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Light and Color Name: _____

Light Waves and Matter

Read from Section 2 of the Light Waves and Color chapter of The Physics Classroom
<http://www.physicsclassroom.com/Class/light/12a.html>

MCQ Question: Light and Color: answer 1

1. A light wave is an electromagnetic wave which has both an electric and magnetic component associated with it. Electromagnetic waves are often distinguished from mechanical waves. The distinction is based on the fact that electromagnetic waves:—
 - a. can travel through vacuum and mechanical waves cannot
 - b. come in a range of frequencies and mechanical waves exist with only certain frequencies
 - c. can travel through a liquid and mechanical waves cannot
 - d. electromagnetic waves cannot transport energy and mechanical waves can transport energy
 - e. electromagnetic waves travel at infinite speed and mechanical waves have a finite speed
2. Consider the diagram below. It represents the hierarchy of an electromagnetic spectrum below. Complete the diagram by labeling the following regions: ultraviolet, infrared, x-ray, radio waves, gamma radiation, and microwave radiation.

		Visible Light		
Long λ Low f				Short λ High f

3. Which region of the electromagnetic spectrum has the highest frequency?
4. Which region of the electromagnetic spectrum has the longest wavelength?
5. Which region of the electromagnetic spectrum will travel with the fastest speed?
6. It is known that electromagnetic waves with longer wavelengths have a greater ability to bend around obstacles that get in their path. This ability to bend around obstacles is referred to as diffraction. Electromagnetic waves with strong diffraction properties are used in communication. Which two regions of the spectrum have the greatest ability to diffract?
7. It is known that electromagnetic waves with high frequency are more capable of causing damage to the organs of living things. Which two regions of the spectrum have the tendency to cause the greatest damage to humans?

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