt into a mound. Using the squirt bottle, spray water onto the dirt gently at first and then much harder. Observe what happens to the dirt as more and more water hits it. Record observations.

Station 3: (H) Demonstrate the effect of water weight on erosion. Using a pan lay down a layer of dirt on the bottom of the pan about 1 inch thick. Slowly pour a cupful of water on the dirt from a height of 1 inch over the dirt. Observe and record what happens to the dirt. Repeat on the same spot, but this time hold the cup of water from as high a distance as possible. Observe, how did the two differ in their effect on the soil below? Record on lab sheet.

Station 4: (M) Place a wedge of sod (dirt and grass) in a pan. Pour water onto the sod. Observe the results as the water moves over the sod. Compare to Station #2. Record observations.

Station 5: (E) Place sand in a small bowl and blow onto the pile of sand. Blow gently at first and then blow harder and harder. Observe what happens to the sand as more and more air hits it. Record observations.

Station 6: (M) Place a pile of ice cubes on a mound of dirt in a pan. Observe and record what happens as it melts. Record observations.

Station 7: (H) Pile gravel up into a small mound in a pan. Shake the pan to simulate an earthquake. Observe what happens to the rocks that were near the top. Record observations.