

## Life Science, Ch. 2 Test

### Multiple Choice

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

- \_\_\_\_\_ 1. A disturbance that transfers energy from place to place is called a
  - a. wave.
  - b. medium.
  - c. vibration.
  - d. compression.
- \_\_\_\_\_ 2. Mechanical waves are created when a source of energy causes a medium to
  - a. move.
  - b. compress.
  - c. expand.
  - d. vibrate.
- \_\_\_\_\_ 3. A wave travels through a medium because
  - a. the medium's particles are carried along with the wave.
  - b. the wave's energy passes from particle to particle.
  - c. the medium transfers electromagnetic energy.
  - d. the wave increases the potential energy of its medium.
- \_\_\_\_\_ 4. The maximum distance that the particles of a medium move from the rest position is the
  - a. amplitude of the wave.
  - b. wavelength of the wave.
  - c. frequency of the wave.
  - d. speed of the wave.
- \_\_\_\_\_ 5. The distance between two corresponding parts of a wave is the wave's
  - a. amplitude.
  - b. wavelength.
  - c. frequency.
  - d. speed.
- \_\_\_\_\_ 6. Frequency is measured in units called
  - a. amps.
  - b. hertz.
  - c. nodes.
  - d. antinodes.
- \_\_\_\_\_ 7. Which waves have some electrical properties and some magnetic properties?
  - a. longitudinal waves
  - b. transverse waves
  - c. mechanical waves
  - d. electromagnetic waves
- \_\_\_\_\_ 8. Electromagnetic waves can transfer energy without a(n)
  - a. medium.
  - b. electric field.
  - c. magnetic field.

- d. change in either a magnetic or an electric field.
- \_\_\_\_\_ 9. What is transferred by electromagnetic waves?
  - a. sound
  - b. electricity
  - c. electromagnetic radiation
  - d. resonance
- \_\_\_\_\_ 10. The range of electromagnetic waves placed in a certain order is called the
  - a. electromagnetic spectrum.
  - b. electromagnetic wavelength.
  - c. electromagnetic frequency.
  - d. electromagnetic field.
- \_\_\_\_\_ 11. When a police officer uses radar for speed control, the officer is using what kind of electromagnetic waves?
  - a. radio waves
  - b. gamma rays
  - c. ultraviolet rays
  - d. X-rays
- \_\_\_\_\_ 12. Which electromagnetic waves have the longest wavelengths and lowest frequencies?
  - a. infrared waves
  - b. radio waves
  - c. ultraviolet rays
  - d. gamma rays
- \_\_\_\_\_ 13. Which of the following is true of ultraviolet rays?
  - a. They are visible.
  - b. They carry information to televisions and radios.
  - c. They help your body produce vitamin D.
  - d. They provide the energy that makes your morning toast.
- \_\_\_\_\_ 14. A material that reflects or absorbs any light that strikes it is
  - a. opaque.
  - b. transparent.
  - c. translucent.
  - d. concave.
- \_\_\_\_\_ 15. Frosted glass and wax paper are
  - a. transparent.
  - b. translucent.
  - c. clear.
  - d. opaque.
- \_\_\_\_\_ 16. Clear glass, water, and air are examples of what kind of material?
  - a. opaque
  - b. fluid
  - c. translucent
  - d. transparent
- \_\_\_\_\_ 17. How would a tomato look under blue light?
  - a. The tomato would seem to disappear.
  - b. The tomato would still appear red.

