Modeling Plate Boundaries

Students are presented with the problem of creating a model for each of the three types of plate boundaries: transform boundary, divergent boundary, and convergent boundary. To solve this problem, students will apply the concepts they have learned about plate tectonics and plate boundaries.

Expected Outcome

Students should use the modeling compound to make three models to represent the three types of plate boundaries. For each model, students should form two flat blocks of clay to represent plates of Earth's lithosphere.

For a transform boundary, the two blocks should be shown sliding past each other, with arrows carved into the plates that show movement in opposite directions.

For a divergent boundary, the two blocks should be shown pulling apart, with a rift valley between. Arrows should indicate that the plates are moving apart.

For a convergent boundary, the two blocks should be shown colliding, with arrows on the blocks that indicate movement toward one another. An excellent model could show either subduction of one plate beneath the other or mountain building on one or both plates.

Content Assessed

This activity assesses students' understanding of plate tectonics and plate boundaries.

Skills Assessed

making models, classifying, applying concepts

Materials

Provide each student with a block of modeling compound large enough to cut into six smaller blocks to represent two plates for each type of boundary.

Advise students to make their models on the sheets of wax paper provided.

Advance Preparation

Cut the modeling compound into the number of blocks needed to give a block to each student.

Tear a sheet of wax paper from a roll for each student in the class.

Time

30 minutes

Monitoring the Task

Demonstrate how to use the knife to cut the modeling compound into plates as well as to carve arrows in the plates to show direction of movement.

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In assessing students' performance, use the following rubric.

	4	3	2	1
Making Models of the Three Types of Plate Boundaries	The student makes models that clearly and accurately show the three types of plate boundaries and what occurs at each.	The student makes models that adequately show the three types of plate boundaries and what occurs at each.	The student makes models that show at least two types of plate boundaries accurately, though does not show clearly what occurs at each.	The student makes a model that shows at least one type of plate boundary, though does not show what occurs there.
Concept Understanding	The student demonstrates a mastery of the concepts related to plate tectonics and the three types of plate boundaries.	The student demonstrates an adequate understanding of the concepts related to plate tectonics and the three types of plate boundaries.	The student demonstrates some understanding of the concepts related to plate tectonics and the three types of plate boundaries, but is confused on some points.	The student demonstrates a weak understanding of the concepts related to plate tectonics and the three types of plate boundaries.

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Name _____ Date _____ Class _____

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Problem

How can you make models of the three types of plate boundaries?

Suggested Materials

modeling compound
plastic knife
wax paper

Devise a Plan

1. Study the materials and think of a way that you could use them to make models of all three types of plate boundaries.
2. Make drawings on a separate sheet of paper of the models you could make.
3. Make the models by referring to your drawings. As you work, make adjustments in your plans so that the models clearly show how plates meet and what occurs at the three types of plate boundaries. You can use the knife to cut the modeling compound into as many separate plates as you need. You can also use the knife to carve arrows on the plates to show direction of movement.

Analyze and Conclude

On a separate sheet of paper, respond to the items that follow.

1. Make sketches of the models you made. Add as many arrows and labels as necessary to clearly show what happens at each type of plate boundary.
2. Name and describe each of the three types of plate boundaries.
3. Could you have made any of your models in another way and still have shown the same type of plate boundary? Describe any alternative models you could have made.
4. What landforms are associated with each of these boundaries?
5. Describe how these plate boundaries relate to plate tectonics.

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