

Earthquakes



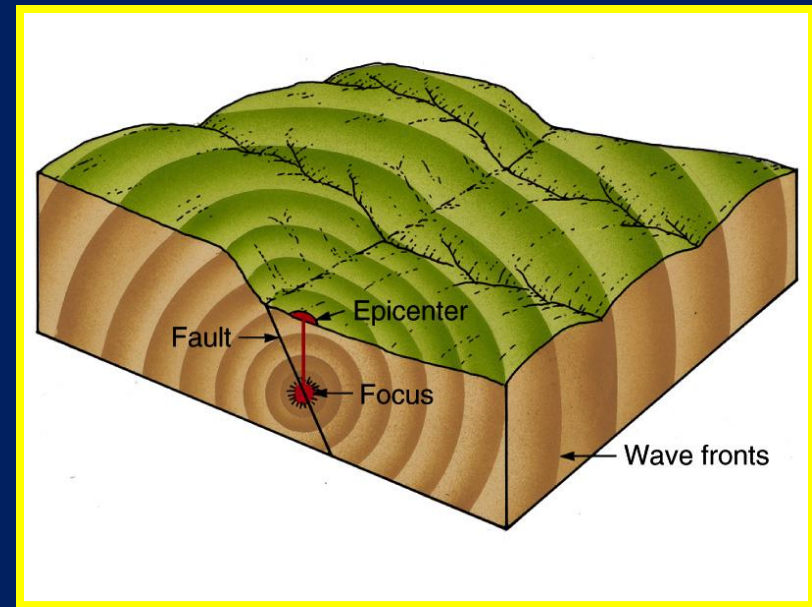
Natural Vibrations

Earthquakes are natural vibrations of the ground that result in the breaking up of Earth's crust.



Anatomy of an Earthquake

Most earthquakes originate deep within Earth's crust.

