78 points total

Name _____ Class _____ Date _____

Chapter 25 Beyond Our Solar System

Section 25.1 Properties of Stars

This section describes the characteristics of stars, explains how astronomers measure distances to stars, and describes the Hertzprung-Russell diagram.

Reading Strategy

30 points

Write four details that you learned about the Hertzprung-Russell diagram on page 704.

4pts

Things I learned about the Hertzprung-Russell Diagram	
a.	b.
c.	d.

Characteristics of Stars

3pts

1. List three properties of stars. _____

2. Is the following sentence true or false? A star's color can tell you what its approximate temperature is.

3. What are binary stars? _____

_____

4. Binary stars can be used to determine the _____ of a star.

Measuring Distances to Stars

5. The apparent change in position of a star when seen from opposite sides of Earth's orbit is called _____.

6. Circle the letter of each statement that is true.

a. Nearby stars have large parallax angles.

b. Nearby stars have larger parallax angles than distant stars have.

c. All stars have measurable parallax angles.

d. The parallax angles of distant stars are too small to measure.

7. Is the following sentence true or false? Astronomers have calculated the parallax angles of millions of stars._____

8. What is a light-year? _____

_____

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Stellar Brightness

3pts

9. List three factors that control the apparent brightness of a star as seen from Earth. _____

_____

10. Is the following sentence true or false? A third-magnitude star is ten times as bright as a fourth-magnitude star.

_____

Match each definition to its term.

	Definition	Term
_____	**11.** a star's brightness as it appears from Earth	a. absolute magnitude b. apparent magnitude
_____	**12.** how bright a star actually is	

13. The star Arcturus has a much greater absolute magnitude than the sun but a much lower apparent magnitude. Why is this? _____

_____

_____

Hertzsprung-Russell Diagram

14. Circle the letter of what a Hertzsprung-Russell diagram shows.

a. the location of stars in the sky
b. the absolute magnitude and temperature of stars
c. the apparent magnitude and temperature of stars
d. the absolute magnitude and mass of stars

15. About _____ percent of stars are main-sequence stars.

5pts

16. Select the appropriate letter in the figure that identifies each of the following features.

_____ the sun

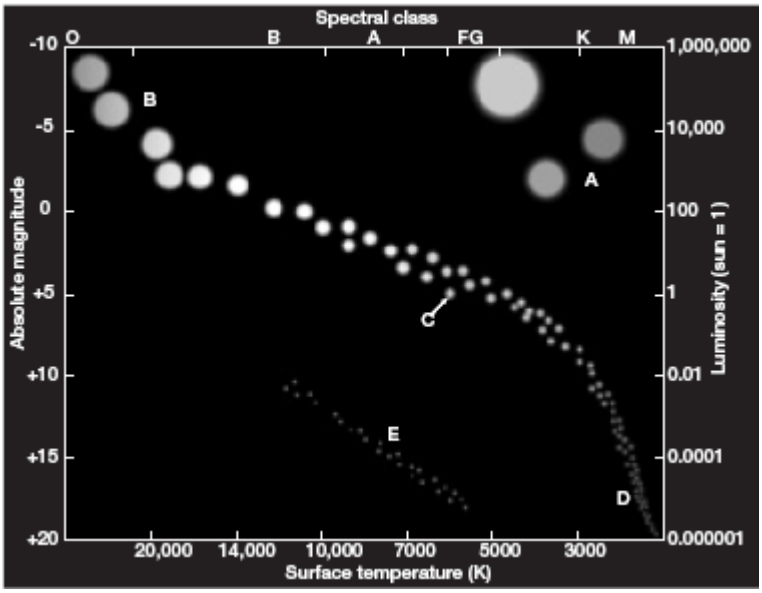
_____ cool, small, red stars

_____ white dwarfs (small faint stars)

_____ red giants (bright cool stars)

_____ hot, large, blue stars

Idealized Hertzsprung-Russell Diagram



Name _____ Class _____ Date _____

Chapter 25 Beyond Our Solar System

Section 25.2 Stellar Evolution

This section describes the evolution of stars from birth to burnout and death. It also discusses types of stellar remnants.

