SOL 5.3 LIGHT

Key Concepts:
- transverse waves;
- the visible spectrum;
- opaque, transparent, and translucent;
- reflection of light from reflective surfaces;
- refraction of light through water and prisms

WAVES; WAVELENGTH; FREQUENCY

1. Which of the above waves has the longest wavelength? (2003-9)
   a. Wave #1
   b. Wave #2
   c. Wave #3
   d. Wave #4

2. Which number on the diagram shows the wavelength? (2008-8)
   a. 1
   b. 2
   c. 3
   d. 4

3. A person will see a flash of lightning before they hear the thunder that goes with it because — (2003-14)
   a. the eye is quicker than the ear
   b. the thunder occurs much later than the lightning
   c. sound travels faster through the atmosphere than light
   d. light travels faster through the atmosphere than sound

4. Which diagram shows a wave with the highest frequency? (2002-17)
   a. Wave #1
   b. Wave #2
   c. Wave #3
   d. Wave #4

5. Which of these does not emit light waves? (2006-2)
   a. A campfire
   b. A light bulb
   c. The sun
   d. The moon

REFRACTION, REFLECTION

6. By passing white light through a prism, you can tell — (2003-31)
   a. that white light is actually a mixture of different colors
   b. the mass of the prism
   c. the original source of the light
   d. that blue light is brighter than white light

7. Which of the following is the best observation of the refraction of light? (2011-12)
   a. Looking at oneself in a mirror
   b. Looking at a shadow of an object
   c. Viewing an object through an open window
   d. Viewing an object partially in water

8. Roger Bacon is credited for developing the magnifying glass. His understanding of which of these was most useful for this development? (2010-33)
   a. Light
   b. Sound
   c. Gravity
   d. Electricity
9. Which explains why the fork looks different under water?
   (2010-37)
   a. Light is refracted at an angle.
   b. The wavelength of light lengthens.
   c. Light cannot pass through the glass.
   d. The amount of light increases when going through water.

10. Students place a pencil in a glass of water as shown. The pencil in the water looks broken because —
    (2009-7)
    a. water can dissolve pencils
    b. water is colder than air
    c. light bends when it enters the water
    d. light is absorbed when it hits the glass

11. The flower’s stem appears larger under water because the
    (2007-20)
    a. absorbs light
    b. produces light
    c. repels light
    d. refracts light

12. A periscope works by using the reflection of mirrors. Tama made several periscopes for watching baby birds in a nest. Which periscope will work?
    (2001-25)

13. When light hits an object, the rays can pass through it, bounce off it, or be absorbed by it. Light rays that bounce back are —
    (2002-40)
    a. radiant
    b. reflected
    c. refracted
    d. radar

14. Which of the following materials is transparent?
    (2002-6)
    a. Clear window glass
    b. Your eyelids
    c. Solid wood door
    d. White paper

15. Which of these objects is opaque?
    (2008-10)
    a. A brick wall
    b. Eyeglass lenses
    c. Liquid water
    d. Stained glass windows

16. Which of these objects is translucent?
    (2009-30)
    a. A student’s notebook
    b. A mirror on the bus
    c. A brick wall of the school
    d. A student’s sunglass lenses

17. Which part of an automobile is transparent?
    (2011-24)
    a. Door Handle
    b. Side Mirror
    c. Hubcap
    d. Windshield

18. Which of these correctly shows how light acts when it hits a mirror?
    (2009-16)
19. Two flashlights are turned on. The light rays they create are shown in the diagram. These light rays best illustrate that —

(a) both rays are reflected  
(b) both rays are refracted  
(c) Ray 1 is reflected and Ray 2 is refracted  
(d) Ray 1 is refracted and Ray 2 is reflected

20. Which object helps people understand what makes up white light?

(a) Barometer  
(b) Prism  
(c) Microscope  
(d) Thermometer

21. A shiny aluminum screen can be placed on the windshield of a parked car. This screen helps to keep the car cool because it —

(a) reflects the sunlight  
(b) absorbs heat  
(c) causes evaporation  
(d) conducts electricity

22. Which of the following would reflect rather than refract light?

(a) Magnifying glass  
(b) Mirror  
(c) Prism  
(d) Lens

23. The picture shows a study that Isaac Newton made with a prism to produce a spectrum. Newton’s discovery led most directly to an understanding of the cause of —

(a) x-rays  
(b) spots  
(c) rainbows  
(d) starlight

24. Which tool is used to separate white light into the color spectrum?

(a) A  
(b) B  
(c) C  
(d) D