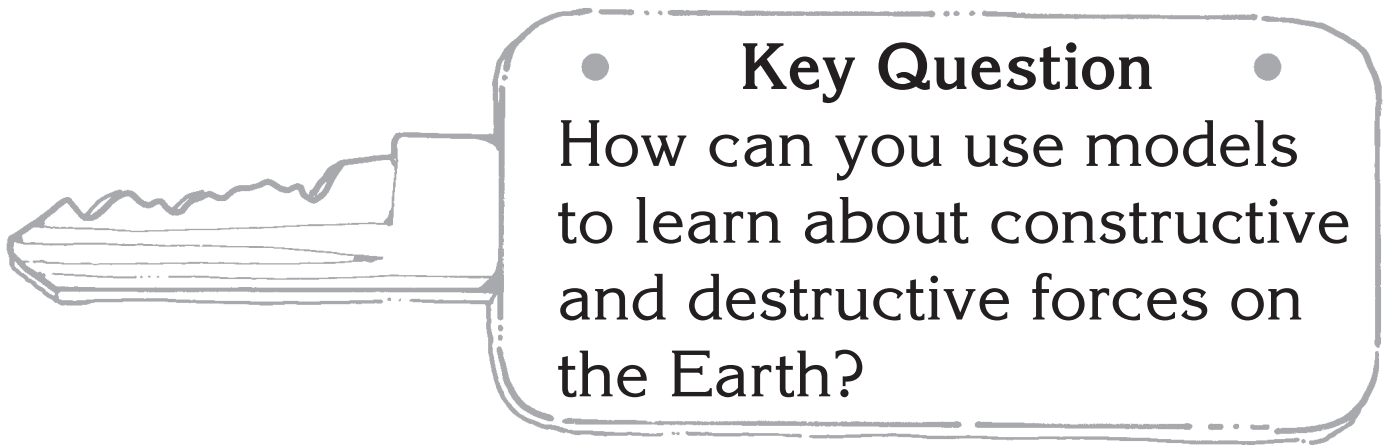


Earth Construction Zone



Learning Goals

Students will:

- identify how plate boundaries can contribute to constructive and destructive forces,
- model how plates can move, and
- identify some Earth features plate movements can create.

Earth Construction Zone

Two types of plates:

- Oceanic
- Continental

Three types of plate movement:

- Divergent
- Convergent
- Transform

The first type of plate movement you will model is at a **divergent** plate boundary. Place a large spoonful of icing on the aluminum foil. You will need to place two pieces of graham cracker next to each other on the icing. Press down slowly on the graham crackers. They represent **oceanic crust**. Oceanic crust is floating on the mantle. The icing models the mantle.

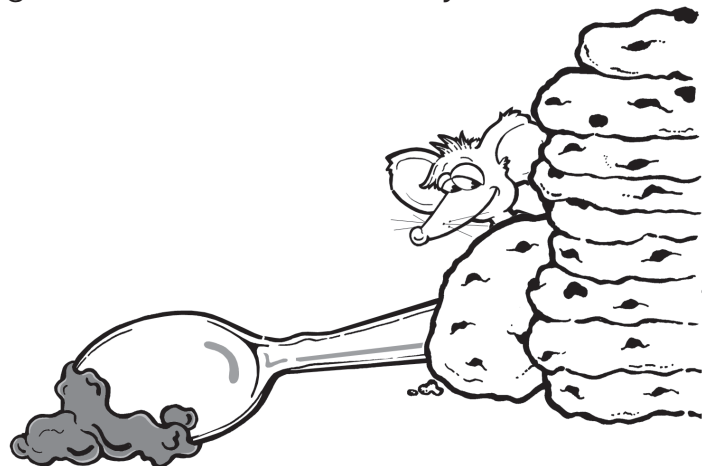
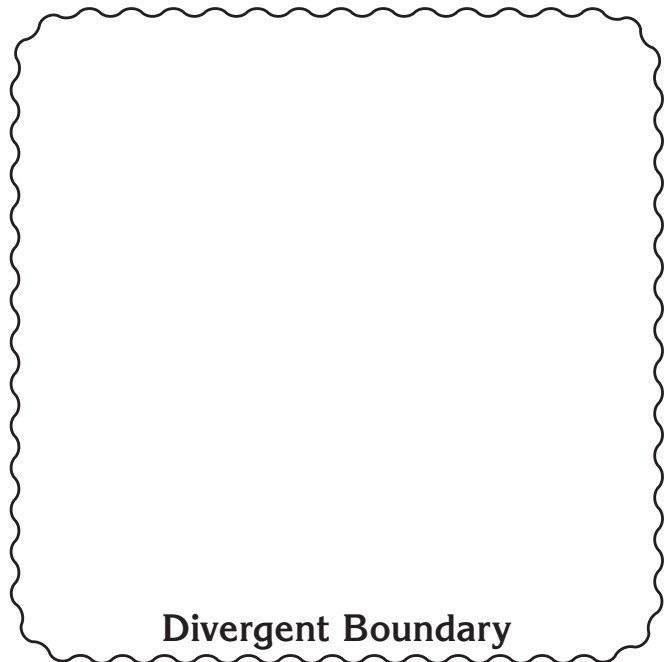
Slowly push the graham crackers about a centimeter apart. Notice how the frosting is exposed where the crackers are separated. This is a model of how magma comes to the surface where real oceanic plates are moving apart. This is a constructive Earth force.

