

Introduction to Latitude and Longitude

WHAT YOU WILL LEARN

To understand the concepts of latitude and longitude

READING STRATEGY

Create a chart like the one below listing the importance of each of the terms in using latitude and longitude.

DEGREE	→	<input type="text"/>
EQUATOR	→	<input type="text"/>
PRIME MERIDIAN	→	<input type="text"/>

TERMS TO KNOW

absolute location, latitude, longitude, degree, Equator, Prime Meridian

Do you know how ships measured their speed long ago? Do you know why a ship's speed is given today in knots rather than miles per hour or kilometers per hour?

Long ago, each ship carried a piece of wood fastened to a rope. The rope had knots tied in it. Each knot was a certain distance from the next. To measure the ship's speed, the piece of wood was thrown overboard. It pulled the rope out behind it. The faster the ship was going, the faster the rope went out. Someone counted how many knots passed over the side of the ship in a certain length of time. If seven knots were pulled out, the ship was said to be traveling at a speed of seven knots. Today, one knot is about 1.15 miles per hour.

Ships of long ago had to keep track of their speed on long voyages because they had no other way to tell how far they had traveled. Ships often became lost. For example, a storm might blow them far away from where they wanted to go.

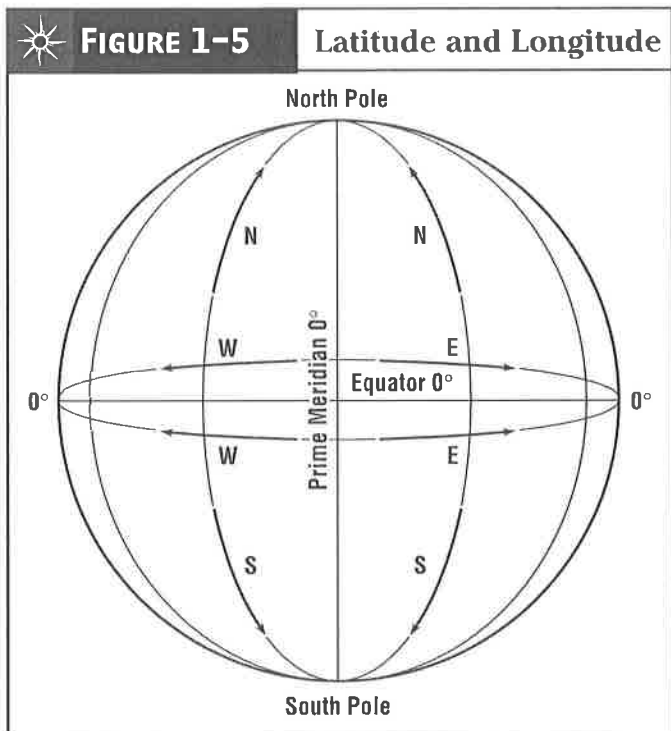
What people needed was a way to tell exactly where they were on the earth's surface—their **absolute location**. They also needed to be able to find their way to any other absolute location.

What they needed was a grid system that covered the entire earth. You know that a grid is made up of two sets of lines that cross each other. A grid system that covered the whole earth would let anyone find any location on Earth. We have such a grid today. We call it **latitude** and **longitude**.

Using Latitude and Longitude

Latitude lines, called *parallels*, run east and west around the earth. Longitude lines, called *meridians*, run north and south. Latitude and longitude are measured in **degrees**. The shape of the earth is a sphere. It is 360 degrees around a sphere. Each degree of latitude or longitude is 1/360th of the distance around the earth. The symbol for degree is °.

The starting point for measuring degrees of latitude is the **Equator**. The Equator is a line of latitude. It divides the earth into two equal parts. The Equator runs east and west all the way around the world, halfway between the North and South Poles. Figure 1-5 shows that the Equator is at zero degrees (0°) latitude. When we give the latitude of a place, we must state whether the place is north or south of the Equator. For example, the North



Pole is at 90° north latitude. If we said only that a place was at 90° latitude, we would not know if the place was the North Pole or the South Pole.

