

Wednesday, February 3rd

- Lesson 2 Getting Started (H3)
- Waves and Earthquakes (H4)
- **HW:**
 - Update vocab log and review vocab terms:
focus, wave, body wave, surface wave,
p-wave, s-wave, amplitude, crest, trough,
wavelength

Lesson 2 Getting Started (H3)

- Do we need to finish any questions?
- Goal: What is the connection between waves and earthquakes?
- Demonstration: [Web Link](#)

Question 1: What formed the waves?

- **The waves were formed by the displacement of water caused by the ball. When the ball enters the pool, it moves the water causing the waves to form.**

Question 2: Direction/movement?

- **The waves formed a circle that moved outward in all directions* from the ball.**

* on one geometric plane

Question 3: Wave reflection?

- **When the waves encounter a barrier, they reflect as an inverse of their shape.**
- Ex:) -> (
- This is true of waves that hit a flat barrier. Barriers with other shapes will result in different reflections.

Question 4: When waves meet?

- **When two waves meet one of three things will happen:**
 - 1. **The two crests combine to increase the crest amplitude.**
 - 2. **The two troughs combine to increase the trough amplitude.**
 - 3. **The crest and trough cancel each other out resulting in zero amplitude.**

Question 5: Connection to earthquakes?

- **Earthquakes generate waves similar to what we did with the simulator.**
- **The shaking of the ground is from the wave moving through it.**

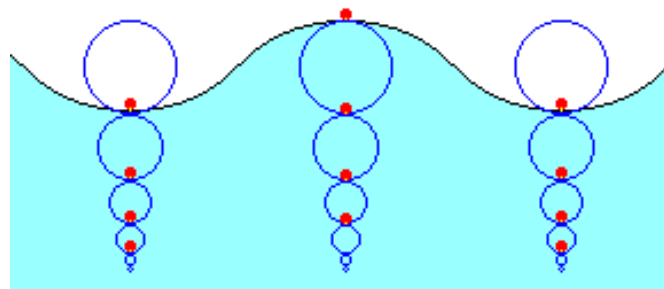
Waves and Earthquakes (H4)

- **Purpose:** To provide background on the connection between waves and earthquakes.
- **GQs:**
 - How is energy from an earthquake transferred?
 - What are the different types of waves generated by an earthquake?

What is a wave?

- A wave is one or more of a series of **movements** passing along a **surface** or through a **substance**. It is a transfer of **energy**.
- Waves have certain properties:
 - A wave can travel **through** a **material** without the material itself **moving** with the wave.
 - A wave can originate at one point and then travel in all directions. (It is not linear; think sphere!)

Waves do not move the matter forward. Matter returns to its starting point.



It's possible for there to be enough energy to displace the matter, but fundamentally waves are energy moving through matter.

What are the parts of a wave?