Most divergent plate boundaries are located on **oceanic crust**. When plates begin to pull apart on continental crust, rift valleys are made. The Great Rift Valley in Africa is an example of this type of plate movement.

Draw and label your model. Include these things: oceanic plates and magma. Draw arrows to show the directions the plates are moving. Draw and label the rift valleys that formed between the divergent plates.

Things you will need:

- Aluminum foil
- Chocolate icing
- Plastic spoon
- Craft stick
- 1 graham cracker, broken in half
- 2 soft chocolate chip cookies
- 2 hard chocolate chip cookies
- 5 chocolate chips

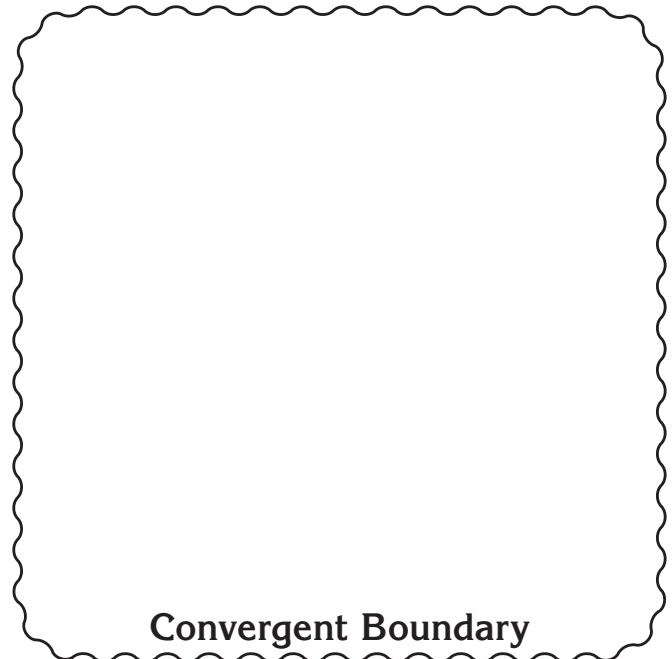


Earth Construction Zone

The second type of plate movement you will explore is when **oceanic crust converges** with (meets) **continental crust**. Pick up one of the graham crackers. Smooth out the icing and place a hard chocolate chip cookie on the icing where the graham cracker was located.

The chocolate chip cookie represents continental crust. This is thicker and less dense than oceanic crust. It floats higher on the mantle, so don't push it down into the icing.

Gently move the chocolate chip cookie and the graham cracker toward each other until the edge of the chocolate chip cookie is on top of the edge of the graham cracker. Place the five chocolate chips on the edge of the cookie that is on top of the graham cracker.



When plates meet like this, the oceanic plate goes under the continental crust and a deep trench is formed. This is a constructive Earth force. You will often find volcanoes along the edge of the continental crust where the oceanic crust is going under.

Draw and label your model. Include these labels: oceanic plate, continental plate, volcanoes, trench. Use arrows to show the directions the plates are moving.

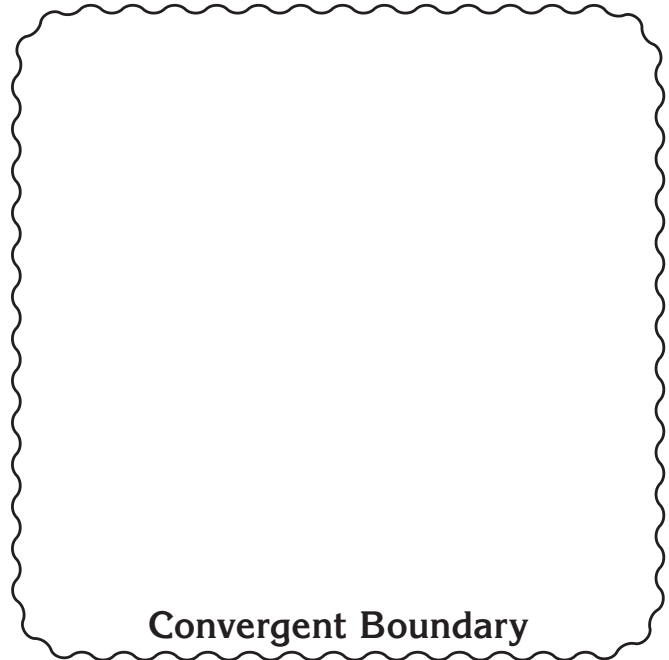


Earth Construction Zone

Now you will explore when **continental crust converges** with (meets) **continental crust**. Remove the graham cracker and the hard chocolate chip cookie from the icing. Smooth out the icing. Put the two soft chocolate chip cookies into the icing. Slowly push the cookies toward each other. Notice how the edges crumple and push up.

