## Lesson Plan: The Rock Cycle

**Standards: 4th Grade: Standard# 1: R4.1.6, A 4.1.4/4.1.7, STANDARD #2 ST 4.2.1, A 4.2.3/4/2.4**

**Objective-**Students will:

* recreate how rocks change over time and demonstrate the cycle of a rock, by conduct experiments with sugar while observing and recording results
* learn how to use safety equipment

**Prior Learning:** The Rock Cycle is illustrates the slow, continuous process of rocks changing from one type to another over millions of years. Earth processes changes rock types through geologic time. For example:

* Igneous rock can change into sedimentary rock or into metamorphic rock
* Sedimentary rock can change into metamorphic rock or igneous rock
* Metamorphic rock can change into igneous or sedimentary rock

**Materials:**

Sugar Cubes, Candles, Test tubes, Clamps, Foil, Hand lens, Goggles

**Procedure:**

* Instruct students on The Rock Cycle (See attached Rock Cycle diagram)
* Have students gather materials and review safety guidelines
* Follow the worksheet directions (attached)
* Discuss findings

**Follow-Up:** Finally, arrange a field trip to the Tate Geological Museum to view the rock cycle, rocks and mineral exhibits.



**http://www.science-class.net/Lessons/Geology/Rocks\_Minerals/sugar\_rock\_cycle.pdf**

***Rock Cycle Experiment Worksheet:***

Examine the sugar cube with a hand lens. How is the sugar cube like sedimentary rock?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Crush the sugar cube into a powder. What part of the rock cycle does this represent?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Make a “boat” with your foil. Pour the crushed sugar into the foil boat.

What part of the rock cycle does this movement represent?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Pour small amount of water on the sugar and let it dry.

What part of the rock cycle does this represent?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Put on your goggles then use the test tube clamp to hold the foil boat over the candle flame. Observe as the sugar begins to melt. What part of the rock cycle does this represent?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Set the foil boat aside and let the sugar cool and harden. What part of the rock cycle does this represent?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Break the hardened sugar into pieces. What part of the rock cycle does this represent?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

On the back of your paper, describe in your own words how the rock cycle works.

***Rock Cycle Experiment Worksheet: Teacher Answer Key***

Examine the sugar cube with a hand lens. How is the sugar cube like sedimentary rock?

Crush the sugar cube into a powder. What part of the rock cycle does this represent?

It is made of lots of tiny grains cemented together

Make a “boat” with your foil. Pour the crushed sugar into the foil boat.

What part of the rock cycle does this movement represent?

The deposition of the sediment in a basin or valley

Pour small amount of water on the sugar and let it dry.

What part of the rock cycle does this represent?

Sediment turning into sedimentary rock

Put on your goggles then use the test tube clamp to hold the foil boat over the candle flame. Observe as the sugar begins to melt. What part of the rock cycle does this represent?

Sedimentary rock being subducted and melted by the heat deep underground

Set the foil boat aside and let the sugar cool and harden. What part of the rock cycle does this represent?

Molten rock cooling and hardening to form solid rock either magma underground or lava at the surface

Break the hardened sugar into pieces. What part of the rock cycle does this represent?

Mechanical weathering of the rock, breaking it back down into colluvium and eventually sediment

