Name _____ Date _____ Class _____

Characteristics of Stars

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, stop and write what you know about that topic. As you read the section, write what you learn. An example is done for you.

What You Know
1. Stars are bright and hot.
2.
3.

What You Learned
1.
2.
3.

Introduction

1. Imaginary patterns of stars are called _____.

Classifying Stars

2. What are five characteristics used to classify stars?

a. _____ **b.** _____

c. _____ **d.** _____

e. _____

3. What reveals a star's temperature?

_____

_____

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

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?

_____

_____

_____

_____

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 is. _____

Characteristics of Stars *(continued)*

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

a. _____

b. _____

Measuring Distances to Stars

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 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

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): _____

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. White dwarfs are brighter than supergiants.
c. Rigel is hotter than Betelgeuse.
d. Polaris is brighter than the sun.