This is how mountains form where continental plates push together. When continents move toward each other, there is nowhere for the rock to go but up. This is a constructive Earth force.

Draw and label your model. Include these labels: continental plates, mountains. Use arrows to show the directions the plates are moving.



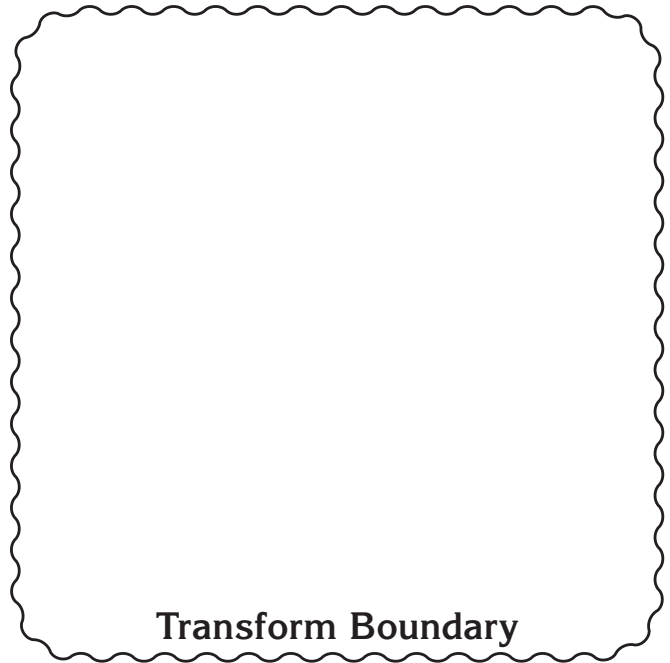
Earth Construction Zone

The last type of plate movement you will explore is when **continental** plates slide past each other. These are called **transform** plate boundaries. Remove the two soft chocolate chip cookies. Put two hard chocolate chip cookies into the icing. Push the two cookies together. Apply pressure so that two cookies begin to slide past each other.

This is the same type of movement that is taking place at the San Andreas Fault in California. You should also notice that small bits of cookies are crumbling where the two cookies are pressing together. This models that the land is under stress where plates are passing beside each other.

Draw and label your model. Use arrows to show the directions the plates are moving. Write the word “stress” where earthquakes would originate. This would be a destructive Earth force.

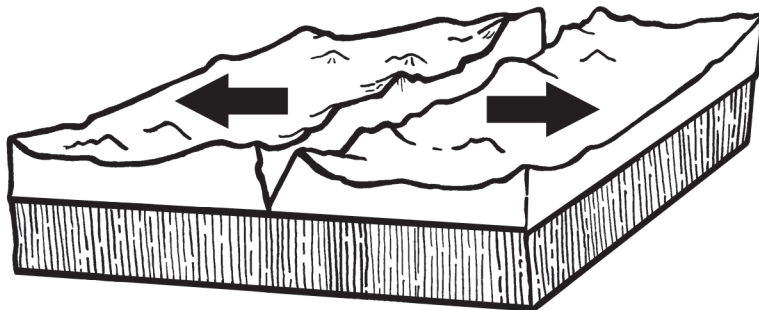
These experiences show some of the processes that are taking place between the plates of the Earth. Look at the drawings of the plate boundaries and tell how the models helped you learn about each type of plate interaction.



Earth Construction Zone

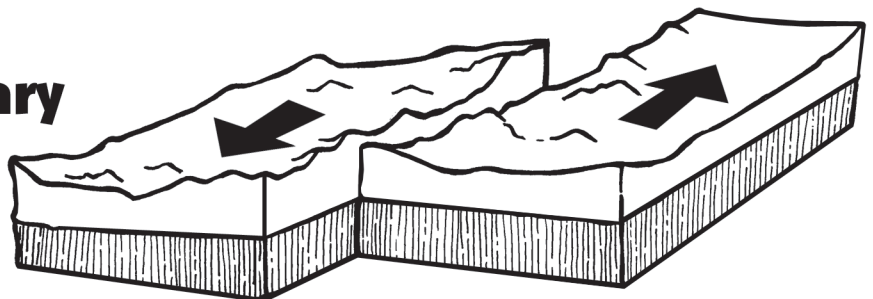
Plate Boundary Study Print

Convergent Boundary



Divergent Boundary

Transform Boundary



Earth Construction Zone



Connecting Learning

1. What are the two types of plates?
2. How are divergent plates different from convergent plates?
3. What are some of the features of the Earth that are constructed by plate movements?
4. How did the models help you learn more about how plates on the Earth create constructive and destructive forces?
5. The Appalachian Mountains are a result of two continental plates pushing together. What does that tell you about the past geologic history of the plate the Appalachian Mountains are on since there is not a plate pushing on the North American plate?
6. What are you wondering now?