

ADVISORY 2, UNITS 4-5, LESSON 4 FOSSILS AND GEOLOGY

Summary

- In this lesson, students will read "Supervolcano!" (pp. 42-51) to learn what volcanoes are, why they exist, and how they can change Earth's surface.

Science Background

Yellowstone National Park, which covers 8,987 square kilometers of land, is located primarily in the northwestern corner of Wyoming. Small parts of the park also extend into Montana and Idaho.

The park lies on top of a supervolcano. The magma (partially melted rock) reservoir beneath the park measures 90 by 30 kilometers on each side. It is about 10 kilometers deep.

The Yellowstone supervolcano fuels one of the most geologically active areas in the world. More than half of all geothermal features on Earth are located within the park's boundaries. This includes an assortment of hot springs, geysers, mud pots, fumaroles and other geothermal features. They are evidence that the supervolcano that lies below the park is still active.

When Yellowstone's supervolcano eventually erupts, it will have massive, global effects. Fortunately, scientists say the threat of an eruption is not imminent. In fact, large earthquakes are a more likely hazard in the near future. There are between 1,000 and 3,000 earthquakes in Yellowstone each year.

ENGAGE

Encourage students to flip through the articles and turn and talk with a partner to discuss what they see. Invite students to ask questions or share what they already know about volcanoes.

EXPLORE

Instruct students to examine the feature "A Look Inside a Supervolcano" on pages 50-51 of their Readers. Discuss the parts of a supervolcano and what happens when one erupts. Then have students examine the photos on pages 42-49 of their Readers. Invite students to share their ideas about how each of these features could be connected to a supervolcano.

EXPLAIN

Remind students that Yellowstone National Park sits on top of one of the world's largest volcanoes. **Ask:** *Why can't you see this volcano?* (It's hidden under the ground.) Point out that the park contains different types of features, including fumaroles, geysers, hot springs, and mud pots. Have students turn and talk as they compare and contrast these features. Encourage them to summarize how and why each one works. Then challenge students to identify different ways Yellowstone's supervolcano and its various features have changed Earth's surface.

ELABORATE

Invite students to watch the National Geographic Education video "Yellowstone Volcano Observatory (Part 1 of 3)" (<https://www.nationalgeographic.org/video/yellowstone-volcano-observatory-part-1-of-3/>). Encourage students to share what they learned about volcanoes. Have students brainstorm a list of other relevant questions. Challenge them to find the answers to each question.

EVALUATE

Have students complete the **Content Assessment** for this lesson. Encourage them to share and compare their results in small groups.

CONTENT ASSESSMENT: Volcanoes

Explain how each of these volcanic features forms and functions.

fumarole	geyser
hot spring	mud pot

Record five additional facts you learned about Yellowstone and its supervolcano.

- 1.
- 2.
- 3.
- 4.
- 5.