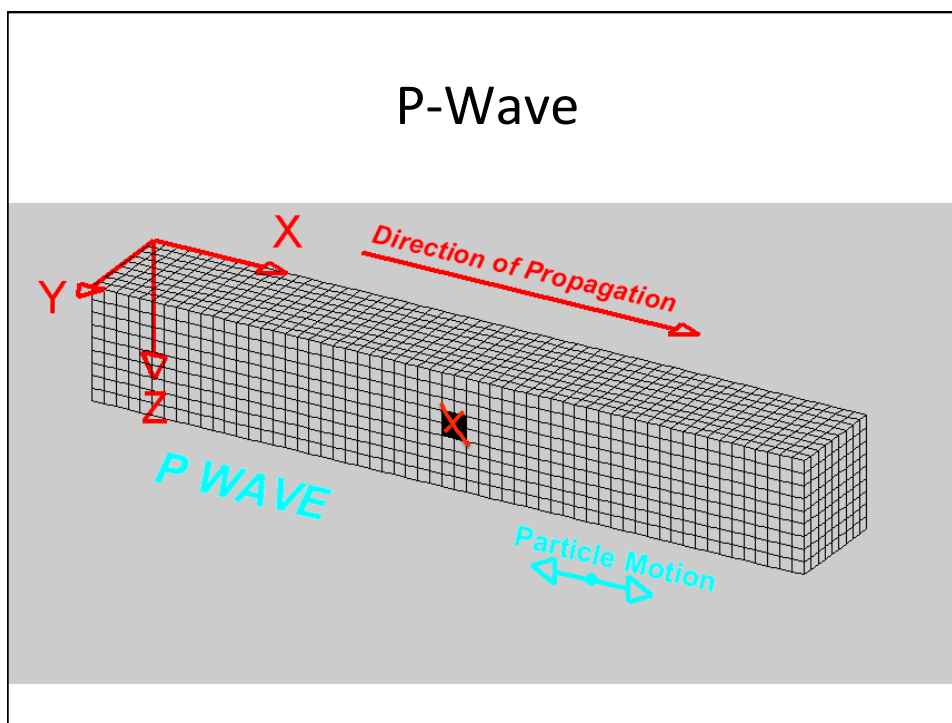
- Amplitude: the distance from the resting line to the crest or the trough.
- Crest: the highest point of a wave above the resting line.
- Trough: the lowest point of a wave below the resting line.
- Wavelength: the distance between one crest and the next or one trough and the next.

What are the types of earthquake waves?

- There are two main categories of earthquake waves: body waves and surface waves.
- Body waves move through the earth and are perpendicular to the ground.
- Surface waves mainly travel at or below the earth's surface (up to 1000km), often parallel to the ground.

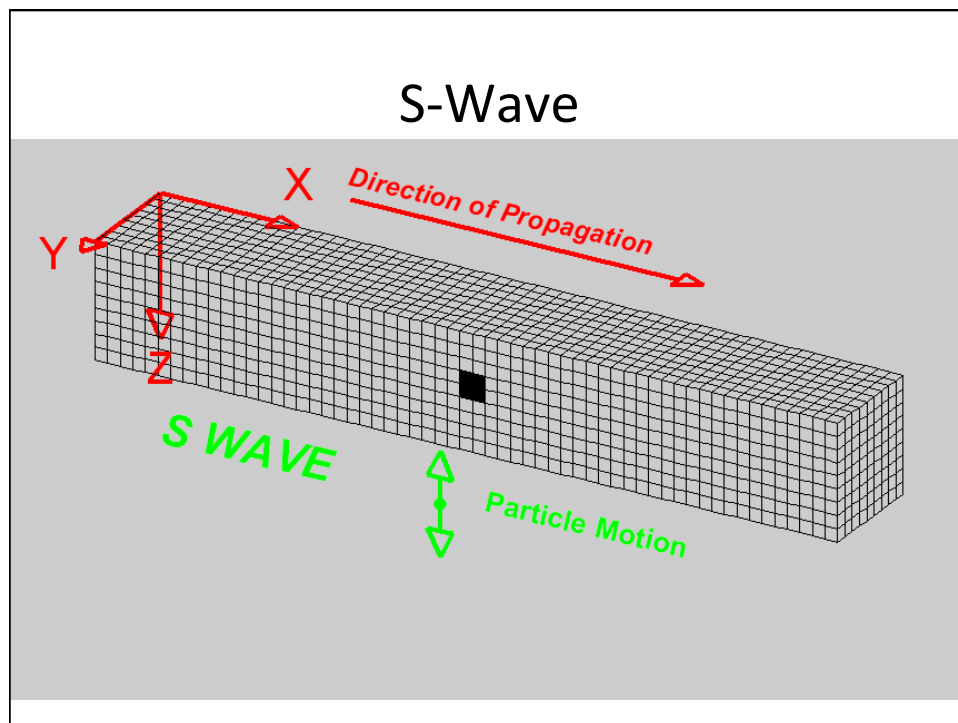
What are the types of earthquake waves?

- There are different types of body waves.
- One type of body wave is called a **P-wave**.
- They compress.
- An easy way to think of this is their action of **push** and **pull**.