Reading Strategy

22 points

As you read, complete the flowchart to show how the sun evolves. Expand the chart to show the evolution of low-mass and high-mass stars. For more information on this Reading Strategy, see the **Reading and Study Skills** in the **Skills and Reference Handbook** at the end of your textbook.

2pts

Star Birth

1. What is the process by which a star is born? _____

_____

_____

8pts

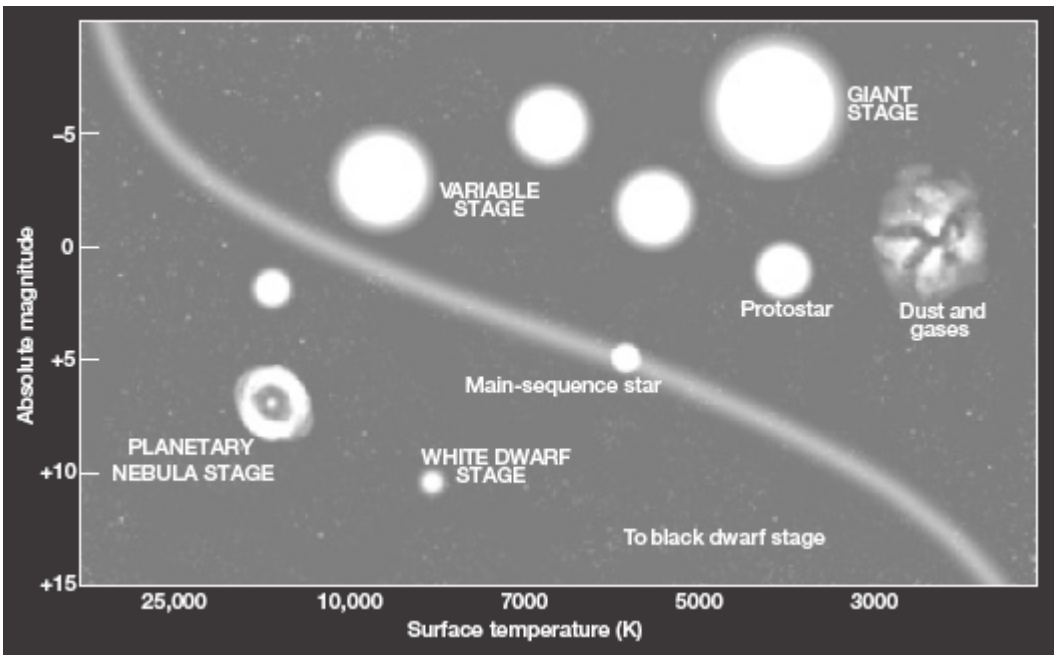
2. List in order the labeled stages shown on the figure that a medium-mass star goes through during its "life." (*Hint:* it may be helpful to draw arrows on the figure from stage to stage.)

a. _____ e. _____

b. _____ f. _____

c. _____ g. _____

d. _____ h. _____



3. A(n) _____ is a developing star not yet hot enough to engage in nuclear fusion.

4. Is the following sentence true or false? An average star spends 90 percent of its life as a helium-burning main-sequence star.

_____

Burnout and Death

5. Is the following sentence true or false? All stars eventually run out of fuel and collapse due to gravity. _____

6. How can a Hertzsprung-Russell diagram be used to show the evolution of a star? _____

_____

_____

_____

Match each death description with its star.

	Death Description	Star
_____	**7.** forms a red giant, which then collapses into a red dwarf and forms a planetary nebula	a. low-mass star
_____	**8.** blows up in a supernova explosion	b. medium-mass star
_____	**9.** does not form a red giant; collapses directly into a white dwarf	c. massive star

Stellar Remnants

10. List the stages the sun has gone through and will go through during its evolution._____

_____

_____

11. A(n) _____ is a neutron star that rotates and generates radio waves.

Match each description with its stellar remnant.

