Physical Principles in Living Systems Name:

Interactions of Light with Matter Period:

Use Chapter 3, Section 2 of your textbook to answer the questions below.

Section 2: Interactions of Light with Matter

1. Because the back of a cat's eyes can _____ light, their eyes appear to glow in the dark.

Reflection (p.82)

2. A ray of light shining through the air is usually _____ .

3. If light rays bounce off of something, we call that _____ .

The Law of Reflection (p.82)

4. If you throw a ball straight down (or shine a ray of light straight down), they will both bounce back _____ . If you throw a ball at an angle (or shine a ray of light at an angle), they will both bounce away at an _____ .

_____ 5. Which of the following angles are equal according to the law of reflection?
a. angle of electromagnetism and angle of visible light
b. angle of incidence and angle of visible light
c. angle of reflection and angle of electromagnetism
d. angle of incidence and angle of reflection

Look at Figure 1, then match the correct description with the correct term. Write the letter in the space provided.

_____ 6. line perpendicular to a mirror's surface

_____ 7. beam of light reflected off a mirror

_____ 8. beam of light traveling toward a mirror

_____ 9. arrival of a beam of light at a surface

_____ 10. angle between the incident beam and the normal

_____ 11. angle between the reflected beam and the normal

a. incident beam

b. normal

c. reflected beam

d. angle of incidence

e. angle of reflection

f. incidence

Types of Reflection (p.83)

12. _____ reflection occurs when light beams reflect at the same angle (like off of a mirror).

13. _____ reflection occurs when light beams reflect at many different angles (like off of a wall).

Light Source or Reflection? (p.84)

14. You can see a light source in the dark because your eyes _____ the light coming from it.

15. An object that emits visible light is called _____ .

16. A visible object that reflects light is said to be _____ .

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Absorption and Scattering (p.84)

17. Light gets _____ the further it gets from its source.

Absorption and Scattering: Absorption of Light (p.84)

_____ 18. What happens during the process of absorption?
a. Light energy is transferred to particles of matter. c. Light energy is reflected by particles of matter.
b. Light energy is diffused by particles of matter. d. Light energy is illuminated by particles of matter.

_____ 19. What happens to light when air particles absorb energy from the light?
a. The light becomes bright. c. The light becomes infrared.
b. The light becomes dim. d. The light becomes ultraviolet.

Scattering of Light (p.85)

_____ 20. What happens when light is scattered?
a. Light is absorbed. b. Light is reflected. c. Light becomes brighter. d. Light changes direction.

21. Scattering is what makes the sky look _____ .

Light and Matter (p.85)

22. _____ is the passing of light through matter.

_____ 23. Look at Figure 5. Why can you see objects outside through a glass window?
a. Light is absorbed by the glass. c. Light is reflected off the glass.
b. Light is transmitted through the glass. d. Light is dissolved by the glass.

_____ 24. Look at Figure 5. Why can you see your reflection in a window?
a. Light is absorbed by the glass. c. Light is reflected off the glass.
b. Light is dissolved by the glass. d. Light is transmitted through the glass.

_____ 25. Look at Figure 5. Why does a glass window feel warm when you touch it?
a. Some light is absorbed by the glass. c. Some light is magnified through the glass.
b. Some light is dissolved by the glass. d. Some light is transferred by the glass.

Types of Matter (p.86)

26. Visible light is easily transmitted through _____ objects such as glass and water.

27. Matter that transmits and scatters light, such as wax paper, is _____.

28. Matter that does not transmit light, such as metal, is _____.