Earthquakes

What are the causes of earthquakes and how do seismic waves cause so much damage.
Earthquakes

- Earthquake - a natural shaking of the lithosphere caused by a release of energy stored in rocks

San Andreas Fault
Earthquakes

• Most earthquakes are caused by a movement along a fault where potential energy is given off as a seismic wave.
Earthquakes

• Fault - crack in the Earth's crust caused by forces displacing rocks on the opposite sides of the fracture

Madrid, Spain
Earthquakes

- Normal Fault - faults that form when the hanging wall drops down
Earthquakes

• Reverse Fault - faults that form when the hanging wall moves up
Reverse Fault
Earthquakes

- Strike-slip Fault - faults that form when two plates are sliding past one another
Strike-slip Fault
Earthquakes

• Epicenter - the location on Earth’s surface directly above the focus
Earthquakes

- Focus - the point inside the Earth where the earthquake originates
Earthquakes

- Seismograph - an instrument used to measure and record movements in the ground
Earthquakes

• Seismogram - record of the seismometer
Earthquakes

• Primary Wave [P-wave]
  • P-waves are the fastest waves
  • Travels through solids, liquids, and gases
  • Compressional - particles travel in the direction of wave movement
Earthquakes

- Primary Wave [P-wave]
Earthquakes

• Secondary Wave [S-wave]
  • S-waves are the slower wave
  • Travels through solids only
  • Shear - particles travel in right angles to the direction of wave movement
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• Secondary Wave
Earthquakes

• Seismic waves radiate away from the focus
• Shadow Zone - area in which seismic waves are not detected due to the liquid outer core
• P-waves are refracted when they reach the liquid outer core
Earthquakes

- S-waves are absorbed when they reach the outer core and are not transmitted through to the other side.
Earthquakes

• Both the p-wave and s-wave are needed to determine the location of an earthquake’s epicenter