

Physical Science
Week 13: Text pp. 350-361

True (+) or False (0): Write all answers on the answer sheet.

1. We see some things that are not reflected light.
2. Newton proposed the wave theory of light.
3. Another theory of light is the particle theory.
4. Electromagnetic waves need a medium through which to move.
5. Electromagnetic waves behave like other waves (reflection, refraction, diffraction and interference).
6. There are no invisible electromagnetic waves.
7. Heinrich Hertz built the first radio transmitter and receiver.
8. Electromagnetic waves are longitudinal waves.
9. Electromagnetic waves are much faster than sound waves.
10. A nanometer is one billionth of a meter.
11. Light has characteristics of both particles and waves.
12. The dual nature of light is called the quantum theory of light.
13. Photons act like waves when interacting with matter.
14. Red is the highest frequency of visible light.
15. Black can be thought of as the absence of color, and white is a mixture of all colors of the visible spectrum.
16. The primary additive colors of light are red, green, and magenta.
17. Look at the illustration at the top of p356. We see a yellow object when it reflects only yellow light.
18. The subtractive primary colors are used to determine the colors reflected by paints and inks.
19. All colors of light are refracted the same amount by a prism.
20. Additive colors refer to light, and subtractive colors refer to pigments.
21. A lens is designed to reflect light.
22. A concave lens bulges outward (thickest in the middle).
23. Convex lenses are used to correct nearsightedness
24. If you look through a convex lens, things appear larger.
25. A rainbow is the result of refracted light.

Fill in the answers on the answer sheet:

1. Newton proposed the ? theory of light.
2. Maxwell demonstrated that light consisted of 2 waves, one a vibrating ? field, and the other a ? field.
3. Maxwell's 2 waves act together as a single ? wave.
4. Electromagnetic waves do not require a ? .
5. Light and other electromagnetic waves travel at a speed of ? miles per second.

6. How many miles can light travel through space in one year? (the answer is not in your book. Calculate it).
7. The first example of Maxwell's "invisible light" was ? waves.
8. Can electromagnetic waves be reflected, refracted, and diffracted? (yes/no)
9. Light with a wavelength of approximately 600 nanometers would be the color ? .
10. Look at the picture of the prism on p355. Which color of light is refracted the least?
11. If all colors of sunlight are reflected from an object, what color would the object appear to be?
12. Something that is perfectly black will reflect what colors?
13. If a ruler is sitting in a beaker of water (p358), the ruler appears to be ? .
14. A piece of glass specially designed to refract light is called a ? .
15. Looking at a printed page through a concave lens will cause the print to look ? .
16. Concave lenses are used to correct a vision problem called ? .
17. Refracted light waves always bend toward the medium that ? .
18. Light travels what percent slower through glass than a vacuum?
19. In order to see a rainbow when it is raining, the sun's rays must be shining from ? .
20. A rainbow reminds us of what promise from God?

Vocabulary - write the definitions for these terms on the answer sheet and be able to explain them next week from memory in your own words .

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| 1. electromagnetic wave | 6. primary additive colors |
| 2. light | 7. subtractive primary colors |
| 3. photons | 8. lens |
| 4. Hertz | 9. refraction |
| 5. visible spectrum | |