- c. The tomato would appear black.
  - d. The tomato would appear white.
- \_\_\_\_\_ 18. The primary colors of light are
- a. red, yellow, and blue.
  - b. yellow, cyan, and magenta.
  - c. red, green, and blue.
  - d. red, orange, yellow, green, blue, and violet.
- \_\_\_\_\_ 19. Colored substances that are used to color other materials are called
- a. pigments.
  - b. lenses.
  - c. mirages.
  - d. filters.
- \_\_\_\_\_ 20. Any two primary colors of light combined in equal amounts produce
- a. a complementary color.
  - b. a secondary color.
  - c. a fluorescent color.
  - d. the third primary color.
- \_\_\_\_\_ 21. The bending of light rays as they enter a new medium is called
- a. diffuse reflection.
  - b. regular reflection.
  - c. refraction.
  - d. diffraction.
- \_\_\_\_\_ 22. What happens when light passes from air into water?
- a. The light speeds up.
  - b. The light continues at the same speed.
  - c. The light slows down.
  - d. The light forms a mirage.
- \_\_\_\_\_ 23. When the surface of a mirror curves inward, like the inside of a bowl, it is called a
- a. plane mirror.
  - b. convex mirror.
  - c. concave mirror.
  - d. diffuse mirror.
- \_\_\_\_\_ 24. What type of image does a plane mirror produce?
- a. real and inverted
  - b. virtual and inverted
  - c. real and upright
  - d. virtual and upright
- \_\_\_\_\_ 25. A flat sheet of glass with a silver-colored coating on one side is a
- a. plane lens.
  - b. plane mirror.
  - c. convex mirror.
  - d. concave lens.
- \_\_\_\_\_ 26. What instruments use lenses or mirrors to collect and focus light from distant objects?
- a. microscopes
  - b. optical fibers

- c. telescopes
- d. lasers
- \_\_\_\_\_ 27. Which device uses lenses to focus light rays and record an image of an object on photographic film?
  - a. microscope
  - b. reflecting telescope
  - c. refracting telescope
  - d. camera
- \_\_\_\_\_ 28. Cone cells enable you to see
  - a. colors.
  - b. black and white.
  - c. at night.
  - d. nearby objects.
- \_\_\_\_\_ 29. Because of the way in which the lens of the eye bends light rays, the image produced by the lens is
  - a. black and white.
  - b. usually blurred.
  - c. right side up.
  - d. upside down.
- \_\_\_\_\_ 30. The law of reflection states that
  - a. reflection occurs when an object or wave bounces off a surface through which it cannot pass.
  - b. the angle of reflection equals the angle of incidence.
  - c. the color of an opaque object is the color of the light it reflects.
  - d. convex mirrors reflect parallel rays of light.

### Modified True/False

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

- \_\_\_\_\_ 31. Waves that require a medium through which to travel are called electromagnetic waves.  
\_\_\_\_\_
- \_\_\_\_\_ 32. The unit associated with amplitude is the hertz. \_\_\_\_\_
- \_\_\_\_\_ 33. Electromagnetic waves that have wavelengths slightly shorter than those of visible light are called ultraviolet rays. \_\_\_\_\_
- \_\_\_\_\_ 34. A transparent material absorbs light. \_\_\_\_\_
- \_\_\_\_\_ 35. A white carpet will appear red when viewed through a red filter because the filter absorbs red light only. \_\_\_\_\_
- \_\_\_\_\_ 36. A secondary color of light is produced by mixing three primary colors together.  
\_\_\_\_\_
- \_\_\_\_\_ 37. A virtual image is formed where light rays meet at a point. \_\_\_\_\_
- \_\_\_\_\_ 38. The eyepiece of a telescope or microscope magnifies an image. \_\_\_\_\_

- \_\_\_\_\_ 39. Reflection occurs when a light ray enters a new medium at an angle, causing it to change speed and direction. \_\_\_\_\_
- \_\_\_\_\_ 40. A(n) trough is made of electric and magnetic fields at right angles to one another. \_\_\_\_\_

