

Earthquakes

Earthquake Footage

Japan Earthquake Footage

<https://www.youtube.com/watch?v=OvG8LGKyC24>

Nepal earthquake footage

<https://www.youtube.com/watch?v=tP7HID2Fark>

Earthquakes

- An earthquake is the shaking of the ground due to the movements of tectonic plates

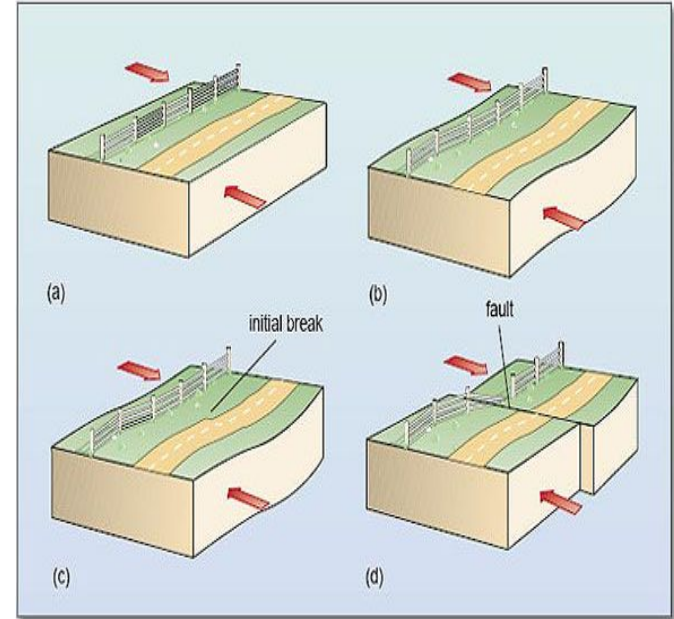


What causes earthquakes?

A **fault** is a break in the Earth's crust where plates move.

Along a fault, **energy** builds up in a rock until it breaks and releases energy.

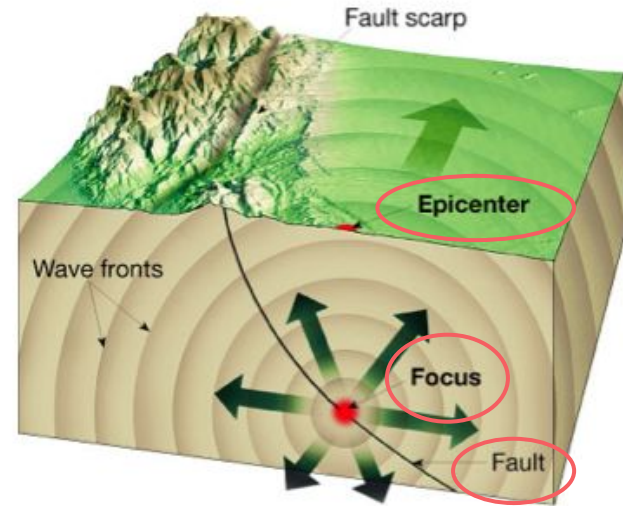
This release of energy causes an earthquake.



Earthquakes

The focus of an earthquake is the point **INSIDE** the Earth where the earthquake starts.

The epicenter is the location on the **surface** of the Earth directly above the focus.



