

Properties of Waves

Amplitude - Wavelength - Frequency

1 Sec

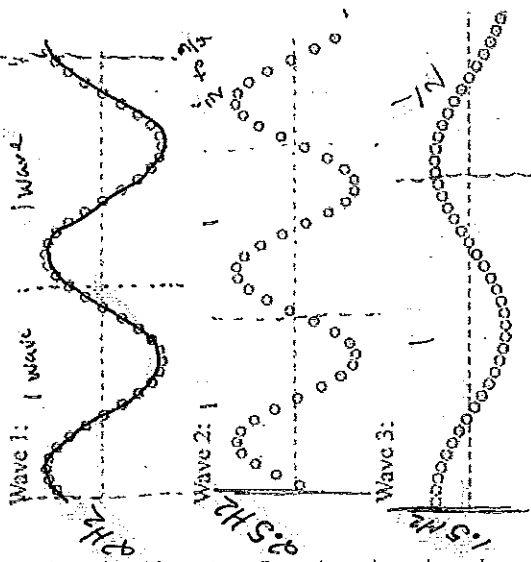
Wavelength λ wave \uparrow

1) What is the definition of wavelength?
distance from any point on a wave to the next identical point on the next wave

2) How many waves are in Wave 1? 2 waves

3) How many waves are in Wave 2? $2\frac{1}{2}$ to $2\frac{3}{4}$

4) How many waves are in Wave 3? $1\frac{1}{2}$ waves



Frequency

$$f = \frac{\# \text{ of waves}}{\text{time}}$$

5) What is the definition of frequency?

How many cycle (wave) occurs in a amount of time (1 sec)

6) Which wave has the highest frequency? Wave 2

7) Which wave has the lowest frequency? Wave 3

8) How can you tell by looking at a wave if it has a high or low frequency? # of waves

High more waves low fewer waves
Small wavelength longer wavelength

Relationship between Frequency and Wavelength (circle the correct word)

9) Increase the frequency, wavelength (increases / decreases).

F \uparrow W \downarrow

10) Decrease the frequency, wavelength (increases / decreases)

F \downarrow W \uparrow

Amplitude

11) What is the definition of amplitude?

Measure (distance) of how far the particles move away from ~~base~~ the rest position (crest to rest) (Trough to rest)

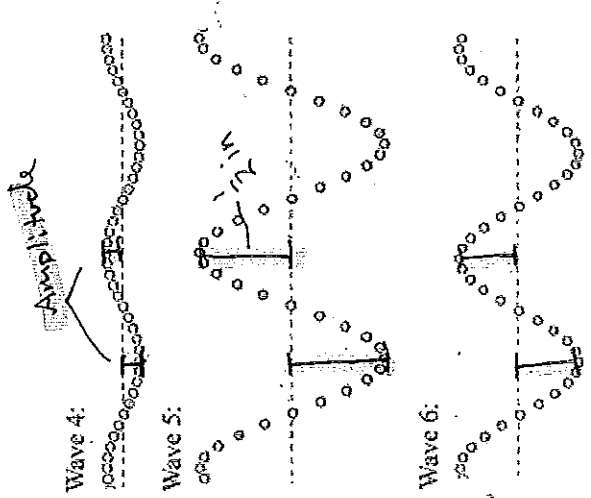
12) Which wave has the highest amplitude? Wave 5

13) Which wave has the lowest amplitude? Wave 4

14) Use a ruler and measure the amplitude of Wave 5? $\frac{1}{2}$ in

15) How can you tell by looking at a wave if it has a high or low amplitude?

The distance from rest to crest/trough by distance larger amplitude



Wave Properties Cont.

Human Wave Model

Create a high amplitude wave and a low amplitude wave

Did it take more energy to create the high amplitude wave or the low amplitude wave? more energy to create high amplitude

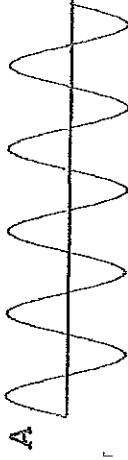
Relationship between energy and amplitude!!!!

