

Directed Reading 30.1 (ODD)**Section: Characteristics of Stars**

1. What is a star?

2. How does the color of stars seen from Earth differ from their actual color?

ANALYZING STARLIGHT

_____ 3. How do astronomers learn about stars?

- a. by analyzing the sounds that stars absorb
- b. by analyzing the light that stars emit
- c. by analyzing the sounds that stars emit
- d. by analyzing the light that stars absorb

_____ 4. What are spectrographs?

- a. devices that separate light into different colors
- b. devices that separate light into different gases
- c. graphs that separate light into different spectra
- d. devices that gather light into different spectra

_____ 5. What are the three types of spectra?

- a. remission, bright-line, and contiguous
- b. emission, absorption, and composite
- c. emission, absorption, and continuous
- d. transmission, absorption, and continuous

_____ 6. What does a star's dark-line spectrum reveal?

- a. the star's distance and size
- b. the star's composition and magnitude
- c. the star's texture and temperature
- d. the star's composition and temperature

_____ 7. What is true of the layers of a star?

- a. the inner layers are very cool; the outer layers are somewhat cool
- b. the outer layers are very hot; the inner layers are somewhat cooler
- c. the inner layers are very hot; the outer layers are somewhat cooler
- d. the outer layers are very hot; the inner layers are somewhat hot

Directed Reading *continued*

8. Elements in the outer layers of a star absorb
- a. some of the light radiating from within the star.
 - b. some of the light radiating from outside the star.
 - c. none of the light radiating from outside the star.
 - d. none of the light radiating from inside the star.

9. What do the colors and lines in the spectrum of a star indicate?

10. What is the most common element in stars? What is the second most common element?

In the space provided, write the letter of the color that best matches the surface temperature of the star.

_____ 11. 3,000 °C

a. red

_____ 12. 35,000 °C

b. yellow

_____ 13. 5,500 °C

c. blue

14. What is indicated by a star's color?

15. What is the temperature range of most stars?

16. What color are the coolest stars?

17. What color are the hottest stars?

18. What is the diameter of the sun?

- a. 1,390,000 km
- b. 11,390,000 km
- c. 1,390,000 miles
- d. 390,000 km

Directed Reading *continued*

- ____ 19. Stars that are very dense may have
- a. greater temperature than the sun and still be much larger.
 - b. less mass than the sun and still be much smaller than the sun.
 - c. more mass than the sun and still be much smaller than the sun.
 - d. lower temperature than the sun and still be much larger.

STELLAR MOTION

- ____ 20. What two kinds of motion are associated with stars?
- a. inferred motion and actual motion
 - b. actual motion and apparent motion
 - c. actual motion and imagined motion
 - d. inferred motion and apparent motion
- ____ 21. What causes the apparent motion of the stars, which we can see with the unaided eye?
- a. the actual movement of the stars
 - b. the movement of the skies
 - c. the movement of the sun
 - d. the movement of Earth
- ____ 22. What causes the circular trails of light seen in long-exposure photographs of the stars?
- a. the revolution of the stars around the North Pole
 - b. the rotation of Earth on its axis
 - c. the revolution of Earth around the sun
 - d. the rotation of the stars on their axes
- ____ 23. In the Northern Hemisphere, circumpolar stars appear
- a. to be extremely distant.
 - b. to circle the sun.
 - c. to circle Polaris, the North Star.
 - d. to circle Mars and Venus.
- ____ 24. What is true of all visible stars at the North Pole?
- a. They are visible at the South Pole.
 - b. They are circumpolar.
 - c. They are perpendicular.
 - d. They are brighter than the sun.
25. What are three types of actual motion that stars may have?

Directed Reading *continued*

26. What is the Doppler effect?

27. What does the fact that most distant galaxies have red-shifted spectra indicate?

DISTANCES TO STARS

28. What is a light-year?

- a. the distance that light travels in one year
- b. the same as the speed of light
- c. the amount of time it takes light to travel one mile
- d. the distance that light travels in one second

29. How many kilometers does light travel in one year?

- a. 300,000 km
- b. 9.46 billion km
- c. 700 trillion km
- d. 9.46 trillion km

30. When we witness an event on the sun, when did it actually take place?

- a. about 8 min before we saw it
- b. about 80 years ago
- c. about 8 light-years before we saw it
- d. about 8 years before we saw it

31. Except for the sun, what star is nearest to Earth?

- a. Polaris
- b. Proxima Centauri
- c. Alpha Centauri
- d. Jupiter

32. What is parallax, and how do scientists use it?

Directed Reading *continued*

33. Astronomers have measured the distance to about a million stars. At what distance are these stars?

STELLAR BRIGHTNESS

_____ 34. How many stars can be seen without a telescope on Earth?

- a. about 6,000
- b. more than 3 billion
- c. less than 1,000
- d. more than 3 trillion

_____ 35. What is the *Hubble Space Telescope*?

- a. a sun-orbiting telescope
- b. an Earth-orbiting telescope
- c. a land-based telescope
- d. a Mars-orbiting telescope

36. What is a star's apparent magnitude?

37. What is a star's absolute magnitude?