Types of Faults

1) Strike-Slip

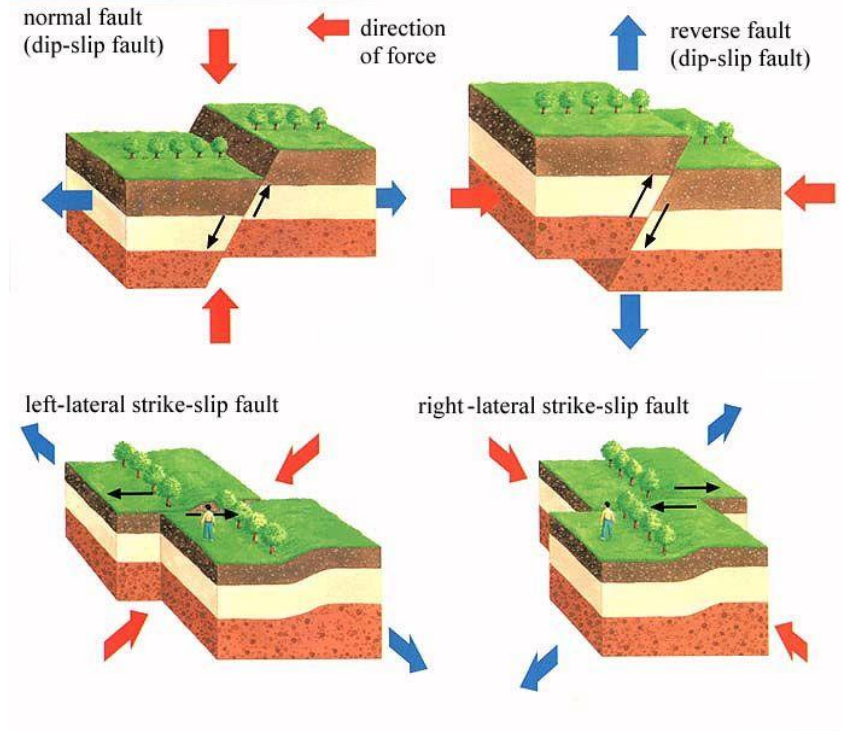
a) Occurs at a transform boundary

2) Reverse

a) Occurs at a convergent boundary

3) Normal

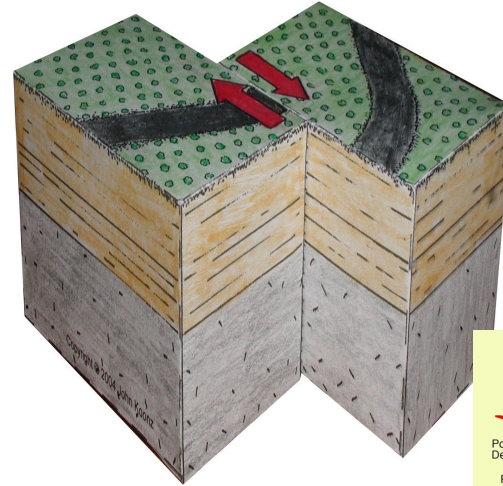
a) Occurs at a divergent boundary



Types of Faults: Strike-Slip

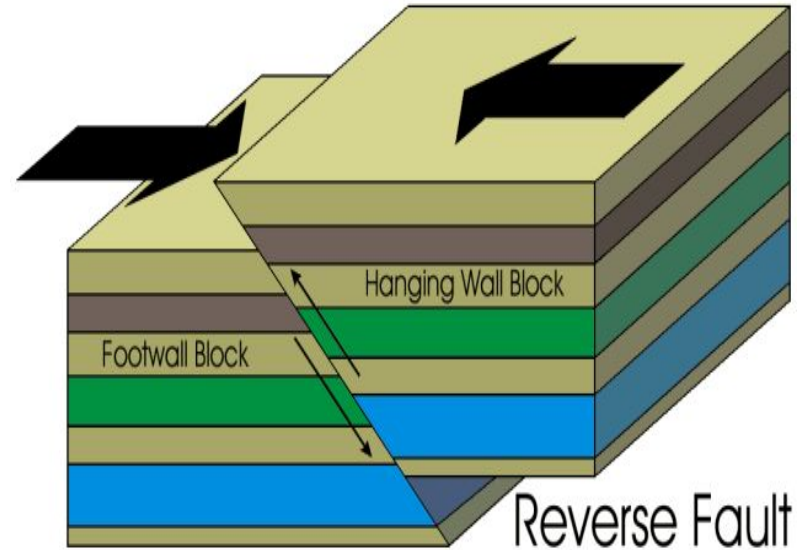
- Occurs at a **transform boundary**
- Two blocks of crust slide past each other **horizontally**
- These types of earthquakes are **moderate** and **shallow**

Example: the **San Andreas Fault** in CA



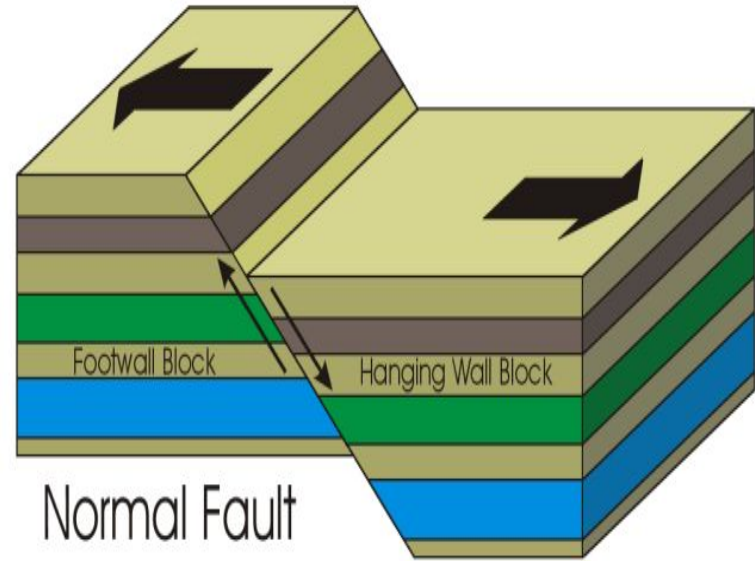
Types of Faults: Reverse

- Occurs at a **convergent boundary**
- Two blocks of crust are **pushed** together and they slide **vertically**
- These types of earthquakes are usually **strong** and **deep**



