Name_____

Investigation 5: What happens when plates move sideways past each other? Assessment

Answer the questions below in complete sentences.

1. What type of plate boundary separates mid-ocean ridge segments and is parallel (in the same direction) to the Charlie-Gibbs Fracture zone?

   There is a transform plate boundary parallel to the Charlie-Gibbs Fracture zone.

2. What type of plate boundary is perpendicular (in the opposite direction) to the Charlie-Gibbs Fracture zone?

   There is a divergent plate boundary perpendicular to the Charlie-Gibbs Fracture zone.

3. What is the magnitude of the earthquake you clicked on?

   Answers will vary. All earthquakes along the transform boundary are between magnitudes 4.2 - 4.7.

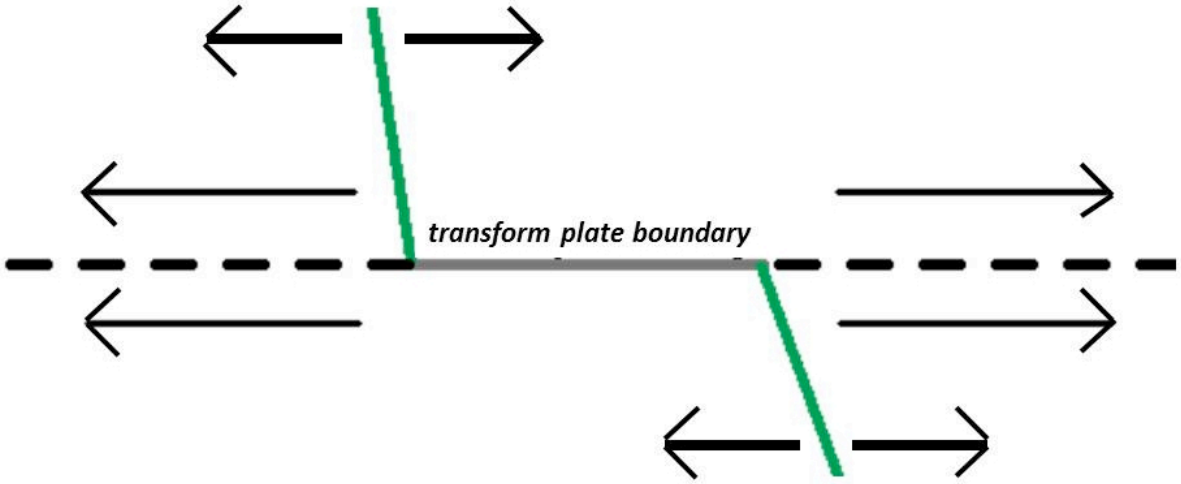
4. Do you think earthquakes on oceanic transform boundaries, such as the Charlie-Gibbs Fracture zone, pose a major threat to cities?

   No, earthquakes on oceanic transform boundaries do not pose a major threat to cities.

   Why?

   Earthquakes on transform boundaries are not very large. The Charlie-Gibbs Fracture zone is located far away from cities.

5. Show how the lithosphere moves along each side of the Charlie-Gibbs Fracture zone outside of the divergent boundaries by labeling the top and bottom lines with arrowheads.



6. How does the lithosphere move at the divergent boundaries along the Charlie-Gibbs Fracture zone?

   The lithosphere moves away from the divergent boundaries in the Charlie-Gibbs Fracture zone.

7. Look at your GIS map and the directional lines you drew immediately north and south of the transform plate boundary at the Charlie-Gibbs fracture zone. How does the lithosphere move at that location? (Does it move in the same or opposite direction?)

   The lithosphere is moving in the same direction immediately north and south of the transform plate boundary at the Charlie-Gibbs Fracture zone.

8. Describe the location of the transform earthquake epicenters relative to the rest of the Charlie-Gibbs Fracture zone.

   Transform earthquake epicenters only occur between the mid-ocean ridge segments. Transform earthquakes do not occur along the rest of the Charlie-Gibbs fracture zone.

9. On the GIS map, there is a purple outline that defines the fracture zone. Is the fracture zone a plate boundary? ***Hint:*** Click back to the Map Layers tab. Investigate plate names by clicking on arrowheads on opposite sides of the fracture zone.

