

Units  
4Handout  
\_\_\_\_\_*Weathering and Surface Area*

**Purpose:** To help you see the relationship between weathering and surface area.

**Instructions:** Follow the instructions below.

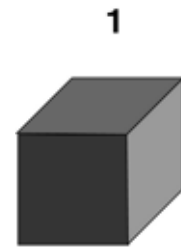
**Step 1**

When rocks break down, they split apart into smaller pieces. This reveals more of their surface area. The surface area is how much of the surface of an object is exposed. Therefore, the more a rock is weathered, the more of its surface area is exposed. This means, its surface area increases as it is weathered.

To calculate surface area, you find the area of each face on an object. Area is calculated as length x width. If an object is a cube, you find the area of one side and multiply by six (because there are six sides on a cube).

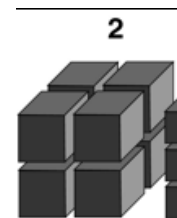
Shown here is a cube with measurements of 4 x 4 x 4 cm.

1. What is the area of each face? \_\_\_\_\_
2. What is the surface area? \_\_\_\_\_

**Step 2**

Now, imagine that same cube before becomes weathered and splits exactly into eight smaller cubes (cut it in half by its length, width, and height).

1. Since each side was cut in half, what is the new length, height, and width of each cube?  
\_\_\_\_\_
2. Knowing the new measurements, what is the area of each face? \_\_\_\_\_
3. What is the surface area of each cube? \_\_\_\_\_
4. Since there are now 8 cubes all together, what is the total surface area of all 8 cubes? \_\_\_\_\_



**Go on to the back!**

**Step 3**

Imagine again that each of those cubes is split even further. Each cube has now turned into four smaller cubes.

1. Each side of the cube was cut in half. What is the new length, width, and height of each cube? (Hint: take your answer from #1 in step two and cut it in half.) \_\_\_\_\_
2. Knowing these new measurements, what is the area of each face of the cubes? \_\_\_\_\_
3. There are a total of 6 sides on each cube. What is the surface area of each cube? \_\_\_\_\_
4. There are now a total of 64 cubes. What is the total surface area of all the cubes combined? \_\_\_\_\_

Fill in the table below with the data you calculated.

	Number of Cubes	Surface Area of Each Cube	Total Surface Area of All Cubes
Step 1			
Step 2			
Step 3			

Answer the following questions below.

1. In each step, the rock was weathered more. What happens to the total surface area of a rock as it weathers? \_\_\_\_\_
2. Which step would the rock weather the slowest? \_\_\_\_\_
3. Which step would the rock weather the fastest? \_\_\_\_\_
4. Write a sentence that describes how surface area affects the rate (speed) at which a rock weathers. \_\_\_\_\_  
\_\_\_\_\_