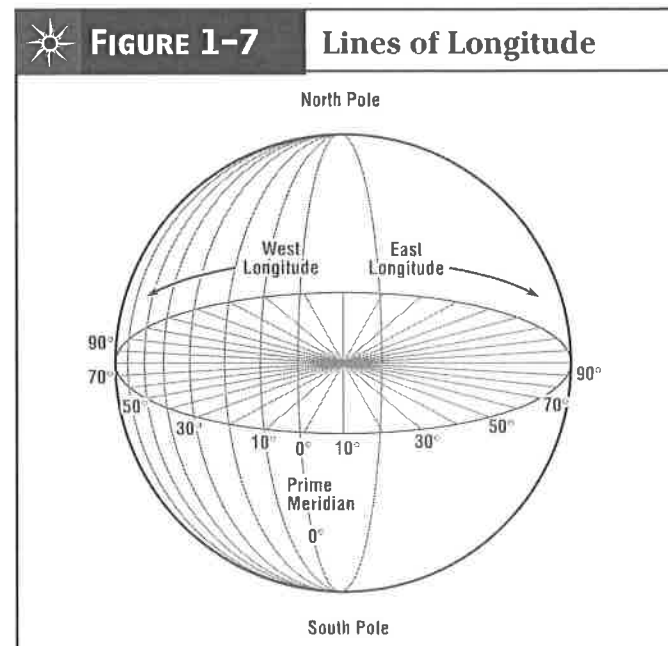
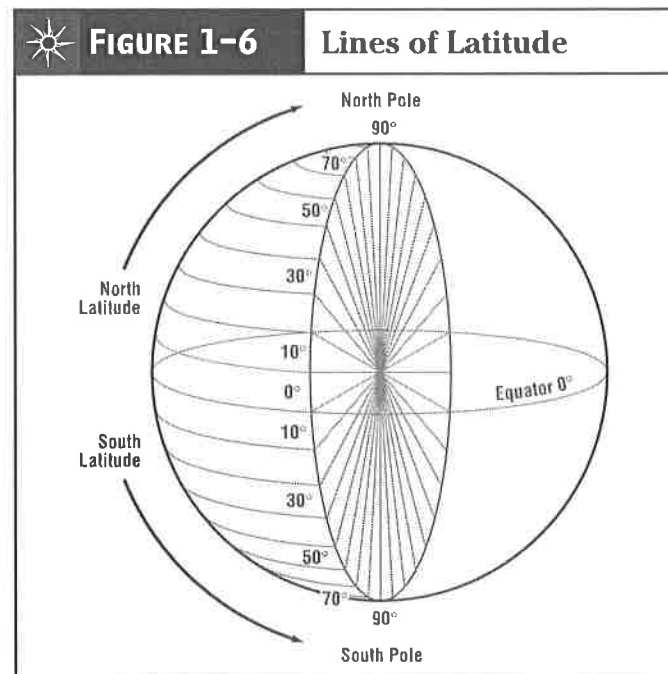
The starting point for measuring longitude is called the **Prime Meridian**. Meridian is another name for a longitude line. The earth does not have an east pole and a west pole. Therefore, some point had to be chosen as the starting point for measuring longitude. Through international agreement, Greenwich, England, was chosen as this place. All longitude is measured from the Prime Meridian that runs from the North and South Poles through Greenwich, England.

Figure 1-5 shows the Prime Meridian is at 0° longitude. When we give the longitude of a place, we must state whether the place is east or west of the Prime Meridian.

Lines of latitude run all the way around the earth, but lines of longitude do not. On the other side of the earth from the Prime Meridian is the line of longitude marked 180° . This line is the ending point for measuring longitude. The area west of the Prime Meridian and 180° is west longitude. The United States is located west of the Prime Meridian.

Latitude and longitude are determined by measuring the angle between the Equator or Prime Meridian and any point on Earth. Look at Figure 1-6 and find the Equator. Now find the line 10° north of the Equator. The angle between the Equator, the center of the earth, and this line is 10° .

Now look at Figure 1-7 and find the Prime Meridian. Now find the line 10° west of the Prime Meridian. The angle between the Prime Meridian, the center of the earth, and this line is 10° .



Using Your Skills

A REVIEWING KEY TERMS

Explain the meaning of each of the following terms.

