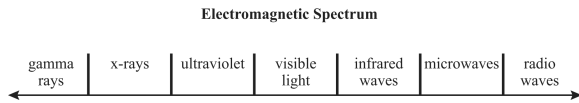


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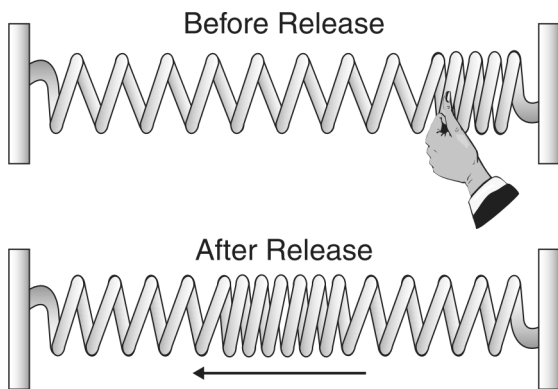
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1. A diagram of the electromagnetic spectrum is shown below.



Sunscreen is a lotion used to protect skin from exposure to the Sun. This sunscreen protects a person's skin from wavelengths that are

- A. longer than radio waves but shorter than x-rays.
 B. longer than x-rays but shorter than infrared waves.
 C. longer than microwaves but shorter than infrared waves.
 D. longer than visible light waves but shorter than radio waves.
2. A sound wave is produced in a metal cylinder by striking one end. Which of the following occurs as the wave travels along the cylinder?
- A. Its amplitude increases. B. Its frequency increases.
 C. It transfers matter. D. It transfers energy.
3. A radio station transmits to a receiving antenna. The radio wave sent is a
- A. sound wave. B. torsional wave.
 C. longitudinal wave. D. transverse wave.
4. A stretched spring attached to two fixed points is compressed on one end and released, as shown below.



The resulting wave travels back and forth between the two fixed ends of the spring until it comes to a stop. This mechanical wave is an example of a

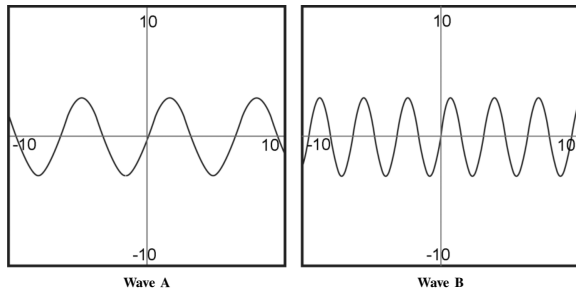
- A. transverse wave. B. longitudinal wave.
 C. superpositioned wave. D. refracted wave.

5. Astronauts on the Moon would *not* be able to hear a landslide because
- A. the lunar dust deadens sounds.
 B. intensive sunlight destroys sound waves.
 C. the magnetic field of the Moon is too weak to carry sound.
 D. air molecules on the Moon are too far apart to carry sound.
6. Where does visible light fall on the electromagnetic spectrum?
- A. between x-rays and gamma rays
 B. between short-wave radio and television
 C. between infrared and ultraviolet
 D. between microwaves and infrared
7. Objects appear different in size and shape in a container of water due to
- A. refraction of the light waves.
 B. interference of the water and light waves.
 C. polarization of the light waves.
 D. diffraction of the light waves.
8. An engineer in a moving train blows the train's horn. The train is moving away from a person standing on the ground. Compared to the frequency of the sound that the engineer hears, the person standing on the ground hears a sound with
- A. the same wavelength. B. more variation in tone.
 C. greater amplitude. D. a lower frequency.
9. Sound waves cannot carry energy through
- A. water. B. air.
 C. a mirror. D. a vacuum.
10. Which of the following choices best explains why grass on a distant hillside appears green?
- A. Grass reflects all colors except green.
 B. Grass absorbs only green light from the sun.
 C. Grass reflects green light more than any other color.
 D. Grass transmits green light in the same way that green-colored cellophane does.

11. Which diagram correctly orders different colors of light according to the value of a property?

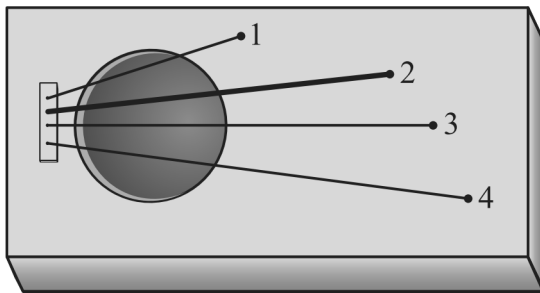
- A. **Smallest amplitude** ← Red Orange Green Blue → **Largest amplitude**
- B. **Largest amplitude** ← Red Orange Green Blue → **Smallest amplitude**
- C. **Shortest wavelength** ← Red Orange Green Blue → **Longest wavelength**
- D. **Longest wavelength** ← Red Orange Green Blue → **Shortest wavelength**

12. Use these graphs to answer the question.



The two waves above are traveling at the same speed. Which statement best describes the difference between the waves?

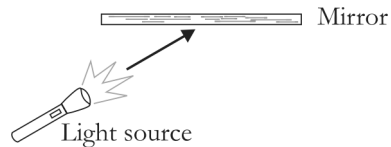
- A. Wave A has a higher frequency than wave B.
- B. Wave A has a lower frequency than wave B.
- C. Wave A has a higher amplitude than wave B.
- D. Wave A has a lower amplitude than wave B.
13. The picture below shows a musical instrument that Jamie made during science class. Each string on the instrument will produce a different sound when plucked.



Which of the following identifies the string that will *most likely* produce the sound with the highest pitch?

- A. string 1, because it is the shortest
- B. string 2, because it is the thickest
- C. string 3, because it is centered over the hole
- D. string 4, because it is the longest

14. Which picture shows how a mirror reflects light?



- A.
- B.
- C.
- D.

15. Which of the following explains why an apple looks red?

- A. The apple is reflecting red light and absorbing all other colors of light.
- B. The apple is absorbing red light and reflecting all other colors of light.
- C. The apple is absorbing all colors of light, but it absorbs the red light better.
- D. The apple is reflecting all the light.