### **Completion**

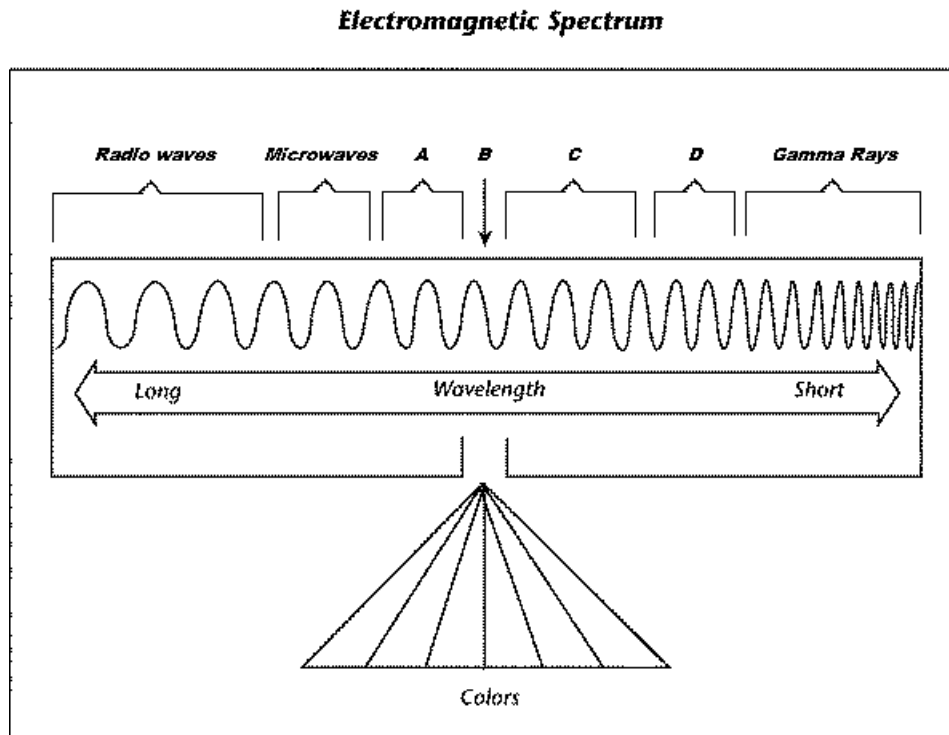
*Complete each statement.*

41. A mechanical wave is created when a medium \_\_\_\_\_, or moves back and forth or up and down.
42. The material through which a wave travels is called a(n) \_\_\_\_\_.
43. The \_\_\_\_\_ of a mechanical wave is a direct measure of its energy.
44. An electromagnetic wave consists of changing electric and magnetic \_\_\_\_\_.
45. The \_\_\_\_\_ rays in sunlight can cause sunburn.
46. The radio waves with the shortest wavelengths and the highest frequencies are called \_\_\_\_\_.
47. \_\_\_\_\_ are used to make images of bones inside the human body.
48. A(n) \_\_\_\_\_ material is one that allows light to pass through it, but not very well.
49. An opaque object has a particular color because it reflects some wavelengths of light and \_\_\_\_\_ the rest.
50. A green pepper will appear \_\_\_\_\_ when viewed under blue light.
51. The color of a translucent object is the color of the light it \_\_\_\_\_.
52. When the three primary pigments are mixed, the resulting color is \_\_\_\_\_.
53. Any two colors that combine to form \_\_\_\_\_ light are called complementary colors.
54. Because of refraction, glass prisms separate white light into a visible \_\_\_\_\_ of colors.
55. A(n) \_\_\_\_\_ image formed by a lens is always on the side of the lens opposite the object.
56. A convex mirror reflects incoming parallel rays of light as though they came from \_\_\_\_\_ the mirror.
57. A(n) \_\_\_\_\_ uses a combination of lenses to form enlarged images of very small objects.
58. The type of image formed by the lens of a camera is a(n) \_\_\_\_\_ image.
59. The \_\_\_\_\_ of the eye bends light rays and focuses them.

60. The speed and angle at which light travels through a medium is determined by the angle at which light enters the medium and the \_\_\_\_\_ of the medium.