1. degree

2. latitude

3. longitude

4. Equator

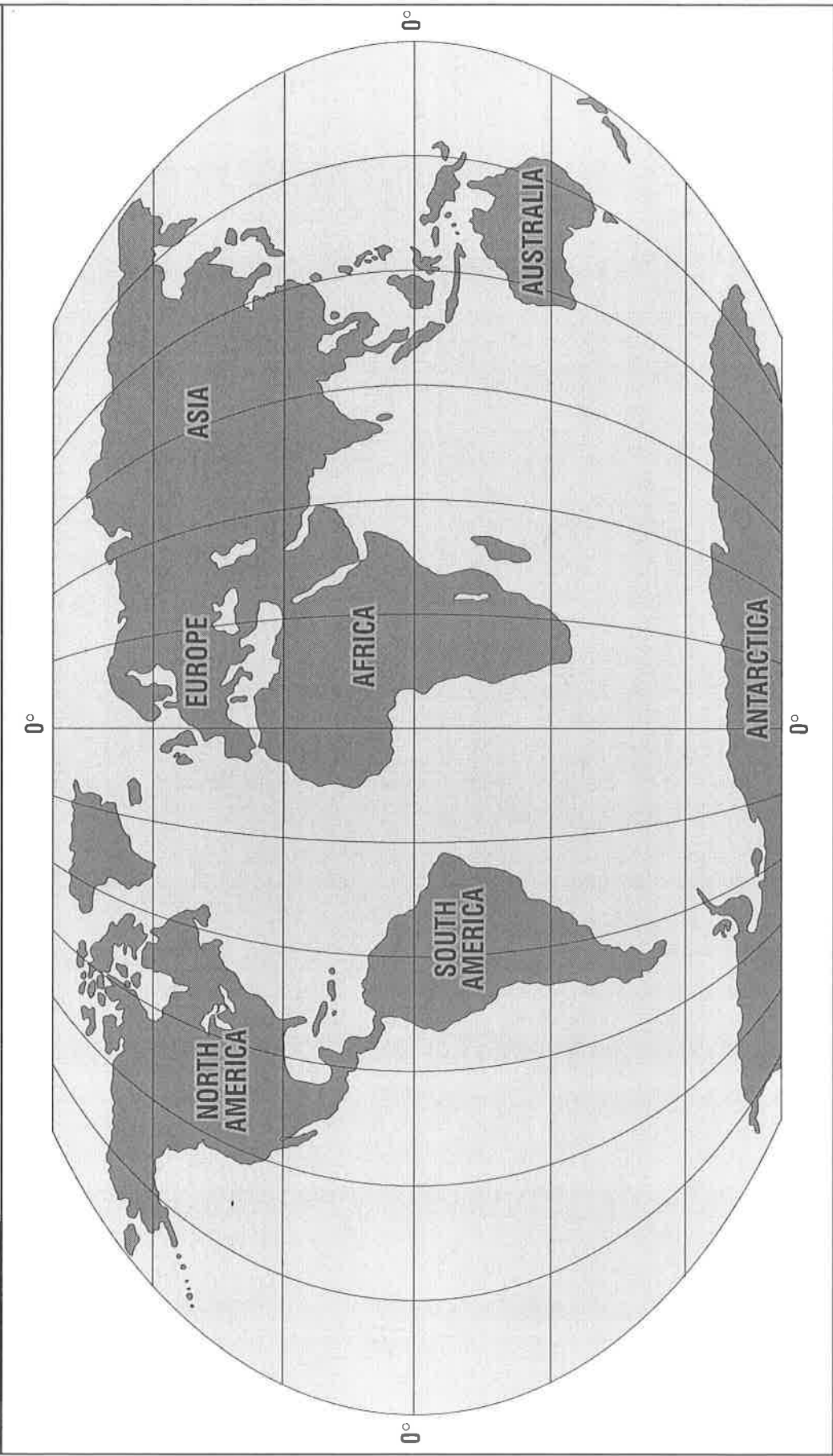
5. Prime Meridian

B PRACTICING MAP SKILLS

Follow the directions to complete Map 1-6: The World.

1. Find the line of latitude that is the Equator. Write Equator on the line.
2. Find the line of longitude that is the Prime Meridian. Write Prime Meridian on the line.
3. The lines of latitude and longitude shown on the map are spaced 30° apart. Find the first latitude line north of the Equator. Label the line 30°N . Find the first latitude line south of the Equator. Label the line 30°S . Now label the rest of the latitude lines correctly.
4. Find the first longitude line east of the Prime Meridian. Label the line 30°E . Find the first longitude line west of the Prime Meridian. Label the line 30°W . Now label the rest of the longitude lines correctly.

