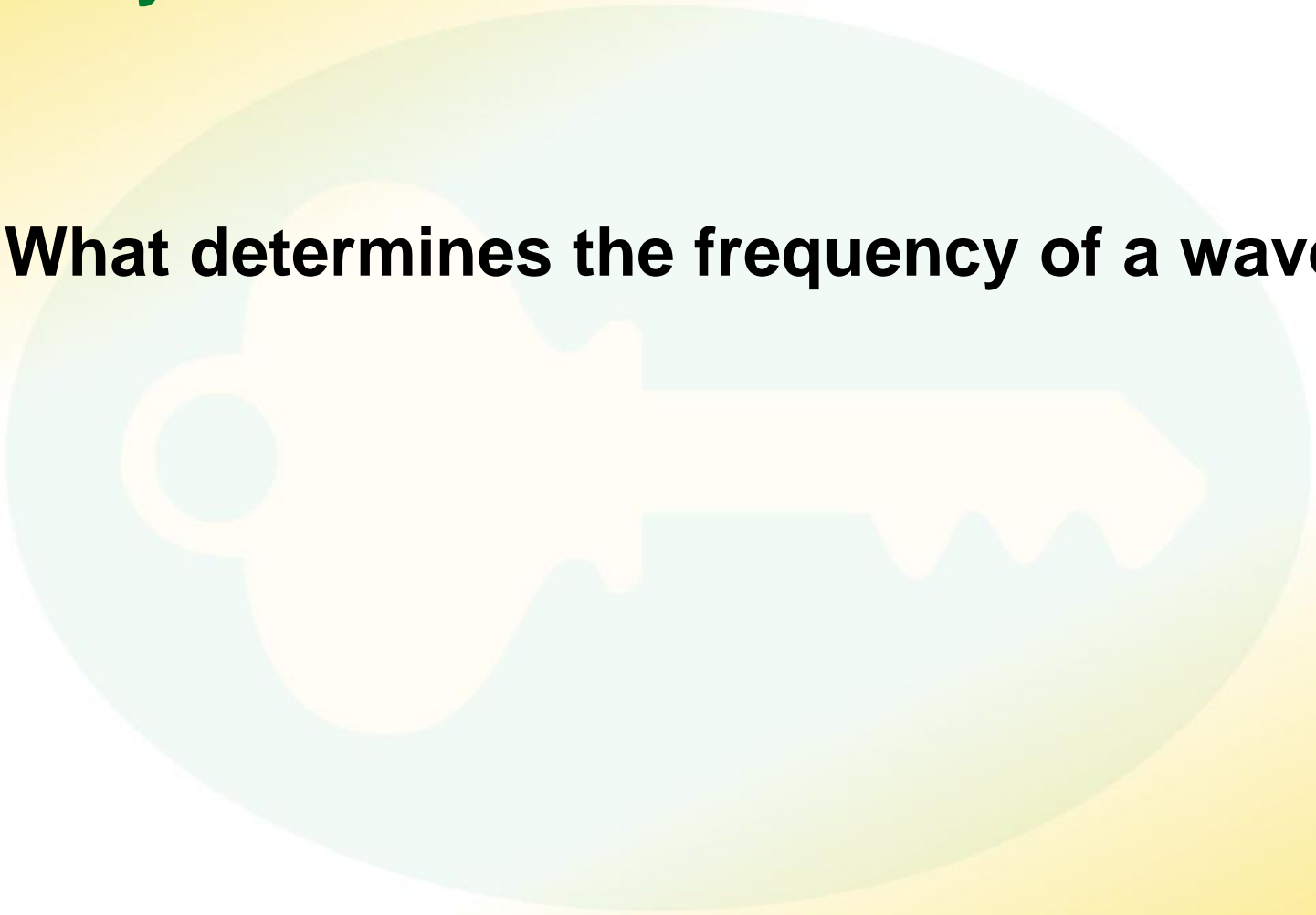


Frequency and Period



What determines the frequency of a wave?