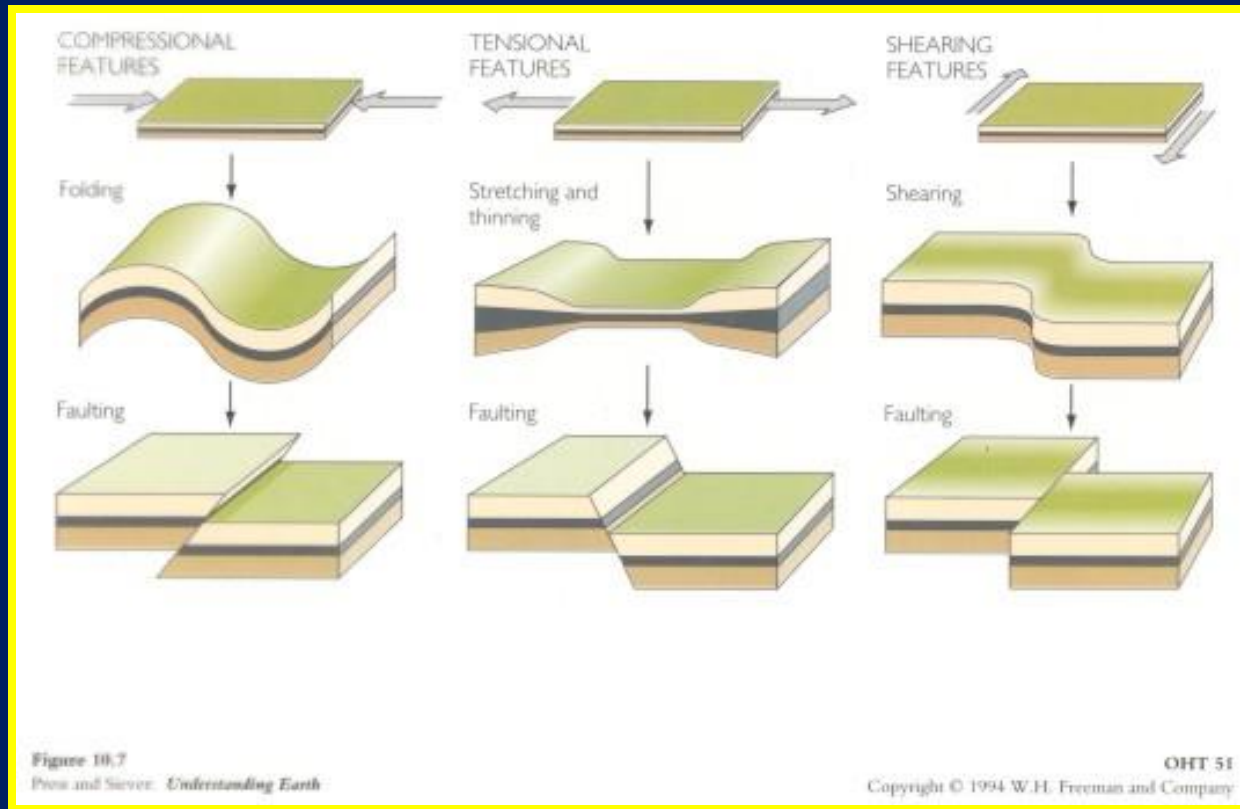


The place where the earthquakes originates, deep within Earth's crust, is called the Focus.

The location on the surface, right about the focus, is called the earthquake's Epicenter.

Fractures and Faults

Stress from rocks being compressed, pulled apart, or twisted can cause fractures in the rock, called faults.

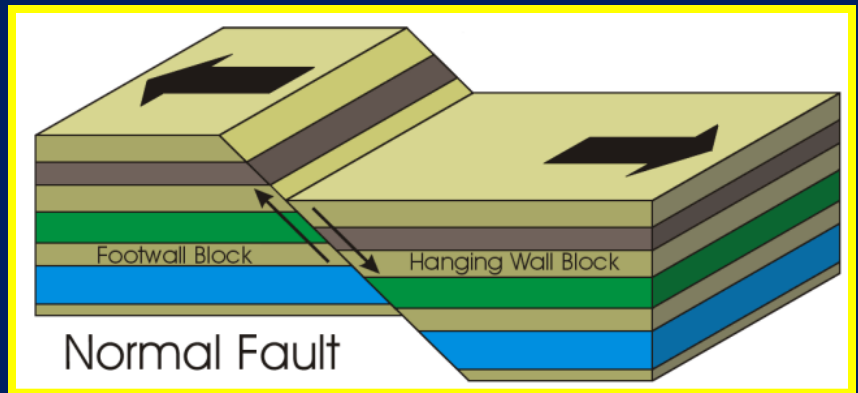


Types of Faults

There are three types of faults based on the movement of the rock along the fracture.

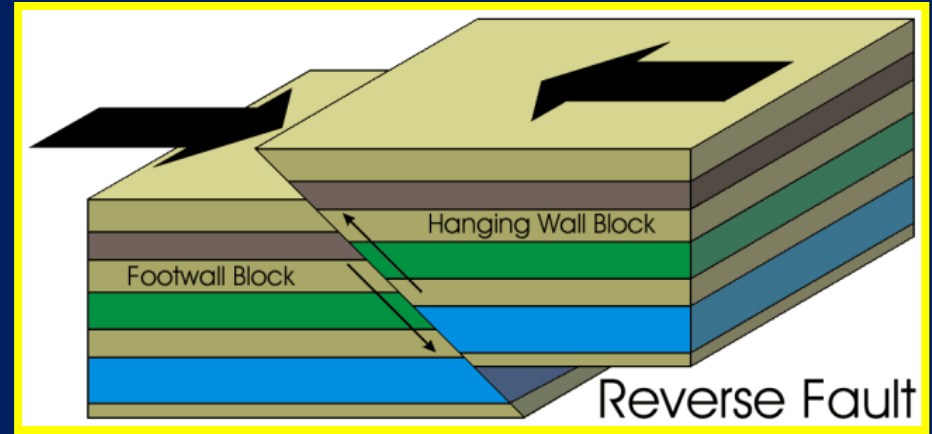
Normal Fault

A normal fault occurs when rocks on each side of a fracture are pulled apart and one side dips downwards.



