

Name: \_\_\_\_\_

Date \_\_\_\_\_

## Unit 4 ~ Learning Guide

### Waves

1. A wave is \_\_\_\_\_
2. A medium is \_\_\_\_\_
3. The three basic kinds of waves are \_\_\_\_\_,  
\_\_\_\_\_, \_\_\_\_\_
4. In a longitudinal (compression) wave, the disturbance travels \_\_\_\_\_  
\_\_\_\_\_
5. A transverse wave is formed by \_\_\_\_\_  
\_\_\_\_\_
6. The movement of a surface wave is \_\_\_\_\_  
\_\_\_\_\_
7. Sound waves are created when air is pushed together and outward from an object or device that has been disturbed. The squished air reaches our eardrums, causing vibrations that our brain interprets as sound. This is a \_\_\_\_\_ type of wave .

8. Wavelength is \_\_\_\_\_

\_\_\_\_\_

9. Amplitude is \_\_\_\_\_

\_\_\_\_\_

10. Frequency is \_\_\_\_\_

\_\_\_\_\_

11. Activity:

With help from your assistant, stretch your spring toy (or string) about 2 metres, and then perform each of the following tasks:

1. Move your arm about 50 centimetres from left to right, twice, to create a pair of transverse waves. Look closely at the size of the waves.

2. Repeat this motion but double the distance of your arm movement to about one metre, left to right. Does the amplitude change? How does the amplitude of the waves change as your arm movement becomes greater or smaller?

3. Now try to double the frequency of your arm movements. That is, if you were moving your arm back and forth twice in two seconds, now try to move it back and forth twice in one second. Does the wavelength change? Describe how the wavelength changes as the frequency of your arm movement increases.

Describe your observations here \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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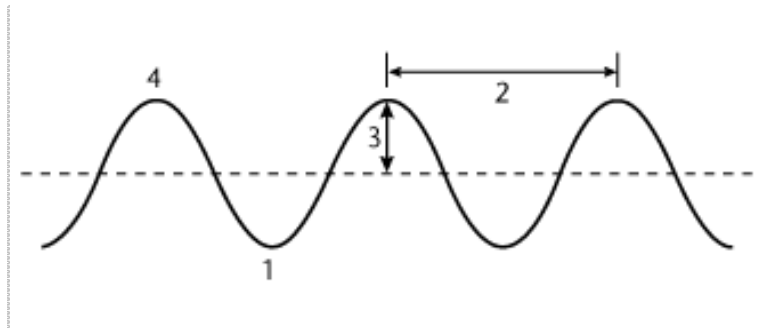
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12. Name each numbered part of the diagram



1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

13. Draw a diagram and label the angle of incidence and angle of reflection.

14. The angle of incidence \_\_\_\_\_ the angle of reflection.

15. A wave that hits a barrier at  $60^\circ$  will it reflect back at \_\_\_\_\_

16. When ocean waves hit shallow water, they \_\_\_\_\_

\_\_\_\_\_

17. When ocean waves hit shallow water at an angle, they \_\_\_\_\_

\_\_\_\_\_

### **The Electromagnetic Spectrum**

18. The following types of electromagnetic radiation in order from lowest to highest energies are: (ultraviolet, radio, infrared, X-rays, black light, red light) \_\_\_\_\_

\_\_\_\_\_.

19. The wavelength (decreases or increases) as the frequency of an electromagnetic wave increases.

20. The type of electromagnetic radiation these things use or produce is:

your eyes \_\_\_\_\_

your skin \_\_\_\_\_

a tanning booth \_\_\_\_\_

a stereo receiver \_\_\_\_\_

21. As the wavelength of electromagnetic radiation decreases, what happens to:

frequency \_\_\_\_\_

energy \_\_\_\_\_

22. How does visible light compare with X-rays in terms of:

wavelength \_\_\_\_\_

frequency \_\_\_\_\_

energy \_\_\_\_\_