Frequency and Period

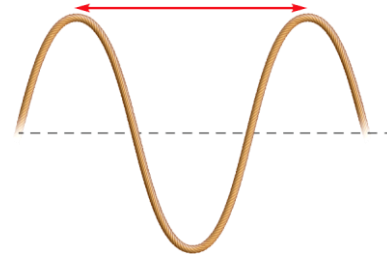
- A. A wave vibrating-
- B. A wave vibrating-

DOK Question:

Construct a word explanation of the below pictures.

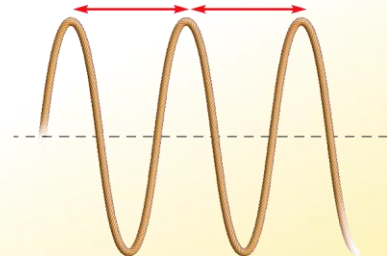
Frequency = 1.0 hertz

- A** One cycle per second



Frequency = 2.0 hertz

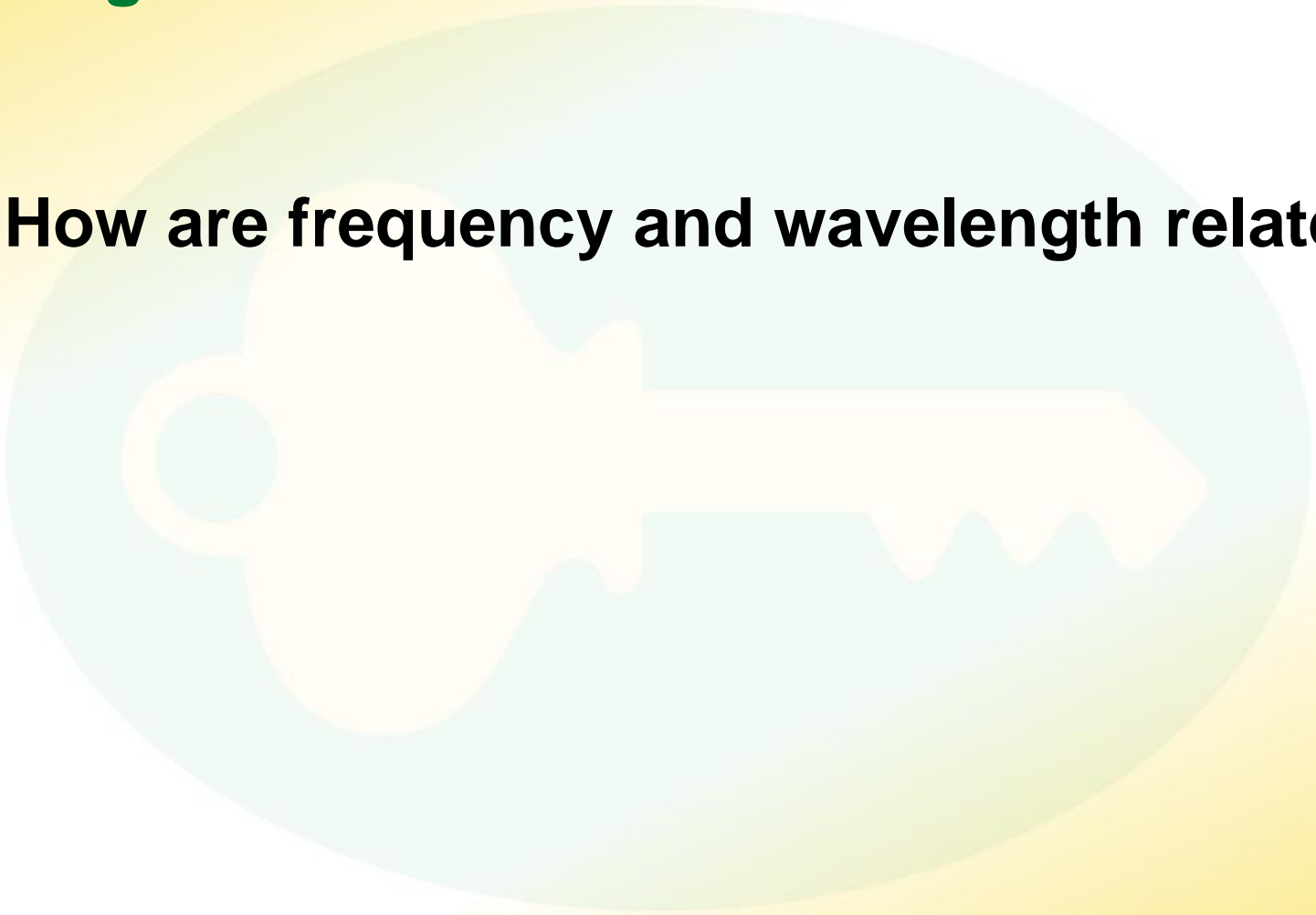
- B** Two cycles per second



Wavelength



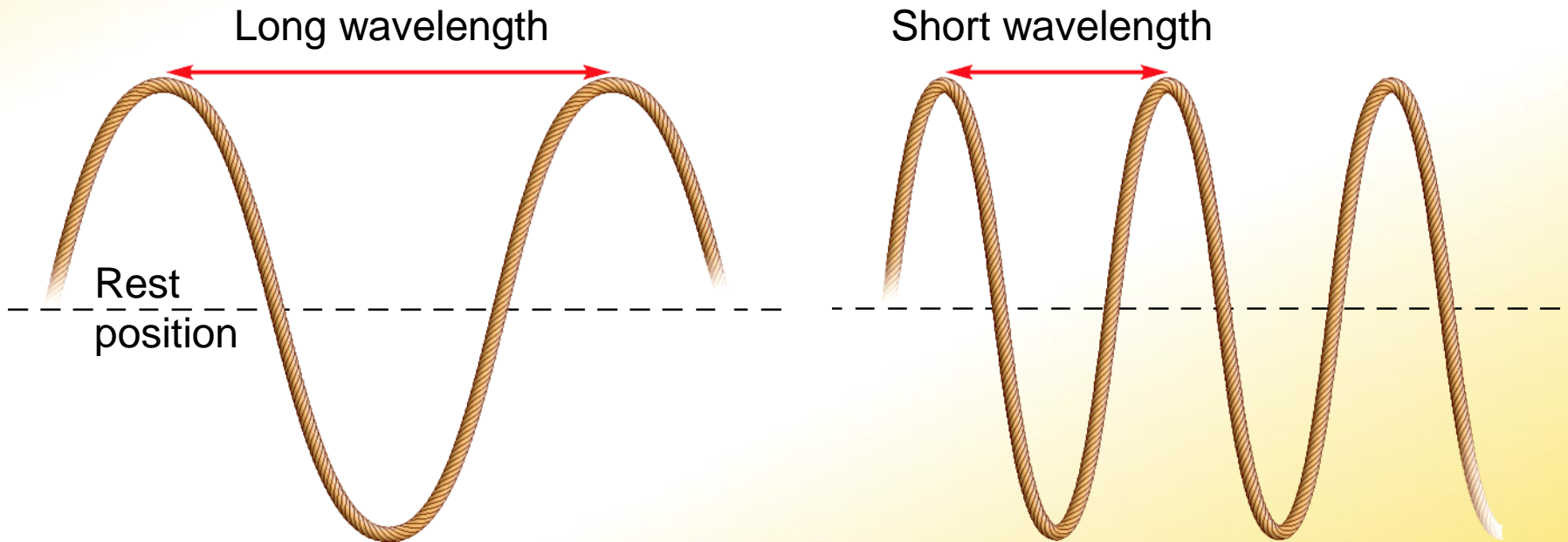
How are frequency and wavelength related?



