

Rocking the Rock Cycle

OBJECTIVE

- Describe the three types of rocks and explain how each type forms
- Trace the movement of rock material through the rock cycle
- Identify the qualities of each type of rock that make it a useful resource

CLASS TIME

60 minutes

MATERIALS

- Pens, pencils, colored pencils, crayons or markers
- Rocking the Rock Cycle Worksheet (*included*)

Procedure

1. To begin, ask students, **“What do you think a rock is made of?”** Record their responses on a whiteboard or poster paper. Explain that rocks are made of minerals, which are natural compounds with a specific chemical composition, and that different combinations of minerals create different types of rocks.
2. Next, ask students, **“What are the three main types of rocks?”** Explain that there are three main types of rocks, and that each type forms in a different way:
 - **Igneous rocks** form when melted rock (called magma underground, or lava above ground) cools and hardens. Examples: granite and basalt.
 - **Sedimentary rocks** form when small particles of rock, sand and organic material are compacted and cemented together over millions of years. Examples: sandstone, limestone and shale.
 - **Metamorphic rocks** form when existing rocks are subjected to intense heat and pressure deep underground. Examples: marble and slate.
3. Then, ask students, **“Can a rock ever change from one type to another?”** Allow students to discuss. Explain that rocks are constantly changing through the rock cycle – a slow, continuous process that transforms rocks from one type to another through heating, cooling, erosion and pressure over millions of years.

4. Next, pass out the **Rocking the Rock Cycle Worksheet**. Review the directions as a class and answer any questions before students begin. Students will first label a rock cycle diagram, then follow the imaginary journey of a single rock particle through the cycle. Set a timer for 20 minutes. Depending on class size, students may work individually or in pairs.
5. At the end of the timer, bring the class back together. Using the **Critical Thinking Questions** as a guide, discuss what students discovered about the rock cycle and its connection to natural gas.

CRITICAL THINKING QUESTIONS

1. What are the three types of rocks, and how does each one form?

Answer:

- Igneous rocks form when magma or lava cools and hardens.
- Sedimentary rocks form when layers of rock particles and organic material are compacted and cemented together over millions of years.
- Metamorphic rocks form when existing rocks are changed by extreme heat and pressure deep underground.

2. How can one type of rock become another type of rock?

Answer: Rocks change through the rock cycle. For example, an igneous rock can be broken down by wind and water into small particles. Those particles settle and are compressed into sedimentary rock. That sedimentary rock can then be pushed deep underground, where heat and pressure transform it into metamorphic rock. If temperatures get high enough, it melts into magma – and when it cools again, it becomes igneous rock, starting the cycle over.

