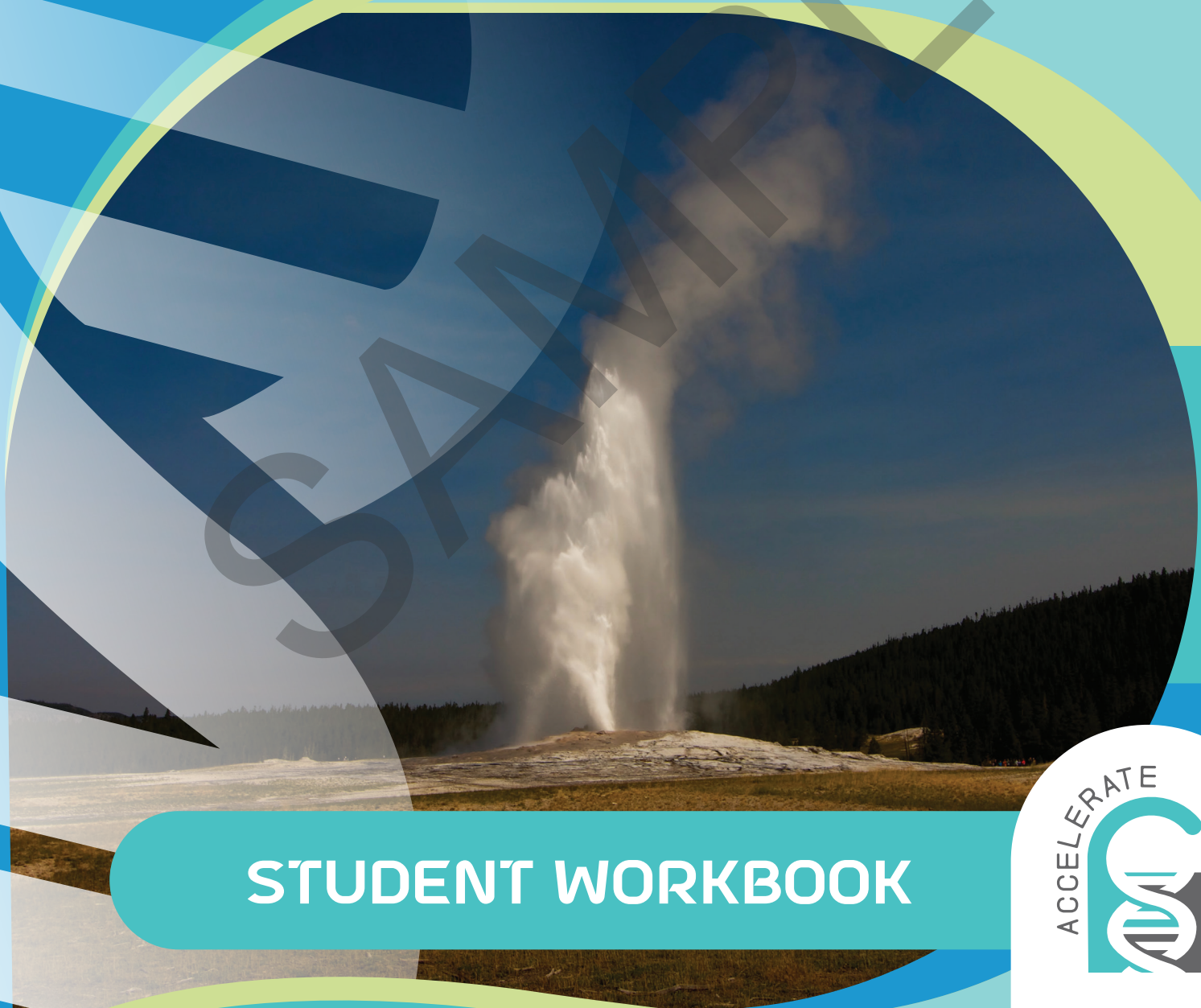


# BENEATH OUR FEET



STUDENT WORKBOOK

ACCELERATE



# DIG INTO HISTORY

One of the things fossils can tell us about is the history of a local region. In this activity, you will use the fossils found in an area to make conclusions about its past.

