

Earthquakes and Tsunamis

An **earthquake** is a sudden and violent movement in Earth's crust, or outer layer. The word "earthquake" is a good description because the earth really does quake (or shake). Because the crust of the earth is not a solid surface, its pieces (or plates) can separate from one another, run into one another, or slip past one another. When this happens, a **fault**, which is a crack or break in the earth, is created.

Three main types of plate movement cause faults: **colliding, separating, and sliding**.

When one plate moves under another, **subduction** (sub = under) occurs. Subduction can cause earthquakes. When two plates collide (run into each other), the crust buckles up and forms mountains. This is called **colliding plate boundaries**, which can also cause earthquakes. When two plates slide past each other, without causing damage, this is called **transform plate boundaries**. The San Andreas Fault in California is an example of this. Transform plate boundaries can also cause earthquakes.

Earthquakes happen when plates move, usually along fault lines, and cause tremendous energy in the earth to be released. The released energy causes the earth to shake, which sends waves of energy, called **shock waves**, through the earth. The shock waves that travel through the earth are called **body waves**, and the shock waves that travel along the surface of the earth are called **surface waves**. The place inside the earth where the earthquake begins is called the **focus**. The **epicenter** is the point on the earth's surface right above the focus.

Scientists use a **seismograph** to record the shock waves created by an earthquake. The strength of an earthquake (the energy it releases) is called its **magnitude**. Magnitude is measured by a **Richter scale**. An earthquake with very little magnitude would be a 3.0 or less. A catastrophic earthquake, one that causes total devastation, would have a magnitude of more than 8.0.

Type of Plate Movement	What Happens	Result	Type of Fault Created	Examples
Colliding (Constructive)	Plates converge: One plate moves up; plates form (construct) a new boundary.	Subduction and colliding plate boundaries cause earthquakes.	Reverse fault	The Himalayas
Separating (Destructive)	Connection between two plates is destroyed as they move apart.	Seafloor spreading	Normal fault	Sierra Nevada mountain range
Sliding (Conserving)	Plates slide past each other without moving up or down: Nothing is made or destroyed; both are conserved.	Transform plate boundaries	Strike-slip fault	San Andreas Fault

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