 **MAP 1-6** The World



Lesson

5

Finding Places Using Latitude and Longitude

WHAT YOU WILL LEARN

To locate places using latitude and longitude

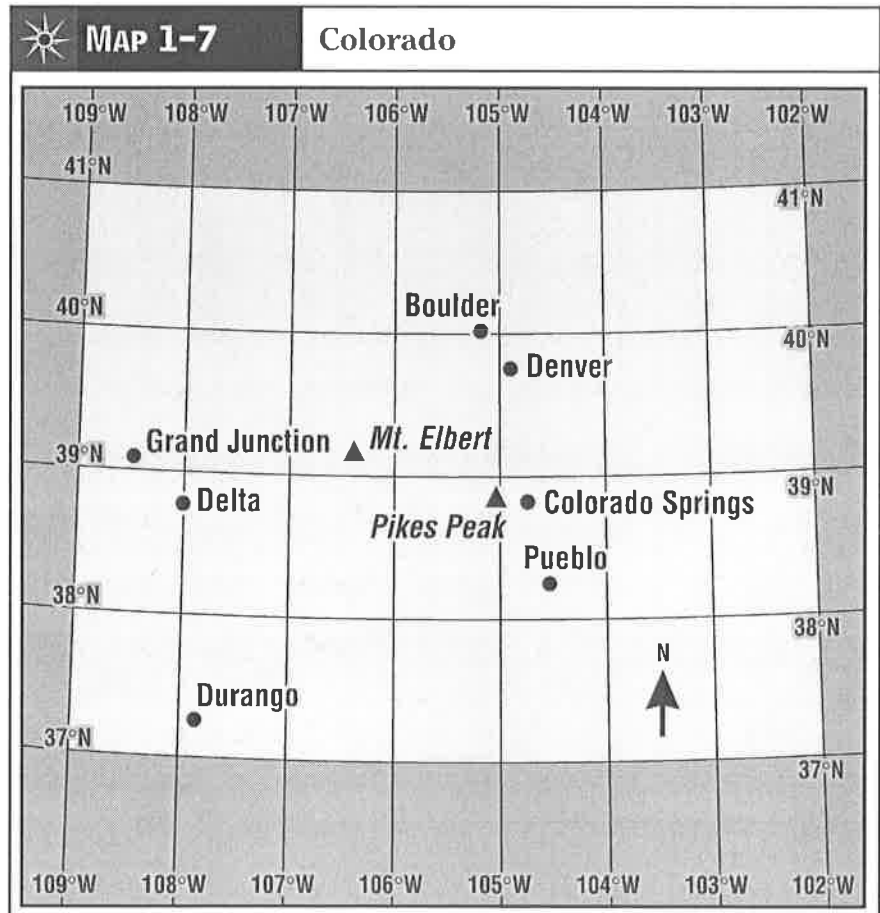
READING STRATEGY

Create a flowchart like the one below to explain how to find a place using latitude and longitude.



Finding places using latitude and longitude is just like using a grid, as you learned about in Lesson 3. Look at Map 1-7. Notice that each degree of latitude and longitude is shown. Find the line for 40°N latitude. What city is located at this latitude? What line of longitude is closest to this city? We say that Boulder is located at about 40°N latitude, 105°W longitude. Remember that when we write the location of a place using latitude and longitude, latitude is always written first.

Now look at the city of Delta. What line of latitude is closest to Delta? What line of longitude runs through Delta? We say that Delta is located at about 39°N latitude, 108°W longitude. This is Delta's absolute location. What is the absolute location of Durango?



Using Your Skills

A PRACTICING MAP SKILLS

Answer these questions about Map 1-7: Colorado.

1. Which line of latitude runs near Pikes Peak? _____
2. Which line of longitude runs near Pikes Peak? _____
3. Write the location of Pikes Peak using latitude and longitude.

4. Which line of latitude runs nearest Pueblo? _____
5. Which line of longitude is closest to Pueblo? _____
6. Write the location of Pueblo using latitude and longitude.

7. What city is near 39°N latitude, 105°W longitude? _____
8. What city is located at about 39°N latitude, midway between 108° and 109°W longitude?

9. Which line of longitude is at Colorado's eastern border? _____
10. Which line of latitude runs nearest Mt. Elbert? _____

B PRACTICING MAP SKILLS

Use a map of your state that includes lines of latitude and longitude to complete the following activities.

1. Write the approximate location of your city using latitude and longitude.

2. Write the approximate location of your state capital using latitude and longitude.

3. Select a popular recreation area in your state, such as a national park, national forest, or large lake. Write the name of this recreation area and its approximate location latitude and longitude.

G PRACTICING MAP SKILLS

Use Map 1-8: Africa to answer the following questions. Be sure always to begin counting degrees of latitude from the Equator and degrees of longitude from the Prime Meridian.

1. What body of water is located at 0° latitude, 0° longitude?

2. What body of water is located between 30°N and 40°N latitude?

3. What city is located near 30°S latitude, 30°E longitude?

4. In what country do the lines of 10°N latitude, 0° longitude cross?

5. In what country do the lines of 10°S latitude and 20°E longitude cross?

6. Write the approximate location of Cairo, Egypt, using latitude and longitude. (Remember that the lines of latitude and longitude on this map are spaced 10° apart. Give locations to the nearest degree.)

7. Write the approximate location of Kigali, Rwanda, using latitude and longitude.

8. Write the approximate location of Cape Town, South Africa, using latitude and longitude.

9. Write the approximate location of Abidjan, Côte d'Ivoire, using latitude and longitude.

10. Write the approximate location of Freetown, Sierra Leone, using latitude and longitude.

MAP 1-8

Africa

