

Plate Tectonics

Overview:

During this lesson, students will use clay to help them learn about and visualize three different types of plate boundaries created when Earth's plates move.

Objectives:

The student will learn that:

- when plates move away from each other, a divergent boundary is created;
- when plates move toward each other, a convergent boundary is created; and
- when plates slide past each other, a transform boundary is created.

Materials:

- Red, orange and blue clay or modeling compound
- Plastic knives
- Transparency: "Plate Boundaries"
- Student Worksheet: "Plate Tectonics"

Answers to Student Worksheet:

1. c. divergent
2. b. convergent
3. a. transform
4. b. convergent
5. c. divergent
6. a. transform
7. plate tectonics

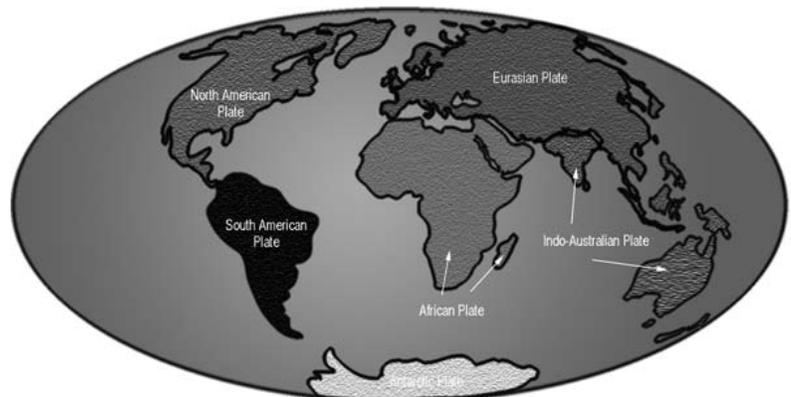


Plate Tectonics

Activity Procedure:

1. Using the Transparency: “Plate Boundaries,” discuss each of the three plate boundaries. Explain that students will use modeling compound to illustrate each type of boundary.
2. Distribute a block of each color of clay or modeling compound and a plastic knife to each student. Ask students to make a rectangular brick with the three colors, each color representing a different layer. Explain that each colored layer represents different types of rocks in Earth’s crust. The layers of clay will simulate realistic rock layer deformation at different plate boundaries.
3. Ask students to use plastic knives to slice their bricks in half. Explain that each half of the brick represents one of Earth’s plates. The first boundary students will demonstrate is a transform boundary, by gently gliding the two brick halves past each other. Students should note that although the friction between the two plates makes sliding difficult, the layers are not significantly changed, other than at their edges.
4. Divide the group into pairs. Explain that one partner will demonstrate a convergent plate boundary and the other will demonstrate a divergent plate boundary.
5. Ask the students to decide which student in each pair will create a convergent boundary. Have those students place their bricks beside each other on the table in front of them. Then show the students how to smash the two brick halves together. The boundary of the two halves should rise up, demonstrating how convergent continental plates create mountain ranges. Explain that this is only one kind of convergent boundary. When an oceanic and a continental plate collide, the oceanic plate is subducted, or pushed under the continental plate, forming a trench. Demonstrate this concept using hand movements.
6. Ask the second student in each pair to place their brick halves next to each other so that they can demonstrate a divergent plate boundary. Show students how to press downward and out with the heels of their hands on each brick half. This will separate the bricks, exposing the colored layers at the boundary of the plates. Explain that divergent boundaries are usually marked by ridges, where Earth’s surface has been pushed up.
7. Distribute the Student Worksheet: “Plate Tectonics” and ask students to complete it.

Note: The Table Tectonics activity (found in Unit 4 of this Teacher’s Manual) further demonstrates divergent plate boundaries.

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Directions: Using what you learned about plate boundaries, circle the correct answers.

1. What type of plate boundary is created when two of Earth's plates move away from each other?
a) transform b) convergent c) divergent
2. What type of plate boundary is created when two of Earth's plates move toward each other?
a) transform b) convergent c) divergent
3. What type of plate boundary is created when two of Earth's plates slide past each other?
a) transform b) convergent c) divergent

4. What type of plate boundary does the illustration below represent?
a) transform b) convergent c) divergent



5. What type of plate boundary does the illustration below represent?
a) transform b) convergent c) divergent



6. What type of plate boundary does the illustration below represent?
a) transform b) convergent c) divergent



7. What is the name of the theory describing the movement of Earth's plates?