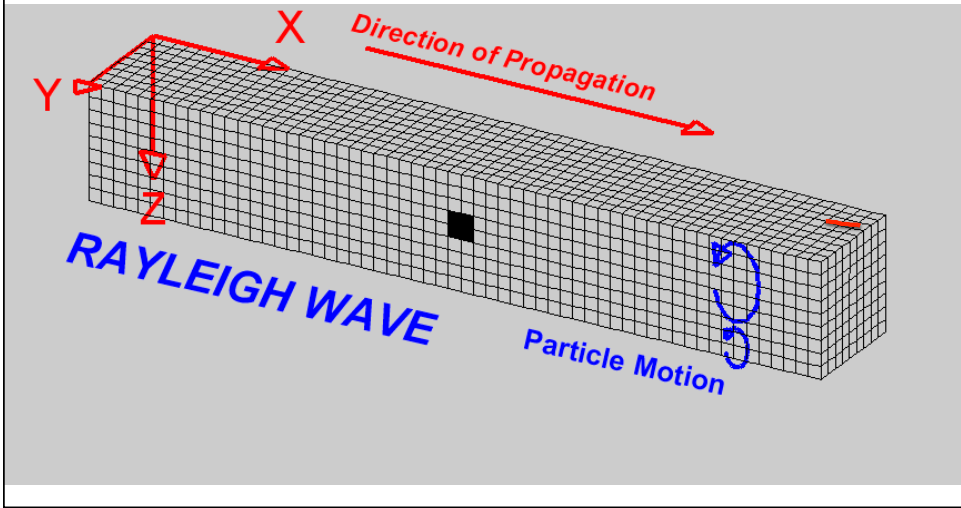


What are the types of earthquake waves?

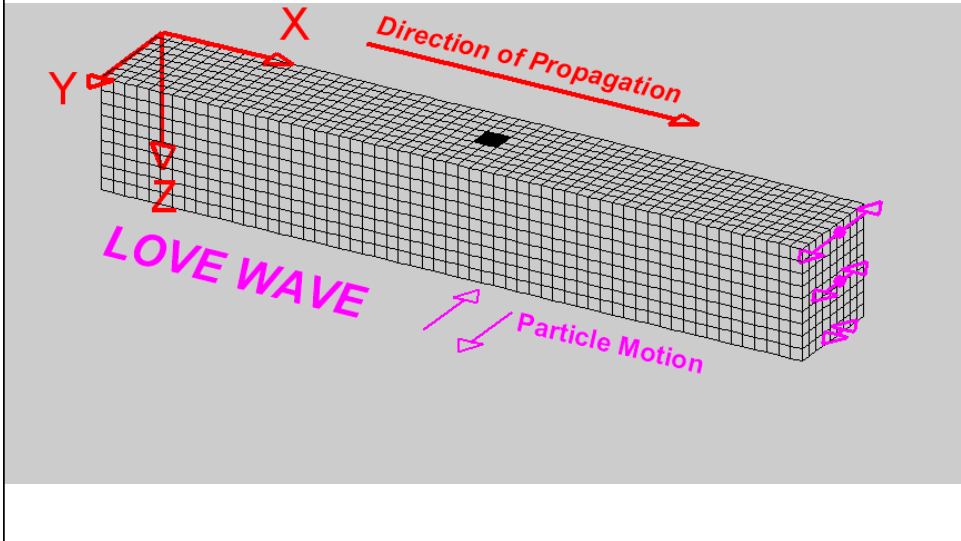
- Another type of body wave is call an **S-wave**.
- Rather than compress, these waves cause **side-to-side** movement that is perpendicular to the surface of the planet.



Example Surface Wave



Example of Surface Wave



Jaws is like a body wave. S/he comes up from below.