Increase the amount of energy then the amplitude will increase

Decrease the amount of energy then the amplitude will decrease

Did it take more energy to create a high frequency wave or a low frequency wave? more energy to create high frequency

For a wave to have a high amplitude the particles have to be moving more. The more the particles move, the more work there is being done on the particles. The more work there is, the more energy there is and so, a wave with a large amplitude has more energy than a wave with a small amplitude. Think about being in the ocean at the beach. Small little waves don't have the energy to knock you over, but the larger ones may sweep you off your feet.



Wave has lower amplitude

Wave has higher amplitude

Finish the following statement:

Wave has the more energy than wave because

Wave Properties Cont.

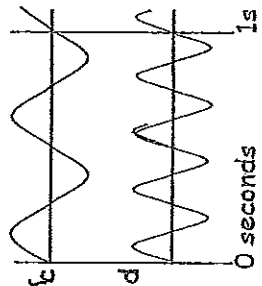
Relationship between energy and frequency!!!!

Increase the amount of energy then the frequency will increase

Decrease the amount of energy then the frequency will decrease

What is the frequency of each wave?

Don't forget your units! $f = \frac{\text{# of Waves}}{\text{time}}$



C = _____
D = _____

Wave _____ has the lowest frequency and wave _____ has the highest frequency.

REVIEW All Parts

What happens to the wavelength when the frequency is increased?

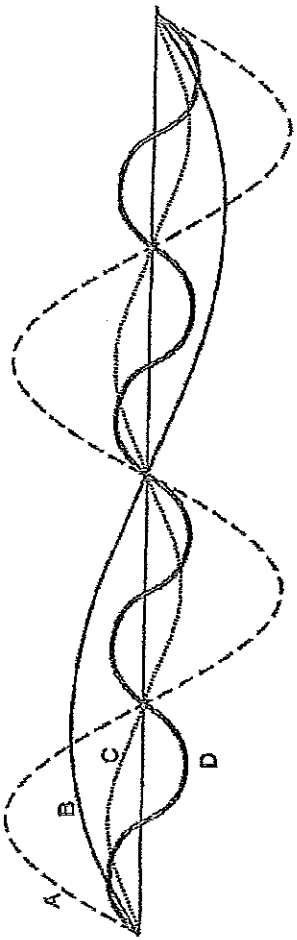
When the frequency is increased the wavelength _____

If you have two waves of the same amplitude, the wave with the shorter wavelength carries _____ (more or less) energy than the wave with the longer wavelength.

Put the waves below in order of highest frequency to lowest frequency

Highest _____

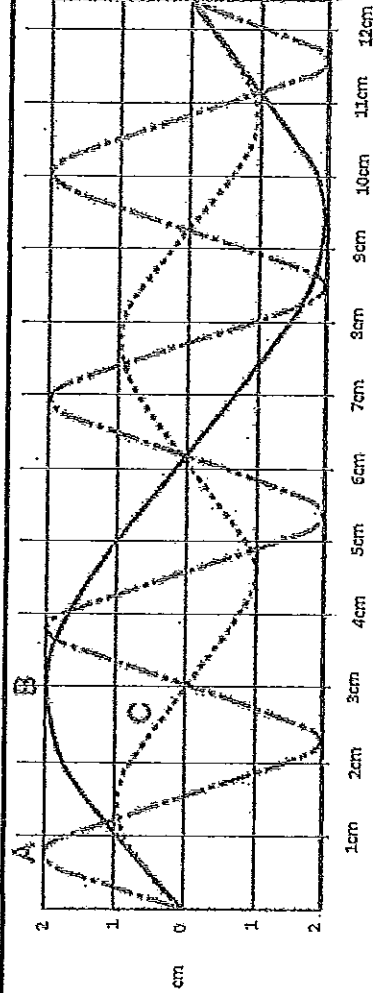
Lowest



Put the waves in order from the smallest amplitude to the largest amplitude _____

Put the waves in order from the smallest wavelength to the largest wavelength _____

Put the waves in order from the smallest frequency to the largest frequency _____



Measure the amplitude of each wave
A = _____
B = _____
C = _____

Measure the wavelength of each wave
A = _____
B = _____
C = _____