3. How is the rock cycle connected to natural resources like natural gas?

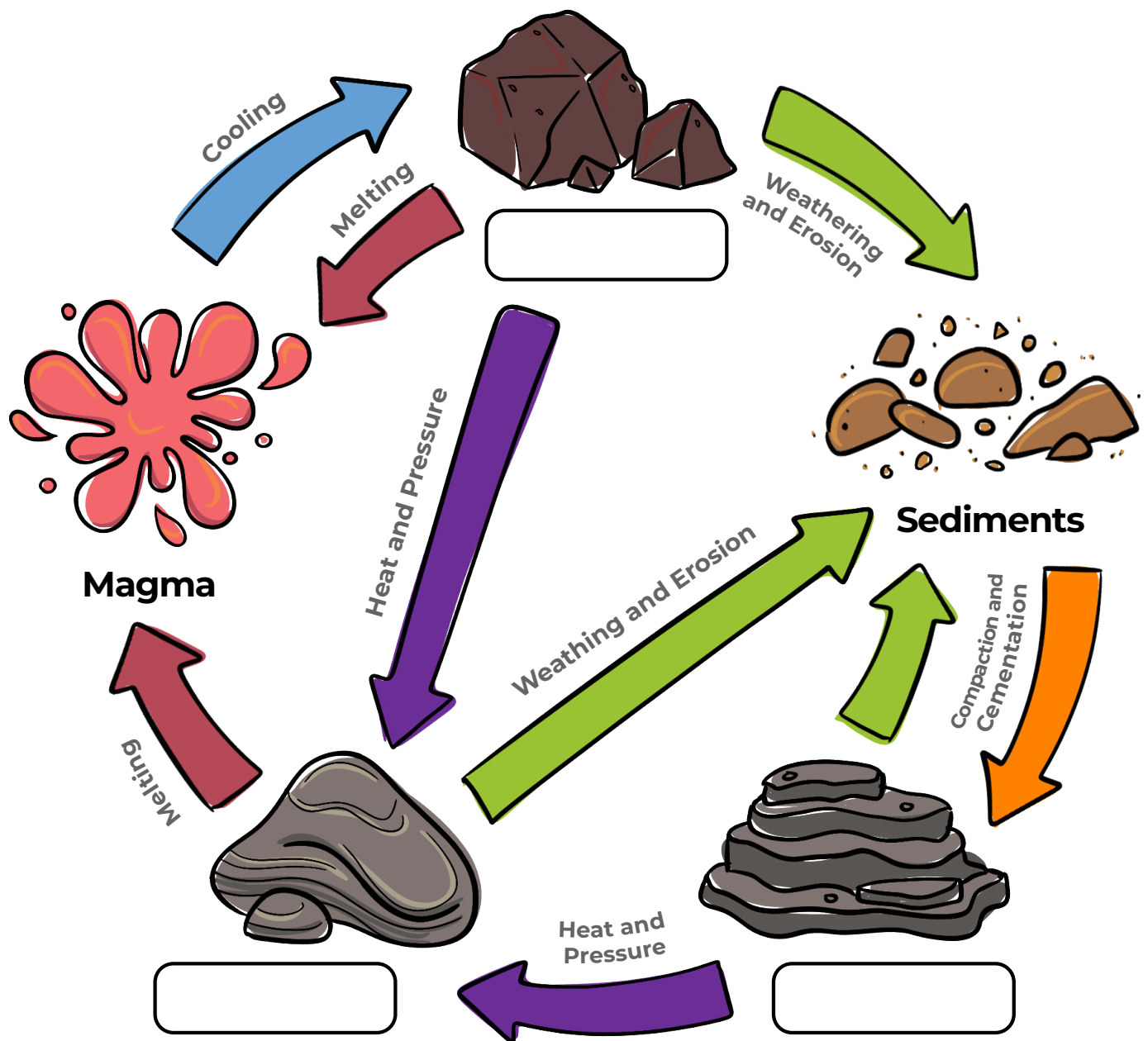
Answer: Different rocks are used for different purposes. Igneous rocks are hard, which makes them good for building, like granite. Metamorphic rocks have unique designs, which make them good for architecture and art, like marble. Sedimentary rocks are looser, with tiny pockets of air, which make them good for holding things – like natural gas. The same heat and pressure that transforms sedimentary rocks into metamorphic rocks also transforms ancient organic material into natural gas, oil and coal over millions of years. Natural gas is essentially a byproduct of the rock cycle!

STUDENT WORKSHEET

Rocking the Rock Cycle

Name _____

Look at the diagram below. Label the three types of rocks in the rock cycle: igneous rocks, sedimentary rocks, and metamorphic rocks.



Next, choose a starting point anywhere in the rock cycle. Imagine you are a tiny particle of rock material. Describe your journey through three stages. What happens to you? What kind of rock do you become?

Stage	What happens to you (the rock)?

Choose your favorite stage of the rock cycle and draw what is happening to your tiny piece of rock in that stage:

Different rocks have different uses! Using a reliable research source, such as the Museum of Natural and Cultural History (<https://mnch.uoregon.edu/rocks-and-minerals-everyday-uses>), investigate which types of rocks are used for which tasks. Then draw lines to match each type of rock to the thing we use it for in everyday life. You might get more than one answer for each use!

ROCK TYPES



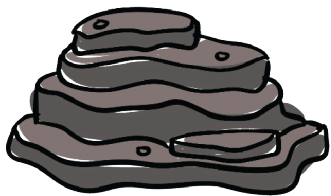
Igneous

Granite, pumice,
obsidian



Metamorphic

Marble, slate



Sedimentary

Gypsum,
limestone, chalk

USES

Chalkboards

Gravel roads

Art and decoration

Countertops

Surgical tools

Oil and natural gas

Building material