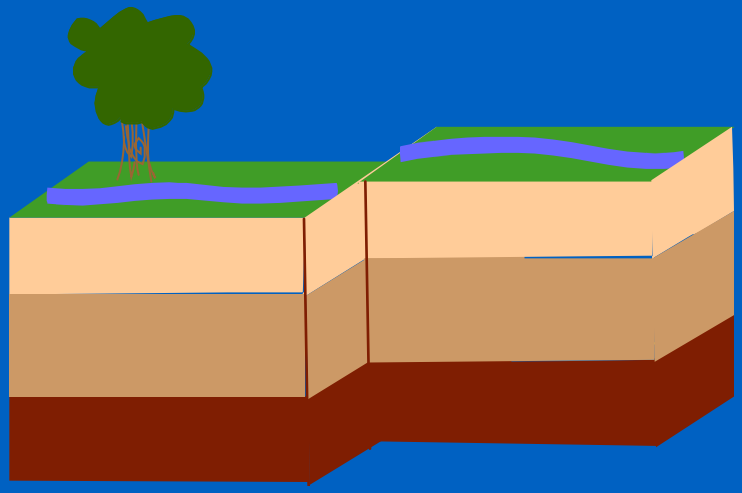
Earthquakes

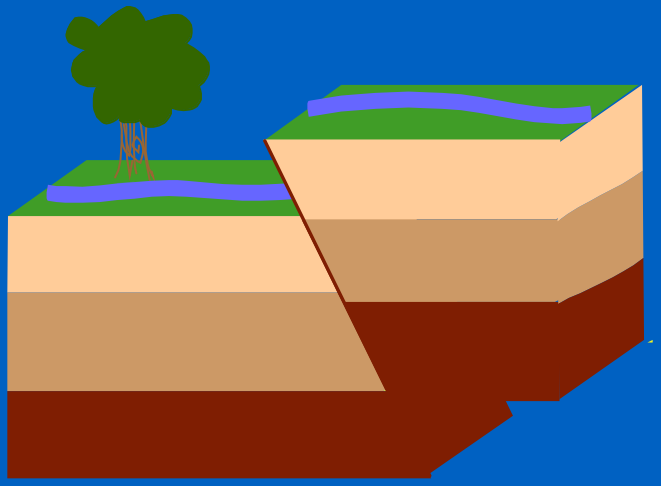
What is an earthquake?

- Used to describe both sudden slip on a fault, and the resulting ground shaking and radiated seismic energy caused by the slip
- Caused by volcanic or magmatic activity,
- Caused by other sudden stress changes in the earth.

