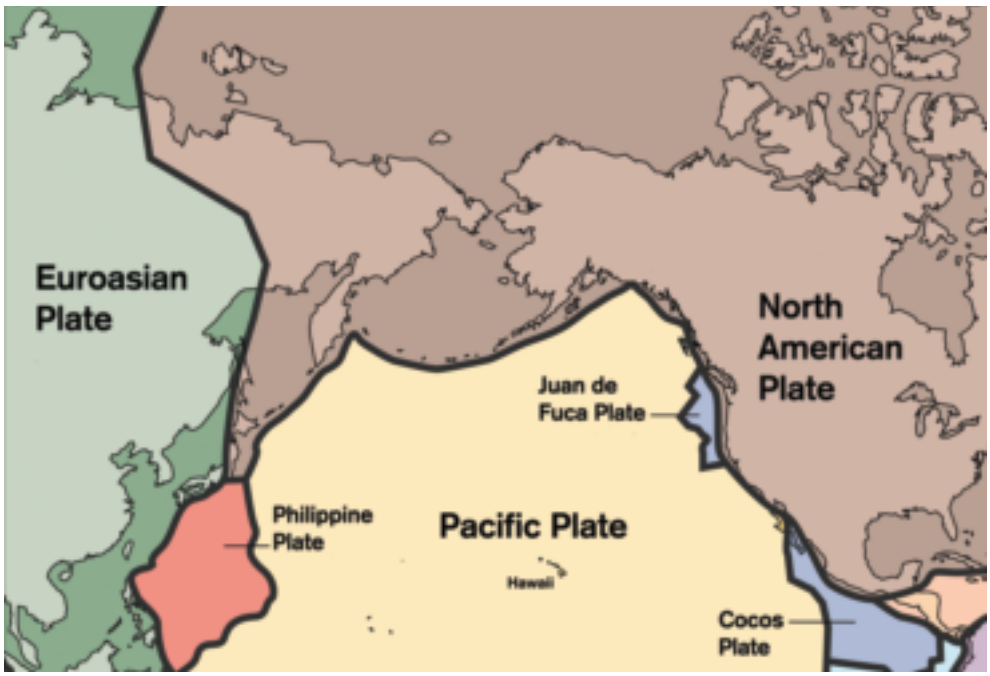
On the Edge

Look for earthquakes and volcanoes on the Hazards Map poster. You'll see that in the United States both happen along the Pacific Ocean. Why?

Tectonic Plates

Geologists are scientists who study how the Earth is put together. They have discovered that the surface of the Earth is made up of gigantic slabs of rock, called *tectonic plates,* that fit together like the pieces of a puzzle. As you can see, the continental United States is part of the North American Plate, but the North American Plate bumps up against the Pacific Plate along the West Coast. That's one area where earthquakes and volcanoes can happen.

Unlike the pieces of a puzzle, tectonic plates move and shift position, and that causes the edges of the plates to be pushed together or pulled apart. This usually happens so slowly that we can't feel it, but when the edges get caught on each other, pressure builds up at that spot until, one day, the two edges break free. That's what we feel as an earthquake.



Magma

The rock underneath the tectonic plates is very hot – so hot that it has melted into a thick fluid called *magma*. In some places, the magma pushes up through the surface of the Earth, and that's the start of a volcano. A volcano is a mountain that has been built up by magma flowing to the surface of the Earth, where it then hardens into solid rock.

As you have probably figured out, the cracks between the tectonic plates make a good place for magma to find a path to the surface. That's why most of the world's volcanoes are located along the edges of tectonic plates. But sometimes the magma finds a soft spot away from the edges where it can push through. That's how the Hawaiian Islands were formed in the middle of the Pacific Plate – they are actually the tops of volcanoes that built up from the bottom of the ocean.

Show What You Know

Can you think of a way to show how an earthquake or a volcano happens?

- Start by thinking about what you could use to show how two tectonic plates push together and then slip against one another to cause an earthquake. Could you show what happens with blocks? Clay? Sponges?
- Or start by thinking about what you could use to show how magma pushes up to the surface of the Earth to make a volcano. Could you show what happens with a tube of toothpaste? A can of soda? A jelly donut?

Use the back of this sheet to draw or describe how you would make a model to show how an earthquake or a volcano happens. To learn more, you can visit *Earthquakes for Kids* at **earthquake.usgs.gov/learn/kids**, or *Learn About U.S. Volcanoes* at **volcanoes.usgs.gov/about/index.php**.

After you have designed your model, get together with some classmates who have come up with their own ideas for a model like yours – one that shows how an earthquake or a volcano happens. Compare ideas and decide on the best way to make your model. Then work together as a team to create a model that you can share with the whole class.

Earthquake and Volcano Safety

Visit the American Red Cross website to find out how to stay safe during an earthquake or when a volcano is ready to erupt. Go to **redcross.org/prepare/disaster** and click on Earthquake and Volcano. Learn how to "Drop, Cover, and Hold On" when an earthquake happens, and practice this safety drill in class. If you live near a volcano, ask your teacher to tell you about your town's plan to get everyone far away if the volcano ever erupts.