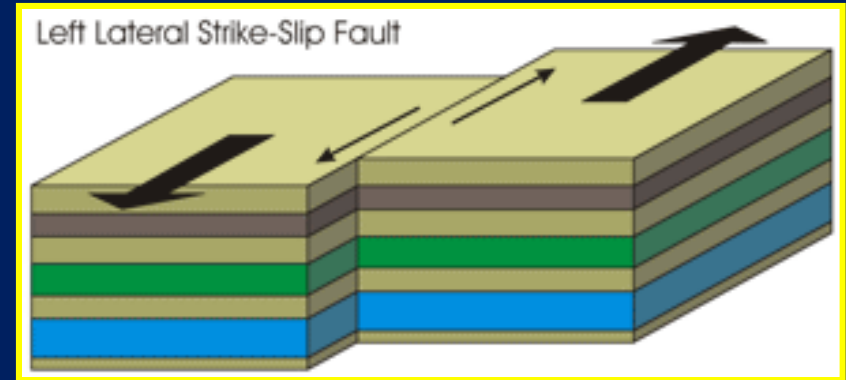
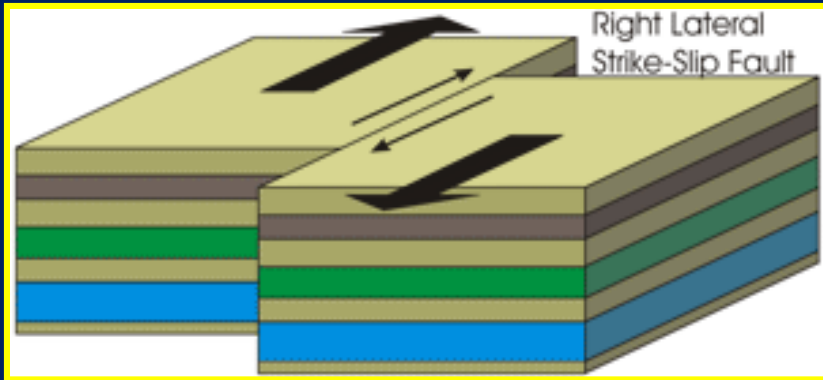
Reverse Fault

A reverse fault occurs when rocks on each side of a fracture are compressed, or pushed together.



In this case, one side is pushed upward.

Strike-Slip Fault



At a strike-slip fault, rocks on either side of the fracture move horizontally past each other.



San Andreas Fault

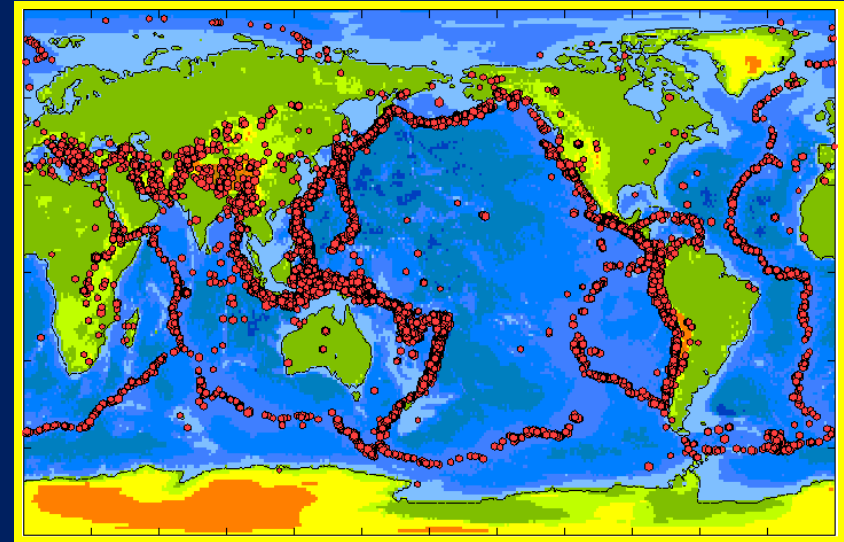
The San Andreas Fault, in California, is an example of a strike-slip fault that occurs along a transform boundary.