### Short Answer

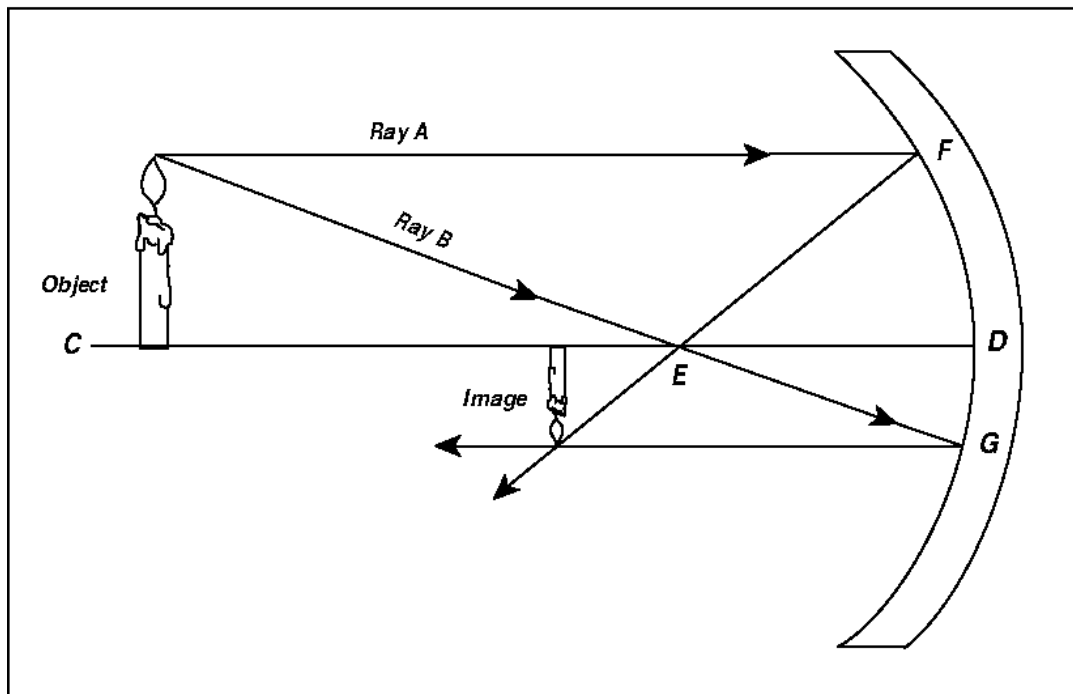
*Use the diagram to answer each question.*



61. Name the type of wave that has the highest frequency.
62. Name the type of wave labeled C.
63. Which letter shows the type of wave that can be seen by the human eye?
64. Name the type of wave labeled A.
65. Which letter indicates X-rays?
66. Name the type of wave that has the greatest energy.

*Use the diagram to answer each question.*

## Mirror



67. What type of mirror is shown?
68. Name and define point E.
69. What type of image does this mirror form?
70. Relate the size and orientation of the image formed by the mirror to the size and orientation of the original object.
71. What type of image will form if the candle is placed between E and D?
72. What will happen if parallel rays of light are directed toward the mirror?

## Essay

73. Compare and contrast the properties of visible light, ultraviolet rays, and X-rays.
74. What properties of gamma rays make them useful in medicine? Explain.
75. A piece of cloth appears red under red light, green under green light, and blue under blue light. What color is the cloth? Explain why it cannot be any other color.
76. You look at your reflection on the inner surface of a spoon held about 30 centimeters away. Then you turn the spoon around and look at the reflection on the back of the spoon. Compare and contrast the two images.
77. What causes refraction?

78. What is the only type of image that can be formed by both a concave lens and a convex lens? For each lens, explain the position of the object relative to the lens that will produce that type of image.
79. How might an artist and a theater-lighting technician compare and contrast their methods for mixing colors? Mention some of the important differences and similarities between pigments and light.
80. Compare and contrast the way light interacts with objects that are transparent, translucent, and opaque. Explain how your eyes see each type of object as a result.



