Warm-up

p. 703, 1. What is shown in fig 5 where fresh lava is forming on the sea floor?

hydrothermal vent

p.703, 2. How much do techtonic plates move a year?

1 to 16 cm per year

p. 704, 3. Plate movement is most likely due to _____ _____ in the asthenosphere (upper mantle).

Convection currents

Warm-up

p. 704, 1. The hot, plastic portion of the mantle is called the:

asthenosphere

p.705, 2. Name some things that occur at plate boundaries:

volcanoes, earthquakes, mountains, rift valleys

p. 705, 3. The boundary where two plates move apart:

Divergent boundary

Warm-up quiz

1. What helps maintaining the Earth high internal temperature?

2. Wegener's theory was ignored until _____ when data discovered on ocean floor.

3. How many major tectonic plates are there?

4. How much do tectonic plates move a year?

5. The boundary where two plates move apart:

Warm-up

p. 705, 1. What is shown on this page in figure 8?

1999, earthquake damage to a running track

p.706, 2. Older lithosphere is _____ at convergent boundaries.

destroyed

p. 706, 3. What is the deepest trench? How deep is it?

Mariana trench, 6.8 miles

Objectives

- **Identify** the causes of earthquakes.
- **Distinguish** between primary, secondary, and surface waves in earthquakes.
- **Describe** how earthquakes are measured and rated.
- **Explain** how and where volcanoes occur.
- **Describe** the different types of common volcanoes.

End Of Slide

Bellringer

1. Imagine a corked bottle of soda pop that is standing in a pan of hot water. What do you think will happen as the soda pop heats up?

2. What happens when the pressure builds up in the soda pop?

3. Molten rock in Earth's mantle is like the soda pop. What happens when pressure builds up in Earth's mantle?

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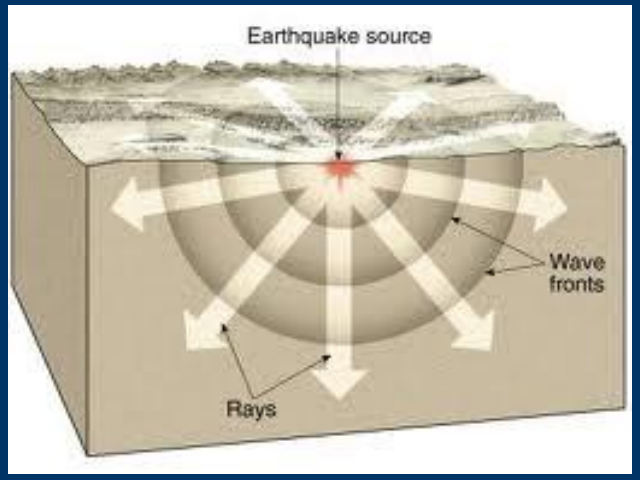
Earthquakes

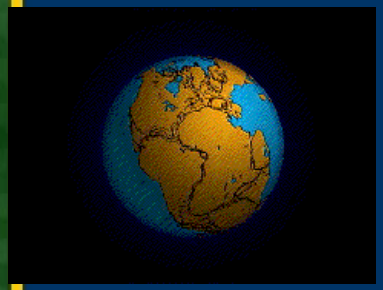
Earthquake – is a sudden shaking vibrations of the Earth's crust

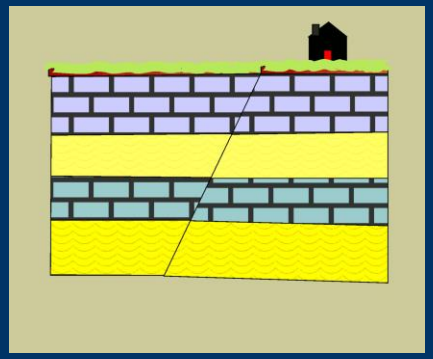
Seismologist – scientist who studies earthquakes

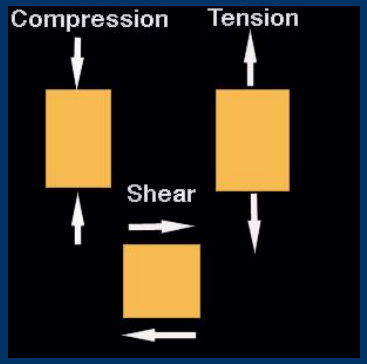


What causes earthquakes?

