Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period \_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**Lesson 2: Does Particle Size Affect Erosion?**

Soil is a mixture of various materials. Rarely are all of the particles of a soil sample an equal size; some particles are small while others are larger. Are you ready to get your hands dirty and find out how the size of soil particles impacts erosion?

Here are some definitions to help you in your investigation.

Soil - surface of the earth that supports plant life

Erosion - the movement of weathered materials from one location to another

Erosion rate - how quickly or slowly erosion happens

Erosion agent - things that increase the rate of erosion

Measurement - the size, length, or amount of something

Length - a measurement of something from one end to the other end

Centimeters (cm) - a unit for measuring length

**Preparing for the Science**

1. To measure the length of something, you must first look at the measuring tool.



 (*Ruler is enlarged and is not to scale*)

2. What unit of length does this ruler measure?

3. After looking at the measuring tool, find the written numbers on the tool. What are the written numbers on the tool?

4. Now, line up the end of the thing you want to measure with the zero (0) mark on the end of the measuring tool.

 



 (*Ruler is enlarged and is not to scale*)

5. Next, find the two written numbers between which the other end of the object is located.

6. This object is between \_\_\_\_\_ and \_\_\_\_\_ centimeters long. So, the pencil is

 longer than \_\_\_\_\_ centimeters, but shorter than \_\_\_\_\_ centimeters.

7. Now comes the estimate part of your measurement. This allows you to estimate the length of the pencil.

 The pencil’s right end is about what part of the way between the two written numbers?

8. This pencil is \_\_\_\_\_\_\_ centimeters long.

**Doing the Science**

1. Start the Erosion Control Simulation by clicking on the “Simulation” tab.

2. Click and drag the large Magnifying Glass over the Mixed Materials container to view the soil sample’s various particle sizes up close. Click the “X” in the upper right-hand corner of the magnified view to close the magnifying glass.

3. Click the “Mixed Materials” container to place a sample on the stream table.

4. Click the red “On” button on the stream table controlling station.

5. Note and record in Table 1 the farthest distance traveled by the various-sized soil particles.

**Table 1. Particle Size and Erosion Distance**

|  |  |
| --- | --- |
| **Table Angle** | **Distance Traveled (in meters) by Particle Size** |
| Small | Medium | Large | Very Large |
| Flat |  |  |  |  |

**Do You Understand?**

1. What was eroded in this experiment?

2. What was the erosion agent in this experiment?

3. If the stream table was gently sloped in this same experiment, which factor would affect the rate of erosion more drastically; the slope or your answer to question #2? Please explain your response.

4. Construct an explanation for how the size of the soil particles affected the distance traveled by the eroded soil. Use evidence from your data table to support your explanation and discuss any pattern in the data that you noticed.

5. Create a model that shows or describes one way that the soil surrounding a home built on a hillside could be protected from erosion. Identify how stability and change affect your model.

6. Plan an investigation for how you could test out your erosion model in the classroom. What materials would you use? What procedural steps would you take? What data would you collect, and how would you organize that data?

7. Aside from particle size and angle/steepness, make a claim about other variables you believe would affect erosion?