

## SECTION 1-1

## SECTION SUMMARY

## Earth in Space

## 1

**Guide for Reading**

- ◆ What causes day and night?
- ◆ What causes the cycle of seasons on Earth?

The study of the moon, stars, and other objects in space is called **astronomy**. Ancient astronomers studied the movements of the sun and moon. They thought Earth was standing still and the sun and moon were moving. The sun and moon seem to move mainly because Earth is rotating on its axis. The imaginary line that passes through Earth's center and the North and South poles is called Earth's **axis**. The spinning of Earth on its axis is called its **rotation**. **Earth's rotation on its axis causes day and night. It takes Earth about 24 hours to rotate once on its axis.**

The movement of one object around another object is called **revolution**. Earth completes one revolution around the sun once every year. Earth's path as it revolves around the sun is called its orbit. Earth's orbit is a slightly flattened circle.

Many cultures have tried to make a workable calendar. This is not easy because Earth takes about 365 1/4 days to circle the sun and 12 moon cycles make up fewer days than a year.

Sunlight hits Earth's surface most directly at the equator. Closer to the poles, sunlight hits Earth's surface at an angle. That is why it is warmer near the equator than near the poles.

**Earth has seasons because its axis is tilted as it moves around the sun.** Earth's axis is tilted at an angle of 23.5° from vertical. As Earth revolves around the sun, its axis is tilted away from the sun for part of the year and toward the sun for part of the year. When the north end of Earth's axis is tilted toward the sun, the Northern Hemisphere has summer. At the same time, the south end of Earth's axis is tilted away from the sun. As a result, the Southern Hemisphere has winter. The hemisphere tilted toward the sun has more daylight hours than the hemisphere tilted away from the sun. The combination of direct rays and more hours of sunlight heats the surface more than at any other time of the year. In June, the north end of Earth's axis is tilted toward the sun.

**Latitude** is a measurement of distance from the equator, expressed in degrees north or south. On two days each year, the noon sun is overhead at either 23.5° north or south. Each of these days is known as a **solstice**. About June 21, the noon sun is directly overhead at 23.5° north latitude. Halfway between the solstices, neither hemisphere is tilted toward the sun. On those two days, the noon sun is directly overhead at the equator. Each of these days is known as an **equinox**, meaning "equal night." During an equinox, the length of nighttime and daytime are about the same. The **vernal equinox**, or spring equinox, occurs around March 21, marking the beginning of spring in the Northern Hemisphere. The **autumnal equinox** occurs about September 23, marking the start of fall in the Northern Hemisphere.

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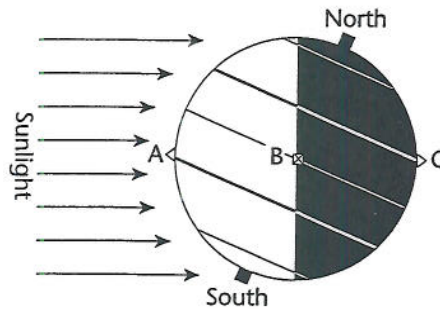
**REVIEW AND REINFORCE**

**Earth in Space**

**◆ Understanding Main Ideas**

Use the following figure to answer questions 1 through 3. Write your answers on the back of this page or on a separate sheet of paper.

**1**



1. In the diagram, what season is it in North America?
2. Would a person at each of the points A, B, and C see the sun? If so, where would the sun be in the sky?
3. Which is a person standing at point B seeing, sunrise or the sunset? Explain.

**◆ Building Vocabulary**

Match each term with its definition by writing the letter of the correct definition in the right column on the line beside the term in the left column.

- |                            |  |
|----------------------------|--|
| _____ 4. astronomy         | a. The path of Earth as it revolves around the sun                                 |
| _____ 5. axis              | b. Occurs in September and marks the beginning of fall in the Northern Hemisphere  |
| _____ 6. rotation          | c. Occurs in March and marks the beginning of spring in the Northern Hemisphere    |
| _____ 7. revolution        | d. The study of the moon, stars, and other objects in space                        |
| _____ 8. orbit             | e. The sun is directly overhead at 23.5 degrees north or south at this time.       |
| _____ 9. latitude          | f. Movement of Earth around the sun  |
| _____ 10. equinox          | g. Movement of Earth around its axis   |
| _____ 11. solstice         | h. The sun is directly overhead at the equator at this time.                       |
| _____ 12. vernal equinox   | i. Line passing through Earth's center and poles                                   |
| _____ 13. autumnal equinox | j. A measurement of distance from the equator, expressed in degrees north or south |