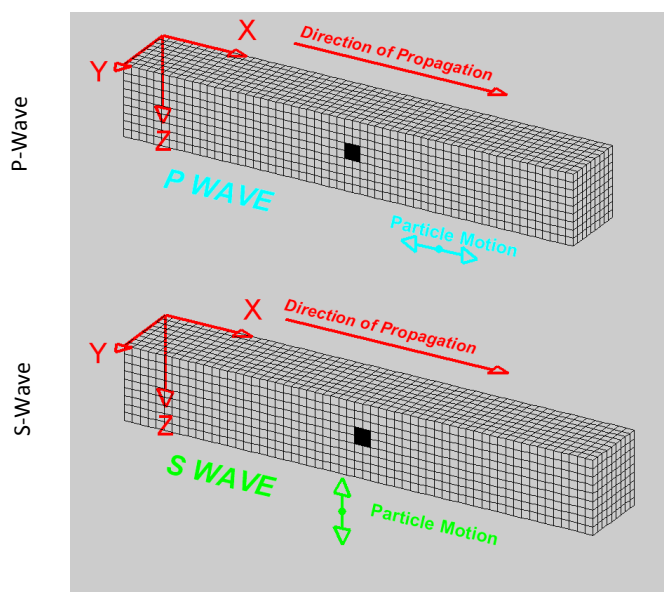
Here Jaws is a surface wave. S/he moves across the surface.



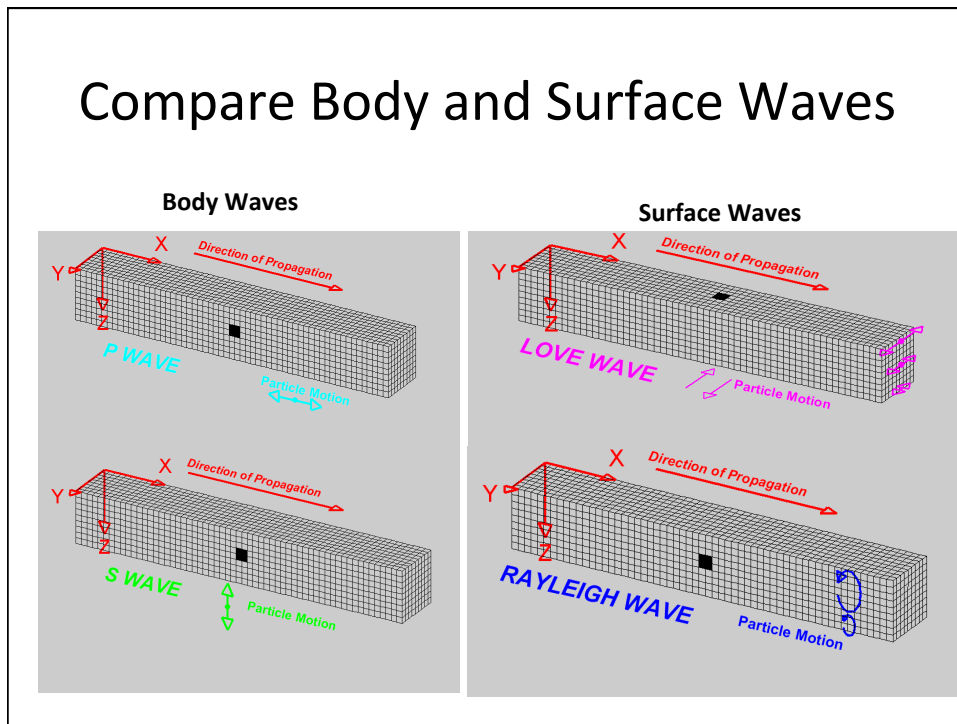
Ultimately

- Know that:
 - P-waves: Push and Pull
 - S-waves: Side to Side
 - Body waves come from below (perpendicular) to the surface.
 - Surface waves travel parallel to the surface.
- Don't worry about:
 - The types of surface waves.

Compare P- and S-Waves



Compare Body and Surface Waves



Update Vocab

- Update your vocab log with the following terms from handout 4:
 - Focus
 - Wave
 - Body Wave
 - Surface Wave
 - P-Wave
 - S-Wave
 - Amplitude
 - Crest
 - Trough
 - Wavelength