

CURIOSITY AT HOME

THE ROCK CYCLE



The rock cycle is a continuous cycle that has occurred throughout geologic time. Over millions and billions of years, volcanoes, earthquakes, erosion and all other geologic forces slowly change the rocks around us. Over its 'lifetime,' a rock rarely stays in the same location and will transform from one rock type to another many times. You can make models of three different rock types at home to learn more about how different types of rocks are formed.

MATERIALS

- Blocks of white and dark/milk chocolate
NOTE: This exploration could also be done using 2 different colored crayons.
- Aluminum foil and/or aluminum foil cupcake holders
- Hot water and a container for it
- Plastic knife
- Science notebook or paper
- Something to write with

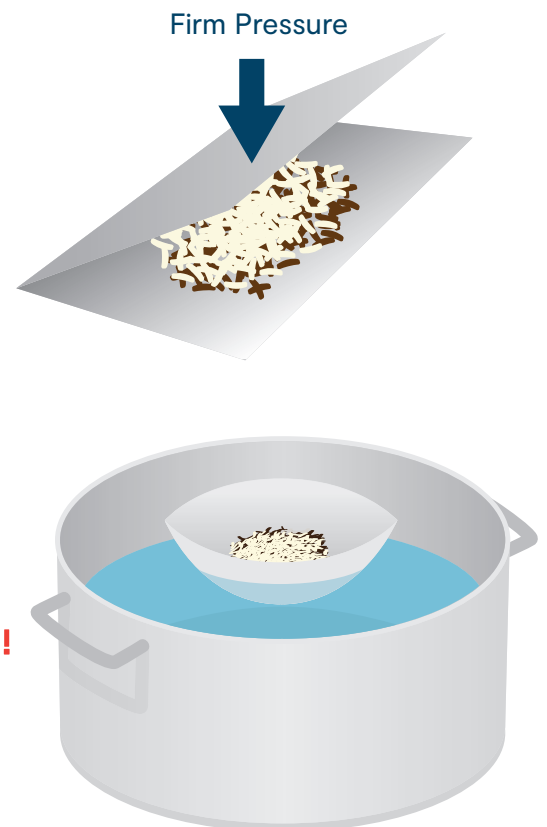
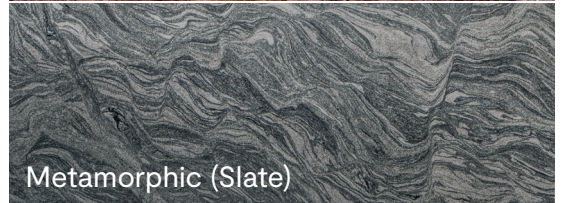
PROCEDURE

Create a model of a **SEDIMENTARY** rock:

- Use plastic knife to create shavings of both white and dark chocolates. Sprinkle shavings onto the foil, first making one layer of dark chocolate, then a layer of white chocolate.
- Fold foil over and press firmly onto shavings. Observe the chocolate. Is it joined together? This is our sedimentary rock, which is a rock composed of sand, gravel or silt arranged in layers. Make observations in your science notebook. How is it different from the shavings we started with?

Using our sedimentary rock, create a model of **METAMORPHIC** rock:

- Place your sedimentary rock into aluminum foil and form foil into a bowl shape that will be able to float on water.
- Float the foil in hot water; make sure the sides of your foil boat are high enough to keep the water from spilling in. As the chocolate heats up, it should begin to soften.
- When the chocolate is soft to the touch, remove the foil from the water (use a utensil to remove it, not your fingers!).



Experiment continued on next page...



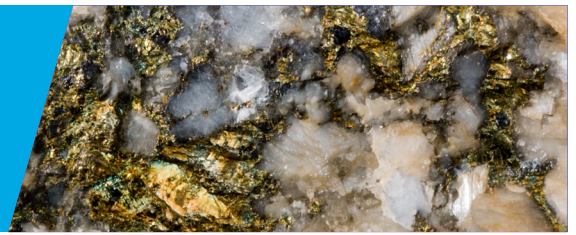
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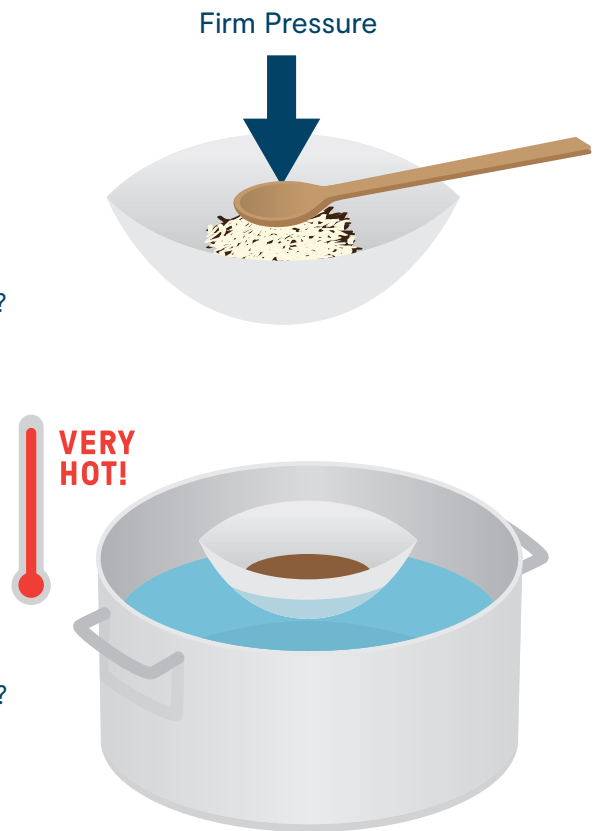


PROCEDURE *continued...*

- Apply pressure to the chocolate rock by squeezing the sides of the foil boat, or pushing down on the chocolate rock with a spoon or other utensil.
- Let it cool. This is now a metamorphic rock, which is a type of rock that has been changed by heat and pressure. Make observations in your science notebook. How is it different from the sedimentary rock? Can you still tell the difference between the white and dark chocolate?

