



Classroom Teacher Preparation

Earth Science 9: The Rock Cycle

Please use the following to prepare for the next SfS lesson.

Description:

This lesson provides an overview of the Rock Cycle, highlighting common rocks and the processes that form them. The three rock types found on Earth (igneous, sedimentary and metamorphic) are discussed and their specific characteristics are described. Students will examine rock samples, note similarities, classify them by rock type, and identify them.

Lesson Objectives – SWBAT (“Students Will Be Able To...”):

3rd-5th

- Explain the rock cycle and describe the mechanisms by which each of the three rock types (igneous, metamorphic, and sedimentary) change from one to another
- Identify the characteristics of rocks, such as color, crystal size, and the presence or absence of layers, that geologists use to determine the identity of a rock

Disciplinary Core Idea (DCI):

ESS2 Earth’s Systems – ESS2.A Earth’s Materials and Systems

- (3rd-5th) Four major Earth systems interact. Rainfall helps to shape the land and affects the types of living things found in a region. Water, ice, wind, organisms, and gravity break rocks, soils, and sediments into smaller pieces and move them around.

Science & Engineering Practice (SEP)

- (3rd-5th) *Constructing Explanations* – Identify the evidence that supports particular points in an explanation.
- (3rd-5th) *Obtaining, Evaluating, and Communicating Information* – Read and comprehend grade-appropriate complex texts and/or other reliable media to summarize and obtain scientific and technical ideas and describe how they are supported by evidence.

Crosscutting Concept (CCC)

- (3rd-5th) *Patterns* – Patterns can be used as evidence to support an explanation
- (3rd-5th) *Structure and Function* – Different materials have different substructures, which can sometimes be observed

Preparation:

This module provides a broad overview of the topic of the Rock Cycle and the three rock types (igneous, sedimentary, and metamorphic), and is best used as an introduction to the subject.

However, it assumes a basic familiarity with the structure of the Earth. Please introduce these terms to your students:

- Magma – liquid rock inside the Earth
- Lava – liquid rock that has emerged from the Earth, such as at a volcano
- Tectonic plates – the (enormous) pieces of rock that make up Earth’s crust, and move supported on the liquid layers below



Room Set Up for Activities:

Students will work in pairs or groups of three, at tables or clusters of desks, for the main activity.

Safety:

Care should be taken when handling the rock samples to prevent breakage.

Related Modules:

This lesson may be taught as part of a sequence or group of related modules on **Earth Science**, particularly Geology. Other modules in this sequence include:

Earth Science 2: Introduction to Tectonics - This lesson is an introduction to basic plate tectonics. It includes a review of the earth's internal structure and the formation of continents, oceans, and mountain ranges as a result of plate movement

Earth Science 10: Fossils - This module briefly explores the various time periods known to humans and provides students the opportunity to excavate fossils from rock, reconstruct, and analyze a fossilized skeleton for clues to the type of creature that existed during the late Jurassic period.

Earth Science 14: Soil Properties - This lesson introduces students to the characteristics and formation of soil. Students will examine the color, texture, and field capacity of soil, and discuss the importance of soil for plant life.

Engineering 7: Earthquake Resistant Buildings - Students will be introduced to the problem—damage due to seismic waves—and will build and test different block configurations to determine which model provides the best solution.

For other module sequences and groups, look here: www.sciencefromscientists.org/sequences

Standards Covered:

Please click the following link to our website to review the standards covered by this lesson, listed by state: www.sciencefromscientists.org/standards/

Lessons are matched to both national NGSS and local state standards.

After Our Visit:

Extend this lesson by modeling the rock cycle with crayons.

Access this Extension activity by visiting the Classroom Post found on our website at sciencefromscientists.org/cohorts. Use the name of your school/cohort and password to log in.

To help Evaluate, check out our Open Response questions online at sciencefromscientists.org/open-response-questions. They are freely available for all of our lessons for current teachers. Use the password supplied by your instructor to log in.

Additional Resources:

For further resources and activities, we recommend these webpages by the Mineralogical Society of America:

- Detailed information, and an extensive dichotomous key that will identify most common rocks: http://www.minsocam.org/msa/collectors_corner/id/rock_key.htm
- Their page for kids: <http://www.mineralogy4kids.org/>