[60 Minutes: California's Deadly Earthquakes](#)

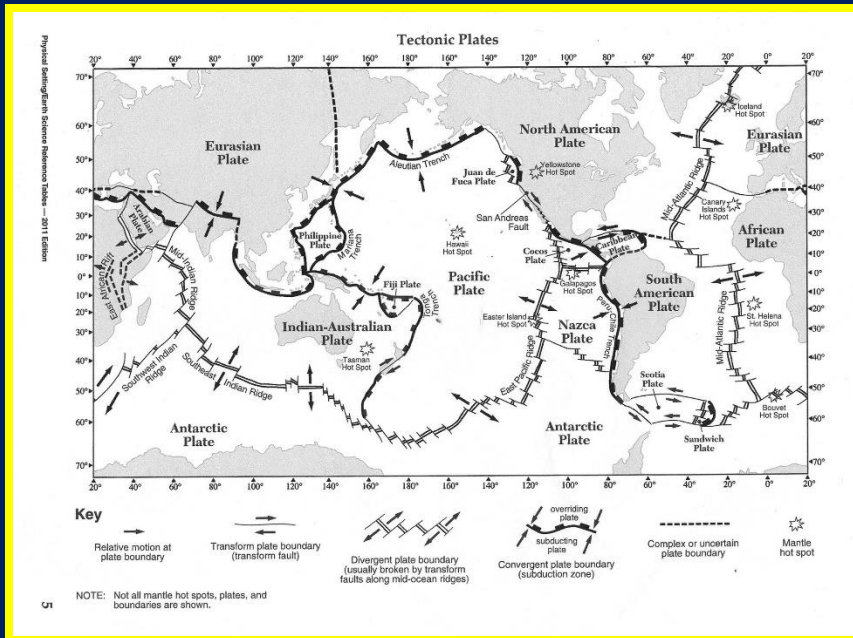


Where Earthquakes Occur

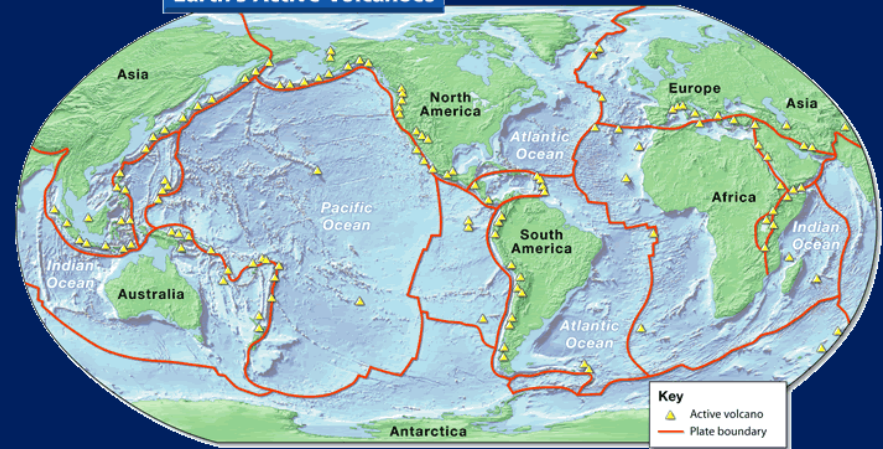
Like volcanoes, Earthquakes tend to occur along plate boundaries.



