



# LESSON PLAN

## ROCKS AND MINERALS GRADES 6-8

### SUMMARY

Students conduct an investigation to understand the rock cycle and use the rock cycle to explain the type of rock formed when sand is struck by lightning.



**MS-ESS2-1.** Develop a model to describe the cycling of Earth’s materials and the flow of energy that drives this process.

**MS-ESS2-2.** Construct an explanation based on evidence for how geoscience processes have changed Earth’s surface at varying time and spatial scales.

#### Science & Engineering Practices

**Developing and Using Models**  
**Constructing Explanations and Designing Solutions**

#### Connections to Classroom Activity

- Students investigate sand and develop a model of the rock cycle to explain how sand can become glass.

#### Disciplinary Core Ideas

##### **ESS2.A: Earth’s Materials and Systems**

All Earth processes are the result of energy flowing and matter cycling within and among the planet’s systems. This energy is derived from the Sun and Earth’s hot interior. The energy that flows and matter that cycles produce chemical and physical changes in Earth’s materials and living organisms. (MS-ESS2-1)

The planet’s systems interact over scales that range from microscopic to global in size, and they operate over fractions of a second to billions of years. These interactions have shaped Earth’s history and will determine its future. (MS-ESS2-2)

#### Connections to Classroom Activity

- Students explain the cycling of rock material through Earth’s systems and how energy as well as geologic processes contribute to the cycling of matter on Earth.

## ESS2.C: The Roles of Water in Earth's Surface Processes

Water's movements—both on the land and underground—cause weathering and erosion, which change the land's surface features and create underground formations. (MS-ESS2-2)

### Cross Cutting Concepts

**Scale, Proportion, and Quantity**  
**Stability and Change**

### Connections to Classroom Activity

- Students construct explanations of how the cycling of matter occurs all over Earth, on both large and small scales, and changes in nature drive the cycling of matter.

## DURATION

45 min.



## ENGAGE

Tell students to make a notice-and-wonder T-chart on their papers. Show students [The Weather Channel video "Glass From LIGHTNING?"](#) and ask them to make and record observations and any questions that arise. You might stop the video to allow students to make observations of the different fulgurites shown.

Ask students if they think fulgurites are sand or rocks. You might pose the question in this way: *If a fulgurite is a rock, what kind of rock is it? If it is not a rock, what is it?* Have students share their ideas with a partner. Encourage students to use their observations of fulgurites in the video, information presented in the video, and prior science knowledge to support their ideas. Then, ask students to share their ideas or a partner's ideas with the class. Use discussion probes with students such as the following:

- How do you know that?
- Tell me more about that.
- What I hear you saying is ...
- Who agrees/disagrees with what \_\_\_\_\_ said? Why?

Additional student questions might include the following:

- Why are fulgurites fragile?
- What is sand?
- Can lightning make fulgurites out of any kind of sand?
- Is all sand the same? (What is sand made of?)
- Are all rocks made out of sand?

## MATERIALS

- Sand (approximately 1 tablespoon of sand per pair of students)
- Hand lens (1 per pair of students)
- Tray or plate for students to spread out sand
- Flashlight (cell phone or small hand light will work)





## EXPLORE

Say to the students, “We have a lot of questions about sand. Does it make sense to investigate these questions first?” Give students a hand lens, flashlight, and sand. You might give each group multiple types of sand (if available). Tell students to make and record their sand observations and add any new questions that arise. You might ask students the following questions as you move around the room:

- Are all the grains of sand the same size? The same shape?
- Are all the grains of sand rounded? Angular? Somewhere in between?
- Are all the grains of sand the same color? What colors do you see? What percentage of the grains are X color? Y color? (You can estimate the percentages.)
- Do you see any patterns in your observations?

Students might ask questions such as the following:

- Why are the grains different colors?
- Why do we find sand at beaches and at the bottom of lakes and rivers?
- How does sand come from rocks?
- How does sand become rocks?



## EXPLAIN



**WATCH THE GENERATION GENIUS ROCKS AND MINERALS VIDEO AS A GROUP**



## ELABORATE

Ask students to return to their initial claim about fulgurites. Have students make a claim (restate or revise) supported by evidence about whether fulgurites are sand or rocks. They should base their claim on evidence from observations of the fulgurites in The Weather Channel video and in sand, science ideas from the Generation Genius video, and prior knowledge. Students should use science ideas to explain why the evidence they have chosen supports their claim.



## EVALUATE

There are multiple ways to assess your students' understanding of this topic. The exit ticket is an opportunity for students to use the science ideas they built in the lesson in a new context. Alternatively, you can use the Kahoot! quiz (which provides downloadable scores at the end of the game) and/or the paper quiz. All these resources are located right below the video in the assessment section.



## EXTENSION

Have students bring in different rock types they can collect. Engage students in a discussion about the textures they observe in the different rocks. Then, have students observe each rock and compare their textures to determine if the rocks are igneous, sedimentary, or metamorphic. Tell students to explain how they know what they know by using evidence from the Generation Genius video as well as their investigation of sand.

