

Optics – Properties of Waves, light, and the Electromagnetic Spectrum

Lessons 19 - 21b


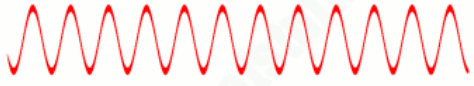

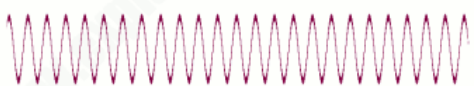
Match each term on the left with the best descriptor on the right. Each descriptor may be used only once. There may be extra descriptors.

Term		Descriptor	
	Crest	A	Used to heat up left-over pizza
	Trough	B	Light we can see
	Amplitude	C	Explains how light behaves like a wave
	Frequency	D	Occurs when a light wave bounces off an object
	Wavelength	E	A range of colours or frequencies of visible light
	Light	F	Used to broadcast television
	Spectrum	G	Occurs when a light wave is absorbed by an object
	Reflection	H	Used by dentists to take a picture of your teeth
	Refraction	I	Bending of light wave as it passes from one material to another
	Visible light	J	Wave that travels through space
	Wave model of light	K	Height of the crest from rest position
	X rays	L	Used by computers to read CDs/DVDs
	Microwaves	M	Used in radiation therapy to kill cancer cells
	Gamma rays	N	A movement that carries energy through matter or space
	Radio waves	O	The lowest point of a wave
		P	Trough to trough
		Q	The highest point of a wave
		R	Cycles per second

Properties of Waves

1. What happens when the amplitude of a wave becomes smaller/shorter?
2. How is wavelength measured?
3. As wavelength increases, frequency _____
4. As frequency increases, wavelength _____
5. As amplitude increases, energy _____

6. Look at the diagram below to answer the questions.

<p>1 </p> <p>2 </p> <p>3 </p> <p>4 </p>	<p>a. Which wave has the highest frequency?</p> <p>b. Which wave has the longest wavelength?</p> <p>c. Which wave has the most energy?</p>
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Visible light and the electromagnetic spectrum

- List the colours of the rainbow in order of decreasing wavelength and increasing frequency.
- Why does a blue car appear to be blue in sunlight?
- What are the additive primary colours?
- What are the secondary colours and what two primary colour need to be combined to produce each secondary colour?
- List the types of radiation in order from longest wavelength to shortest wavelength.
 - Visible light
 - Infrared
 - Microwaves
 - Gamma rays
 - Radio waves
 - X rays
 - Ultraviolet
- When comparing radio waves to visible light, what are its three characteristics? Think about wavelength, frequency, and energy.
- On the electromagnetic spectrum, what type of radiation gives off the highest amount of energy?
- Name the three types of radiation that have higher frequencies than visible light.
- How does the frequency of electromagnetic radiation change as wavelength of the radiation decreases?