Most Significant Earthquakes

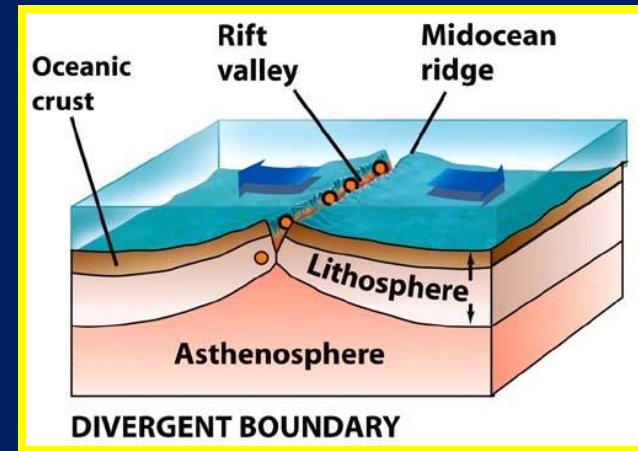
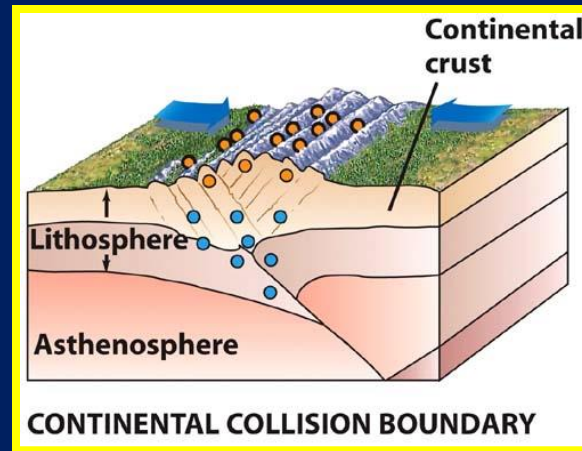
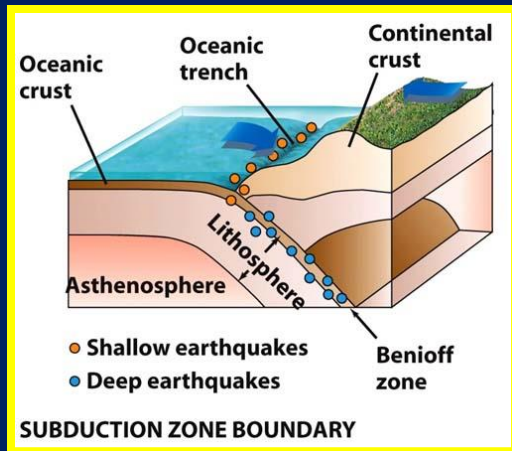
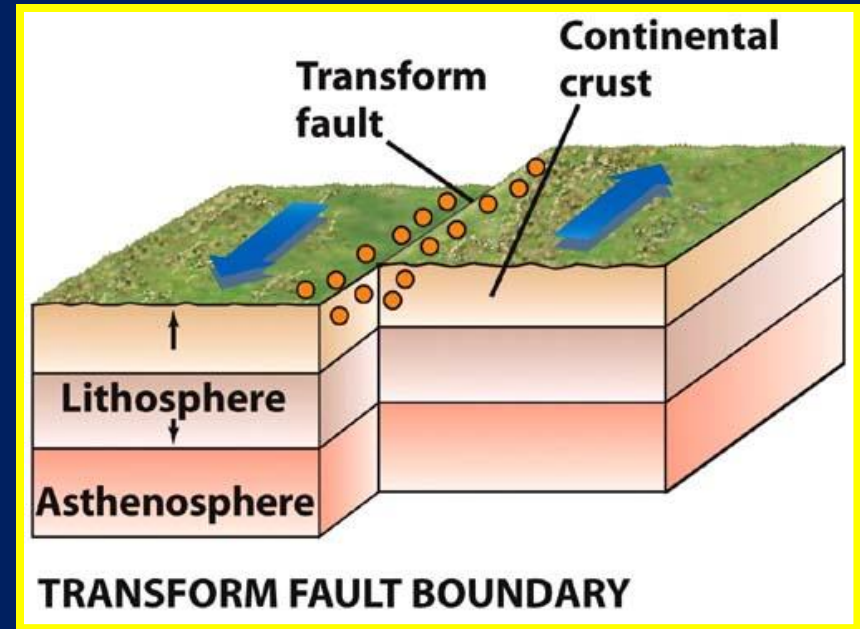


Earth's Active Volcanoes



Where Earthquakes Occur

However, unlike volcanoes, Earthquakes can occur at all three types of plate boundaries, including transform boundaries.



Where Earthquakes Occur

Earthquakes associated with transform boundaries tend to be shallow but very destructive earthquakes.



