

11. Polarized sunglasses work by
- A. blocking light waves that vibrate in one plane.
 - B. gradually refracting light as it passes through the lenses.
 - C. bending light as it passes from air into the lenses.
 - D. reflecting most of the light that strikes the sunglasses.
12. Which of the following occurs as light travels farther from its source?
- A. The source gives off less light as photons move away from it.
 - B. Far from the source, photons spread over a larger area.
 - C. The intensity of light increases as photons move away from the source.
 - D. Far from the source, photons come together in a small area.
13. The primary colors of pigments
- A. are the same as the secondary colors of light.
 - B. are cyan, yellow, and magenta.
 - C. combine in equal amounts to produce black.
 - D. all of the above
14. Infrared rays have a shorter wavelength than
- A. ultraviolet rays.
 - B. X-rays.
 - C. gamma rays.
 - D. radio waves.
15. The full range of frequencies of electromagnetic radiation is called
- A. visible light.
 - B. invisible radiation.
 - C. radio waves.
 - D. the electromagnetic spectrum.
16. The waves with the longest wavelengths in the electromagnetic spectrum are
- A. gamma rays.
 - B. infrared rays.
 - C. radio waves.
 - D. X-rays.
17. Blue light and yellow light combine to produce white light because
- A. they are complementary colors of light.
 - B. they absorb each other's wavelengths.
 - C. they are both primary colors of light.
 - D. blue, yellow, and white are primary colors.
18. A translucent material
- A. scatters some light.
 - B. absorbs all light.
 - C. transmits all light.
 - D. transmits no light
19. An incandescent light bulb produces light when electrons flow through the
- A. glass.
 - B. filament.
 - C. air.
 - D. vacuum.
20. Because light travels in a straight line and casts a shadow, Isaac Newton hypothesized that light is
- A. a stream of particles.
 - B. heat.
 - C. radiation.
 - D. a wave.
21. What color is produced when magenta light is passed through a red filter?
- A. white
 - B. blue
 - C. black
 - D. red

Matching – Match the scientist with his contribution.

- _____ 31. First person to propose the idea that light travels as a stream of particles
- _____ 32. First person to accurately measure the speed of light
- _____ 33. Discovered that there is invisible radiation outside of the visible light spectrum
- _____ 34. Explained the photoelectric effect in terms of light traveling as a stream of photons
- _____ 35. His double slit experiment showed interference of light waves

- A. Einstein
- B. Young
- C. Newton
- D. Michelson
- E. Herschel

Matching – Match the term with its description.

- _____ 36. type of electromagnetic radiation which transmits heat energy
- _____ 37. the term for a packet of light energy
- _____ 38. electromagnetic radiation with the highest frequencies and shortest wavelengths
- _____ 39. the double slit experiment is evidence that light behaves like this
- _____ 40. most sunglasses block this type of EM radiation to protect your eyes from harmful rays
- _____ 41. the best evidence for light behaving as a particle comes from the explanation of this experiment
- _____ 42. caused because light travels at different speeds in air at different temperatures – makes road look wet on hot days
- _____ 43. light amplification by stimulated emission of radiation

- A. mirage
- B. photon
- C. laser
- D. ultraviolet
- E. infrared
- F. wave
- G. photoelectric effect
- H. gamma

Diagram: Use figure 18.3 to answer questions 44 – 45

44. What color is the object in figure 18.3? Explain how you know.

45. Suppose the light hitting this object is only red light. What color would the object appear when viewed in that light?

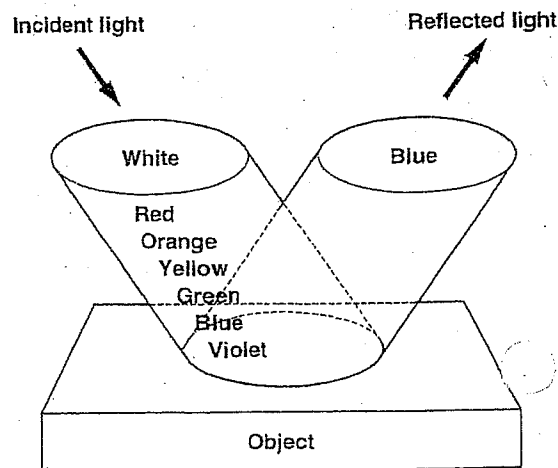
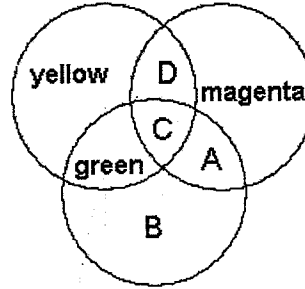


Figure 18-3

Pigment Colors

1. Based on the following diagram for **pigment**, determine which colors are missing and write them in the blanks provided.

A = _____
B = _____
C = _____
D = _____



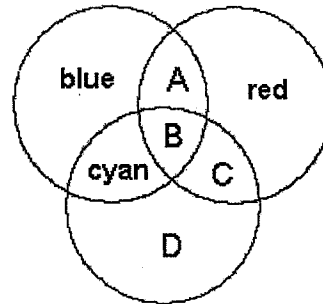
2. Fill in the following list of complementary **pigment** colors with the missing color

- A. cyan and _____
B. green and _____
C. yellow and _____
D. complementary colors of pigment are mixed to make _____ pigment

Light Colors

3. Based on the following diagram for **light**, determine which colors are missing and write them in the blanks provided.

A. _____
B. _____
C. _____
D. _____



4. Fill in the following list of complementary **light** colors with the missing color.

- A. blue and _____
B. red and _____
C. magenta and _____
D. complementary colors of **light** are mixed to make _____ light

Light and Objects

5. Name an object that would be considered opaque. _____
6. Name an object that would be considered transparent. _____
7. Name an object that would be considered translucent. _____