	Description	Stellar Remnant
_____	**12.** remnant of a supernova event; similar to a large atomic nucleus	a. black hole
_____	**13.** small dense object formed from the remnants of a star at least three times as massive as the sun	b. white dwarf
_____	**14.** remnant of a low-mass or medium-mass star	c. neutron star

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Section 25.3 The Universe

This section describes the Milky Way galaxy and types of galaxies. It also explains how we know the universe is expanding, how the universe probably began, and how it might end.

26 points

Reading Strategy

As you read, complete the outline of the most important ideas in this section. For more information on this Reading Strategy, see the **Reading and Study Skills** in the **Skills and Reference Handbook** at the end of your textbook.

7pts

I. The Universe

A. Milky Way Galaxy

1. _____
2. _____

B. _____

1. Spiral Galaxy _____
2. Elliptical Galaxy _____
3. _____
4. _____

_____

_____

_____

1. A(n) _____ is a large group of stars, dust, and gases held together by gravity.

The Milky Way Galaxy

2. Why is it difficult to study the Milky Way Galaxy, using optical telescopes?

_____

3. Circle the letter of the type of galaxy that the Milky Way is.

a. spiral galaxy
b. elliptical galaxy
c. irregular galaxy
d. cluster galaxy

Types of Galaxies

Match each description with its galaxy.

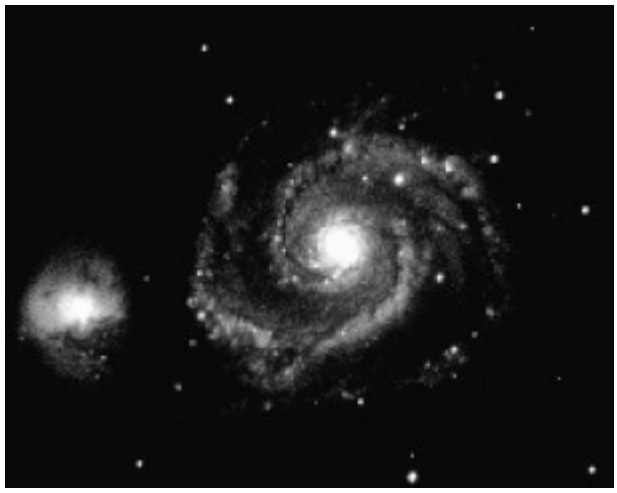
	Description	Galaxy
_____	**4.** ranges in shape from round to oval; most are small	a. spiral
_____	**5.** composed mostly of young stars	b. elliptical
_____	**6.** usually disk-shaped with many variations	c. irregular

7. Is the following sentence true or false? The disk of the Milky Way Galaxy is about 100,000 light-years wide and about 10,000 light-years thick at the nucleus.___

8. A(n) _____ of thin gas and clusters of stars surrounds the disk of the Milky Way Galaxy.

9. Galaxies are not distributed randomly but are grouped in _____.

10. The larger galaxy in the photograph is a(n) _____galaxy.



11. Is the following sentence true or false? The larger galaxy in the photograph probably contains mostly young stars.

_____

The Expanding Universe

12. Is the following sentence true or false? The Doppler effect can tell us whether a galaxy is moving toward or away from us.

_____

13. Most galaxies have Doppler shifts toward the _____end of the spectrum.

14. What is Hubble's law? _____

_____

15. The red shifts of distant galaxies show that the universe is _____

.The Big Bang

16. Is the following sentence true or false? All distant galaxies are moving away from ours because our galaxy is at the center of the universe._____

17. The _____ theory states that the universe began when a dense, hot, supermassive ball violently exploded.

18. Circle the letter of each item that is evidence for the big bang theory.

a. red shift of galaxies
b. supernova explosions
c. cosmic background radiation
d. galactic clusters

2pts

19. Describe two possible ways the universe might end._____

_____

_____

_____