Wavelength

Wavelength-

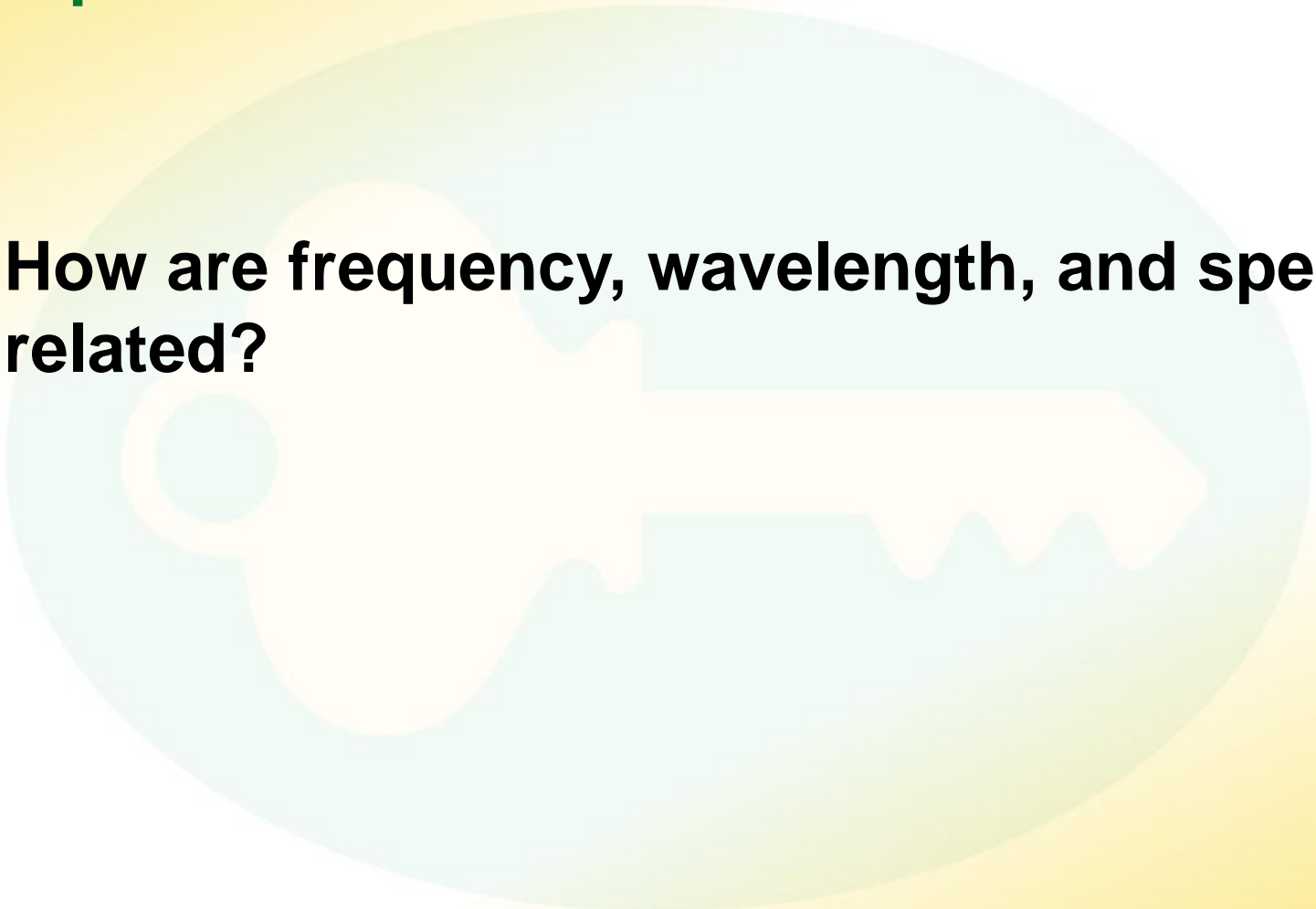
DOK Question: Construct a word explanation of the below pictures.



Wave Speed



How are frequency, wavelength, and speed related?



Wave Speed

When the wavelength is-
The speed of a wave is-

Speed of Waves

$$\text{Speed} = \text{Wavelength} \times \text{Frequency}$$

Wave Speed

Math Skills

Speed of Mechanical Waves

One end of a rope is vibrated to produce a wave with a wavelength of 0.25 meter. The frequency of the wave is 3.0 hertz. What is the speed of the wave?

Wave Speed

Math Practice

1. A wave on a rope has a wavelength of 2.0 m and a frequency of 2.0 Hz. What is the speed of the wave?

Answer:

Wave Speed

Math Practice

2. A motorboat is tied to a dock with its motor running. The spinning propeller makes a surface wave in the water with a frequency of 4 Hz and a wavelength of 0.1 m. What is the speed of the wave?

