

Most Earthquakes Occur at Tectonic Plate Boundaries

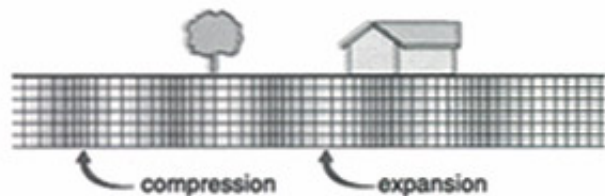
What causes earthquakes?

Most earthquakes occur when the earth's tectonic plates move against each other. The earth's crust is a puzzle of crust pieces or "plates", shown in the world map at the bottom of this page. The plates float on the earth's interior magma which is composed of hot liquid rock.

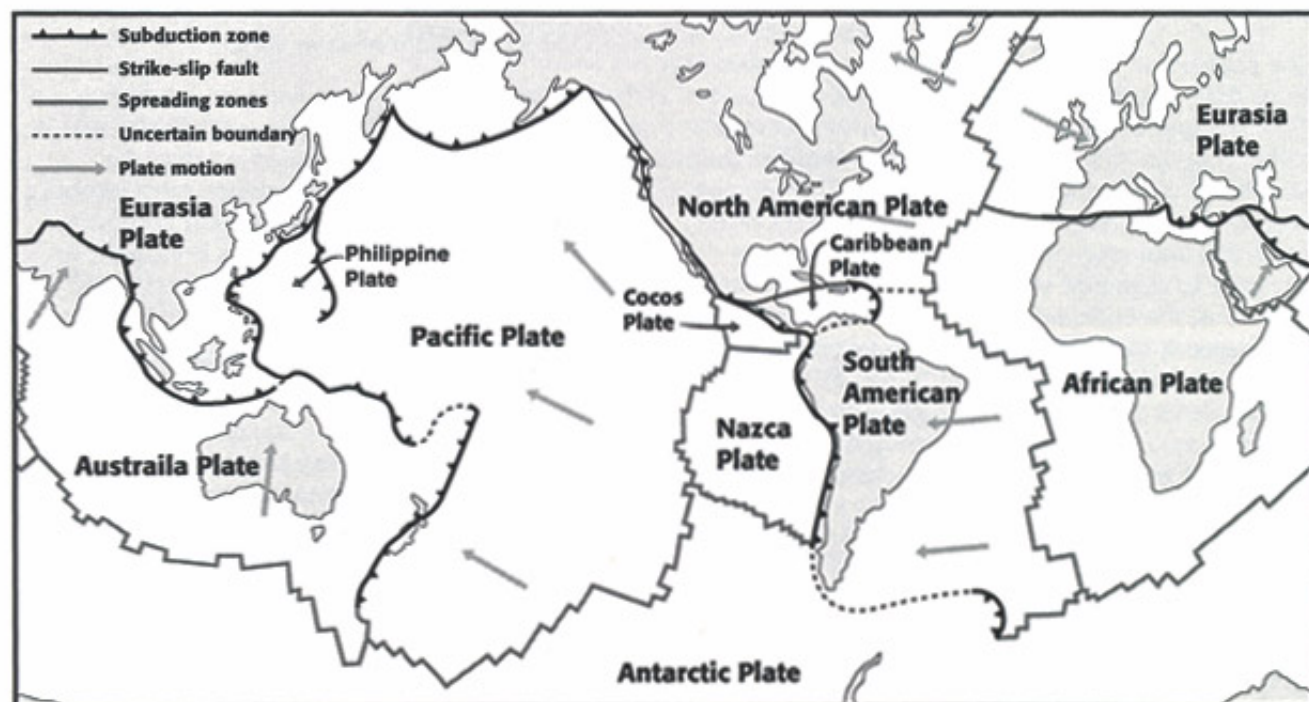
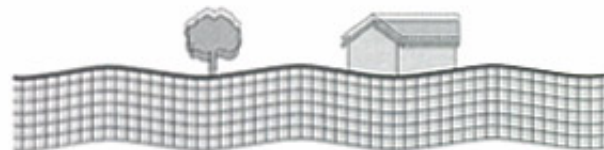
Most of the plate boundaries located in the ocean are slowly separating, often allowing the earth's magma to ooze up—forming ridges on the ocean floor. So if the plates are spreading apart at the ocean floors they must be pushing against each other at other places, and this is indeed happening. "Head on" plate collisions create massive mountain chains such as the Himalayas in which one plate is pushed up and the other forced down into the earth's interior. This head-on collision is called a "subduction zone". There are also areas along the plate boundaries, such as along much of the San Andreas Fault, where the plates are slipping past each other. These are called "strike-slip" faults. The largest earthquakes generally occur at the subduction zones and strike-slip faults.

What is an earthquake?

The earth our towns and cities are built on is somewhat elastic, like gelatin. A sudden movement of the earth at a fault line will send out waves of movement in the gelatin-earth. The primary earthquake wave is the compressing and expansion of the earth, exactly as sound waves cause air to compress and expand:



There is also a secondary wave that causes the earth to move up and down like the swells of the ocean:



This is a simplified version of a map from *The Solid Earth*, by Fowler, C.M.R., and also used in Bruce Bolt's book, *Earthquakes*