

GRADES 3–5

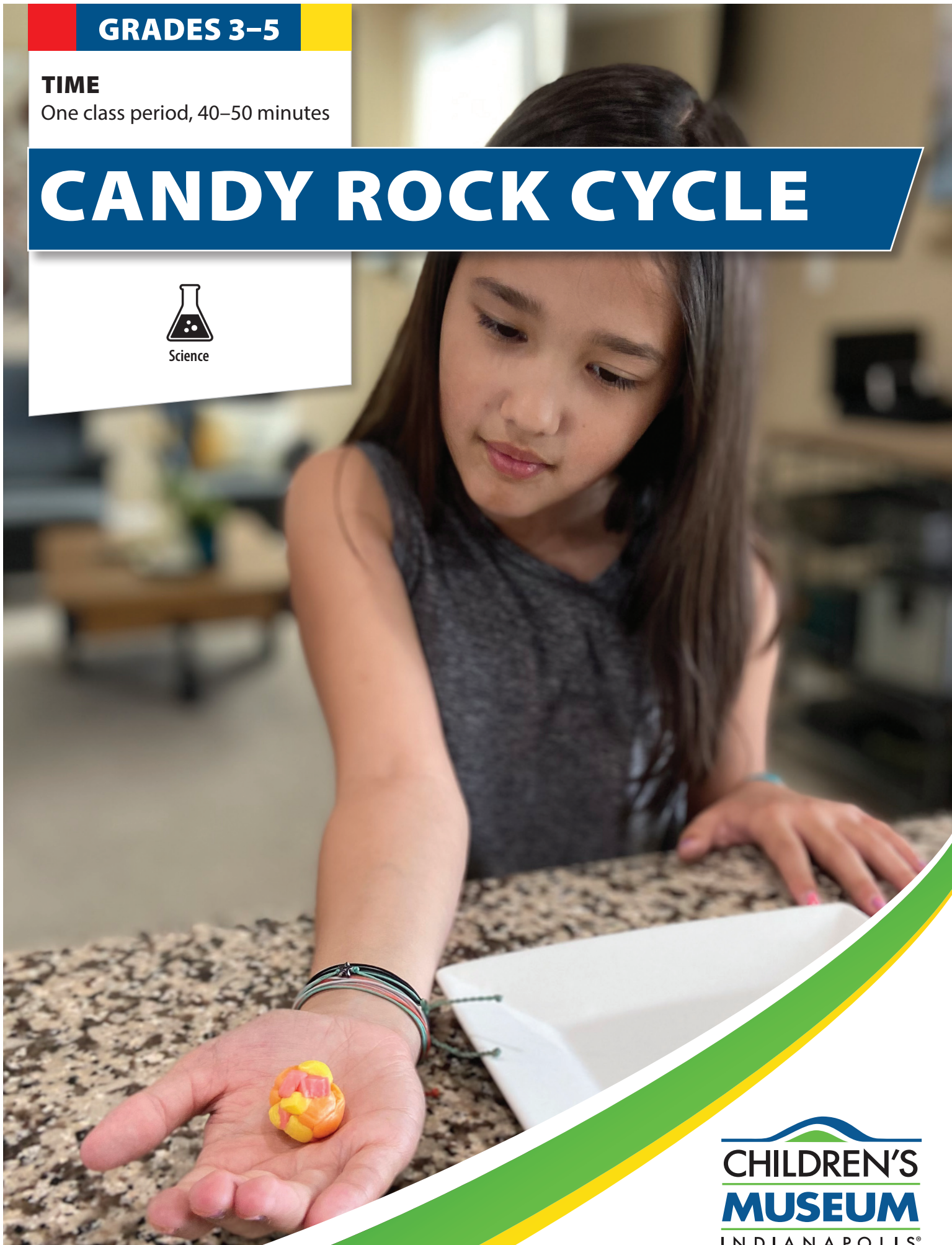
TIME

One class period, 40–50 minutes

CANDY ROCK CYCLE



Science



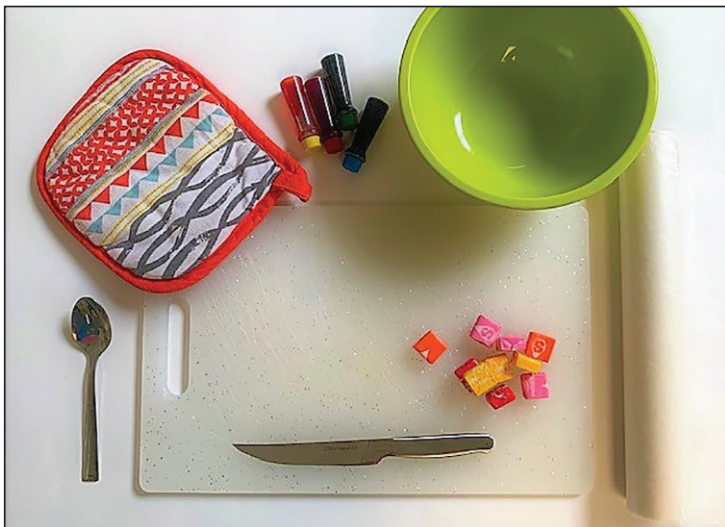
CANDY ROCK CYCLE

The Children's Museum's lessons are designed to weave classroom experiences and museum education together. All lessons are interdisciplinary and can be used as individual classroom experiences or in combination to create a cohesive unit. Lessons are optimized when used in connection with museum field trips.

The rock cycle is the process in which sedimentary, metamorphic, and igneous rocks are created. Although a cycle, it's anything but a simple circle! Each type of rock has the opportunity to become a different type of rock, whether it is through weathering and erosion, cementation and compaction, heat and pressure, or melting and cooling. Understanding the rock cycle provides an explanation of how our planet is constantly recycling itself and have a better understanding of where the rock you dug up in your garden or found on vacation may have once been!

FOCUS QUESTIONS

- What are the differences between sedimentary, igneous and metamorphic rocks?
- How does the rock cycle transform rocks over time?
- What type of rock do we find fossils in?



INDIANA ACADEMIC STANDARDS

Science: 3.EES.3, 4.ESS.3, 7.ESS.1

OBJECTIVES

Students will:

- Identify the different types of rocks
- Model the formation of rocks