1. Tectonic Plate movement
2. Faulting – movement of rocks along a fault
3. Volcanoes
4. Compression, tension, shear
5. Something impacting on Earth







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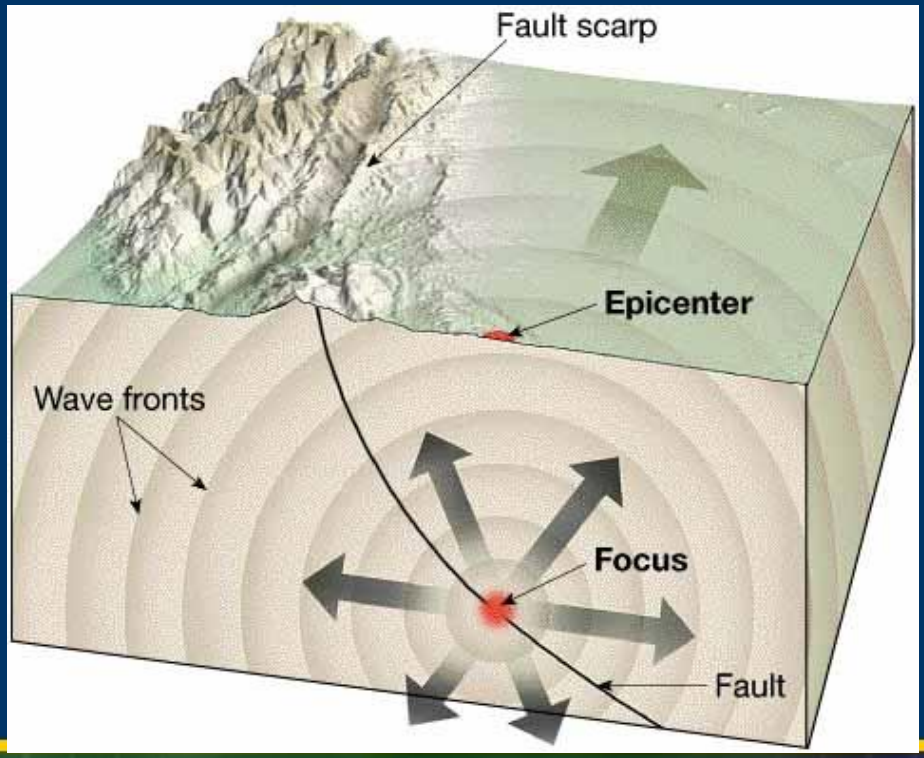
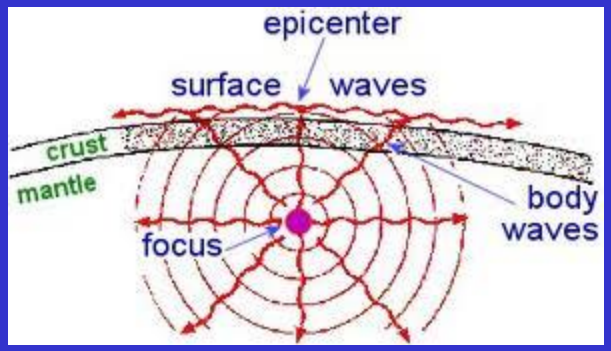
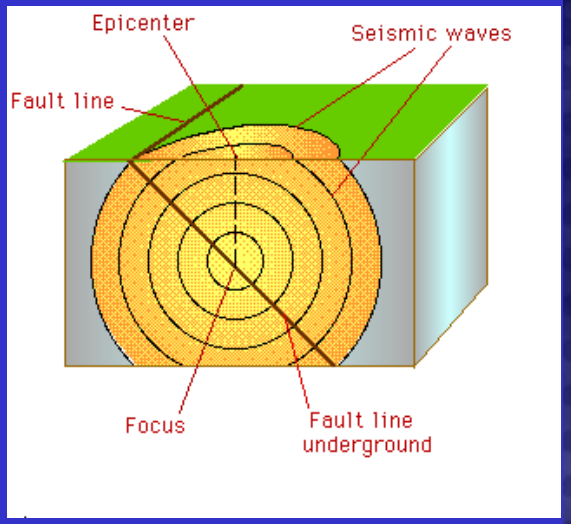
Where Earthquakes start:(parts & features)

