# 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.*

## 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.

DRAW The Milky Way Galaxy

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. irregular galaxy
C. elliptical galaxy
D. cluster galaxy

## Types of Galaxies

*Match each description with its galaxy.*

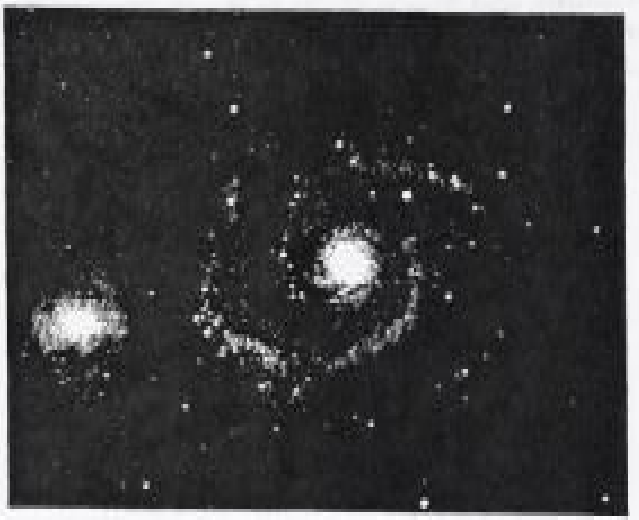
| Description | Galaxy |
|---|---|
| _____ 4. ranges in shape from round to oval; most are small | a. spiral |
| _____ 5. composed mostly of young stars | b. elliptical |
| _____ 6. usually disk-shaped with many variations | c. irregular |

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

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