

**Geology Crayons**  
Teacher Instructions  
Grades K-3

**Synopsis:**

In this lesson students will explore the rock cycle by first looking at real examples of sedimentary, metamorphic, and igneous rocks. The students will then make their own rocks out of crayons through weathering, sedimentation, pressure, and heat.

**Learning Goals:**

- Students will understand the rock types (phases) and processes of the rock cycle.
- Students will be able to explain the difference between a phase and a process.
- Students will be able to identify the different characteristics of sedimentary, metamorphic, and igneous rocks when looking at crayon rocks.

**Recommended Grades:** K-3

**Estimated Time:**

Prep time: 30 minutes (depends on how many crayons you have to peel for the students, much shorter if you make them peel their own crayons)

Class time: 55 minutes (longer if they have to peel their own crayons)

**Key Concepts and Terms:**

- Rock Cycle: The rock cycle is the combination of processes and stages that materials go through in forming rocks and changing from one type of rock to the other among the three main rock types.
- Weathering and Erosion: This is the process through which rocks are broken into smaller pieces by the effects of wind, waves, freezing, chemical erosion, and interactions with other rocks.
- Compaction and Cementation: This is the process through which weathered rock material forms sedimentary rocks under intense pressure and over long periods of time.
- Heat and Pressure: These are the two main driving forces of the rock cycle, heat and pressure can cause rocks to become liquid or to soften and become metamorphic rocks or magma.
- Cooling: This is the process through which magma becomes igneous rock. Cooling can either happen quickly or slowly and this will determine the type of rock formed.

**Materials Needed per 15 Students:**

- 15 Peeled crayons
- 10 hand-held pencil sharpeners
- 6 cupcake wrappers
- Tongs
- Tinfoil
- Very hot water (almost boiling)
- Bowl of cold water

**Estimated Cost:** <\$20

**Lesson:**

Stage 1: Hook

Have a number of rock samples laid out at the front of the classroom or passed out, have kids come up to the front of the class and look at these rocks.

- Ask which rocks they like the best?
- Do they notice any differences between the rocks?

Stage 2: Introduction of concepts

Explain that rocks are made in different ways. “Can you think of any ways rocks are made?” Introduce the idea that there are three types of rock and explain how each is formed. Draw the rock cycle out on the board or overhead.

Stage 3: Activity

Students will be making the three types of rocks with crayons. While students are waiting for rocks to heat and cool have them look at the samples of real rocks.

1. Break the class into three groups, each of these groups will start with a different rock type. If possible have one adult supervisor for each group.
2. Distribute 5 crayons to each group.
3. Sedimentary rocks: Have the first group start “weathering” their crayons by breaking them down with their pencil sharpeners.
  - a. Once the groups has an oreo sized pile of shavings have them scoop the shavings into a tinfoil square. Have an adult fold the square around the pile of shavings.
  - b. Next apply pressure to the shavings by pressing them, standing on them, jumping on them, putting chairs on them etc.
  - c. Unwrap to find sedimentary rocks.
4. Metamorphic rocks: The second group should start by “weathering” their crayons using a pencil sharpener.
  - a. Have the students put their combined weathered pieces in a foil cupcake wrapper.
  - b. Heat the shavings by floating the cupcake wrapper in hot water, until they are mostly melted.
  - c. Remove the cupcake wrapper and fold it around the shavings, next have each student in the group apply pressure to the folded tin by stepping on it.
  - d. Unwrap to find a metamorphic rock.
5. Igneous Rocks: The third group will start my making igneous rocks.
  - a. Have each student select small pieces of crayon and put them in a combined group cupcake wrapper.
  - b. Float the cupcake wrapper in hot water until the pieces melt together.

- c. Move the cupcake wrapper to a bowl of cool water to harden. Remove the wrapper to find an igneous rock.
  - d. While the igneous rocks are melting show the students examples of real igneous rocks. If possible have them try making pumice float.
6. Have the groups rotate through all of the stations. They can use their same five crayons through the whole lesson.

#### Stage 4: Review

Ask a few review questions about the rock cycle.

- Which type of rocks forms from cementation? melting? heat and pressure?
- Which types of rocks might have fossils?

**References:** This activity was adapted from

<http://www.navigatingbyjoy.com/2013/03/31/how-to-simulate-the-rock-cycle-with-crayons/>

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Student Instructions  
K - 3

1. Look at the rock samples provided and listen to an explanation of how they are made.
2. Divide into groups
3. Make all three rock types using crayons
  - a. Sedimentary:
    - i. "Weather" a crayon using a pencil sharpener.
    - ii. Put the weathered pieces of crayon in a tinfoil square and fold the square around the pieces
    - iii. Put pressure on the square by stomping on it
    - iv. Unwrap the tinfoil to find a sedimentary rock
  - b. Metamorphic:
    - i. Weather a crayon using a pencil sharpener
    - ii. Put the weathered pieces in a foil cupcake wrapper
    - iii. Heat the shavings until they are soft
    - iv. Fold the wrapper around the melted shavings
    - v. Apply pressure to the melted shavings
    - vi. Unwrap to find a metamorphic rock
  - c. Igneous
    - i. Break a crayon into small pieces
    - ii. Put the pieces of crayon into a foil cupcake wrapper
    - iii. Folat the cupcake wrapper in hot water until the crayon melts
    - iv. Move the wrapper to a bowl of cold water
    - v. Unwrap to find an igneous rock