Types of Faults: Normal

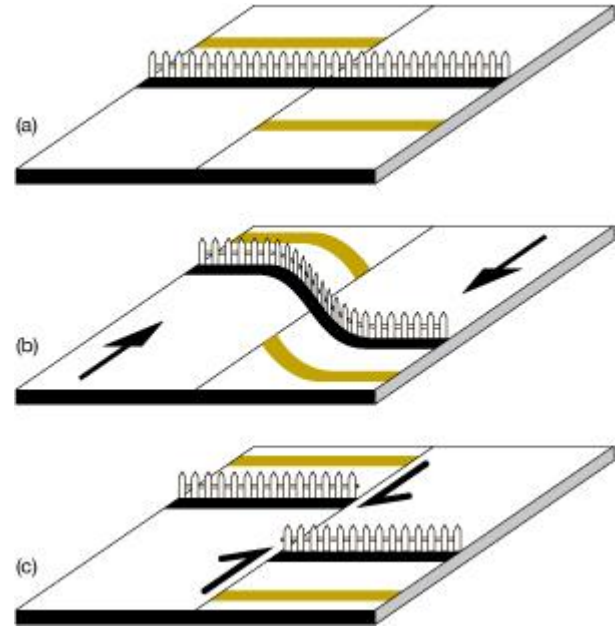
- Occurs at a **divergent boundary**
- Two blocks of crust are **pulled away** from each other and slide **vertically**
- This type of earthquake is usually **weak** and **shallow**



Earthquakes

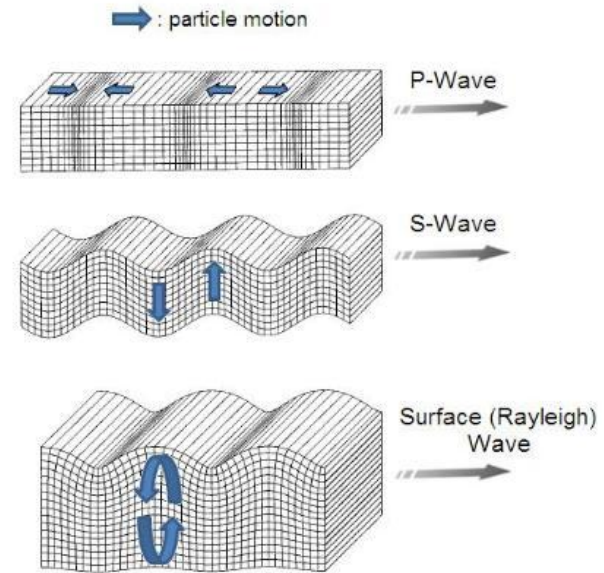
Elastic rebound = the sudden return of **deformed** rock to its **undeformed** shape

(el repentino regreso de roca deformada a su forma no deformada)



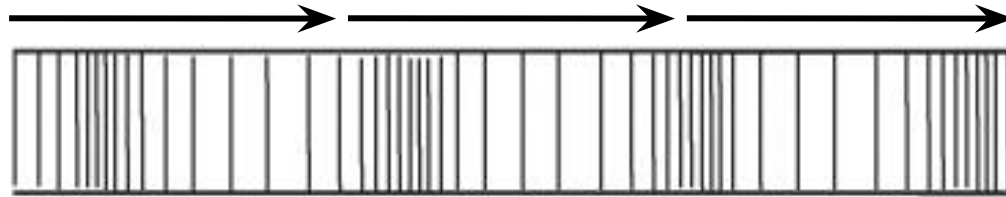
How do Earthquakes cause damage?

- When an earthquake occurs, the energy flows out from the **focus** in seismic waves
- There are 3 types of seismic waves:
 1. “P” or **primary** waves
 2. “S” or **secondary** waves
 3. **Surface** waves
- Body waves- P-waves and S-waves



How do earthquakes cause damage?

