PARK EAST HIGH SCHOOL
Purpose, Preparation, Pride

Global History (1750-Present) - Mr. Ott
Due Date: Monday 9/16/2019

Name: _____ Date: _____ Period: _____

Directions: Complete the Geography Map Packet Online at:

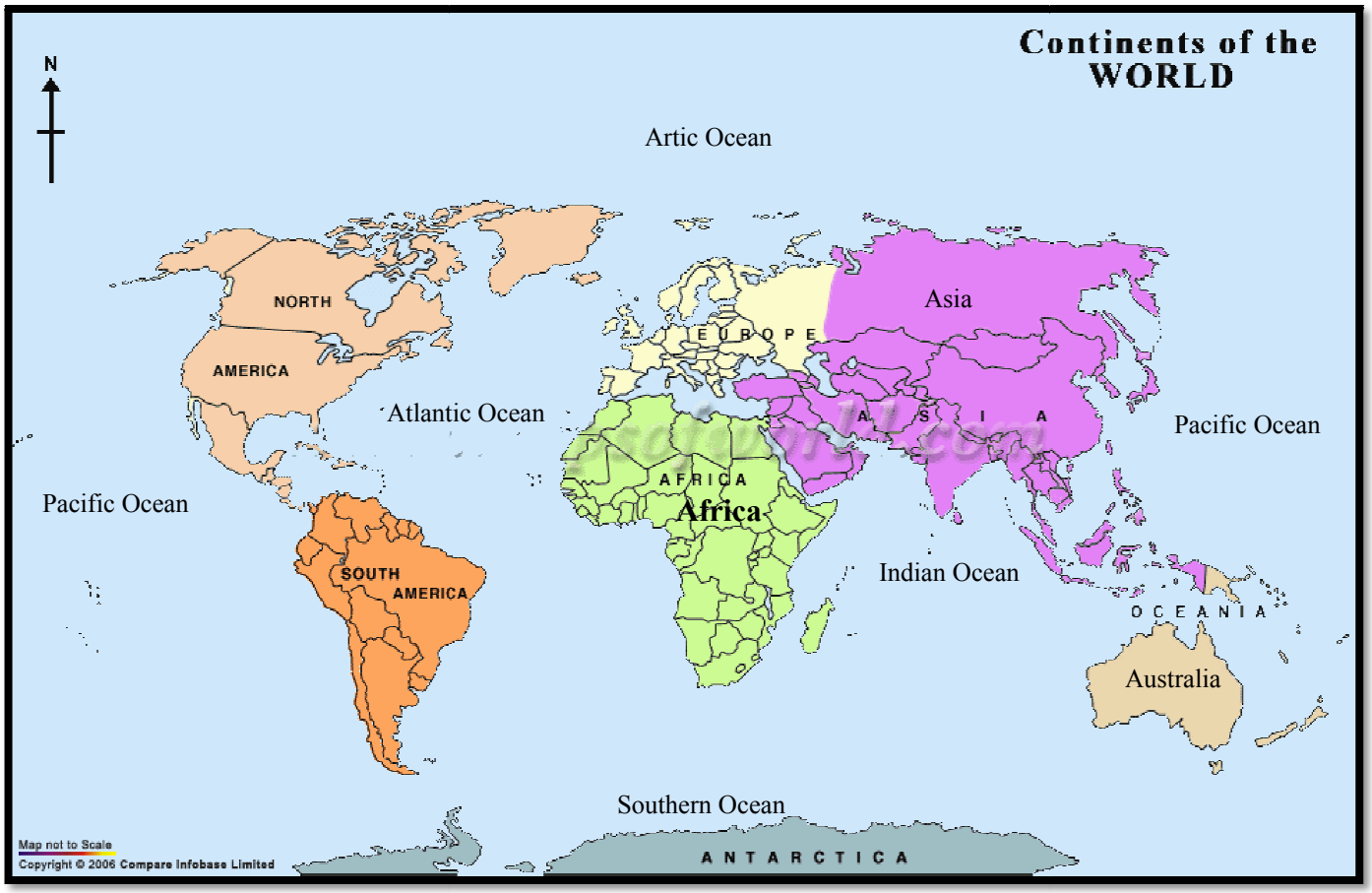
Or in written form by printing out the packet, and submitting by the due date above.