- Explain the rock cycle



MATERIALS

- Taffy-like candy, such as Starbursts
- Waxed paper
- Microwave safe plate or bowl
- Spoon
- Microwave
- Hot pad

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Demonstrating the Rock Cycle

Read all instructions before beginning the lab activity. Remember to wear safety equipment at all times.

PROCEDURES

Explain to students that they will complete a model to demonstrate the rock cycle. Share with students that rocks can be classified by the way they were formed— **sedimentary**, **igneous** and **metamorphic**.

1 Unwrap 4-5 candies, and cut them into small pieces (about the size of a pea). The pieces will represent the sediment to form sedimentary rocks.



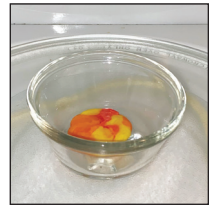
2 Gather the candy pieces into a ball and gently press them together to form a rock. If they candies aren't holding together, place a drop or two of water on the candies. This is how a sedimentary rock is formed over time.



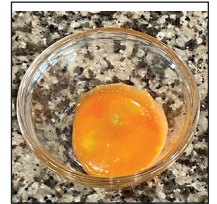
3 Place the candy rock in-between layers of waxed paper. Use your hands to gently press, and flatten the rock. Complete this process several times, to create a metamorphic rock.



4 Set the metamorphic rock on a microwave safe plate or bowl, and microwave for 30 seconds. An adult should assist with this step, and use proper safety gear, as the plate or bowl will get hot.

