

SI Geology - Full Discipline Demo

Plate Tectonics

Final Report - Answer Guide

Institution	Science Interactive University
Session	SI Geology - Full Discipline Demo
Course	SI Geology - Full Discipline Demo
Instructor	Sales SI Demo

Test Your Knowledge

Categorize each statement as true or false.

⚡ Convection currents in the lithosphere lead to tectonic plate motion.

⚡ The lithosphere is composed of discrete, rigid plates called tectonic plates.

⚡
Tectonic plate motion can be observed at divergent and convergent boundaries, but not at transform boundaries.

⚡
Tectonic plate motion determines the distribution of the continents and ocean on the Earth's surface.

True

False

1

2

Correct answers:

1 The lithosphere is composed of discrete, rigid plates called tectonic plates.

Tectonic plate motion determines the distribution of the continents and ocean on the Earth's surface.

2 Convection currents in the lithosphere lead to tectonic plate motion.

Tectonic plate motion can be observed at divergent and convergent boundaries, but not at transform boundaries.

Categorize each statement as describing convergent, divergent, or transform boundaries.

⚡ Associated with energy release in the form of shallow earthquakes.

⚡ Associated with the destruction of the lithosphere.

⚡ Associated with the formation of mountains and trenches.

⚡ Associated with the formation of new crust and lithosphere.

⚡ Associated with the formation of rift valleys.

⚡ Occur where two tectonic plates are moving away from each other.

⚡ Occur where two tectonic plates are moving toward each other.

⚡ Occur where two tectonic plates slide past one another.

Convergent Boundary	Divergent Boundary	Transform Boundary
1	2	3

Correct answers:

- 1

Associated with the destruction of the lithosphere.
Associated with the formation of mountains and trenches.
Occur where two tectonic plates are moving toward each other.
- 2

Associated with the formation of new crust and lithosphere.
Associated with the formation of rift valleys.
Occur where two tectonic plates are moving away from each other.
- 3

Associated with energy release in the form of shallow earthquakes.
Occur where two tectonic plates slide past one another.

Exploration

Scientists hypothesize that convection in the ____ causes tectonic plate motion.

- ☐ lithosphere
- ☒ asthenosphere ✓
- ☐ inner core
- ☐ outer core

Divergent boundaries occur primarily in the continental lithosphere.

- ☐ True
- ☒ False ✓

Mountain range formation is characteristic of which type of collision?

- ☐ Continent-Ocean Collision
- ☐ Ocean-Ocean Collision
- ☒ Continent-Continent Collision ✓

Transform boundaries occur where two tectonic plates slide past one another.

- ☒ True ✓
- ☐ False

Exercise 1

In this exercise, what part of the Earth did the transparency paper represent?

In this exercise, what part of the Earth did the modeling dough represent?

Based on your results, what type of collisional boundary was simulated in the convergent plate boundary modeling exercise?

What type of plate boundary produces new lithosphere? What type of plate boundary destroys lithosphere?

Data Table 1: Observations of Plate Boundaries
(SAMPLE ANSWER BELOW)

Plate Boundry	Observations
Divergent	Dough initially stretched as sheets were pulled apart and then fractured and split leaving uneven margins. The space between the fractured area was large.
Convergent	Dough folded as one sheet slid under the other. No fracturing observed.
Transform	Dough stretched before fracturing as sheets were slid parallel to one another. The margins of the fractured dough were uneven. The space between the fractured section was small.

Photo 1: Divergent Plate Boundry
(SAMPLE ANSWER BELOW)





Photo 2: Convergent Plate Boundry
(SAMPLE ANSWER BELOW)



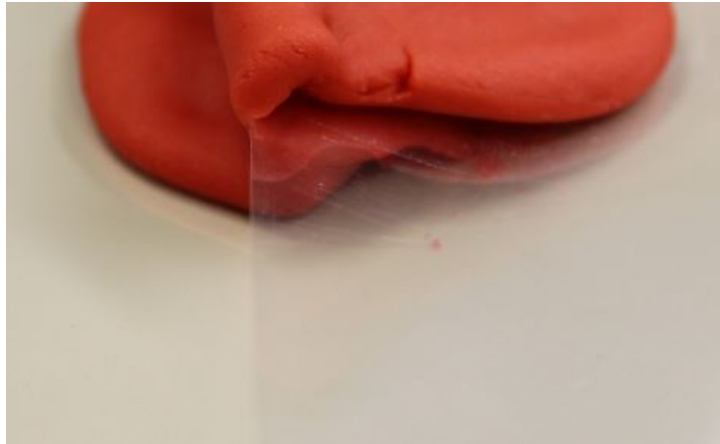


Photo 3: Transform Plate Boundry
(SAMPLE ANSWER BELOW)

