Practice - The Atomic Model, Part I: Light

Answer the following.

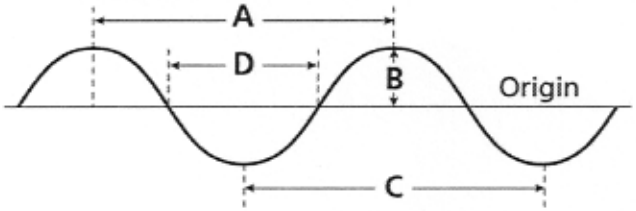
Amplitude	energy	frequency	hertz	light	wave	wavelength	speed

Use each of the terms above just once to complete the passage.

Electromagnetic radiation is a kind of (1) energy that behaves like a(n) (2) wave as it travels through space. (3) Light is one type of electromagnetic radiation. Other examples include X rays, radio waves, and microwaves.

All waves can be characterized by their wavelength, amplitude, frequency, and (4) speed. The shortest distance between equivalent points on a continuous wave is called a(n) (5) wavelength. The height of a wave from the origin to a crest or from the origin to a trough is the (6) amplitude. (7) Frequency is the number of waves that pass a given point in one second. The SI unit for frequency is the (8) hertz (Hz), which is equivalent to one waver per second.

Use the figure to answer the following questions.



9. Which letter(s) represent one wavelength? A & C
10. Which letter(s) represent one amplitude? B
11. If twice the length of A passes a stationary point every second, what is the frequency of the wave?
2 waves / 1 s = 2 wave/s = 2 Hz

Answer the following.

12. What is a wave?
A rhythmic disturbance caused by the movement of energy.
13. What is the difference between a mechanical wave and an electromagnetic wave?
Mechanical requires a medium through which to travel. Electromagnetic does not.
14. Ocean waves are caused by wind hitting the water. What causes electromagnetic waves?
The movement of an electron.
15. What is the relationship between wave speed, frequency, and wavelength for an EM wave?
$c = \nu\lambda$ (freq. & wavelength are inv. proportionate.
16. What is the relationship between wave energy and frequency? Wave energy and wavelength?
freq. is directly proportionate to E. E & wavelength are inv. proportion
17. Explain what the "electromagnetic spectrum" is?
Entire range of electromagnetic wave freqs. / wavelengths / energies.
18. What is the speed of EM waves and what letter do we typically replace this constant value with?
≈ 300,000 km/s, called "c"