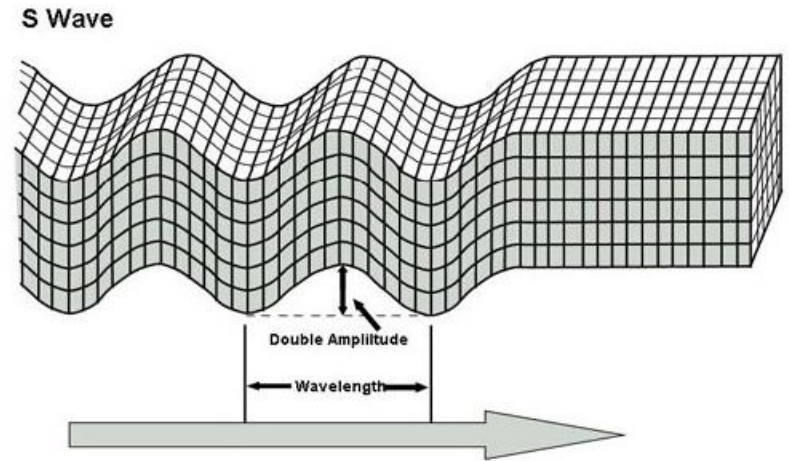
- Primary wave (P-wave)
 - The initial jolt (*sacudida*)
 - It travels fast
 - Alternately compressing (*comprimiendo*) and releasing (*liberando*) the rock



P waves

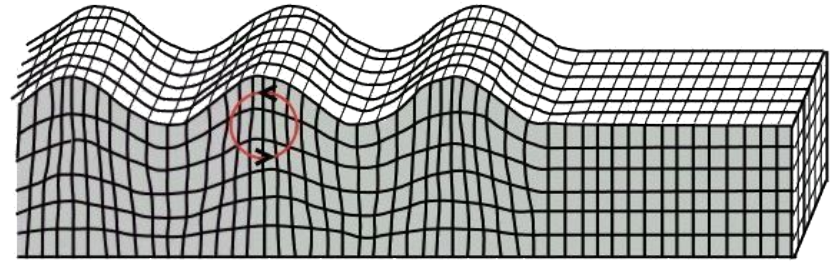
How do earthquakes cause damage?

- Secondary wave (S-wave)
 - The second jolt
 - **Slower** and **stronger** than P-waves
 - Shakes the ground in an **up** and **down** motion

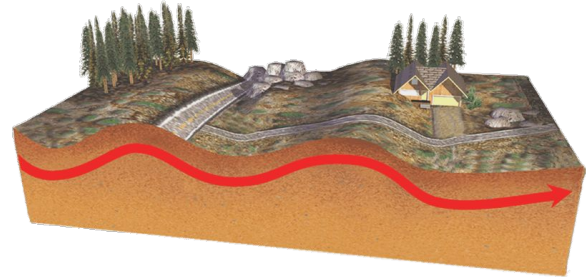


How do earthquakes cause damage?

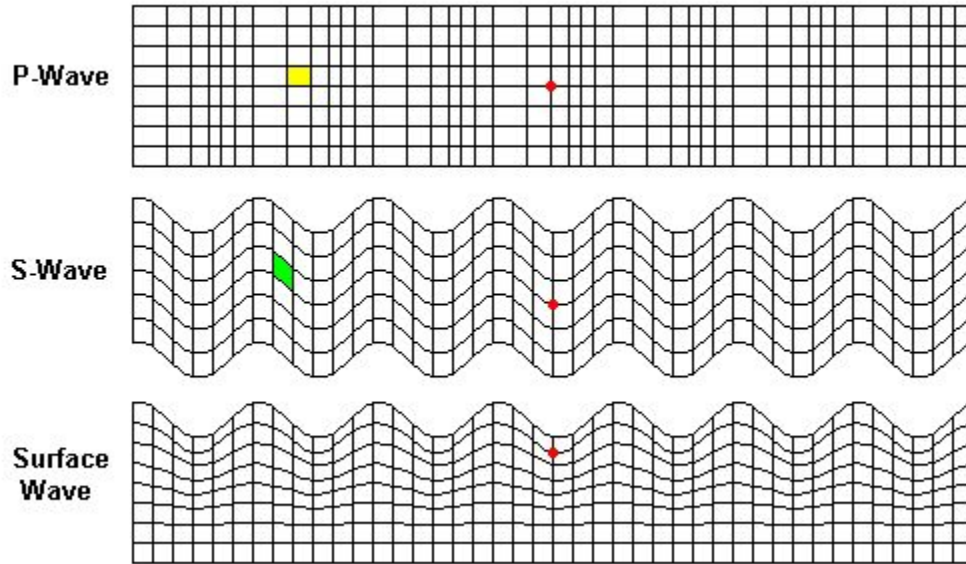
- Surface waves
 - Arrive last
 - Travel **horizontally** across Earth's surface
 - **Slowest** moving
 - **Most damaging wave**



Surface waves
The ground surface rolls
with a wavelike motion.