Lastly, we will create a model of an **IGNEOUS** rock:

- Place the metamorphic rock, any leftover sedimentary shavings and chunks of the original chocolate blocks into aluminum foil.
- Form foil into a boat shape and float it in very hot water, ensuring the boat walls are high enough to keep the water from spilling in.
- When chocolate is completely melted and a smooth liquid forms, remove from heat. Allow to cool. This is now your igneous rock, make observations in your science journal. This process was similar to a metamorphic rock, but how is it different and how is the result different? Can you still see the colors of the white and dark chocolate?
- Think about the relationships between the 3 rock types. How can an igneous rock turn into a sedimentary rock? How can a metamorphic rock be turned into an igneous rock? In your science notebook, write down or draw the relationships you noticed.

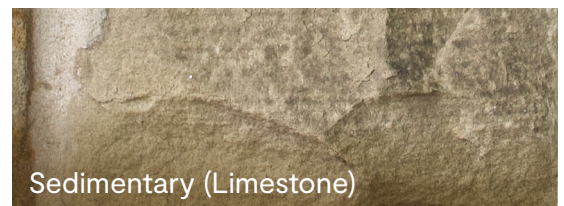


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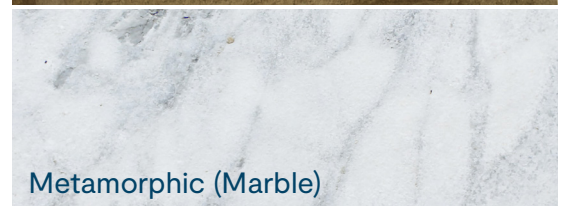
Sedimentary rocks are created when small bits of other rocks, like sand and pebbles, are stuck together. As this happens over long periods of time, layers form (like the white and dark layers we observed in the experiment). These layers can also be called sedimentary beds. Sedimentary is the only type of rock where fossils can be found.

Rocks at the earth's surface are exposed to relatively low pressures and temperatures. As new rocks form above, rocks at the surface can be buried very deep, where the temperatures and pressures are far greater. When these rocks experience the high temperatures and pressures (such as the hot water and pressure in our experiment), these buried rocks can melt slightly and reform as metamorphic rocks.

Igneous rocks are formed from molten magma (the very hot water in our experiment). If magma reaches the surface of the earth, it is called lava. As magma or lava cools, crystals form. When igneous rocks cool at the surface, small crystals form when the rocks cool quickly. When these rocks cool underground, larger crystals form as the rock cools slowly.



Sedimentary (Limestone)



Metamorphic (Marble)



Igneous (Granite)



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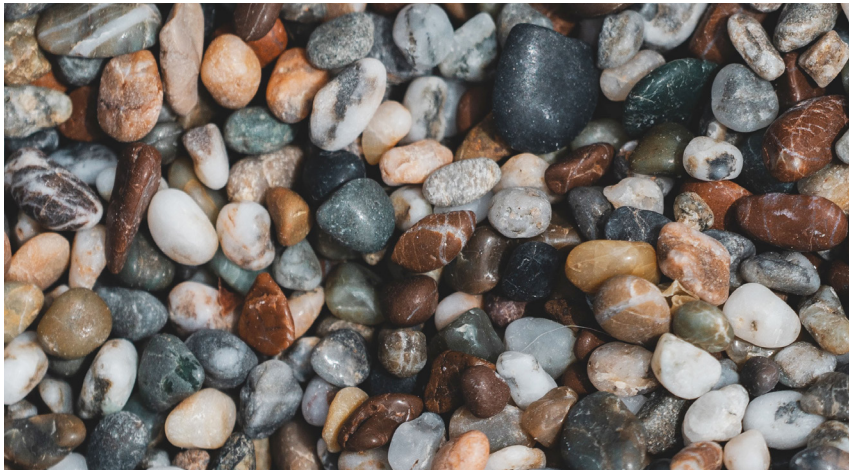
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6–8 GRADE EXPLORATION

Explore the following questions and write your observations in your science notebook

- Now that we have seen the process with chocolate, can you recognize it in the real world? Hypothesize what a real sedimentary, igneous, and metamorphic rock look like in real life and how would you distinguish one from another?
- Go outside and find 5–10 different looking rocks; you can collect them if they are not in a private area. Make observations about each rock in your science notebook. What did you notice? Do you see any clues on your rocks that might tell you which type of rock it is? Did you find more igneous, sedimentary or metamorphic rocks?
- Can you think of a way that a rock could be multiple types? Can an igneous rock have sedimentary layers? Can a sedimentary rock have metamorphic parts? Draw a picture of what that rock might look like.



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