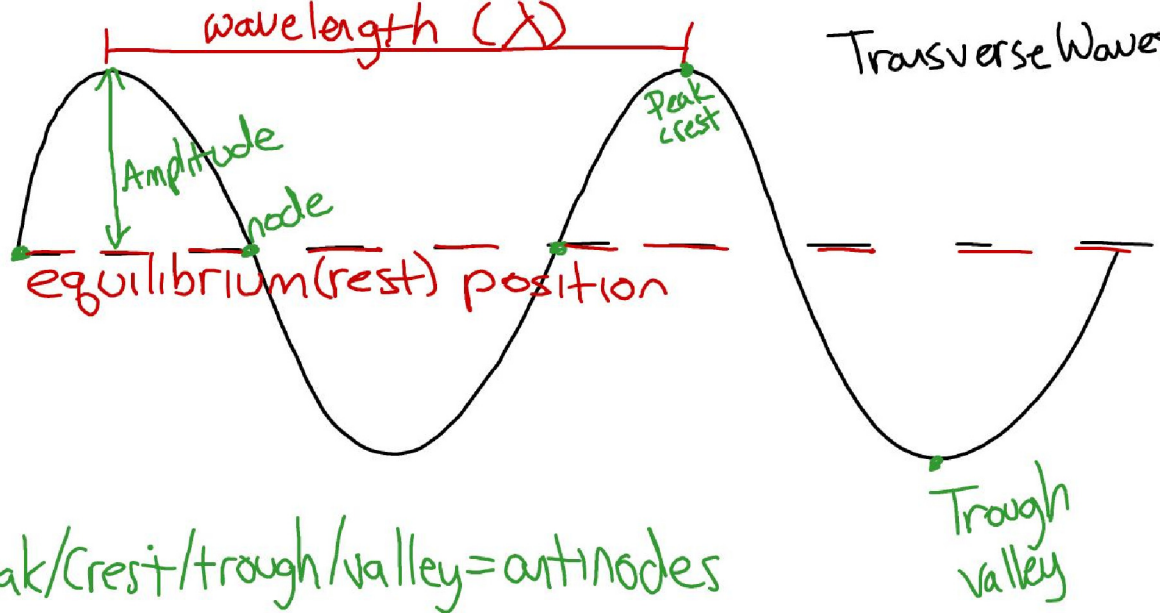
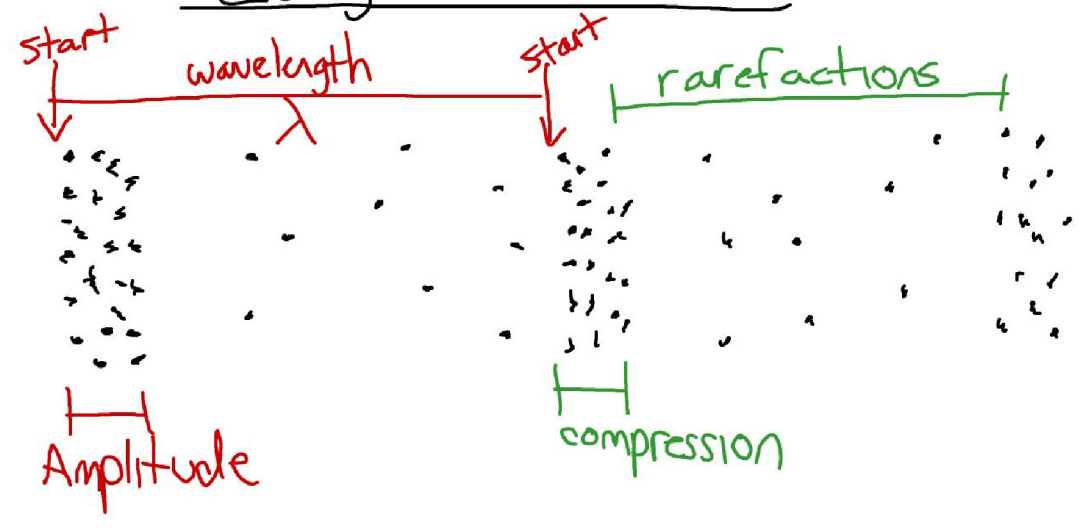


Transverse Waves



Longitudinal waves



Period and Frequency

- $T = \text{Period} \rightarrow$ Time for 1 wave
 - $f = \text{frequency} \rightarrow$ # waves per second
 - $T = 1/f$
 - $f = \frac{1}{T}$
- $\rightarrow \text{Period} = \frac{1}{\text{frequency}}$



Example

- If a wave has a period of 5 s, what is the frequency?

$$T = 5 \text{ s}$$
$$f = ?$$
$$T = \frac{1}{f}$$
$$f = \frac{1}{T} \rightarrow f = \frac{1}{5 \text{ s}}$$
$$f = 0.2 \text{ Hz}$$



Practice $f = \frac{1}{T}$

- If a wave has a period of 15 s, what is its frequency?

$$\frac{1}{15} \text{ Hz}$$

- If a wave has a period of 8 s, what is its frequency?

$$\frac{1}{8} \text{ Hz}$$



Example

- The frequency of a wave is 20 hz, what is its period?

$$f = 20 \text{ Hz}$$

$$T = ?$$

$$T = \frac{1}{f}$$
$$T = \frac{1}{20} = 0.05 \text{ s}$$



Speed

- The speed of a wave is equal to its wavelength x its frequency
- $v = \lambda f$
- OR
- The speed of a wave is equal to its wavelength divided by its period
- $v = \lambda / T$



Example

- How fast is a wave moving if it has a frequency of 50 hz and a wavelength of 3 m?

$$v = \lambda f$$
$$v = (3\text{ m})(50\text{ Hz})$$
$$v = 150 \frac{\text{m}}{\text{s}}$$



Practice

$$v = \lambda f$$

- How fast is a wave moving if it has a frequency of 20 Hz and a wavelength of 7 m?
- How fast is a wave moving if it has a wavelength of 12 m and a frequency of 4 Hz?

$$140 \text{ m/s}$$

$$48 \text{ m/s}$$



Example

- How fast is a wave moving if it has a wavelength of 12 m and a period of 2 s?

$$\lambda = 12 \text{ m}$$

$$T = 2 \text{ s}$$

$$v = \frac{\lambda}{T} = \frac{12}{2} = 6 \text{ m/s}$$



Practice

- How fast is a wave moving if it has a wavelength of 40 m and a period of 4 s?
- How fast is a wave moving if it has a wavelength of 12 m and a period of 4 s?
- A wave moves at 35 m/s and has a frequency of 7 Hz. What is its wavelength?
- The speed of a wave is 10 m/s, what is its period if it has a wavelength of 20 m?

$$v = \frac{\lambda}{T}$$

$$v = \lambda f$$
$$35 = \lambda (7)$$
$$5\text{m} = \lambda$$
$$T = 25$$

LESSON

BACKGROUNDS

Cool Down

- 1) How do you find the frequency of a wave if you know its period?
- 2) Write a problem (and solve it) where you have to find the speed of a wave.