Answer:

Wave Speed

Math Practice

3. What is the speed of a wave in a spring if it has a wavelength of 10 cm and a period of 0.2 s?

(Hint: Use the equation

$$\text{Speed} = \frac{\text{Wavelength}}{\text{Period}} .)$$

Answer:

Wave Speed

Math Practice

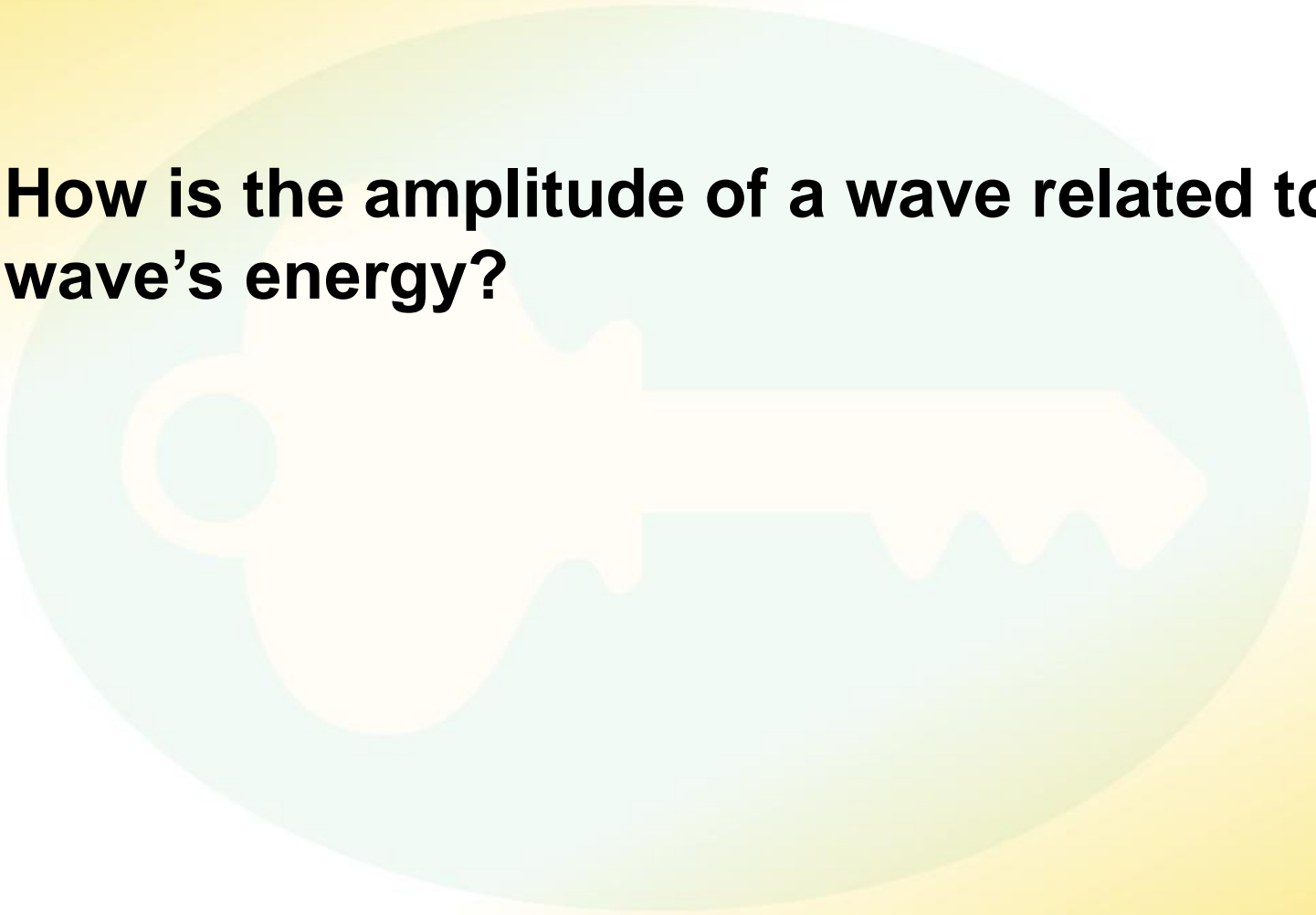
4. What is the wavelength of an earthquake wave if it has a speed of 5 km/s and a frequency of 10 Hz?

