

How an Earthquake Happens

From a stuck fault to waves racing around the planet: the six stages of an earthquake, and how scientists measure it.

1

Stress builds up

Plates keep moving, but the rough edges of a fault stick together. The rock on each side bends slightly and stores energy, sometimes for hundreds of years.

2

The rock snaps

When the stress beats the friction, the fault slips suddenly. The point underground where the slip starts is the hypocentre, or focus.

3

Seismic waves spread out

Energy races out in all directions. P waves arrive first, then S waves, then slower surface waves that roll the ground and do most damage.

4

The surface shakes

Shaking is usually strongest near the epicentre, the point on the surface above the hypocentre. Soft ground shakes more than solid rock.

5

Seismometers locate it

The time gap between P and S waves gives each station's distance. Circles drawn around three stations cross at the epicentre.

6

Size is measured

Scientists give one moment magnitude (Mw). Each whole step is 10 times bigger waves and about 32 times more energy. Aftershocks follow.



Lightning and thunder

P waves are like lightning and S waves like thunder. The longer the gap between them on a seismogram, the further away the earthquake was.

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