   No, the fracture zone is not a plate boundary.

10. How can you identify the fracture zones in the Atlantic Ocean?

    You can identify the fracture zones in the Atlantic Ocean by looking for areas with offset ocean floor ages.

11. Which plate next to the San Andreas Fault Zone is moving the fastest? ***Hint:*** Click on the map to find out the name of the plates.

    The Pacific Plate is moving the fastest in the *San Andreas Fault Zone.*

12. Which two major cities along the San Andreas Fault zone have the highest populations?

    The two major cities along the San Andreas Fault zone with the high populations are Los Angeles and San Francisco. San Jose is also an acceptable answer since it is part of the greater San Francisco Bay area.

13. Should residents that live along the San Andreas Fault zone be more concerned with earthquake or volcanic hazards? Support your decision with evidence from your map.

    People living on a plate boundary should be more concerned about earthquakes. No volcanoes occur along the San Andreas Fault zone.

14. What is the seismic hazard for the San Francisco area and in Los Angeles area?

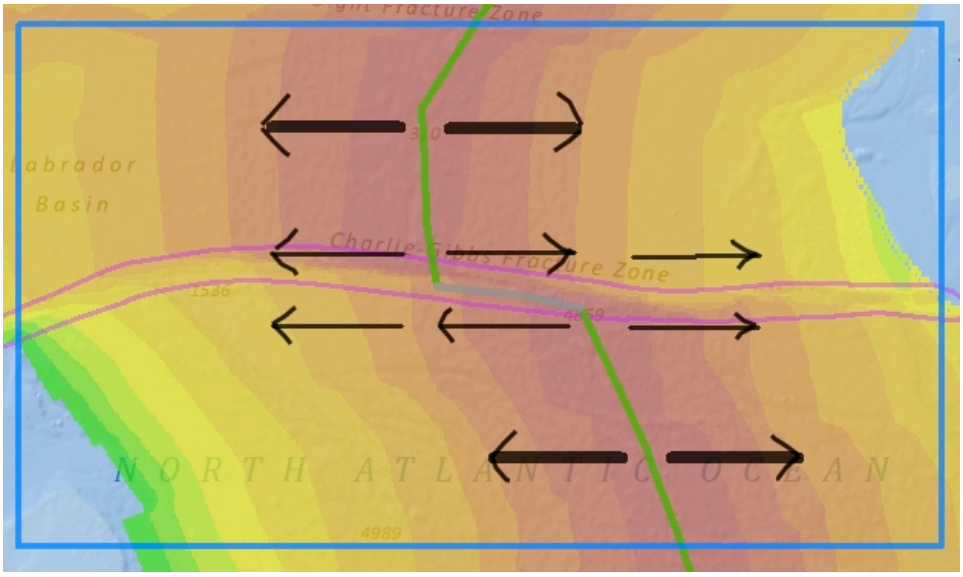
    The seismic hazard for the San Francisco area is 8-10. The seismic hazard for the Los Angeles area is 5-10.

15. List three types of evidence you observed in the photographs that show that an earthquake occurred and the area is seismically active.

    - *There are fractures on the Earth's surface.*
    - *There are offset rows of crops in farm fields*
    - *There are damaged buildings*
    - *There are cracked roads and broken freeway overpasses.*

