

Alternative Chapter Assessment

1. The magnification of a telescope is determined by:
 - a) the focal lengths of the lenses
 - b) the diameters of the lenses

2. To make a telescope, you need:
 - a) two concave lenses
 - b) a mirror and a convex lens
 - c) two convex lenses

3. A speedometer with a dial and a pointer makes:
 - a) a digital representation of speed
 - b) an analog representation of speed

4. A digital image is made from:
 - a) an analog signal
 - b) a light signal
 - c) a series of ones and zeroes

5. Which of the following is *not* an electromagnetic wave?
 - a) light
 - b) infrared
 - c) x-rays
 - d) sound

6. A diffraction grating contains many:
 - a) dots
 - b) wavelengths
 - c) parallel lines
 - d) colors

7. Which stores more information?
 - a) the long-playing record
 - b) the compact disc

8. Astronomers use parallax to measure the distance to:

- a) nearby stars
- b) distant stars
- c) distant galaxies

9. If a source of sound begins moving toward you, the pitch you hear, compared to the pitch if the source were stationary, would be:

- a) higher
- b) lower
- c) the same

10. A light-year is:

- a) a speed unit
- b) a time unit
- c) a distance unit

11. The highest speed ever recorded is the speed of _____.

12. How do you find the focal length of a lens?

13. Explain how a real image is different from a virtual image.

14. Here is the digital data that represents a number.

A zero stands for a white pixel, and a one stands for a black pixel.

1 0 1 1 1 1 0 0 1 0 0 1 0 0 1

In the boxes shown here, make the number from these digits.

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15. a) Tell one way that light waves are similar to radio waves.

b) Tell one way that light waves are different from radio waves.

16. You looked at the spectrum of different substances that were in the spectrum tubes. How can a scientist use the spectrum to identify the substance?
17. a) How is a sound recording stored on a long-playing record?
b) How is a sound recording stored on a compact disc?
c) Which is better, and why?
18. a) Suppose your friend stands near the middle of a soccer field. You walk up and down one sideline and observe your friend. If you move 20 meters down the sideline, how does the position of your friend seem to change?
b) How could you measure the distance to your friend?
19. Explain how astronomers measure how faraway galaxies are moving. Give as much detail as you can.
20. a) Name two different methods to send a message to an extraterrestrial civilization.
b) Explain why one method is better than the other.
21. a) If we sent a message to extraterrestrials, how long might it take to receive a reply?
b) Explain how your answer to **Part (a)** makes communication more difficult.