Focus – is the point in the Earth's interior where the rocks break and energy is released

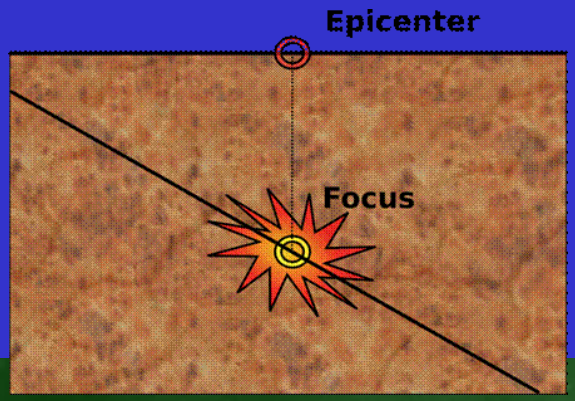


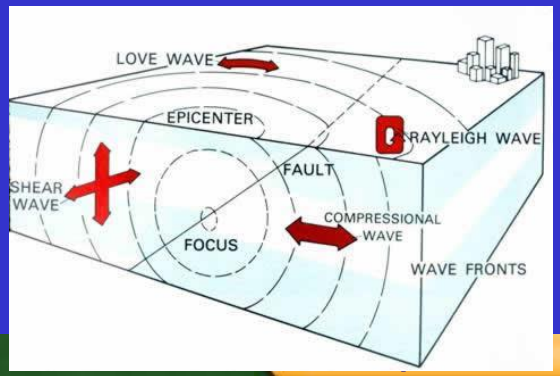
Seismic Waves – waves of energy vibrations that move outward from focus point of an Earthquake

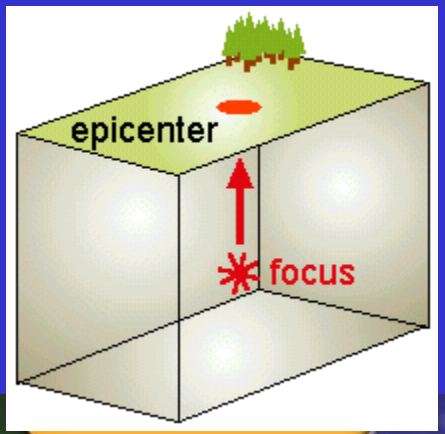




Epicenter – point on the Earth's surface directly above the focus







What are Earthquakes?

- Earthquakes occur at plate boundaries.
- **Earthquakes** are vibrations resulting from rocks sliding past each other at a fault
- **Seismic waves** are waves of energy released during in earthquake
- **Focus** the area along a fault at which the first motion of an earthquake occurs
- **Epicenter** the point on Earth's surface directly above an earthquake's focus

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What are Earthquakes? *continued*

- Energy from earthquakes is transferred by waves.
  - Earthquakes generate three types of waves:
    - Longitudinal waves
    - Transverse waves
    - Surface waves

- **Longitudinal waves** travel by compressing and stretching crust, also called primary waves (P waves)
- **Transverse waves** travel in an up and downward movement, also called secondary waves (S waves)
- **Surface waves** seismic waves that can move only through solids, move in a rolling circular motion – long waves L-wave

End Of Slide

What are Earthquakes? *continued*

- Waves move through Earth and along its surface.
  - Both P waves and S waves spread out from the focus in all directions through the earth.
  - Surface waves move only on Earth's surface.