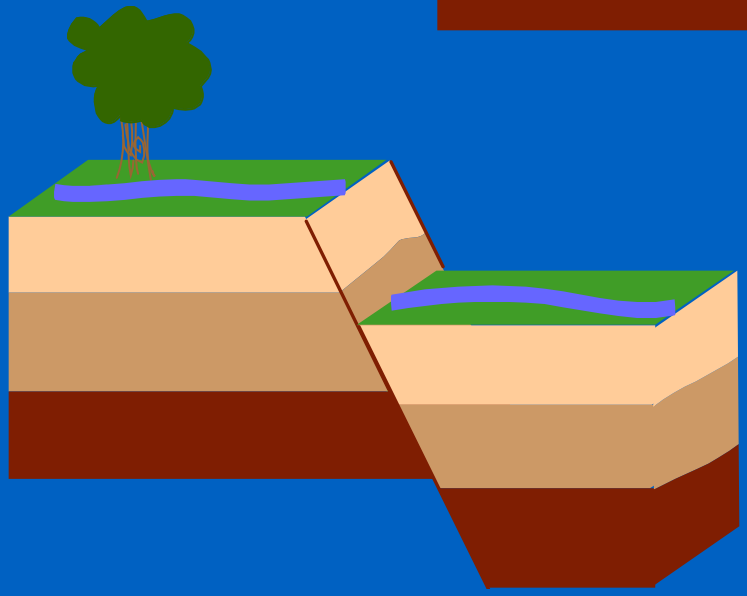
Three Types of Faults



Strike-Slip



Thrust

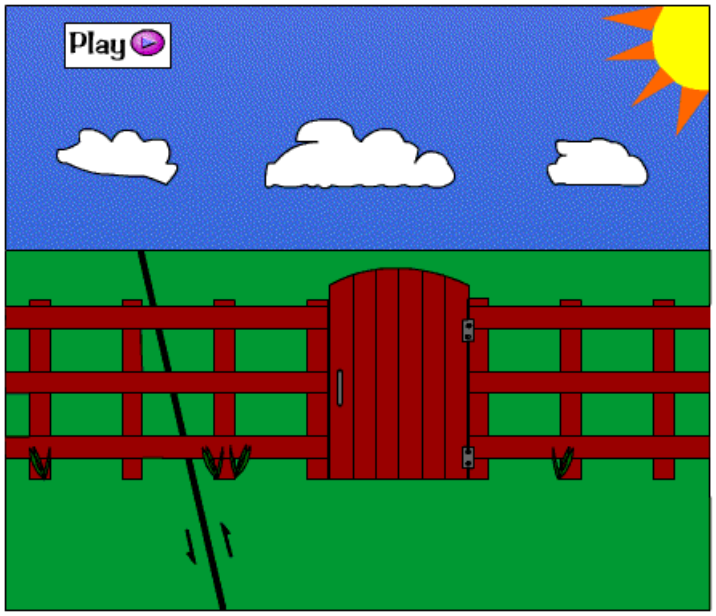


Normal

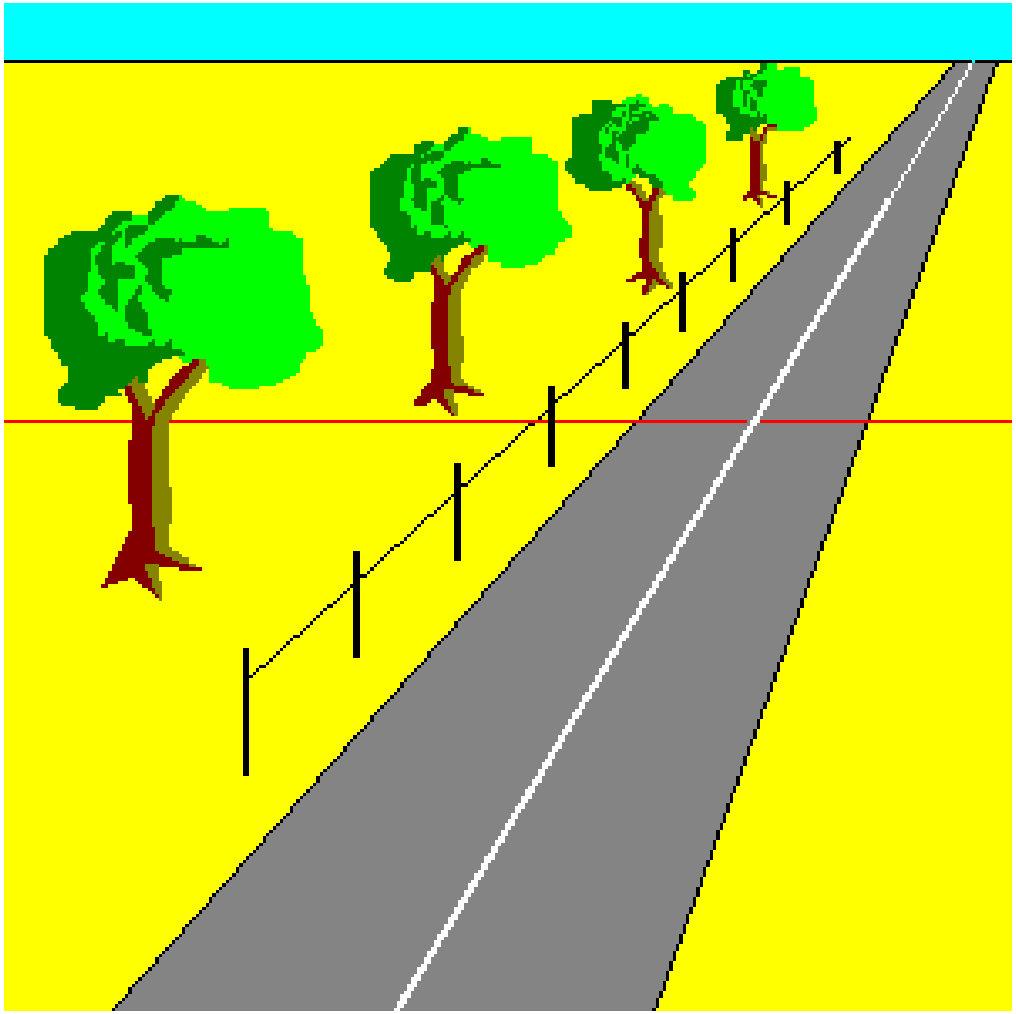
USGS

What causes earthquakes?

- Tectonic plates move past each other causing stress. Stress causes the rock to deform
  - Plastic deformation – does not cause earthquakes
  - Elastic deformation – rock stretches then reaches a breaking point, releasing energy.



Elastic Rebound – deformed rock goes back to its original shape



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Focus – point inside the Earth where an earthquake begins