## LEARNING GOALS:



I can use rock and fossil evidence to explain how landscapes have changed over time.

## FOSSIL SECRETS

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So, how are the secrets of fossils uncovered? These secrets are revealed by using paleontology, the study of fossils and ancient life. Scientists who study and work in **paleontology** are known as paleontologists.

Paleontologists use the clues provided by fossils to make conclusions about what happened in the past. Finding a fossil in a rock layer means the rock layer formed when the organism type was living. For example, finding several aquatic (ocean or lake) fossils in a rock layer would mean that area was covered in water when that rock layer formed. Finding fossils of organisms that lived on land means it was not covered in water during the time the rock layer formed.



Paleontologists discovered the *Mesosaurus* and other fossils you read about in the previous activity. Just one paleontologist, or even a team of paleontologists, would not have thought finding a *Mesosaurus* fossil was strange. It was when scientists communicated with each other about the fossils that they found out there was an interesting or unusual pattern in where they're located on Earth.

When fossils are found, they must be excavated carefully so that they are not damaged. Special tools like large paintbrushes and X-ray machines are used to get the fossils out and examine them.

Not every organism becomes a fossil after death, but fossils can form from many organisms and in several different environments. There are six major types of fossils: cast, mold, carbon film, preserved remains, permineralization, and trace.



## Make a Fossil Inclusion

In this hands-on activity, you will model the way rock layers form with fossils in them. You will make a model of a fossil inclusion. An **inclusion** is a rock formation in which one rock layer forms around a smaller rock or fossil. Afterward, you will think about how that affects the process of figuring out the relative ages of rocks and fossils.

### WHAT YOU NEED:

#### FROM THE KIT:

- Dinosaur bone fragment
- Fossilized shark tooth
- Modeling dough, pack of 4
- Paintbrush
- Plastic cup
- Coral fossil

### SAFETY:

**WARNING! DO NOT EAT OR DRINK anything in this kit.**



### WHAT TO DO:

**1.** Take out all four colors of modeling dough. Tear each dough in half. Then, tear one half of each color into two. You should have 4 large pieces of dough and 8 smaller ones.

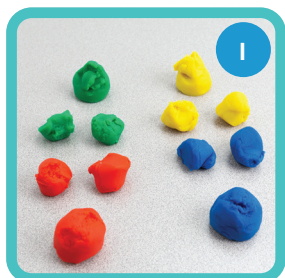
**2.** Combine the smaller dough pieces to make more colors by kneading and rolling.

- Mix red with blue to make purple
- Mix red with yellow to make orange
- Mix blue with green to make teal
- Mix yellow with green to make green-yellow

You should now have 8 colors of dough, each about the same size.

**3.** Use the scissors or tip of a pen to make a small hole in the side of the cup, just above the bottom, about the size of a pencil eraser. Then, spread the red modeling dough in the bottom of the cup.

**4.** Place the dinosaur bone fossil on top of the red dough layer so that it is touching the side of the cup.





? Which tectonic plate boundary did you just model? Explain.

3. Put the foam pieces back in their original positions. Slowly move them away from each other.

? Which tectonic plate boundary did you just model? Explain.

4. While the foam pieces are separated, slowly move them toward each other.

? Which tectonic plate boundary did you just model? Explain.

5. Hold one foam piece in each hand. Explore how the two pieces can cause tension, friction, stress, and strain by rubbing them together, pushing them toward each other, and pushing them past each other. Model the three types of plate boundaries.



## THINK ABOUT IT!

? Tectonic plates are large and have rough surfaces. How do you think the tension, friction, and stress between tectonic plates compares to what happened between the foam pieces? Explain.

## THEORY OF PLATE TECTONICS

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### What is a Theory?

The idea that tectonic plates move and put pressure on other ones is part of the theory of plate tectonics. You may have heard the word “theory” in daily life, like when someone says “I have a theory about why that happened.” In daily life, the word “theory” usually means a guess.

In science, the word “theory” is more serious. A **scientific theory** is an explanation of something that happens in nature that is backed by strong evidence. This evidence is usually in the form of the results of repeated experiments in many situations. There are many misconceptions people tend to have about theories.



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Kit	SU-BENEAT
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