Social Studies Department

2019-2020

Geography Map Packet Due Date:_____

This Map Packet will assist you in preparing for the NYS Examination in Global History and Geography.



To the Student

Do you live in a city, or in a small town? Or do you live on a farm or a ranch? Has your family lived there a long time or a short time? How does living where you do affect the way you live? For example, do you need special clothes in the winter? Is your favorite food grown nearby, or is it brought in from far away?

All these questions have to do with **geography.** Geography is the study of our home—the earth—and how our lives are affected by it. Almost every detail of our lives is affected by geography. The clothes we wear, the food we eat, the things we do for fun, and the kinds of homes in which we live are all connected to geography.

Ask yourself these six questions about a food in the store where you shop. Where was it grown? What is the place and how it is like other places on Earth? Why does the place look the way it does? How do the people who grow the food live? How do the people use the resources in their environment? What problems do the people living in the place have to solve?

These six questions deal with the very heart of geography. As you look for answers to these questions, you are studying geography.

When we study a place on the earth, we ask six questions that are very similar to the six above. We ask (1) where a place is, (2) what the place is like and how that place is like other places on the earth, (3) how were the physical features in the place formed, (4) how the people there live, (5) how do people interact with their environment, (6) what does geography tell us about the past and how does it help us plan for the future. These questions deal with the six essential elements of geography. These elements are **the world in spatial terms, places and regions, physical systems, human systems, environment and society,** and **the uses of geography.**

The World in Spatial Terms

Objectives

After completing this unit, you will be able to:

- **describe locations in absolute and relative terms;**
- **locate places on a map using latitude and longitude;**
- **locate major landmasses and bodies of water;**
- **read map symbols, legends, and scales;**
- **compare different types of maps and map projections.**

A radio announcer breaks into regular programming to announce the devastating consequences of a flash flood, hurricane, forest fire, or other disaster. People immediately wonder where the disaster occurred. Often the disaster has only local consequences, affecting the people living in the area where the disaster happened. In some cases, however, the disaster has a far-reaching impact, and affects the lives of people in other areas.

One of the most notable disasters took place in 1986, when a series of human errors caused the reactor at the nuclear power plant in Chernobyl, Ukraine, to explode and catch fire. Deadly radioactive material spewed into the air. Winds began carrying the particles to the northwest into other European countries and eventually around the world. Dozens of people were killed. Hundreds more became very ill.

When news of the disaster became known, most people's first question was, "Where is Chernobyl?" That is, they wanted to know exactly where on the face of the earth it was located. The nuclear reactor at Chernobyl is at a precise position on the earth. This is called its **absolute location.**

Within days after the disaster, news outlets reported on the spread of the radioactive cloud from the explosion. Poland, Sweden, and England reported increases in radiation. Farmers across Europe were forced to destroy crops covered with radioactive dust. People were afraid to drink the water. Now people were asking a different question about the location of Chernobyl: "Where is it *from here*?" People needed to know in what direction, and how far, Chernobyl was from their own location. This is called **relative location.** By knowing their location in relation to Chernobyl, people could tell whether the wind was carrying the radioactive material closer or farther away.

Geographers use latitude and longitude to describe absolute location. Lessons in this unit will teach you how to use latitude and longitude. Geographers also use absolute location to make maps. This unit will teach you how to read several kinds of maps. You will also learn about relative location and its importance to you.

The world in spatial terms is one of the six essential elements of geography. Spatial relations refers to the connections that people, places, and environments have to one another because of their location on the earth's surface. While location does not determine how we live, it does influence our lives.

DID YOU KNOW?

Tallest Mountain

For many years Mount Everest in Nepal, a part of the Himalaya mountain ranges, has been recognized as the world's highest peak. Its elevation was measured at 29,028 feet (8,848 m) above sea level. However, in 1999 scientists using Global Positioning System (GPS) satellite equipment determined the height of Everest to be greater than the official recorded elevation.