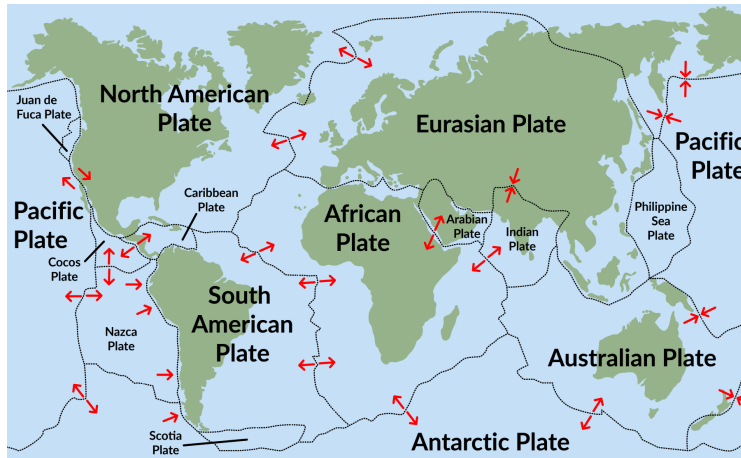




Exercise 2

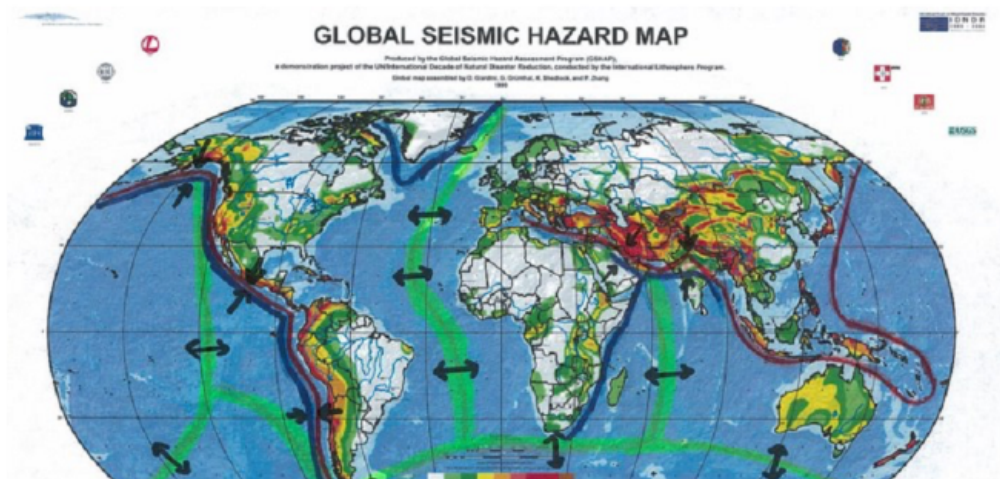
Describe your process of assigning directional motion for each plate boundary. What information did you use to determine how a plate was moving?

Compare your completed Map 1 to the map of Earth's tectonic plates below. What are some of the differences between your map and the figure?



What information do you think could have helped you construct a more accurate map of the tectonic plates? Why?

Photo 4: Completed Map 1
(SAMPLE ANSWER BELOW)





Competency Review

New crust and lithosphere is created at divergent boundaries.

- ☐ True ✓
- ☐ False

Rift valleys are associated with ____ boundaries.

- ☐ convergent
- ☐ transform
- ☐ divergent ✓
-

The movement of the lithosphere and resulting topography at transform boundaries depends on the type of lithosphere involved in the collision.

- ☐ True
- ☒ False



What geologic feature is associated with continent-ocean collisions at convergent boundaries?

- ☐ Rift valleys
- ☐ Mountain ranges
- ☐ Volcanoes
- ☒ None of the above.



The ____ is composed of discrete, rigid plates that move relative to each other due to convection currents in the asthenosphere.

- ☒ lithosphere
- ☐ mantle
- ☐ inner core
- ☐ outer core



What type of boundary is represented by the image below?



- ☐ Convergent boundary
- ☐ Transform boundary
- ☐ Divergent boundary

✓

What would cause deformation at the boundary pictured below?



- ☐ Heat
- ☐ Pressure
- ☐ Shear stress
- ☐ All of the above.

✓

The highest points of elevation on Map 3 would be associated with which type of collision?

- ☒ Continent-Continent Collision ✓
- ☐ Ocean-Ocean Collision
- ☐ Continent-Ocean Collision

Extension Questions

The San Andreas Fault is a site of frequent earthquake activity and it is close to several major cities. Many people believe that Los Angeles and other parts of southern California will one day fall into the ocean due to a large earthquake along the fault. Use your knowledge of transform plate boundaries to support or refute this belief. (SAMPLE ANSWER BELOW)

Los Angeles will not fall into the ocean from an earthquake occurring on the San Andreas Fault. Although transform boundaries are characterized by frequent earthquakes, these boundaries do not destroy significant portions of the Earth's crust, nor do they result in vertical movements of crust. Instead, Los Angeles is slowly being moved along the continent relative to its location now.