Epicenter – point on Earth's surface above focus

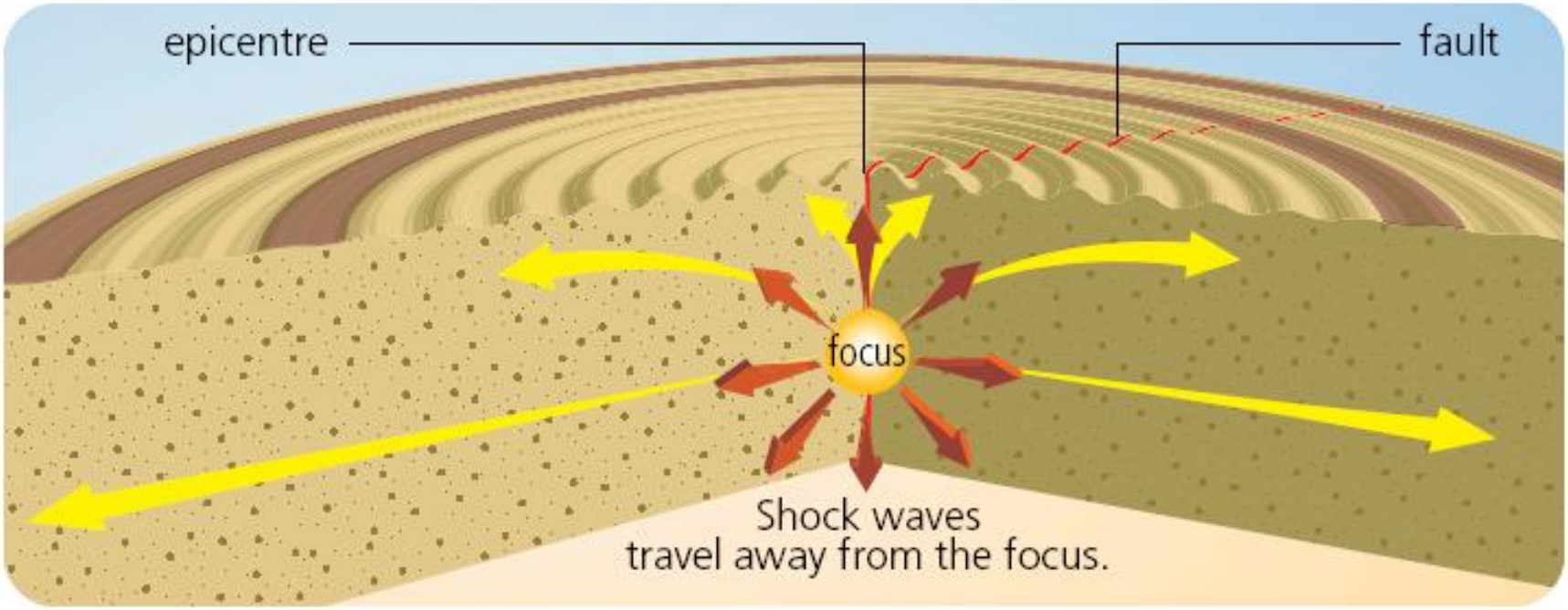
