Name: _____ **Period:** _____ **Date:** _____ **ID: A**

Chapter 2 Study Guide

True/False
Indicate whether the statement is true or false.

____ 1. Water is the medium through which ocean waves move.

____ 2. Light can travel through solids, liquids, and gases.

____ 3. Light is an electromagnetic wave.

____ 4. You can see the light from the entire range of the electromagnetic spectrum.

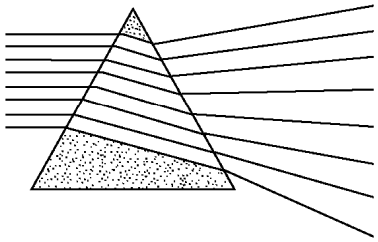

Figure 1

____ 5. Refer to Figure 1. Reflection is causing light rays to bend or change direction when they move from one material into another.

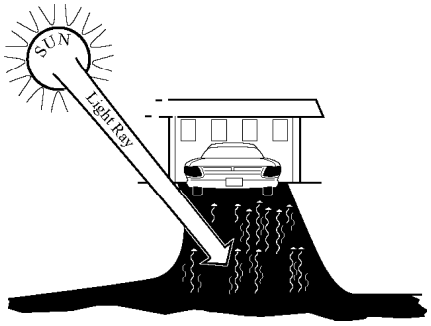

Figure 2

____ 6. Figure 2 models the Sun's rays heating a driveway. This process is called absorption.

____ 7. Transmission occurs when light rays strike a material and pass through it.

____ 8. Scattering occurs when a material emits light, and then re-emits the light in different directions.

____ 9. In a vacuum, light travels at about 500,000 km/s.

____ 10. The distance between any two crests or any two troughs is called the amplitude of the wave.

Modified True/False

Indicate whether the statement is true or false. If false, change the identified word or phrase to make the statement true.

____ 11. The frequency of a wave is the number of wavelengths that pass by a point each second. _____

____ 12. The substance through which a wave moves is called the medium. _____

____ 13. When the difference in the speed of light in two materials is large, so is the amount of reflection. _____

____ 14. The difference in the temperature of light in two materials determines how much the light will bend. _____

____ 15. Red, green, and blue light are called the secondary colors. _____

____ 16. Light waves never change direction. _____

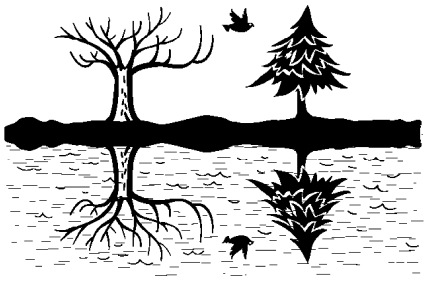

Figure 3

____ 17. The light rays in Figure 3 are being reflected. The direction of the reflected ray is dependent upon the direction of incoming light rays as they strike the surface of the water. _____

____ 18. According to the law of refraction, when a light ray is reflected from a surface, the angle of incidence equals the angle of reflection. _____

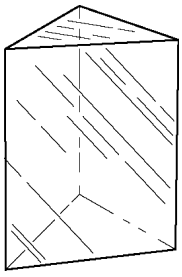

Figure 4

____ 19. Refer to Figure 4. The object shown is called a(n) obelisk. _____

____ 20. Refer to Figure 4. When light rays pass through this object, they reflect. _____

____ 21. Refer to Figure 4. Light rays coming from this object are separated into the colors of the infrared light spectrum. _____

____ 22. Refraction occurs only when light rays enter a material in a straight beam. _____

Multiple Choice

Identify the choice that best completes the statement or answers the question.