## Life Science, Ch. 2 Test

### Answer Section

#### MULTIPLE CHOICE

1. ANS: A                      PTS: 1                      DIF: L1  
OBJ: CaLS.2.1.1 Explain what causes waves.                      STA: S 7.6  
BLM: knowledge
2. ANS: D                      PTS: 1                      DIF: L1  
OBJ: CaLS.2.1.1 Explain what causes waves.                      STA: S 7.6  
BLM: knowledge
3. ANS: B                      PTS: 1                      DIF: L2  
OBJ: CaLS.2.1.1 Explain what causes waves.                      STA: S 7.6  
BLM: comprehension
4. ANS: A                      PTS: 1                      DIF: L1  
OBJ: CaLS.2.1.2 Describe the basic properties of waves.                      STA: S 7.6  
BLM: knowledge
5. ANS: B                      PTS: 1                      DIF: L1  
OBJ: CaLS.2.1.2 Describe the basic properties of waves.                      STA: S 7.6  
BLM: knowledge
6. ANS: B                      PTS: 1                      DIF: L1  
OBJ: CaLS.2.1.2 Describe the basic properties of waves.                      STA: S 7.6  
BLM: knowledge
7. ANS: D                      PTS: 1                      DIF: L1  
OBJ: CaLS.2.1.3 State what an electromagnetic wave consists of.  
STA: S 7.6                      BLM: knowledge
8. ANS: A                      PTS: 1                      DIF: L1  
OBJ: CaLS.2.1.3 State what an electromagnetic wave consists of.  
STA: S 7.6                      BLM: knowledge
9. ANS: C                      PTS: 1                      DIF: L1  
OBJ: CaLS.2.1.3 State what an electromagnetic wave consists of.  
STA: S 7.6                      BLM: knowledge
10. ANS: A                      PTS: 1                      DIF: L1  
OBJ: CaLS.2.1.4 Name the waves that make up the electromagnetic spectrum.  
STA: S 7.6.a                      BLM: knowledge
11. ANS: A                      PTS: 1                      DIF: L2  
OBJ: CaLS.2.1.4 Name the waves that make up the electromagnetic spectrum.  
STA: S 7.6.a                      BLM: comprehension
12. ANS: B                      PTS: 1                      DIF: L1  
OBJ: CaLS.2.1.4 Name the waves that make up the electromagnetic spectrum.  
STA: S 7.6.a                      BLM: knowledge
13. ANS: C                      PTS: 1                      DIF: L1  
OBJ: CaLS.2.1.4 Name the waves that make up the electromagnetic spectrum.  
STA: S 7.6.a                      BLM: knowledge

14. ANS: A PTS: 1 DIF: L1  
OBJ: CaLS.2.2.1 Describe how white light interacts with an object.  
STA: S 7.6.f BLM: knowledge
15. ANS: B PTS: 1 DIF: L1  
OBJ: CaLS.2.2.1 Describe how white light interacts with an object.  
STA: S 7.6.f BLM: knowledge
16. ANS: D PTS: 1 DIF: L2  
OBJ: CaLS.2.2.1 Describe how white light interacts with an object.  
STA: S 7.6.f BLM: application
17. ANS: C PTS: 1 DIF: L2  
OBJ: CaLS.2.2.2 Describe what determines the color of an opaque object.  
STA: S 7.6.b BLM: application
18. ANS: C PTS: 1 DIF: L1  
OBJ: CaLS.2.3.2 Explain how mixing pigments is different from mixing colors of light.  
STA: S 7.6.b BLM: knowledge
19. ANS: A PTS: 1 DIF: L1  
OBJ: CaLS.2.3.2 Explain how mixing pigments is different from mixing colors of light.  
STA: S 7.6.b BLM: knowledge
20. ANS: B PTS: 1 DIF: L2  
OBJ: CaLS.2.3.2 Explain how mixing pigments is different from mixing colors of light.  
STA: S 7.6.b BLM: comprehension
21. ANS: C PTS: 1 DIF: L1  
OBJ: CaLS.2.4.2 Explain why light rays bend when they enter a medium at an angle.  
STA: S 7.6.c BLM: knowledge
22. ANS: C PTS: 1 DIF: L2  
OBJ: CaLS.2.4.2 Explain why light rays bend when they enter a medium at an angle.  
STA: S 7.6.c BLM: comprehension
23. ANS: C PTS: 1 DIF: L1  
OBJ: CaLS.2.4.3 Describe what determines the types of images formed by convex and concave lenses. STA: S 7.6.g BLM: knowledge
24. ANS: D PTS: 1 DIF: L1  
OBJ: CaLS.2.4.3 Describe what determines the types of images formed by convex and concave lenses. STA: S 7.6.g BLM: knowledge
25. ANS: B PTS: 1 DIF: L1  
OBJ: CaLS.2.4.3 Describe what determines the types of images formed by convex and concave lenses. STA: S 7.6.g BLM: knowledge
26. ANS: C PTS: 1 DIF: L1  
OBJ: CaLS.2.5.1 Describe how lenses are used in telescopes microscopes and cameras.  
STA: S 7.6.d BLM: comprehension
27. ANS: D PTS: 1 DIF: L1  
OBJ: CaLS.2.5.1 Describe how lenses are used in telescopes microscopes and cameras.  
STA: S 7.6.d BLM: knowledge
28. ANS: A PTS: 1 DIF: L1  
OBJ: CaLS.2.2.1 Describe how white light interacts with an object.  
STA: S 7.6.b BLM: knowledge