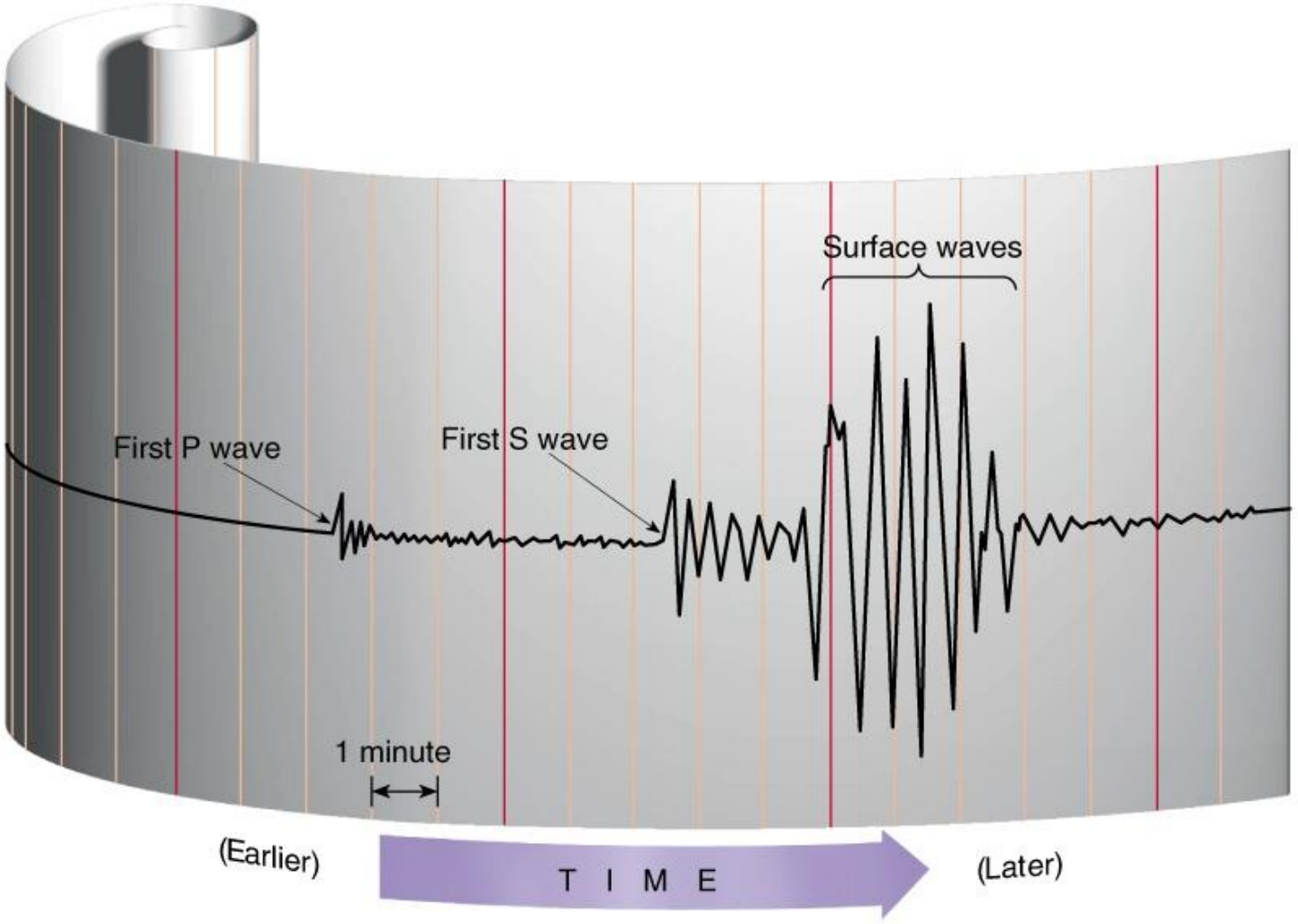


Figure 5

Comparing the focus and epicentre of an earthquake.