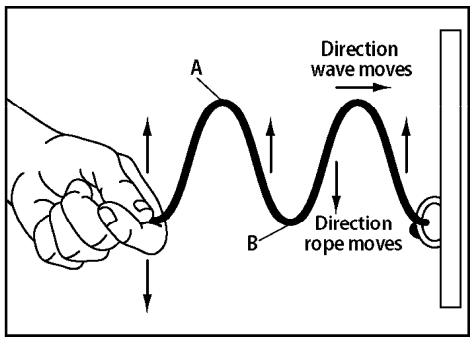

Figure 5

____ 23. Refer to Figure 5. Point A is called a ____.

a. amplitude
b. crest
c. rarefaction
d. trough

____ 24. Refer to Figure 5. Point B is called a ____.

a. compression
b. crest
c. diffraction
d. trough

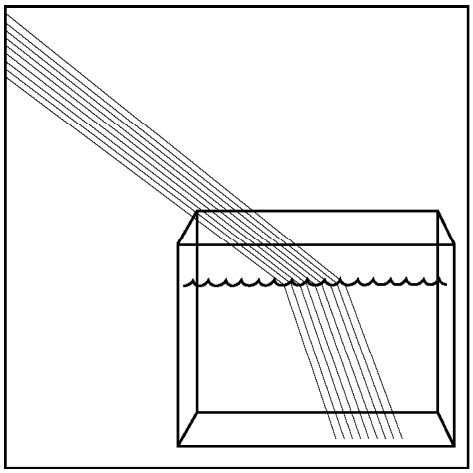

Figure 6

____ 25. Refer to Figure 6. The light waves change direction as a result of ____.
a. diffraction
b. reflection
c. refraction
d. reverberation

____ 26. Refer to Figure 6. The directional change of the light waves occurs because ____.
a. light waves travel faster through air than water
b. light waves travel faster through water than air
c. the angle of reflection of waves always equals the angle of incidence
d. waves carrying less energy produce light with lower intensity

____ 27. Light travels fastest in ____.
a. empty space
b. fresh water
c. solids
d. seawater

____ 28. Light waves carry ____ from place to place.
a. light atoms
b. energy
c. gaseous particles
d. heat

____ 29. A light ray is a narrow beam of light that travels in a ____ line.
a. curved
b. straight
c. convex
d. focused

____ 30. Some light is visible, but all light is a(n) ____wave.
a. invisible
b. particle
c. electromagnetic
d. scattered

____ 31. Human eyes can detect electromagnetic waves that are in the ____.
a. visible light range
b. green-red range
c. short wavelength range
d. infrared range

____ 32. Visible light has wavelengths that are so short they are usually measured in units of ____.
a. millimeters (mm)
b. nanometers (nm)
c. centimeters(cm)
d. kilometers (km)

____ 33. If light waves with the longest wavelengths are entering your eye, which of the following colors are you seeing?

a. white
b. pink
c. blue
d. red

____ 34. According to the law of reflection, when a light ray is reflected from a surface, the angle of incidence ____ the angle of reflection.

a. is greater than
b. equals
c. is less than
d. is unrelated to

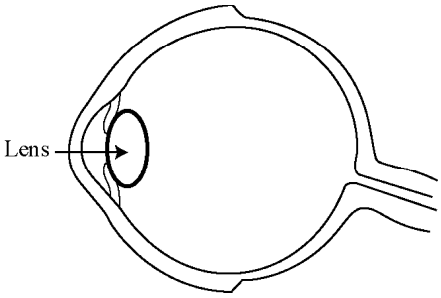

Figure 6

____ 35. Refer to Figure 6 for help. Light enters the eye through the ____.

a. iris
b. sclera
c. cornea
d. retina

____ 36. Refer to Figure 6 for help. As light enters your eye, the lens focuses and produces an image on the ____.

a. back
b. periphery
c. retina
d. front

____ 37. As the frequency of electromagnetic waves ____, wavelength ____.

a. increases, decreases
b. decreases, increases
c. increases, increases
d. decreases, decreases

Completion

Complete each statement.

38. _____ in the retina of the eye detect light and send signals to the brain.

39. According to the law of _____, when a light ray is reflected from a surface, the angle of incidence equals the angle of reflection.

40. Light rays reflected from _____ surfaces always obey the law of reflection.

41. As white light strikes an object, some of the light is absorbed and some is _____.

42. The color of an object depends on the _____ of light that are reflected by the object.

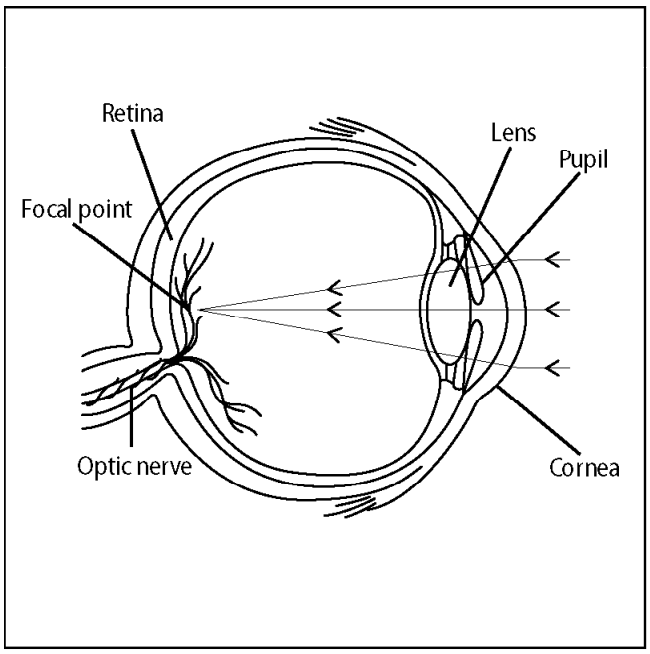

Figure 8

43. Refer to Figure 8. In the figure shown, the _____ is the flexible part of the eye that changes shape to enable the eye to focus on objects that are near or far.