Answer:

Amplitude



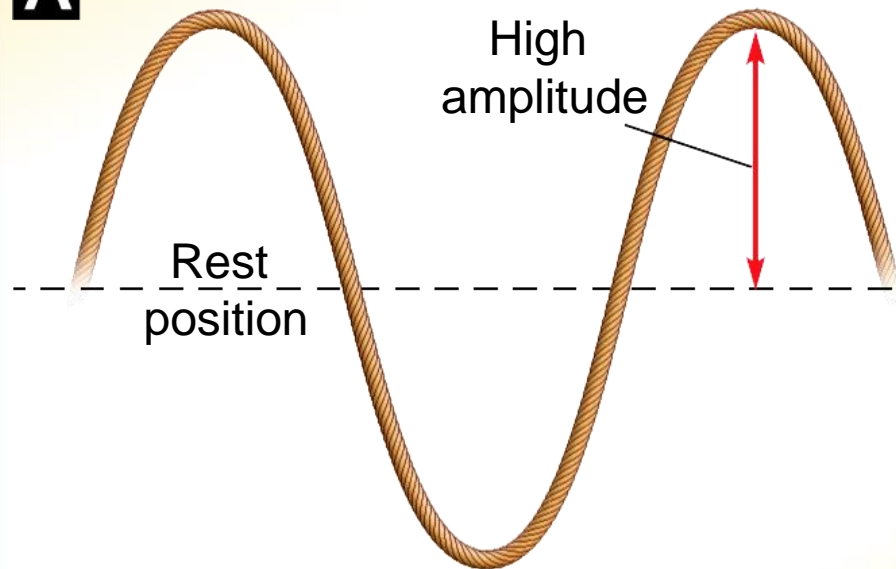
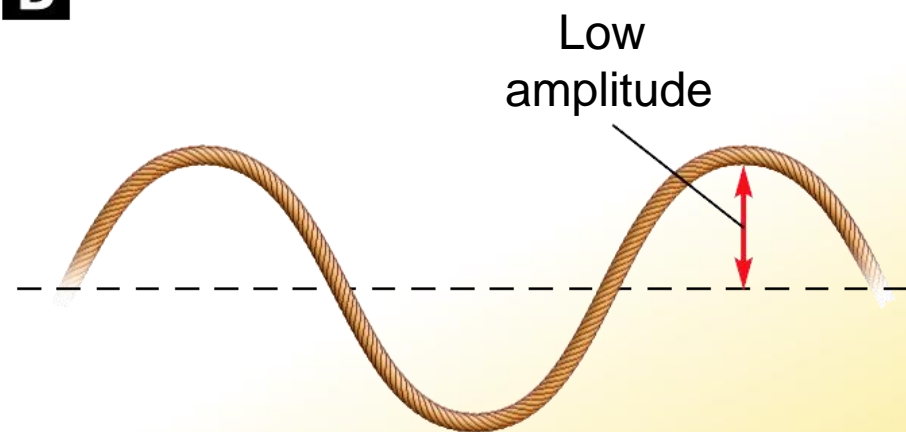
How is the amplitude of a wave related to the wave's energy?



Amplitude

The more energy a wave has-

DOK Question: Construct a word explanation of the below pictures.

A**B**

Assessment Questions

1. While wading in shallow waters, six waves crash into your legs in a 24-second span. What is the frequency of the waves?
 - a. 4 Hz
 - b. 18 Hz
 - c. 0.25 Hz
 - d. 2 Hz

Assessment Questions

2. What is the speed of an earthquake wave if it has a wavelength of 2.3 km and a frequency of 3 Hz?
- a. 6.9 km/s
 - b. 5.3 km/s
 - c. 6.0 km/s
 - d. 1.3 km/s

Assessment Questions

3. Which wave property increases as the energy of a wave increases?
- a. period
 - b. frequency
 - c. wavelength
 - d. amplitude