1906 San Francisco Earthquake 7.9



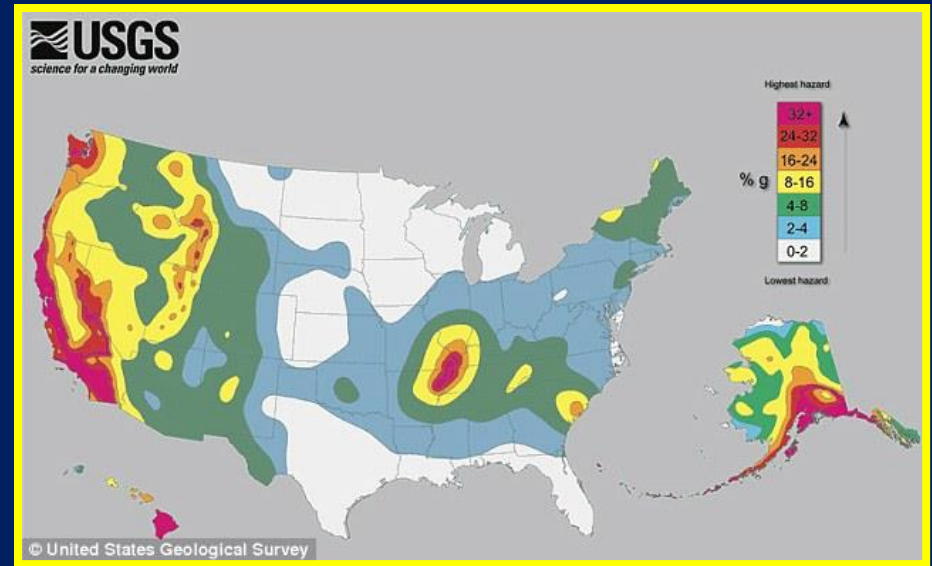
2010 Haiti Earthquake 7.0



Baja, California Earthquake 6.9

Where Earthquakes Occur

Earthquakes can also occur along fault lines, or fractures in Earth's crust.



Memphis, Tennessee (1812)



Charleston, SC (1886)

Where Earthquakes Occur

In 2011, a 5.6 earthquake in Virginia sent aftershocks along the east coast.

[Washington Memorial During Quake](#)



Where Earthquakes Occur

Earthquakes are also associated with volcanic eruptions and have been used to help predict when a volcano will erupt.



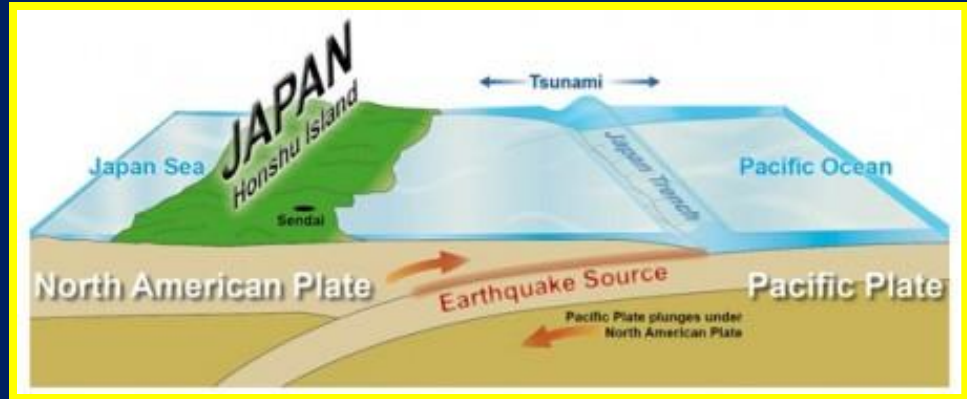
Mt. St. Helens – May 1980

Within two months prior to eruption, more than 1,000 earthquakes occurred.

The final 5.1 earthquake caused the north side of volcano to collapse which was soon followed by the volcanic eruption that killed 55 people.

Tsunamis

When earthquakes, associated with subduction zones, produce vertical uplift, tsunamis can occur.



Science of Tsunamis



Thailand - 2004



Japan - 2011

Earthquake Safety



Earthquake Safety

Unreinforced concrete and brick buildings are the most prone to earthquake damage.



Wooden buildings are more resilient to shaking and less vulnerable to damage.

Reinforced steel frame buildings very rarely collapse during earthquakes.



The End