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Measuring Earthquakes

- Seismologists detect and measure earthquakes.
- **Seismology** the study of earthquakes including their origin, propagation, energy, and prediction
  - Seismologists use sensitive equipment called seismographs to record data about earthquakes.

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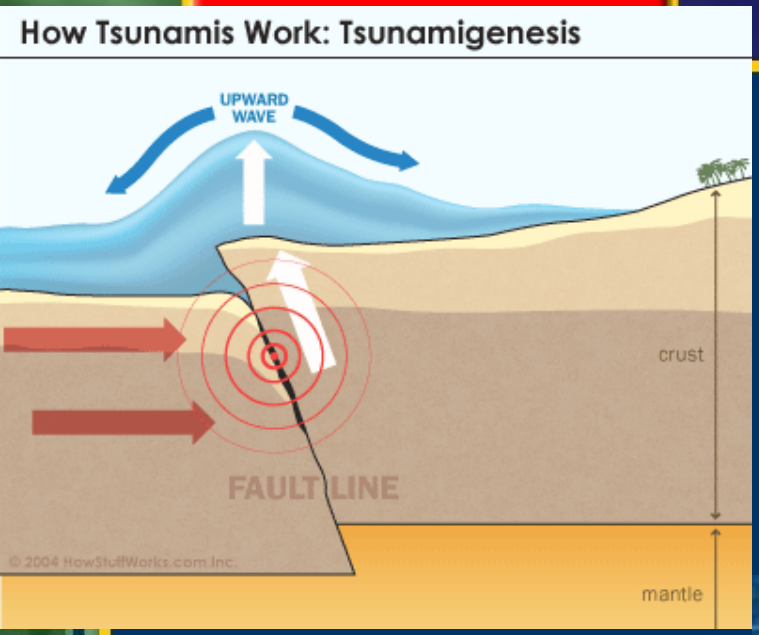
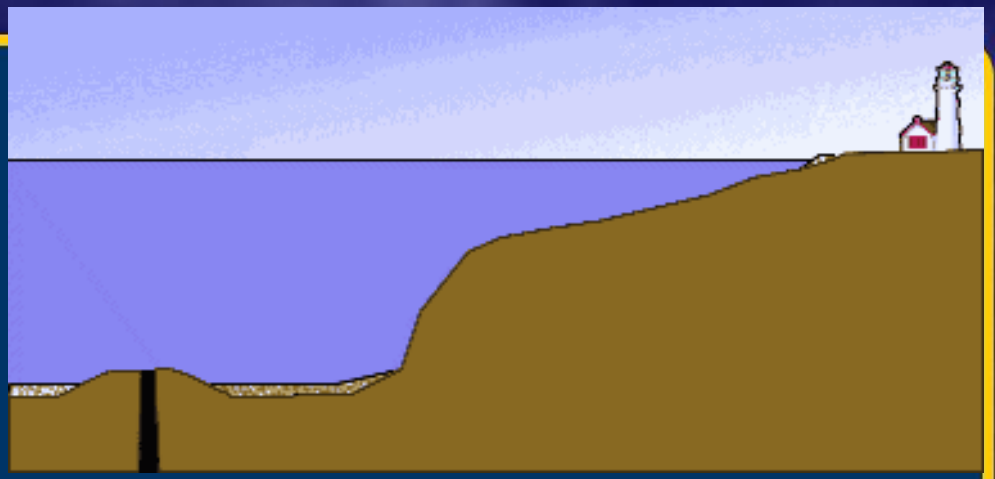
Effects of Earthquakes