Typical Seismogram



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Comparing Seismic Waves

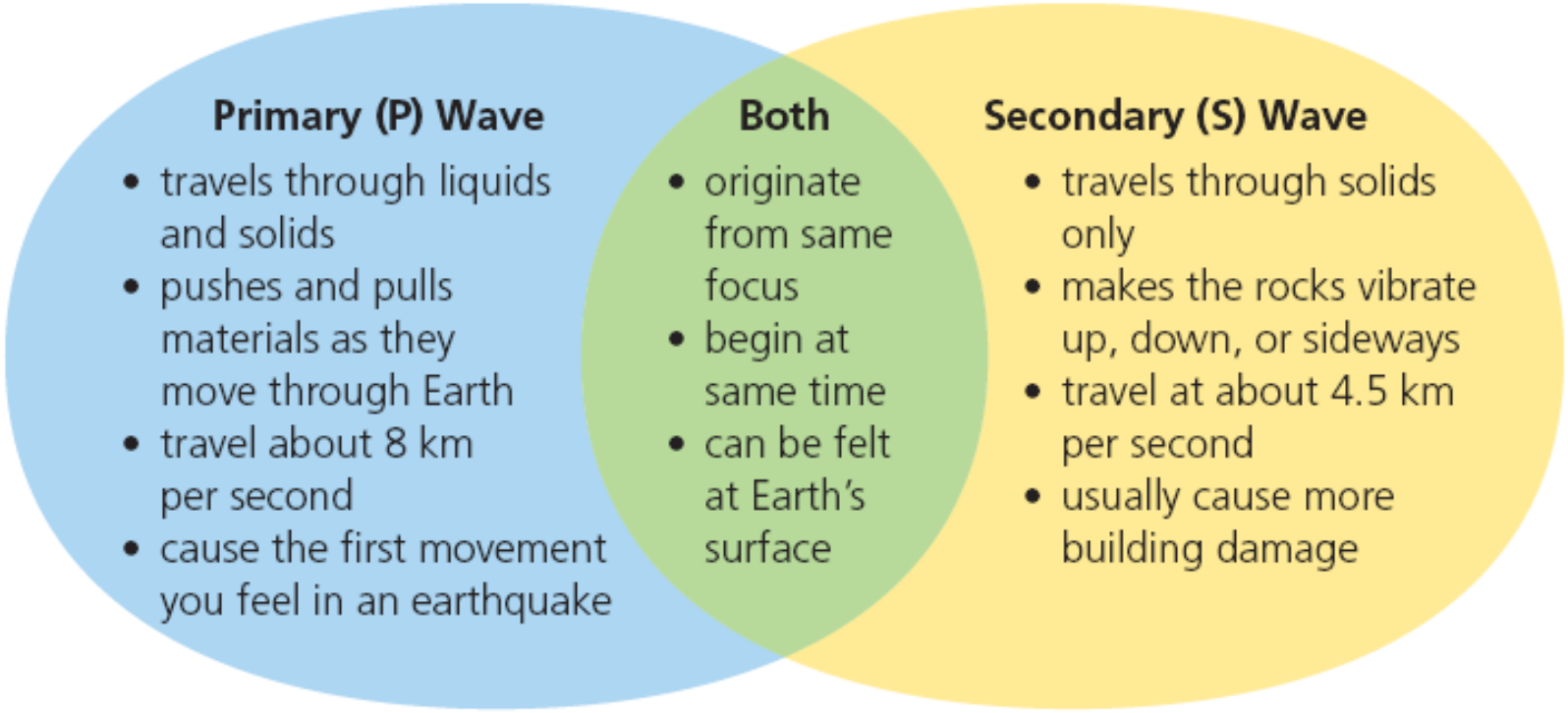


