

# RAFT IDEAS

**Topics:** Rocks and Minerals; Rock Cycle; Patterns of change

## Materials List

- ✓ 1 crayon per student (light colors work best)
- ✓ 1 craft stick per student
- ✓ 1 plastic sandwich bag per student
- ✓ 10 cm x 10 cm (4" x 4") piece of foil per group
- ✓ 1 razor blade for teacher use only
- ✓ Heat source (hot plate, toaster oven)

This activity can be used to teach: Next Generation Science Standards:

- Property of materials (Grade 2, Physical Science, 1-1)
- Heating and cooling of materials (Grade 2, Physical Science, 1-4)
- Earth Events (Grade 2, Earth & Space Science, 1-1)
- Rock formation (Grade 4, Earth & Space Science, 1-1)
- Geosphere, Cycling Earth's material, Geoscience Processes, (Earth/Space Science, Grade 5, 2-1; Middle School, 2-1 & 2-2)



## Playing with the Rock Cycle Modeling the Rock Cycle with Crayons



Given enough time, everything changes: mountains are built up and torn down, continents move and change shape, even rocks get worn down and reform. Imagining these changes that take millions of years is often easier for students if they model the processes in class using familiar materials. In this activity, students model the changes in rocks over time using crayons.

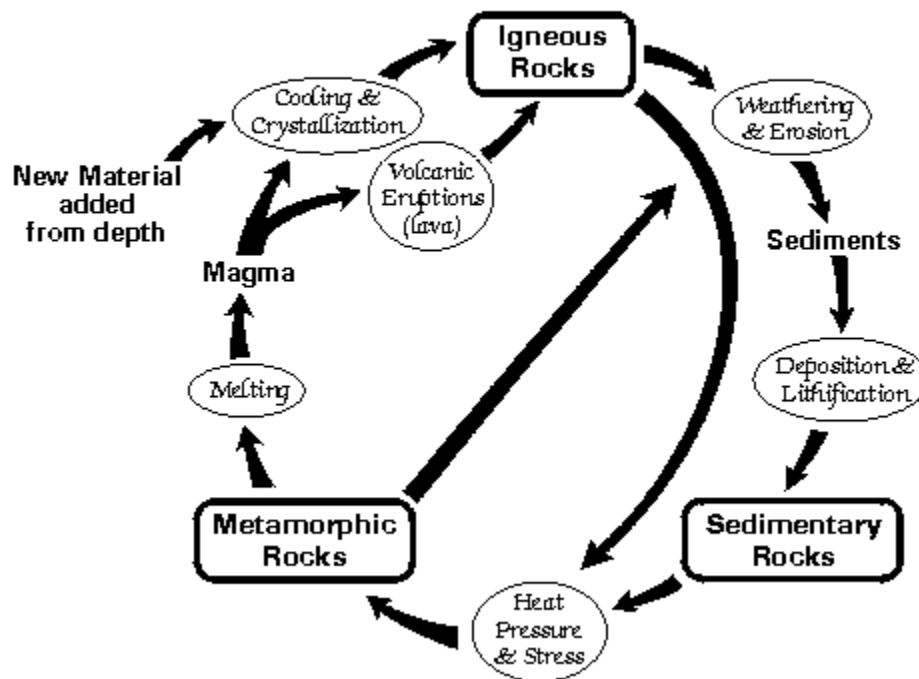
### To Do and Notice

1. Distribute a crayon to each student. Explain that this “rock-crayon” type (igneous) represents a rock cooled from under the Earth’s crust. Instruct the students to examine the “rock-crayons” and describe their properties. Key observations of this “rock-crayon” type are: small holes produced from air bubbles upon cooling, one uniform substance, and smooth (almost glassy) luster.
2. Next, students will “weather” the rocks with craft sticks into small bits (shavings). Students should shave as much as they can manage in about 10 minutes.
3. Instruct students to place the crayon “sediments” into the plastic bags and add pressure, such as by pressing the bag with their hands. After the students get the crayon sediments to stick together, they should take out the newly formed type of “rock-crayon” (sedimentary) and describe this rock type. Key observations of this rock-crayon are: visible pieces of rock fragments/particles, possible stratification (visible layering), not as hard (more brittle) than the first “rock-crayon” type.
4. For the next “rock-crayon” type, add heat. Working in teams of 4-6, instruct students to form a small cup with a handle using the foil. The bottom of the cup should be about 3 cm (1¼”) in diameter. Students should place sediments and sedimentary rock pieces into the cup and melt them together, creating the third “rock-crayon” (metamorphic). (It is important to remove the cups from the heat as soon as the crayons melt!) Let the melted crayon cool and solidify.
5. After students remove these “metamorphic crayons” from the cups, the instructor can slice up the rock-crayon pieces with a razor blade so that the inside can be viewed. Students now make key observations of this rock-crayon type that might include: no individual particles seen, but rock contain many different substances; colors may be swirled together rather than layered or chunked; “rock-crayon” hardness is increased (compared with the sedimentary rock).
6. After students have participated in the “crayon cycle” activity, the instructor should go over the real rock cycle with the students, reviewing the forces of change (pressure and heat) and vocabulary (rock, mineral, lava, magma, igneous, sediment, sedimentary, lapidary, evolution.)
7. Optional: Have each student create a display with a sample of each type of “rock-crayon” type. Samples of real rocks of the corresponding types could also be included. See **Taking it Further** for suggested real rock samples.

## The Science Behind the Activity

We live on a very dynamic planet. Rocks, like everything else, change over time. When melted rock (magma) from the Earth's interior reaches the surface, it cools and solidifies. Over time, these igneous rocks get broken and weathered by wind, water, and land movement. Sediments get deposited in layers (strata), and heat and pressure eventually cements these pieces back together creating a new type of rock (sedimentary). Given enough time, more heat and pressure change these rocks again into the third rock type (metamorphic). Finally, complete melting will turn the rocks back into magma. The two main framework themes illustrated by the rock cycle are Cycles (nature repeats itself) and Evolution (major changes over time).

# The Rock Cycle



## Taking it Further

Students can now use their observation skills and rock-type knowledge to classify real rocks. Pass out 4 or 5 real rock samples per group and allow the students to discuss their observations and agree on a rock type. Invite groups to share their conclusions with the class, giving reasons for their choices. Some good rock samples to choose include:

**Igneous:** lava rock, granite, obsidian, pumice, basalt

**Sedimentary:** sandstone, shale, conglomerate, limestone, slate

**Metamorphic:** serpentine, marble, schist

**Web Resources** (Visit [www.raft.net/raft-idea?isid=325](http://www.raft.net/raft-idea?isid=325) for more resources!)

Rocks are made of minerals. A good source of mineral information (including chemistry, physical characteristics, and images) can be found at: <http://mineral.galleries.com/default.htm>