Name Date\_\_\_\_\_\_\_\_\_\_\_ PD\_\_\_\_\_ CB \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**TITLE:**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**MATERIALS:**



**HYPOTHESIS:** Predict what 2 factors are required to cause changes to rocks? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The rock cycle is a never-ending process. Igneous rock forms from magma or lava. Weathering breaks igneous rock into sediments such as pebbles and sand. These small pieces are compacted and cemented under pressure into sedimentary rock. Under great heat and pressure inside the Earth’s crust, igneous and sedimentary rocks are changed into metamorphic rocks. These rocks are brought to the earth’s surface where they are weathered again.

**Part 1 Weathering and Erosion of Igneous Rock Makes Sediment**

1. Select 3 colors of crayons without paper wrappers & use the knife to shave into 3 small piles
2. Open the starburst and cut into smaller pieces
3. Use the hammer to gently smash the mint inside the wrapper
4. Pour 1/3 of the little pieces and shavings into the cup & add 1/3 the crayons to make another layer
5. Repeat the process creating different layers in the cup
6. Gently pour the contents of the cup into the plastic bag & observe the appearance
7. Gently shake the bag and observe the appearance differences **(answer the questions below)**

**Draw and color what you see from the top. Draw and color what you see from the side.**

1. Explain how the process above represents “Weathering and Erosion”
2. Why did shaking the bag simulate how waves and wind help to form sediment?

# Part 2 Layering with Pressure Makes Sedimentary Rock

* 1. Gently add PRESSURE to compact the sediment by placing 2-3 heavy books on top of the bag
	2. leave for 3 minutes before removing the books. Observe **(answer the questions below)**

**Draw and color what you see from the top. Draw and color what you see from the side.**

1. Why are sedimentary rocks so fragile?
2. How is sediment different than sedimentary rock?

# Part 3 Compacting and Cementing Makes Metamorphic Rock

* 1. Move the sedimentary rock model onto the center the foil and fold the aluminum foil over
	2. Have one member of the group press very hard on the foil with their hands for 30 seconds
	3. Have another member of the group do the same for another 30 seconds
	4. Continue doing this until all members of the group have done it twice
	5. Unwrap the aluminum foil and observe the chips **(answer the questions below)**

**Draw and color what you see from the top. Draw and color what you see from the side.**

1. How did the steps above model compacting and cementing?
2. How is metamorphic rock different from sedimentary rock? Why is it not fragile like sedimentary rock?

**Part 4 Melting Rocks and/or Minerals Makes Magma *Safety Concern: The hot plate will cause burns.***

* 1. Turn the foil into a small boat and put the metamorphic rock model in the center
	2. Use the tongs to take the foil to a hot plate and lay it on the hot plate for 30-45 seconds (Melting)
	3. Use the tongs to pick up the package by the sides and return it to your table **(Do NOT touch it)**
	4. Answer the questions while you wait for it to cool about 10 minutes
1. Explain how these steps represent how magma is made?
2. What happens when matter keeps getting hot? Why is magma so hot it can melt rocks?

**Part 5 Cooling and Crystalizing Makes Igneous Rock** **~*Safety Concern: Liquid sugar is extremely hot***

* 1. Gently use the tongs to test if the sugar has crystalized
	2. Once your rock has finished cooling describe its physical properties below
1. How is this different than metamorphic or sedimentary rock?
2. If this igneous rock came out of a volcano, as magma to lava, where would it complete cooling and crystalizing?
3. What would happen if it was hit by wind, rain, and other rocks?

**HYPOTHESIS REVIEW:** What are the 2 factors of the rock cycle that determine what state of matter (Solid, Liquid, Gas), a rock will be? *(Hint: This is the same rule for ALL matter even water).*