**Objective:** Gather evidence to explain the theory of plate tectonics.

**Materials:** Work in pairs sharing one computer with Internet access.

**Engage:** 1. What continent do you live on? Can you think of any ways the continent has changed over time?

**Explore:** Navigate to the Earthquakes Living Lab at <http://www.teachengineering.org/livinglabs/earthquakes/> .Notice the four main components of the Earthquakes Living Lab.

2. Select the second option, the “Southern California” box. Next, click the second link on the right side of the page titled, “How have the Earth’s continents changed over time?” Watch the animation in the top left of the screen.

3. Compare the map of the world today (such as the real-time earthquake map) to a map of the world 250 million years ago (called Pangaea). Use the interactive continental drift map to watch the change in the Earth’s landforms over millions of years.

• As you watch the animation, record at least three examples of how the continents have changed their positions over time.

• If the plates continue to move in this pattern, draw a sketch of what the world might look like 250 million years in the future.

**4. Explain:** Navigate BACK (X) to the Earthquakes Living Lab main page and click on the third link titled, “What is the Theory of Plate Tectonics?”. Explore more about the theory. Read the background information and answer the following questions:

* What part of the Earth is broken into plates? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* How far do the plates typically drift in one year? \_\_\_\_\_\_\_\_\_\_\_\_\_\_
* How many years has I taken to see significant changes to Earth’s geography? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5. Navigate BACK (X) to Earthquakes Living Lab main page and click on the first link titled, “General information on plate tectonics…”. Scroll down to click on the “Break up of Pangea” and watch the video.

* What continent is Australia closest to until it drifts off to the East? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6. Navigate BACK one click to find the middle link called “Plate boundaries”. Use the buttons across the top to select “Plates”

* What plate are we on? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Next select “Major Earthquakes”.

* Where do the majority of Major earthquakes happen in the U.S.? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Next select “Subduction Zone”.

* What could be causing the major earthquakes that North America experiences? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Navigate BACK one click to find the third link called “Plate Movements”.

* What forms as plates separate? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* What forms aa plates collide? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* What three things can form as a result of a subduction zone? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* What can happen at transform boundaries? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. Navigate BACK (X) to Earthquakes Living Lab main page by “X-ing” out of your current page. Use the links provided to fill in the chart below.

|  |  |
| --- | --- |
| Sea Floor Magnetism  **Link Title:** “How do scientists use evidence to support the theory of plate tectonics? How do scientists use drilling evidence, fossil evidence and sea floor spreading to support the theory of plate tectonics?” |  |
| **Fossils**  **Link Title**: “How do scientists use the fossil record to explain the theory of plate tectonics?” |  |
| Volcanoes  **Link Title:** “How does subduction change the Earth’s surface?” Be sure to read #5, #10, #11, #12 |  |
| Earthquakes  **Link Title:** “How do scientists explain tectonic plate movement?” (Use related links: What is an Earthquake) |  |

8. **Evaluate:** In the early 1900s scientist Alfred Wegener proposed the continents were “drifting.” The scientific community did not support his theory due to a lack of scientific evidence. Using what you learned in this activity, would you support Wegener’s hypothesis or not?

On a separate sheet of paper write a paragraph to support your position. You must explain four pieces of evidence to support your claim.