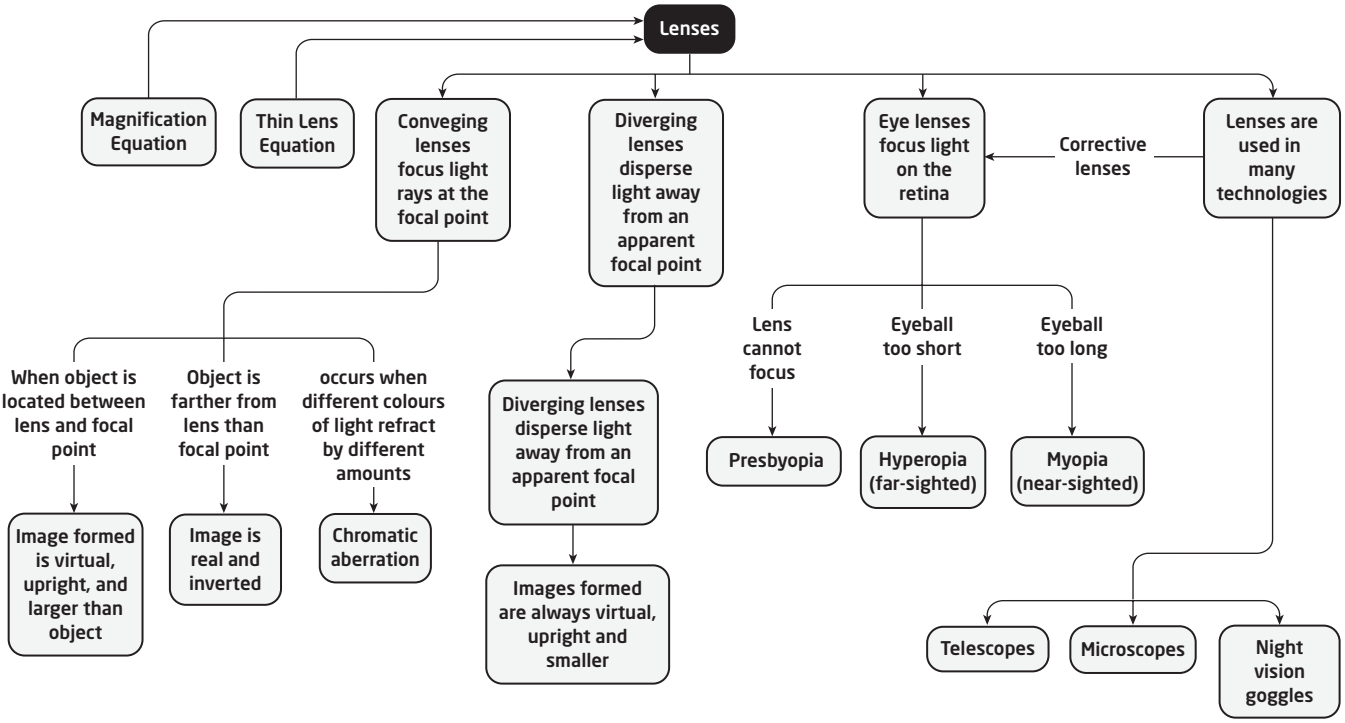
Chapter Review Answers (Student textbook pages 518 to 519)

Please also see **BLM 12-11 Chapter 12 Review (Alternative Format).**

Make Your Own Summary



Reviewing Key Terms

1. b.

2. c.

3. f.

4. a.

5. g.

6. e.

7. d.

Knowledge and Understanding

8. converging lens

9. The light rays bend toward the normal as they enters the glass, but they bend away from the normal as they leave the glass. The rays do not change direction, but they do shift.

10. Light can pass through a lens from either side, so there is a focal point on each side of the lens and at the same distance from the centre of the lens. Light can only pass through a mirror from one side.

11. the curvature of the lens and the thickness of the lens

12. the dispersion of light through a lens

13. Converging lens; The object must be between the focal point and the lens.

14. When lenses are thin, the spherical and chromatic aberration are small enough to be ignored.

15. a. Kepler's telescope allowed for greater magnification than Galileo's.

b. The image was inverted.

16. a. When the ray meets the centre of the lens, it travels in a direction that appears to have come from the focal point on the left side of the lens.

b. continues through the lens without changing direction

c. leaves the lens travelling parallel to the principal axis

17. A night-vision device works by intensifying what little light there is. In complete darkness, there is no light to intensify, and so someone could not see inside a building.

Thinking and Investigating

18. A. See Figure 12.12C on student textbook page 496. The image is closer to the lens than the object is, inverted, smaller than the object, and real.

B. See Figure 12.12B on student textbook page 496. The image is farther to the lens than the object is, inverted, larger than the object, and real.

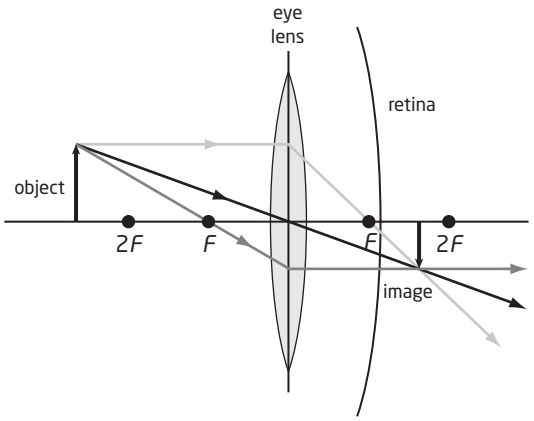
C. See Figure 12.12A on student textbook page 496. The image is farther to the lens than the object is, upright, larger than the object, and virtual.

D. See the diagram for step 5 in Table 12.2 on student textbook page 497. The image is closer to the lens than the object is, upright, smaller than the object, and virtual.

19. The pinhole is a very small source of light. The ray diagram should show that a light from the bottom and top of the object meets at the pinhole and, by extending the lines, show that the rays create a real image on the back of pinhole camera.

20. The small aperture excludes rays from the edges of the lens, where the prism-like shape causes rays to refract away from the focal point.

21. In a person with hyperopia, the image forms behind the retina, so the person sees a blurry image.



22. Example: The focal length of a lens can be used to correct vision.

23. Example: The microscope has provided an incredible amount of useful information in the studies of biology and chemistry. These sciences contribute to understanding the body, disease, and disease prevention.

Application

24. Example: Contact lenses are thinner than eyeglasses, reducing spherical and chromatic aberration.

25. Examples: night time search and rescue; wildlife research; a manhunt in the dark

26. Example: Your eyes have become less elastic and harder to focus. You will benefit from corrective lenses for both close viewing and distance. Bifocals combine both corrective lenses into one pair of glasses (or contact lenses). It takes some getting used to, but is very convenient and less expensive than separate pairs.