- Huge cracks and fissures in crust
- Landslides & rock falls
- Collapsed structures

Tsunami (tidal wave)

- immense sea wave that moves at speeds of 700 km/hr and can reach heights of 30 meters





Chapter

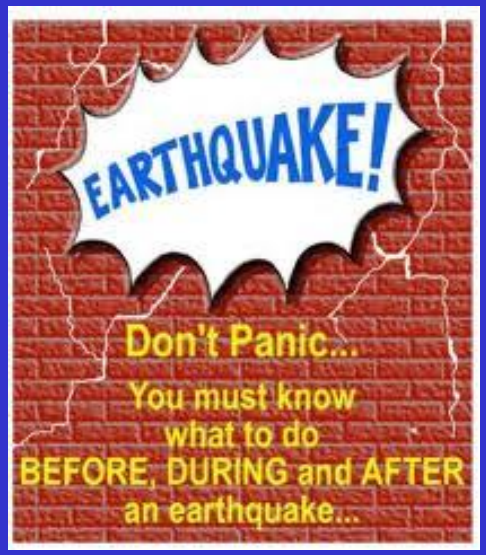
Tsunami video show

- https://www.youtube.com/watch?v=oArd_9uZOnE
- https://video.search.yahoo.com/yhs/search;_ylt=AwrEeBwKIphcdG4AUy8PxQt.;_ylu=X3oDMTByMjB0aG5zBGNvbG8DYmYxBHBvcwMxBHZ0aWQDBHNlYwNzYw--?p=you+tube+tsunami&fr=yhs-pty-pty_email&hspart=pty&hsimp=yhs-pty_email#id=170&vid=1cd99fc4aa52a544481497916e6b810e&action=view
- https://video.search.yahoo.com/yhs/search;_ylt=AwrEeBwKIphcdG4AUy8PxQt.;_ylu=X3oDMTByMjB0aG5zBGNvbG8DYmYxBHBvcwMxBHZ0aWQDBHNlYwNzYw--?p=you+tube+tsunami&fr=yhs-pty-pty_email&hspart=pty&hsimp=yhs-pty_email#id=4&vid=0430de525ca5f1383daa143b1104b76c&action=view
- https://video.search.yahoo.com/yhs/search;_ylt=AwrEeBwKIphcdG4AUy8PxQt.;_ylu=X3oDMTByMjB0aG5zBGNvbG8DYmYxBHBvcwMxBHZ0aWQDBHNlYwNzYw--?p=you+tube+tsunami&fr=yhs-pty-pty_email&hspart=pty&hsimp=yhs-pty_email#id=38&vid=c342da3fcd13b91b20fe068f9932a668&action=view
- https://video.search.yahoo.com/yhs/search;_ylt=AwrEeBwKIphcdG4AUy8PxQt.;_ylu=X3oDMTByMjB0aG5zBGNvbG8DYmYxBHBvcwMxBHZ0aWQDBHNlYwNzYw--?p=you+tube+tsunami&fr=yhs-pty-pty_email&hspart=pty&hsimp=yhs-pty_email#id=48&vid=71460cb18834cd1da69106bf74cce1e3&action=view

Precautions during and after an Earthquake

- If outside move away from buildings and electrical wires
- Inside – stand in doorway or get under bed or table
- Stand next to solid wall

- After turn of electric and gas lines **(may start fires)**
- Grab emergency kit, Check for injured get away from building as soon as possible



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http://news.bbc.co.uk/2/hi/science/nature/7533950.stm

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Cool down

1. Plates moving apart is called a _____ boundary.

Divergent

2. The force that causes convergent boundaries, folded mountains and volcanoes is _____.

compression

Cool down

1. What is the 1st seismic wave to reach a siemograph called?

Primary wave or longitudinal wave

2. Point on the surface above the focus point of an earthquake is called?

epicenter