44. Refer to Figure 8. The _____ is the part of the eye on which light waves are focused, forming an image.

45. Refer to Figure 8. The _____ is the transparent layer of the eye through which light first passes.

46. Eyeglasses change the way light is _____ on a person's eye.

47. A curved, transparent object used to refract light is called a _____.

48. Although lenses have different shapes, all lenses have at least one _____ surface.

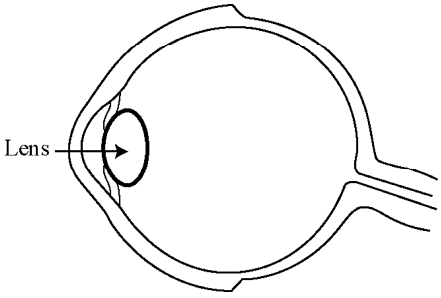

Figure 7

49. Refer to Figure 7. The lens bulges outward, so you know it is _____.

Matching

Match each term with the correct statement below.

a. visible light
b. wave
c. refraction
d. wavelength

____ 50. disturbance that moves through matter or space

____ 51. distance between two corresponding parts of a wave (for example, the distance between to adjacent crests)

____ 52. change in direction of a wave when it changes speed as it travels from one material to another

____ 53. electromagnetic waves that people can see

Short Answer

54. What is the electromagnetic spectrum?

55. What is the difference between nearsightedness and farsightedness?

56. How do rod and cone cells differ in function?

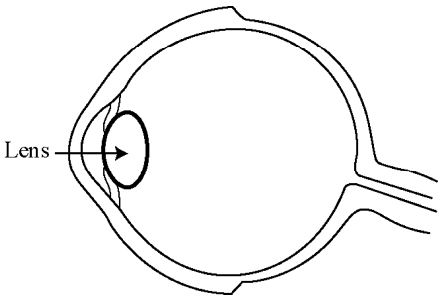

Figure 13

57. Use Figure 13 for help. What is the retina, and what does it do?

58. Use Figure 13 for help. What is the cornea, and what does it do?

59. How does the iris control the amount of light that enters the human eye?

60. Why do you see very little color at night?

61. What is the function of the cone cells in your retina?

Chapter 2 Study Guide
Answer Section

TRUE/FALSE

1. T
2. T
3. T
4. F
5. F
6. T
7. T
8. T
9. F
10. F

MODIFIED TRUE/FALSE

11. T
12. T
13. F, refraction
14. F, speed
15. F, primary
16. F, can
17. T
18. F, law of reflection
19. F, prism
20. F, refract
21. F, visible
22. F, at an angle

MULTIPLE CHOICE

23. B
24. D
25. C
26. A
27. A
28. B
29. B
30. C
31. A

32. B
33. D
34. B
35. C
36. C
37. A

COMPLETION

38. Rod and cone cells
39. reflection
40. all
41. reflected
42. wavelengths
43. lens
44. retina
45. cornea
46. focused
47. lens
48. curved
49. convex

MATCHING

50. B
51. D
52. C
53. A

SHORT ANSWER

54. the complete range of frequencies and wavelengths of electromagnetic waves
55. A person who is nearsighted can see nearby objects clearly, but distant objects seem blurry. A farsighted person can see distant objects clearly, but cannot focus clearly on nearby objects.
56. Rod cells are sensitive to dim light, and cone cells enable the eye to see colors.
57. Possible answer: The retina is a sheet of light-sensitive cells in the back of the eye. It is the part of the eye which converts light into nervous signals.
58. Possible answer: The cornea is a convex lens, the clear part of the eye covering the iris and pupil; it lets light into the eye, permitting sight.
59. Possible answer: When the light is dim, the iris is small and the pupil is large. This allows more light to enter the interior of the eye. When the light is bright, the iris is bigger and your pupil is smaller, so less light enters your eye.

60. Possible answer: Cone cells can perceive color only in bright light.
61. These cells are specialized to detect different colors of light.