Creating Models of Plate Movements

The movement of plates and the changes to Earth’s surface that result from this movement are too slow for you to observe directly. In this investigation, it will take you only a few minutes to use models to demonstrate the different ways that plates move over millions and millions of years.

Question

How can you demonstrate plate movement at the three types of plate boundaries?

Materials

• modelling clay in 4 different colours
• rolling pin
• dinner knife
• 2 sponges of different colours

Procedure

1. Use the rolling pin to flatten each colour of modelling clay to about 1 cm thick. Stack the four layers on top of each other and press down. Cut straight across the slab so that you have two equal pieces. These pieces will be one of your models for plates. The two sponges will be your other model.
Conduct an Investigation

2. Using the sponge model, demonstrate plate movement for each type of plate boundary:
   - divergent
   - convergent
   - transform fault

Record your demonstration for each boundary with sketches.

3. Repeat step 2 using your modelling-clay model.

4. Use whichever model seems to work best for each of the following demonstrations:
   - Demonstrate how movement at the boundary between the African Plate and the Arabian Plate separated Saudi Arabia from the rest of Africa. What type of boundary is this?
   - Demonstrate how the Juan de Fuca plate is being subducted under the North American Plate. What type of boundary is this? Identify the type(s) of plates (oceanic and/or continental) involved.
   - Demonstrate the formation of an ocean trench.
   - Demonstrate how the Andes Mountains were formed. What type of boundary is this? Identify the type(s) of plates (oceanic and/or continental) involved.
   - Demonstrate how the Himalayas were formed. What type of boundary is this? Identify the type(s) of plates (oceanic and/or continental) involved.
   - Demonstrate how a landform (hill or stream) can be separated by plates sliding past each other along a transform fault boundary.

Analyze and Evaluate

1. Which model worked best for each demonstration? What were the limitations of the other model?

2. Were you able to create mountains in more than one way with colliding plates?

Apply and Extend

3. What were the limitations of your models in demonstrating the formation of a rift valley? How could you modify or add to one of your models to improve the demonstration?

4. What other materials could you use to model plate movement?

CHECK YOUR UNDERSTANDING

1. What are the advantages and disadvantages of using models to show plate movement?