

Earthquake Notes

Earthquakes are a sudden release of energy in Earth's lithosphere, which can cause shaking at the surface. This energy can be generated by a sudden movement along a fault line, by a volcanic eruption, or even by manufactured explosions. Lithospheric plates that form the outer surface of Earth are constantly in motion. Sometimes the movement is gradual; at other times, the plates are locked together due to the friction between them, and are unable to release accumulating energy. Eventually, this energy overcomes the friction between the plates and they break, causing an earthquake.

The lithosphere may at first bend, and then when the stress exceeds the strength of the rock, it breaks and 'snaps' into a new position, through a process called **elastic rebound**. This process of breaking generates vibrations called seismic waves. The waves travel outward from the source of the earthquake through the earth at varying speeds, depending on the material through which they are moving. Earthquakes can be destructive in many ways. They can cause shaking at the surface that can damage buildings and other infrastructure. Earthquakes that occur beneath the ocean floor sometimes generate tsunamis. Other earthquakes can cause natural hazards, such as landslides or liquefaction of the soil, which can harm people and the environment.

The location of an earthquake's origin is called the **focus**. The foci of most earthquakes are located in Earth's crust or upper mantle. Earthquakes are also commonly located by their **epicenter**, which is the point on Earth's surface directly above the focus.

A fracture in Earth's surface, along which two blocks of the crust have slipped, is known as a **fault**. Faults are usually described by how the blocks move in relation to each other. Geologists have found that earthquakes tend to reoccur along faults, which are most common on or near lithospheric plate boundaries.

Scientists use machines called **seismometers** to measure earthquakes. A seismometer is designed to address the fact that when the ground moves, so does the seismometer.

Energy is the ability to do work, which in science means applying a force to an object that causes the object to move. Potential energy is stored energy that has the potential to do work. Kinetic energy is the transformation of kinetic energy when it is released. The lithosphere stores potential energy as friction builds, when it is released (moves and creates an earthquake) where kinetic energy is released.