29. ANS: D PTS: 1 DIF: L2  
OBJ: CaLS.2.4.1 Explain how one sees objects. STA: S 7.6.e  
BLM: comprehension
30. ANS: B PTS: 1 DIF: L1  
OBJ: CaLS.2.3.1 State the law of reflection. STA: S 7.6.g  
BLM: knowledge

### MODIFIED TRUE/FALSE

31. ANS: F, mechanical
- PTS: 1 DIF: L1 OBJ: CaLS.2.1.1 Explain what causes waves.  
STA: S 7.6 BLM: knowledge
32. ANS: F, frequency
- PTS: 1 DIF: L1  
OBJ: CaLS.2.1.2 Describe the basic properties of waves. STA: S 7.6  
BLM: knowledge
33. ANS: T PTS: 1 DIF: L2  
OBJ: CaLS.2.1.4 Name the waves that make up the electromagnetic spectrum.  
STA: S 7.6.a BLM: comprehension
34. ANS: F, transmits
- PTS: 1 DIF: L1  
OBJ: CaLS.2.2.1 Describe how white light interacts with an object.  
STA: S 7.6.f BLM: knowledge
35. ANS: F, transmits
- PTS: 1 DIF: L2  
OBJ: CaLS.2.2.2 Describe what determines the color of an opaque object.  
STA: S 7.6.b BLM: application
36. ANS: F, two
- PTS: 1 DIF: L1  
OBJ: CaLS.2.3.2 Explain how mixing pigments is different from mixing colors of light.  
STA: S 7.6.b BLM: knowledge
37. ANS: F, real
- PTS: 1 DIF: L1  
OBJ: CaLS.2.4.3 Describe what determines the types of images formed by convex and concave lenses. STA: S 7.6.b BLM: knowledge
38. ANS: T PTS: 1 DIF: L1  
OBJ: CaLS.2.5.1 Describe how lenses are used in telescopes microscopes and cameras.  
STA: S 7.6.d BLM: knowledge
39. ANS: F, Refraction

PTS: 1 DIF: L2  
OBJ: CaLS.2.4.2 Explain why light rays bend when they enter a medium at an angle.  
STA: S 7.6.c BLM: comprehension

40. ANS: F, electromagnetic wave

PTS: 1 DIF: L2  
OBJ: CaLS.2.1.3 State what an electromagnetic wave consists of.  
STA: S 7.6.a BLM: comprehension

## COMPLETION

41. ANS: vibrates

PTS: 1 DIF: L1 OBJ: CaLS.2.1.1 Explain what causes waves.  
STA: S 7.6 BLM: knowledge

42. ANS: medium

PTS: 1 DIF: L1 OBJ: CaLS.2.1.1 Explain what causes waves.  
STA: S 7.6 BLM: knowledge

43. ANS: amplitude

PTS: 1 DIF: L1  
OBJ: CaLS.2.1.2 Describe the basic properties of waves. STA: S 7.6  
BLM: knowledge

44. ANS: fields

PTS: 1 DIF: L1  
OBJ: CaLS.2.1.3 State what an electromagnetic wave consists of.  
STA: S 7.6 BLM: knowledge

45. ANS: ultraviolet

PTS: 1 DIF: L1  
OBJ: CaLS.2.1.4 Name the waves that make up the electromagnetic spectrum.  
STA: S 7.6.a BLM: knowledge

46. ANS: microwaves

PTS: 1 DIF: L1  
OBJ: CaLS.2.1.4 Name the waves that make up the electromagnetic spectrum.  
STA: S 7.6.a BLM: knowledge