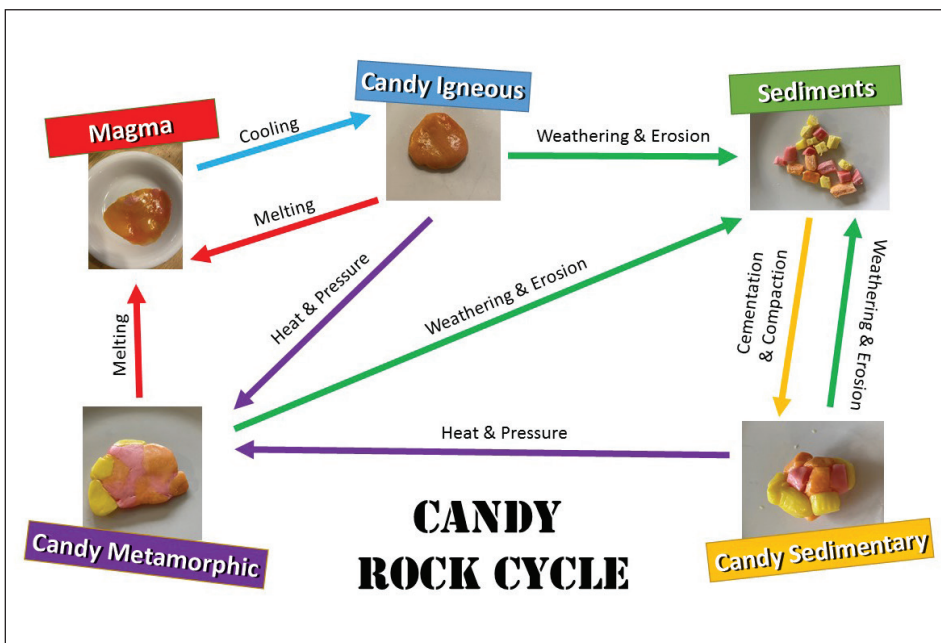
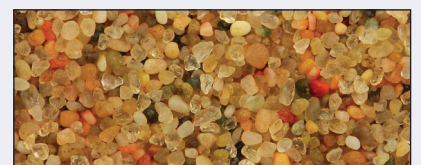


5 Gently stir the melted candy, this is now magma. Allow it to cool for at least 5 minutes. The candy is now an igneous rock.



EXTENDING EXPERIENCE

One way to help students understand the weathering process, which leads to the creation of sedimentary rocks, is by observing grains of sand. Provide students with hand lenses or use a digital microscope attached to a computer. Invite students to make observations about the fine grains of sand. Students should notice that under magnification, the sand looks like small rocks. Students might also notice that they see different colored grains of sand. Explain that the Earth's continents are made up of different rocks and minerals. Have students predict where each color may have originated from.



Geologic Time

The Law of Superposition is used as a basic method for evaluating Earth's history. The law states that, "in an undisturbed stack of rock layers, the oldest layers will always be on the bottom, and the youngest on top." This layering, in any particular place, indicates the ages of rocks and fossils found within each layer and how the layers each relate to one another. A layer cake is a great way to visualize the Law of Superposition. If we pretend that this layer cake is a cross-section of the Earth, and follow the Law of Superposition, the red layer would be the youngest layer of sedimentary rock and the purple would be the oldest. This is a method of relative dating used to date fossils. You wouldn't find the remains of dinosaurs that lived millions of years apart in the same layer! It helps scientists better understand the sequence of geologic time and give clues to what species lived together and how different organisms have evolved over time.



DID YOU KNOW?

- Sometimes hot igneous rock intrudes, or makes its way, into already existing rock and bakes it into a new type of rock by changing its mineral makeup without any pressure at all! This process is called contact metamorphism!
- The bands on a metamorphic rock are caused from a great amount of pressure causing the flat or long minerals to line up within the rock. Rocks with this type of texture are called Foliated Metamorphic rocks.
- Igneous rocks that cool and solidify slowly underground over many thousands of years have coarse and larger crystals because they have so much time to grow. They are called Intrusive Igneous Rocks.

VOCABULARY

- Sedimentary
- Igneous
- Metamorphic

TRY IT AGAIN!

Did you love this candy rock cycle activity? Try it again with old crayons to check for understanding!

You will need: old crayons, a plastic knife, wax paper, a heat lamp or warm lightbulb, aluminum foil, hot pad, ice cube

Weathering and Erosion

1. Take different colors of crayons and make a pile of shavings using a plastic knife.

Erosion -> Deposition

2. Combine all of the different colored shavings together into 1 pile on some wax paper.

Compacting & Cementing

3. Apply pressure to the sediments by folding the wax paper over them and stepping on them a few times.

Metamorphism

4. Hold the rock under a heat lamp for 30 seconds and then apply pressure again by bouncing on the rock with the weight of your feet.

Magma, Lava, Volcanic Activity

5. Remove the rock from the wax paper and place it into a small cup made by aluminum foil and set it on top a hot pad.

Cooling and Hardening

6. Pour the melted rock onto an ice cube to cool.

Discussion Questions:

- As you are doing this activity with your students, have them identify what type of rock is being formed during each step of the different processes.
- Ask students to explain how they might turn their crayon-rock back into a different type of rock, but in a different order, to demonstrate the cycle further.

