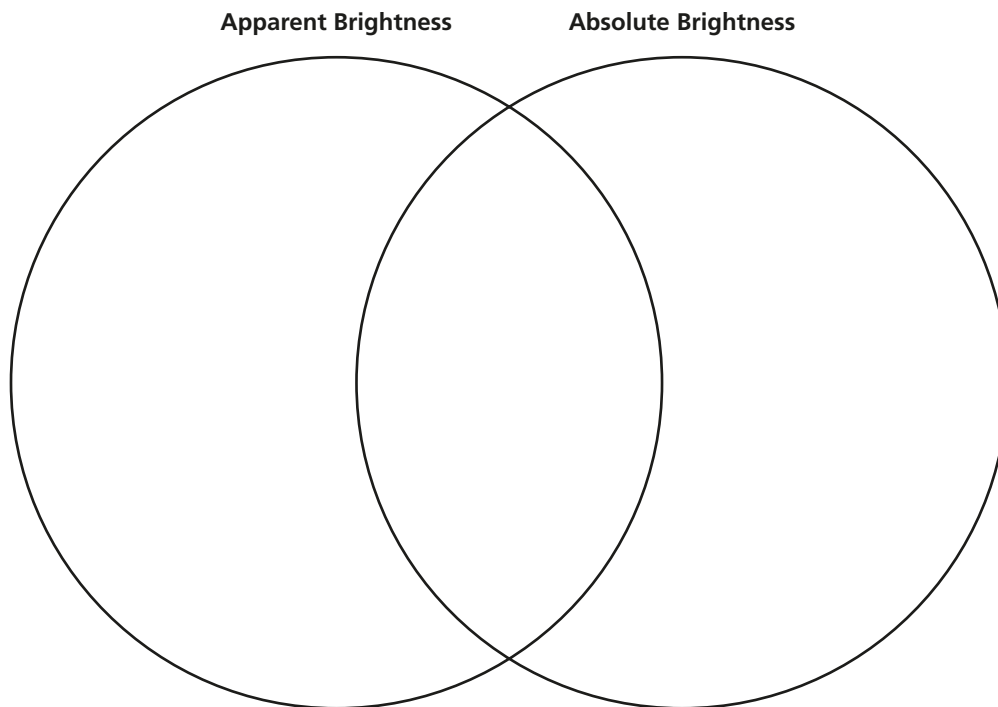


Stars, Galaxies, and the Universe ▪ *Reading/Notetaking Guide***Characteristics of Stars** (pp. 598–605)

This section explains how astronomers measure distances to stars. It also describes how stars are classified.

Use Target Reading Skills

As you read about stars, compare apparent brightness and absolute brightness in the Venn diagram below. Write the similarities in the space where the circles overlap and the differences on the left and right sides.

**Introduction** (p. 598)

1. Imaginary patterns of stars are called _____.

Classifying Stars (pp. 599–600)

2. What are five characteristics used to classify stars?

a. _____ b. _____
c. _____ d. _____
e. _____

3. What reveals a star's surface temperature?

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4. Circle the letter of what is revealed by the red color of the supergiant star called Betelgeuse.
 - a. It is an extremely hot star.
 - b. It is in a constellation.
 - c. It is far away.
 - d. It is a fairly cool star.
5. Stars that are much larger than the sun are called _____.
6. Is the following sentence true or false? Each element has a unique set of lines on a spectrum. _____
7. How can astronomers infer which elements are found in a star?

8. What does a spectrograph do?

9. What is the chemical composition of most stars?

Brightness of Stars (pp. 600–601)

10. The amount of light a star gives off is called its _____.
11. Why does Rigel shine as brightly as Betelgeuse, even though Rigel is much smaller than Betelgeuse?

Stars, Galaxies, and the Universe ▪ *Reading/Notetaking Guide***Characteristics of Stars** *(continued)*

12. What two factors determine how bright a star looks from Earth?

a. _____

b. _____

13. Complete the table about the measurement of a star's brightness.

Brightness of Stars	
Measurement of Brightness	Definition
Apparent brightness	a.
Absolute brightness	b.

Star X is closer to Earth than Star Y. Star X appears brighter than Star Y.
Use the table to answer the following questions.

c. Compare Star X with Star Y using the term *apparent brightness*.

d. Can you compare the absolute brightness of Star X with Star Y? Why or why not?

14. Is the following sentence true or false? The closer a star is to Earth, the brighter it appears. _____

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15. What two things must an astronomer find out in order to calculate a star's absolute brightness?

a. _____

b. _____

Measuring Distances to Stars (pp. 602–603)

16. Is the following sentence true or false? In space, light travels at a speed of 300,000 kilometers per year. _____

17. What is a light-year?

18. A light-year equals about _____ kilometers.

19. Is the following sentence true or false? The light-year is a unit of time.

20. What is parallax?

21. Astronomers frequently use parallax to measure the distance to which of the following objects?

a. distant stars

b. the sun

c. the planets

d. nearby stars

22. To measure parallax shift, astronomers look at the same star at two different times of the year, when Earth is on different sides of the

_____.

The Hertzsprung-Russell Diagram (pp. 604–605)

23. The diagram that shows the relationship between the surface temperatures of stars and their absolute brightness is called the

_____.

24. Look at the Hertzsprung-Russell diagram in your textbook. Write what is measured on each of the two axes of the diagram.

a. *x*-axis (horizontal axis): _____

b. *y*-axis (vertical axis): _____

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Characteristics of Stars *(continued)*

25. An area on the Hertzsprung-Russell diagram that runs from the upper left to the lower right and includes more than 90 percent of all stars is called the _____.
26. Circle the letter of each sentence that is true based on the Hertzsprung-Russell diagram in your textbook.
 - a. The sun is a main-sequence star.
 - b. The absolute brightness of white dwarfs is greater than that of supergiants.
 - c. Rigel is hotter than Betelgeuse.
 - d. The absolute brightness of Polaris is greater than that of the sun.