



Curiosity Guide #503

Rocks

Accompanies Curious Crew, Season 5, Episode 3 (#503)

Explain the Rock Cycle

STEM Challenge

Description

Design a wax model to explain the rock cycle.

Materials

- Plastic knife or cheese grater
- Crayons
- Paper towels
- 20-milliliter syringe
- Hacksaw
- Aluminum foil
- Wax paper
- Microwave-safe container
- Water
- Popsicle stick
- Microwave. Adult supervision is recommended.
- Oven mitts
- Paper cups

Procedure

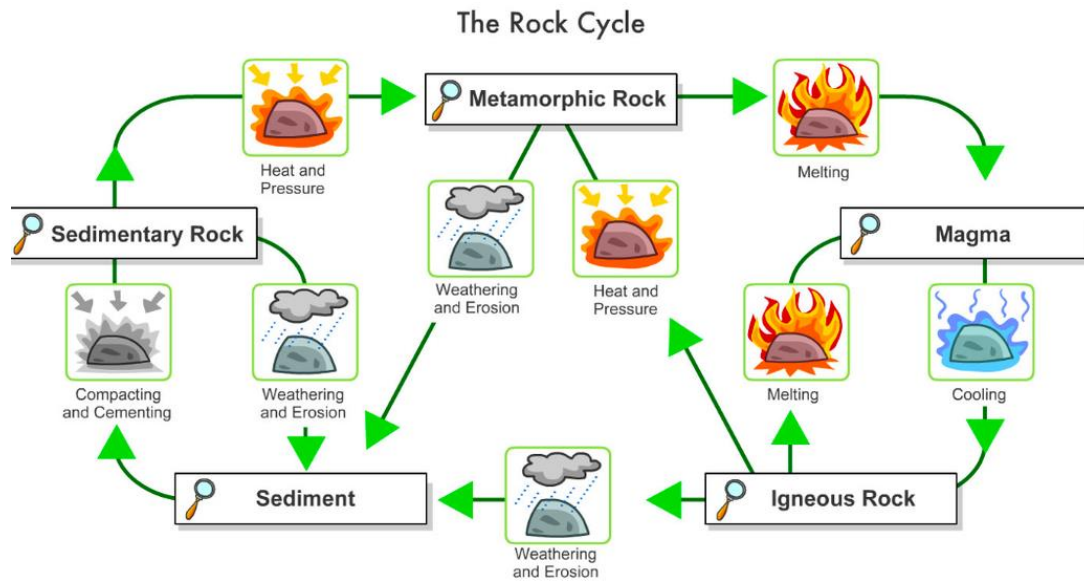
- 1) Cut the end and nozzle off the syringe with a hacksaw.
- 2) Use the edge of the plastic knife or cheese grater to shave bits of crayon into separate colored piles, each color on its own paper towel.
- 3) Pull back the plunger of the syringe.

- 4) Load one color of crayon sediments into the syringe, making a layer of color.
- 5) Fill up the syringe, repeating with different colors to establish clear layers.
- 6) Place a small piece of foil over the opening. Carefully turn the syringe over onto the table.
- 7) Press down on the plunger to compress the bits of wax crayon into a solid.
- 8) Turn the plunger on its side and carefully press out the form.
- 9) How is this like a sedimentary rock? What's missing? Write down your observations and ideas under My Results.
- 10) Form a piece of aluminum foil into a small boat. Place the wax form that came out of the syringe inside the boat shape.
- 11) Heat water in a microwave-safe container. Remove the container carefully from the microwave, using oven mitts.
- 12) Lay the boat on top of the hot water. Rotate the form carefully with your fingers or with a Popsicle stick. You are doing this to warm the wax form.
- 13) Once the wax is warm, lay the form on a piece of wax paper, fold up the edge, and press down with the heel of your hand.
- 14) How is this like a metamorphic rock? Are the layers still visible? Add your observations and ideas to My Results.
- 15) Place the new "rock" into a paper cup and microwave until melted. Use oven mitts to remove from the microwave, or let the rock and cup cool before removing.
- 16) Let the rock cool. How does this final rock compare to the others?
- 17) How is this rock like an igneous rock?
- 18) Could we start the process over again by weathering and eroding the igneous wax form? Add your answers and ideas to My Results.

My Results

Explanation

In this model, the crayons represent rocks. The scraping of the crayons simulates the weathering and erosion that break down rocks into small particles. When the particles or sediments are dropped into the syringe, this represents how water carries the particles and deposits them into layers, or strata, under water. When the wax is compressed in the syringe, this simulates how the particles are compressed by additional layers and bodies of water to bond the particles into sedimentary rock. Our model shows compaction but does not include the cementing particles that help bond them together. When the wax is heated and pressed again, this simulates how metamorphic rock forms. When the metamorphic wax form is melted in the microwave, this resembles the rock melting into magma within the depths of the earth. The cooled form is like igneous rock, which could be scraped again, starting the entire cycle over.



Even though rocks are constantly changing, the change process is difficult to observe because this process takes millions of years. Scientists must use models to help explain what happens over a long period of time. In our wax model, we explained how rocks can change from sedimentary, to metamorphic, to igneous rocks, but the process doesn't have to go in that order. For example, an igneous rock could melt again and cool into another igneous rock; get heated and pressurized into a metamorphic rock; or experience weathering and erosion, where the igneous sediments would become sedimentary rock. Geology rocks!

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