

Where Is the Safest Place to Live?

AN UNDERSTANDING OF PLATE TECTONICS is important for assessing potential risks for earthquakes and volcanoes. In this regard, knowing the locations and types of any plate boundaries is especially important. In this exercise, you will examine an unknown ocean between two continents and identify the locations of plate boundaries and other features. Using this information, you then will predict the risk for earthquakes and volcanoes and determine the safest sites to live.

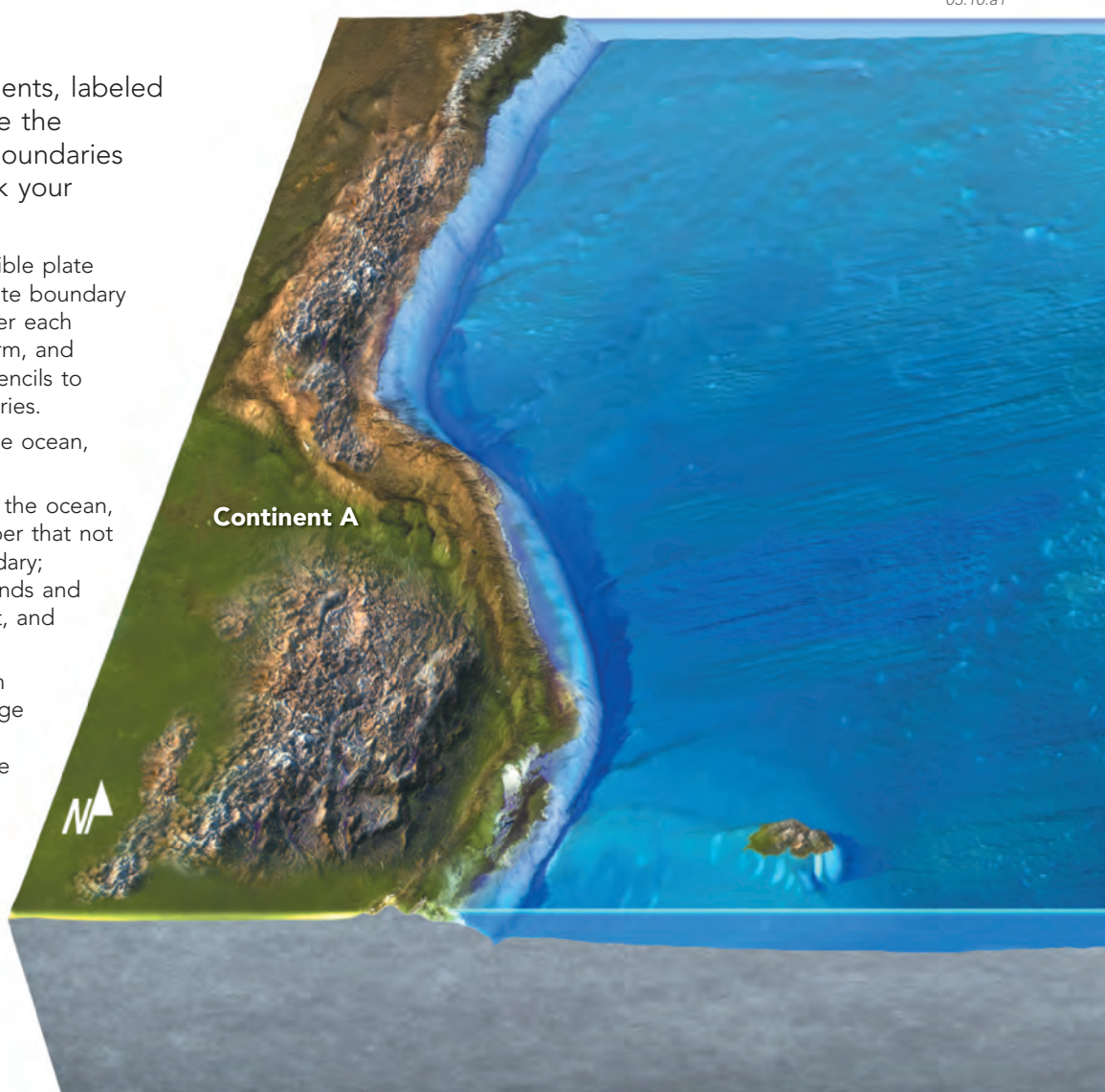
Goals of This Exercise:

- Use the features of an ocean and two continental margins to identify possible plate boundaries and their types.
- Use the types of plate boundaries to predict the likelihood of earthquakes and volcanoes.
- Determine the safest site for two cities, considering the earthquake and volcanic hazards.
- Draw a cross section of your plate boundaries, to show the geometry of the plates at depth.

Procedures for the Map

This perspective view shows two continents, labeled A and B, and an intervening ocean. Use the topography to identify possible plate boundaries and complete the following steps. Mark your answers on the map on the worksheet.

- Use the topographic features to identify possible plate boundaries and mark the location of each plate boundary on the map in the worksheet. Propose whether each boundary is divergent, convergent, or transform, and mark this on the map. You can use colored pencils to better highlight the different types of boundaries.
- Draw circles [O] at any place, on land or in the ocean, where you think earthquakes are likely.
- Draw triangles [Δ] at any place, on land or in the ocean, where you think volcanoes are likely. Remember that not all volcanoes form *directly* on the plate boundary; some form off to one side. Also, a line of islands and seamounts could mark the track of a hot spot, and may not be on a plate boundary.
- Determine a safe place to build one city on each continent. Show each location with a large plus sign [+] on the map. On the worksheet, explain your reasons for choosing these as the safest sites.



Procedures for the Cross Section

The figure below shows a cross section across the area. On the worksheet version of this figure, draw a simple cross section of the geometry of the plates in the subsurface. Use other figures in this chapter as a guide to the thicknesses of the lithosphere and to the geometries typical for each type of boundary. Some features are not located along the front edge of the figure and so cannot be shown on the cross section.

- Draw the geometries of the plates at depth for any spreading center or subduction zone.
- Show the variations in thickness of the crust and variations in thickness of the lithosphere.
- Draw arrows to indicate which way the plates are moving relative to each other.
- Show where melting is occurring at depth to form volcanoes on the surface.

