

Plate Tectonics Boundaries Lab

In this lab, you will access the *Internet* to review the basic types of Plate Tectonic boundaries. The summary chart you produce is the graded end product of the lab.

Classic Plate Tectonic Boundaries

A. Convergent Boundary (Ocean \Rightarrow \Leftarrow Continent)

Topography

The west coast of South America is the world's best example of this type of plate boundary. As the ocean plate pushes against the continent, the former is subducted beneath the continent, producing earthquakes, volcanoes, and mountain building. View the topography of this region by selecting South America from the "topography" section. Then answer the following questions on your "Summary Chart".

1. Where are the Andes Mountains, relative to the coastline?
2. Where is the plate boundary, relative to the coastline?
3. What two plates are converging at this plate boundary?

Seismicity

View the seismicity (earthquake activity) of the area by selecting South America from the "seismic activity" section. Then answer the following questions on your "Summary Chart".

1. How many earthquakes have affected this area since 1975?
2. What is the maximum depth of earthquakes here?
3. Think about... why are the earthquakes deepest to the east and shallowest to the west?
Think about subduction zones.

Volcanism

View images of the region's volcanic activity by selecting South America from the "volcanic activity" section. Then answer the following questions on your "Summary Chart".

1. Relative to the earthquakes and mountain ranges, where are volcanoes located on the South American continent?

B. Convergent Boundary (Continent ⇌ ⇐ Continent)

Topography

The boundary between India and Asia is the world's best active example of colliding continents. Here, India is pushing beneath and lifting Asia, as the two plates converge. Select "Central Asia" for each category, then answer the following questions on your "Summary Chart".

1. Where are the Himalayan Mountains, relative to the boundary between Asia and India?
2. Prior to their collision, what was between India and Asia?
3. What two plates are converging at this plate boundary?

Seismicity

1. How many earthquakes have affected this area since 1975?
2. What is the maximum depth of earthquakes here?
3. Why are the earthquakes shallower than the deepest quakes observed in western South America?

Volcanism

1. Why is the nature of volcanism different at this convergent boundary than the convergent boundary along western South America?

C. Divergent Boundary (⇐Plate Plate⇒)

Topography

The mid-Atlantic Ridge, along the seafloor of the Atlantic Ocean, results from tensional stress pulling the ocean floor apart. New seafloor forms as magma from the mantle pours onto the surface at these divergent plate tectonic boundaries. Select "South Atlantic Ocean" for each category, then answer the following questions on your "Summary Chart".

1. Does the mid ocean ridge trend generally North-South or East-West?
2. Describe the trend of the mid ocean ridge relative to the shoreline of eastern South America and western Africa.
3. What plate is being pulled apart by this divergent plate boundary?

Seismicity

1. How many earthquakes have affected this area since 1975?
2. What is the maximum depth of earthquakes here?
3. Why are these earthquakes shallower than those along convergent boundaries?

Volcanism

1. Can you find any volcanic activity along this plate boundary? Summarize the activity.

D. Transform Boundary (Plate $\uparrow\downarrow$ Plate)

Topography

The west coast of North America, along southern California, is an excellent example of a transform plate tectonic boundary. Here, an ocean plate and a continental plate are grinding past each other. Motion is horizontal (rather than vertical), so little change in topography is associated with the boundary. Select “Western North America” for each category, then answer the following questions on your “Summary Chart”.

1. What two plates are moving along this plate boundary?
2. Where is the plate boundary, relative to the coastline?
3. Explain why mountains along this boundary are lower than those of the Andes or Himalayan Mountains.

Seismicity

1. How many earthquakes have affected this area since 1975?
2. What is the maximum depth of earthquakes here?
3. Is the Baja Peninsula on the Pacific Plate or the North American plate?
4. Why are the earthquakes here shallow?

Volcanism

1. Like the Andes Mountains (S. America) the plate boundary involves a continent and an ocean plate. Why is the nature of the volcanic activity different here?

If you have difficulty answering the questions with the material provided, used the Internet to assist you. An excellent resource is a document entitled “This Dynamic Earth” published by the USGS, and available on the web at

<http://pubs.usgs.gov/publications/text/understanding.html> .