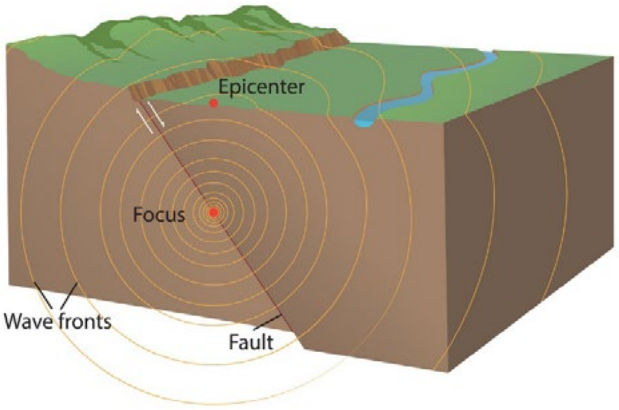
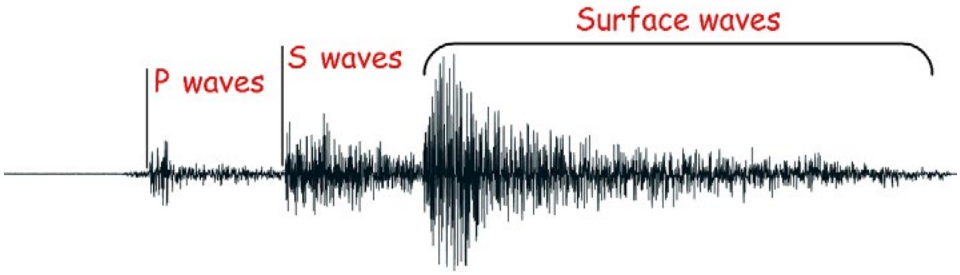
Seismic Waves: Wave Properties—Scientific Background

Most earthquakes occur along cracks in the ground called faul plates meet, such as along California's San Andreas Fault, which runs from San Francisco to Los Angeles. Plate movements cause the rock on either side of the fault to move very slowly. If the rock becomes stuck along part of the fault, tension can build up until the rocks move violently and suddenly. This is an earthquake.



When an earthquake occurs, seismic waves emanate outward from the focus of the quake, where the rocks moved below Earth's surface. The epicenter is the point on Earth's surface directly above the focus where the shaking is first felt.

There are three types of seismic waves. The first type are primary waves, or P waves. Along the P wave, the bedrock moves back and forth, parallel to the direction of the wave. This is an example of a longitudinal wave. Next are the secondary waves, or S waves. As an S wave passes, the bedrock moves side to side at a right angle to the direction of the wave. When P and S waves reach the surface, they combine to form rolling surface waves, causing the ground to move in a circular motion as the waves pass. Because they combine the energy of P and S waves, surface waves are the largest and most destructive waves. The three types of waves can be identified on a seismogram, which shows the level of shaking over time.



Seismic waves allow the tremendous energy of an earthquake to travel through Earth's crust for hundreds of kilometers, allowing earthquakes to be felt far from the epicenter. This property also allows earthquakes to be monitored, measured, and located by seismograph stations scattered across earthquake-prone areas.

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