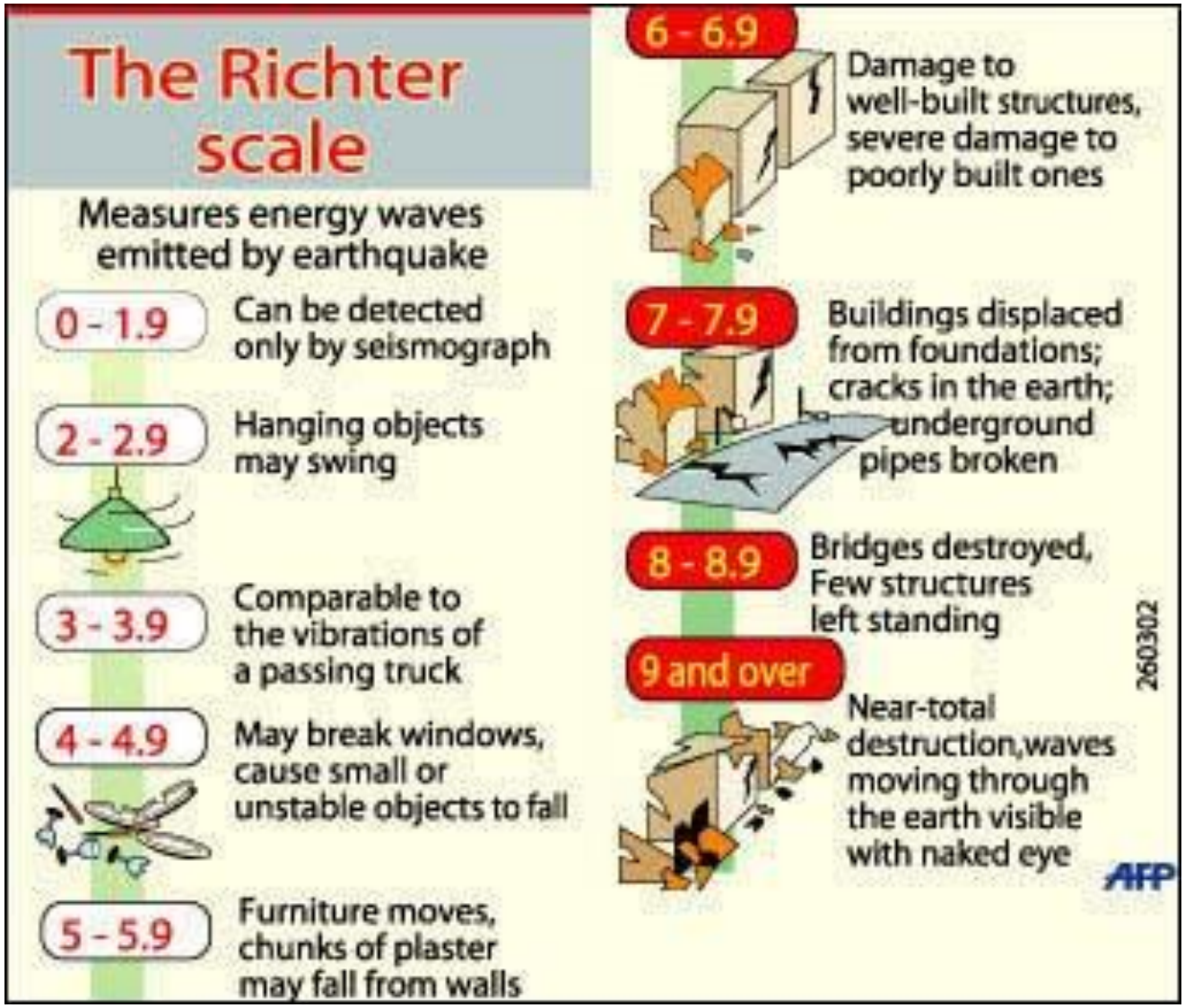
Figure 6

The two types of seismic waves that are produced by an earthquake cause different effects.