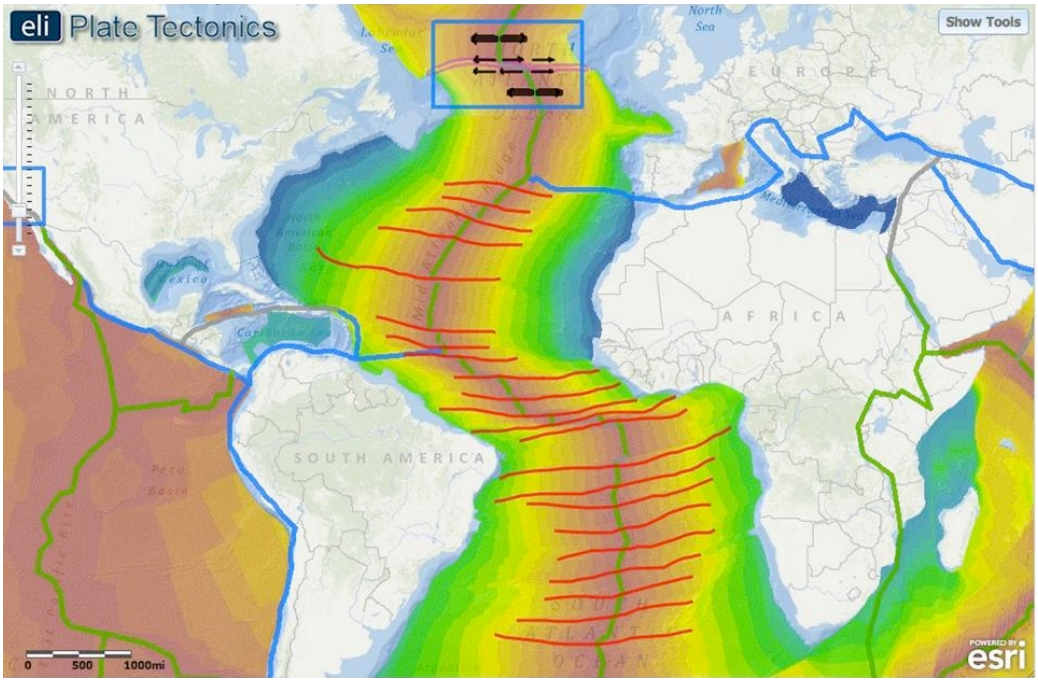
Assessing the exported map images:

Map #1: Draw arrowheads on each line segment in black.



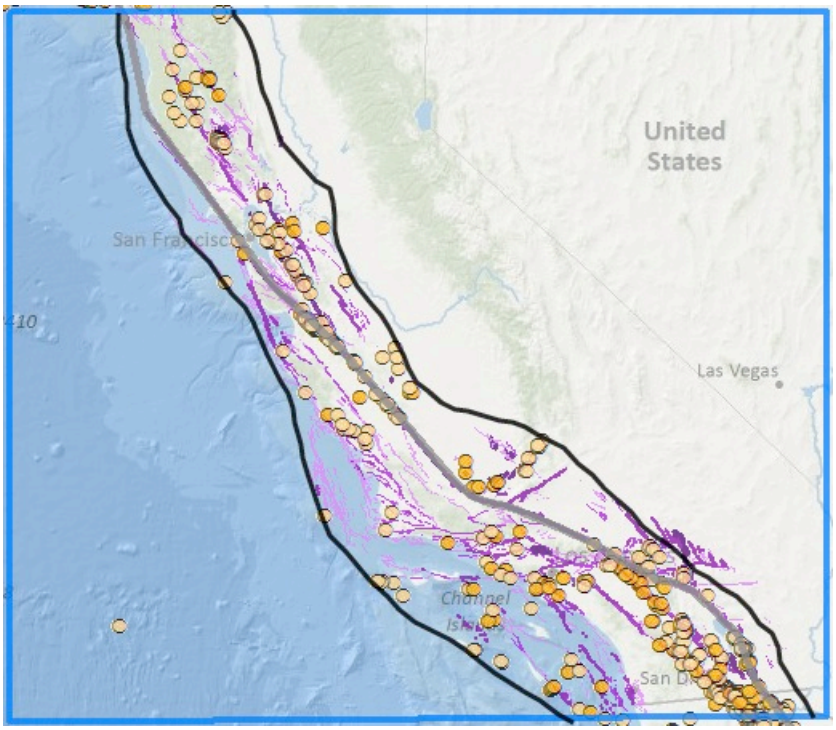
Students exported image should have 10 arrowheads, one for each line segment. Arrowheads on the eastern side of the divergent boundary (right), should be pointing to the east (right). Arrowheads on the western side of the divergent boundary (left) should be pointing towards the west (left).

Map #2: Trace five more fracture zones in the Atlantic Ocean.



Students exported image should include 5 of the red lines drawn on the image above. Correct areas will include locations with offset colors of the age of the ocean floor.

Map #3: Outline the San Andreas Fault zone



Students exported image should included 2 black lines drawn parallel to the California coast. The area between the lines should include all of the earthquakes and the gray transform plate boundary.