47. ANS:  
X-rays  
X rays

PTS: 1 DIF: L1

- OBJ: CaLS.2.1.4 Name the waves that make up the electromagnetic spectrum.  
STA: S 7.6.a BLM: knowledge  
48. ANS: translucent
- PTS: 1 DIF: L1  
OBJ: CaLS.2.2.1 Describe how white light interacts with an object.  
STA: S 7.6.f BLM: knowledge  
49. ANS: absorbs
- PTS: 1 DIF: L2  
OBJ: CaLS.2.2.2 Describe what determines the color of an opaque object.  
STA: S 7.6.f BLM: comprehension  
50. ANS: black
- PTS: 1 DIF: L2  
OBJ: CaLS.2.2.2 Describe what determines the color of an opaque object.  
STA: S 7.6.b BLM: application  
51. ANS: transmits
- PTS: 1 DIF: L1  
OBJ: CaLS.2.2.2 Describe what determines the color of an opaque object.  
STA: S 7.6.b BLM: knowledge  
52. ANS: black
- PTS: 1 DIF: L2  
OBJ: CaLS.2.3.2 Explain how mixing pigments is different from mixing colors of light.  
STA: S 7.6.b BLM: comprehension  
53. ANS: white
- PTS: 1 DIF: L1  
OBJ: CaLS.2.3.2 Explain how mixing pigments is different from mixing colors of light.  
STA: S 7.6.b BLM: knowledge  
54. ANS: spectrum
- PTS: 1 DIF: L2  
OBJ: CaLS.2.4.2 Explain why light rays bend when they enter a medium at an angle.  
STA: S 7.6.g BLM: comprehension  
55. ANS: real
- PTS: 1 DIF: L1  
OBJ: CaLS.2.4.3 Describe what determines the types of images formed by convex and concave lenses. STA: S 7.6.g BLM: knowledge  
56. ANS: behind
- PTS: 1 DIF: L2

- OBJ: CaLS.2.4.3 Describe what determines the types of images formed by convex and concave lenses. STA: S 7.6.g BLM: comprehension
57. ANS: microscope
- PTS: 1 DIF: L1
- OBJ: CaLS.2.5.1 Describe how lenses are used in telescopes microscopes and cameras.
- STA: S 7.6.d BLM: knowledge
58. ANS: real
- PTS: 1 DIF: L1
- OBJ: CaLS.2.5.1 Describe how lenses are used in telescopes microscopes and cameras.
- STA: S 7.6.d BLM: knowledge
59. ANS: lens
- PTS: 1 DIF: L1 OBJ: CaLS.2.4.1 Explain how one sees objects.
- STA: S 7.6.b BLM: knowledge
60. ANS: density
- PTS: 1 DIF: L3
- OBJ: CaLS.2.4.2 Explain why light rays bend when they enter a medium at an angle.
- STA: S 7.6.c BLM: synthesis

## SHORT ANSWER

61. ANS:  
gamma rays
- PTS: 1 DIF: L2
- OBJ: CaLS.2.1.4 Name the waves that make up the electromagnetic spectrum.
- STA: S 7.6.a BLM: application
62. ANS:  
ultraviolet rays
- PTS: 1 DIF: L2
- OBJ: CaLS.2.1.4 Name the waves that make up the electromagnetic spectrum.
- STA: S 7.6.a BLM: application
63. ANS:  
B
- PTS: 1 DIF: L2
- OBJ: CaLS.2.1.4 Name the waves that make up the electromagnetic spectrum.
- STA: S 7.6.a BLM: application
64. ANS:  
infrared rays

- PTS: 1 DIF: L2  
OBJ: CaLS.2.1.4 Name the waves that make up the electromagnetic spectrum.  
STA: S 7.6.a BLM: application
65. ANS:  
D
- PTS: 1 DIF: L2  
OBJ: CaLS.2.1.4 Name the waves that make up the electromagnetic spectrum.  
STA: S 7.6.a BLM: application
66. ANS:  
gamma rays
- PTS: 1 DIF: L2  
OBJ: CaLS.2.1.4 Name the waves that make up the electromagnetic spectrum.  
STA: S 7.6.a BLM: application
67. ANS:  
concave
- PTS: 1 DIF: L2  
OBJ: CaLS.2.4.3 Describe what determines the types of images formed by convex and concave lenses. STA: S 7.6.g BLM: application
68. ANS:  
E is the focal point, the point at which rays of light meet.
- PTS: 1 DIF: L2  
OBJ: CaLS.2.4.3 Describe what determines the types of images formed by convex and concave lenses. STA: S 7.6.g BLM: application
69. ANS:  
real
- PTS: 1 DIF: L2  
OBJ: CaLS.2.4.3 Describe what determines the types of images formed by convex and concave lenses. STA: S 7.6.g BLM: application
70. ANS:  
The image is reduced and upside down.
- PTS: 1 DIF: L2  
OBJ: CaLS.2.4.3 Describe what determines the types of images formed by convex and concave lenses. STA: S 7.6.g BLM: application
71. ANS:  
virtual
- PTS: 1 DIF: L3  
OBJ: CaLS.2.4.3 Describe what determines the types of images formed by convex and concave lenses. STA: S 7.6.g BLM: synthesis
72. ANS:

All of the rays will be reflected back through the focal point.

PTS: 1 DIF: L2

OBJ: CaLS.2.4.3 Describe what determines the types of images formed by convex and concave lenses. STA: S 7.6.g BLM: application

## ESSAY

73. ANS:

Visible light, ultraviolet rays, and X-rays are all parts of the electromagnetic spectrum, and travel at the same speed. Humans can see visible light, but not ultraviolet rays or X-rays. Ultraviolet rays have shorter wavelengths, higher frequencies, and higher energy than visible light. X-rays have shorter wavelengths, higher frequencies, and higher energy than ultraviolet rays.

PTS: 1 DIF: L2

OBJ: CaLS.2.1.4 Name the waves that make up the electromagnetic spectrum.

STA: S 7.6.a BLM: analysis

74. ANS:

Gamma rays have the highest energy of all the waves in the electromagnetic spectrum. They are the most penetrating waves because of their energy. Gamma rays can be used to kill cancer cells in radiation therapy. Gamma rays can also be used to examine the body's internal structures. For example, a patient can be injected with a fluid that emits gamma rays. A gamma-ray detector can then form an image of the inside of the body.

PTS: 1 DIF: L2

OBJ: CaLS.2.1.4 Name the waves that make up the electromagnetic spectrum.

STA: S 7.6.a BLM: comprehension

75. ANS:

White. If the cloth were any other color, it would appear black when seen through at least one of the filters because it would absorb the colored light. Only a white cloth reflects all colors of light.

PTS: 1 DIF: L3

OBJ: CaLS.2.2.2 Describe what determines the color of an opaque object.

STA: S 7.6.e BLM: application

76. ANS:

The first image would be a real image that is reduced and inverted. The second image would be a virtual image that is reduced and right-side up.

PTS: 1 DIF: L2

OBJ: CaLS.2.4.3 Describe what determines the types of images formed by convex and concave lenses. STA: S 7.6.g BLM: application

77. ANS:

When a wave enters a new medium at an angle, one side of the wave changes speed before the other side. As a result, the entire wave bends.



PTS: 1 DIF: L2

OBJ: CaLS.2.4.2 Explain why light rays bend when they enter a medium at an angle.

STA: S 7.6.c BLM: comprehension

78. ANS:

Virtual. The image formed by a concave lens is always virtual, no matter where the object is. A convex lens will form a virtual image when the object is between the focal point and the lens.

PTS: 1 DIF: L3

OBJ: CaLS.2.4.3 Describe what determines the types of images formed by convex and concave lenses. STA: S 7.6.g BLM: synthesis

79. ANS:

The primary colors of light are red, green, and blue, which produce white light when mixed together. The primary colors of pigments are cyan, magenta, and yellow. As more pigments are added, the color becomes darker and darker. An artist would use pigments to create colors for a painting; a theater-lighting technician would use lights to create effects onstage.

PTS: 1 DIF: L3

OBJ: CaLS.2.3.2 Explain how mixing pigments is different from mixing colors of light.

STA: S 7.6.e BLM: analysis

80. ANS:

Transparent materials transmit most of the light that strikes them. Since light passes through these objects, our eyes see through them as well. Translucent materials scatter light that passes through, so only some of the light is transmitted. We can see outlines or shapes through translucent materials, but the details are blurry. Opaque materials either reflect or absorb all of the light that hits them, so that none of the light passes through. Opaque objects appear entirely solid.

PTS: 1 DIF: L2

OBJ: CaLS.2.2.1 Describe how white light interacts with an object.

STA: S 7.6.f BLM: analysis