How do scientists calculate how far a location is from the epicenter of an earthquake?

- Scientists calculate the difference between arrival times of the P waves and S waves
- The further away an earthquake is, the greater the time between the arrival of the P waves and the S waves

How are Earthquakes Measured?
Richter Scale



Tsunamis

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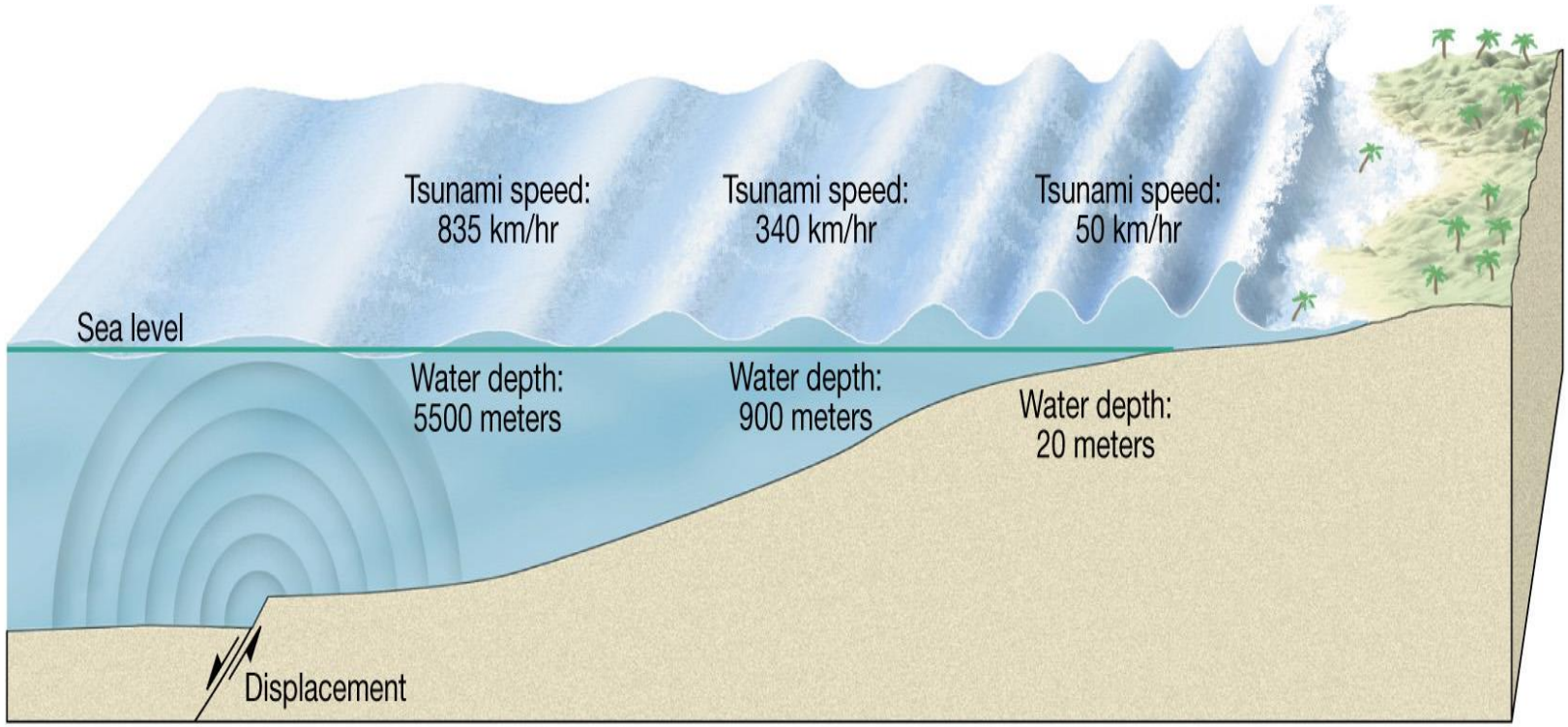
Formation of a tsunami



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