

Review 1: Electromagnetic Spectrum and Producing Visible Light

True or False, if False, correct the mistake.

1. Microwaves have a *longer wavelength and higher energy* than visible light.
2. The only form of electromagnetic radiation that can be detected by the human eye is *infrared rays*.
3. All colours of light travel at the *same* speed through a vacuum.
4. A ray of red light has a *higher* frequency than a ray of yellow light.
5. When you use a remote control to change channel on a TV, the remote is emitting *ultraviolet* radiation.
6. Infrared light is invisible because it has a wavelength that is *longer* than the human eye can perceive.
7. When you see a rainbow, light of different colours is travelling at *same* speeds.
8. When an object is heated to the point that it glows, the process is called *incandescence*.
9. *Fluorescence* involves passing electricity through a gas, causing the gas to glow.
10. Phosphorescent light sources absorb UV light and emit visible light *immediately*.
11. Some products prevent sunburn by blocking *infrared* light from the sun.
12. *More than 90 %* of the electric energy that passes through an incandescent bulb is converted to light energy.
13. Dyes in detergents and *incandescent* lights work on the same principle.
14. In a fluorescent bulb, the mercury vapour is used to produce *infrared light* which excites the fluorescent surface to give off visible light.
15. Electric discharge occurs when electricity passes through a gas, causing it to *glow*.
16. Lightning and fluorescent lights are similar in that both involve *fluorescence*.
17. Dyes in detergents and *highlighters* both give off light by fluorescence.
18. A piece of metal glowing red is *hotter* than one glowing yellow.
19. The *temperature* of a neon bulb depends on the type of gas that is inside the bulb.
20. Compact fluorescent bulbs are much more *efficient* than incandescent bulbs.
21. One reason that a compact fluorescent bulb uses less electricity than an incandescent bulb of the same brightness is because *it produces much less heat*.
22. A crime scene technician sprays a substance on a section of floor. A moment later, the floor begins to glow, indicating that blood is present. This is an example of *bioluminescence*.

Explain the following

23. How is visible light different from all other forms of electromagnetic radiation?
24. Infrared light travels from the Sun to heat up Earth. Why is the space between Earth and the Sun not heated up by this infrared light?
25. Stars in the sky give off light because of their enormous temperatures. Which kind of stars would you expect to burn the hottest?
26. What must happen to an object in order for incandescence to occur?
27. Electric discharge occurs when electricity passes through what?
28. Which kind of light uses both electric discharge and fluorescence?
29. Inside a fluorescent tube, the mercury vapour produces light by which process?
30. If you were to develop a line of clothing that blocked ultraviolet light, which claim could you make in your advertising?
31. A company wants to make glow-in-the-dark toys. They coated the toys with a fluorescent material. They are very bright in daylight, but do not glow in the dark. What should the company do?
32. What does the prefix *tribo-* most likely mean ?
33. How are chemiluminescence and triboluminescence similar?
34. A farmer who wants to provide a small source of heat for a chicken coop, what type of light bulbs should the farmer use to light the coop ?