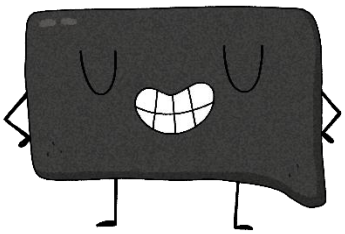
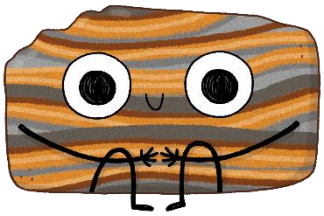
Crayon Model Rock Cycle

Let's model the rock cycle! Rocks have three common forms that they cycle between: sedimentary, metamorphic, and igneous. They can change from any of these into any of the others!

Sedimentary rocks are made of little bits, called sediment, cemented together.



Igneous rocks are cooled liquid rock that has hardened into solid rock.



Metamorphic rocks are rocks that were once a different rock, but have changed from heat, pressure, or chemicals.

It takes a long time for rocks to change types, so we are going to model it here much more quickly, using… crayons!

The materials:

- Crayons (old, broken ones work great!)
- Cutting board
- Child-safe chopping knife
- Silicone bowls (microwave safe!)
- Toothpicks
- Small spoon
- Aluminum foil
- Microwave
- Optional: Refrigerator

Directions

Step 1:

Create crayon sediment! Shave bits of old crayons off using a cutting board and a child-safe knife. (Alternatively, sediment can be prepared ahead of time by an adult with a sharper knife or grater.)

You can think of the whole crayons as igneous rocks, and the process of shredding them into small bits as erosion and weathering.

Step 2:

Make a sedimentary rock! Mush together the sediment you made in Step 1 by folding the pile into tin foil and squishing by hand, or pressing with a heavy object, like a book.

Depending on how hard you squish it, and the humidity that day, the sediment may not fully bind together by pressure alone. Often sedimentary rocks form with the help of natural cements, like mud or silt! To mimic this, take some of the extra bits of sediment and place in a microwave safe dish. Microwave for 5 second intervals until it gets melty!

Then use the cement you've made to help bind your sediment together by mixing it into your compacted sediment bits.

Finally, press it all into a ball shape. You have made your sedimentary rock model!

And probably have messy fingers. Give your hands a wash!

Step 3:

Time to make your sedimentary rock into a metamorphic rock. You will be doing this through HEAT and PRESSURE.

This models what happens when a rock gets buried deep underground. The heat from being closer to magma can warm it. The pressure from the weight of the material above it can squish it. Between those forces, the rock changes, even down to the mineral level. It often becomes shinier and denser.

To warm your rock model, place it in the microwave safe silicone dish. Then place in the microwave. Microwave for ~30 seconds.

IMPORTANT! Do not MELT the rock model! Microwave only long enough to warm it!

Step 4:

Once the rock model is warm, apply pressure with a spoon! Do not use your fingers, as the wax from the crayons may still be hot.

Now observe the changes that have happened to your rock!

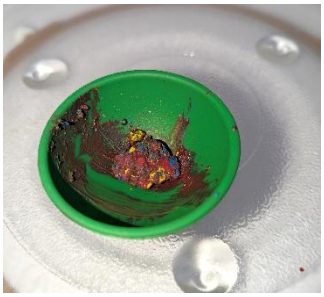
It is now a metamorphic rock model! Shinier, harder, denser, and different!

Step 5:

Place your metamorphic rock model back in the silicone bowl. Microwave for 30 second-intervals until the wax is fully melted. (Usually takes around 1 minute.)

Caution, it will be hot!

Feel free to use a toothpick to stir up the melted material.



Step 6:

Let it cool either at room temperature for about 15-30 minutes, or in the refrigerator for about 1 minute. It will harden into a solid chunk!

Once solid, press the sides of the silicone bowl to loosen the rock model and remove gently with a spoon. Congratulations, you have an igneous rock model!






Optional activity add-ons:

Make a model of all three types!

- *Create enough sediment at the start to make THREE sedimentary rocks.*
- *Take TWO through the process of turning metamorphic.*
- *Take ONE of the metamorphic rocks and change it to igneous.*
- *Now you have a rock model of each type!*

Go through the cycle again!

- *Use your newly formed igneous rock and break it down into sediment.*
- *Use that sediment to go through the rock cycle model using the steps above!*
- *Do your rocks look different this time?*

Mix and match the cycle!

- *There is no directionality to rock cycle changes. So, let's mix it up!*
- *Start by melting all the way to liquid rock and cooling to an igneous rock.*
- *Take that igneous rock and do the metamorphic steps above.*
- *Take that metamorphic rock and do the sedimentary steps above.*
- *Now, try any order of the steps to make a variety of rocks! You can even turn a sedimentary rock into another sedimentary rock, or a metamorphic rock into another metamorphic rock, or an igneous rock into another igneous rock!*