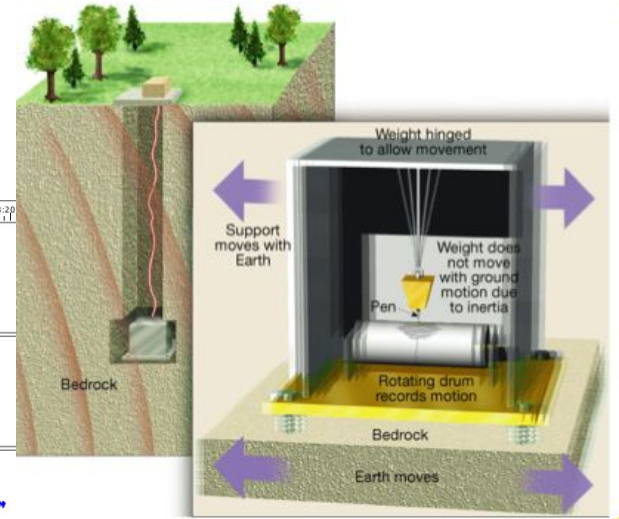
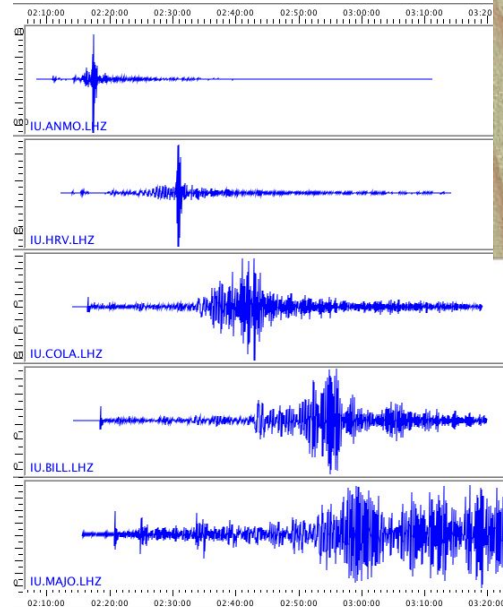
Types of Waves



How do Scientists Measure Earthquakes?

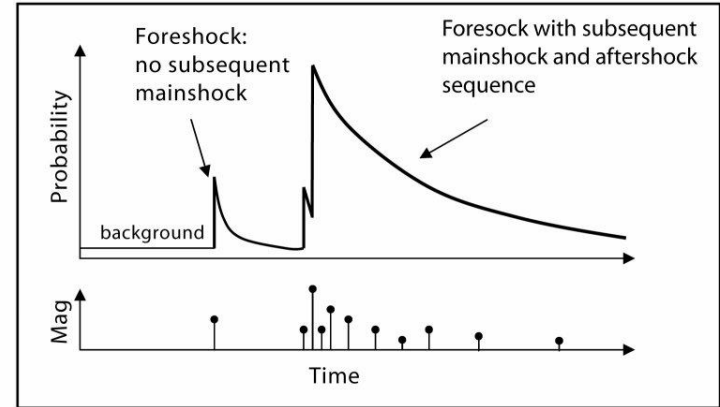
Seismograph:

Instrument used by scientists to measure Earthquakes.



Earthquakes

An **aftershock** is a smaller earthquake that occurs **after** a large earthquake in the same area.



Measuring Earthquakes

Richter Scale –

- a scale from 1 – 10 that tells the magnitude of the seismic wave of an earthquake

Moment Magnitude-

- based on the amount of displacement that occurs along a fault zone

Value	Potential Hazard
10	Extraordinary
9	Outstanding
8	Far-reaching
7	High
6	Noteworthy
5	Intermediate
4	Moderate
3	Minor
2	Low
1	Insignificant

Measuring Earthquakes

- Scientists determine the epicenter by calculating the difference between the arrival of the P-wave and the S-wave
- 3 seismic stations are needed to locate the center of an earthquake

Earthquake Zones

The Pacific Ring of Fire is both a major earthquake zone and volcano zone.