On May 5, 1999, scientists used the GPS satellites to make precise observations for about 50 minutes. The equipment measured the elevation at 29,035 feet (8,850 m) above sea level. That measurement was only 7 feet more than the previous official height of Mount Everest, which was set in 1954. The measurements also showed that Mount Everest was moving horizontally to the northeast by about 2.4 inches (about 6 cm) a year.

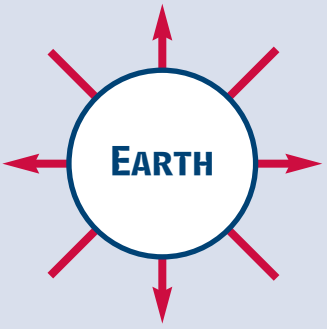
Lesson 1 Direction and Distance

What You Will Learn

To identify direction and distance information from maps

Reading Strategy

Create a diagram like the one below to list the cardinal and intermediate directions.



Terms to Know

compass rose, cardinal directions, intermediate directions, scale, scale bar

Have you ever drawn a map in the dirt to show someone where you live? Such drawings were some of the earliest maps. Other early maps were made of sticks tied together, or pieces of wood sewn to a piece of sealskin. People have used maps for thousands of years to show *where* places are, *how far* it is from one place to another, and the *direction* to travel to get from here to there.

Maps are important tools. Maps tell us where to catch a bus and where that bus will take us. Maps help us find a friend's house in a part of town that is new to us. Maps help us plan vacation trips. They help us learn about the town or state to which we are moving.

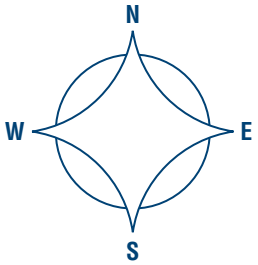
Direction

Direction is one of the most important things we can learn from a map. You use direction every day—left, right, forward, back, up, down. But these directions depend on where you are and which way you are facing. Maps use the directions north, south, east, and west. These directions do not change. North is always toward the North Pole of the earth. If you stand facing the North Pole, east will be to your right. West will be to your left. South will be behind you.

Usually, north will be at the top of a map. However, this is not always true. You must check to be sure. Mapmakers use a **compass rose** or a north arrow to show directions. If there is no compass rose, north arrow, or other symbol to indicate direction, you can assume that north is at the top of the map.

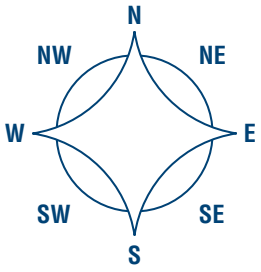
Look at the examples below. Find north, south, east, and west on Figure 1-1. These are the **cardinal directions.** Turn your book so that north on the compass rose points north (toward the North Pole). Face north yourself. Now east is to your right, west is to your left, and south is behind you.

Figure 1-1 Cardinal Directions



Look straight north. Hold your right hand straight out to the side. In what direction are you pointing? You are correct if you said *east.* Now turn your head just halfway toward your right arm. You are no longer looking north. But you are not looking east, either. You are looking *northeast.* Look at Figure 1-2. Find northeast, southeast, northwest, and southwest. These are known as **intermediate directions.**

FIGURE 1-2 **Cardinal and Intermediate Directions**



Notice that Figure 1-3 is just an arrow with its point labeled *N.* The *N* stands for north. The arrow points north. When you see a north arrow, remember that east is to the right, west is to the left, and south is in the opposite direction from north.

FIGURE 1-3 **North Arrow**



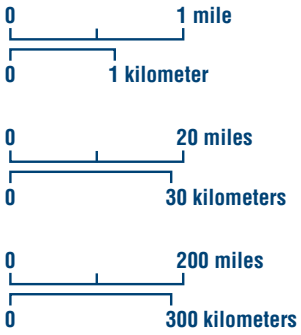
Distance

If you make a drawing of a person, you will probably not make the picture as large as the person. That would take a piece of paper the same size as the person. A map is a drawing of a part of the earth. A map as big as the earth would be too large to put in your pocket and carry with you across Africa! Maps are drawn so that a certain distance on the map represents a much larger distance on the earth. This is called **scale.** Scale makes it possible to show the whole earth on a piece of paper the size of this page.

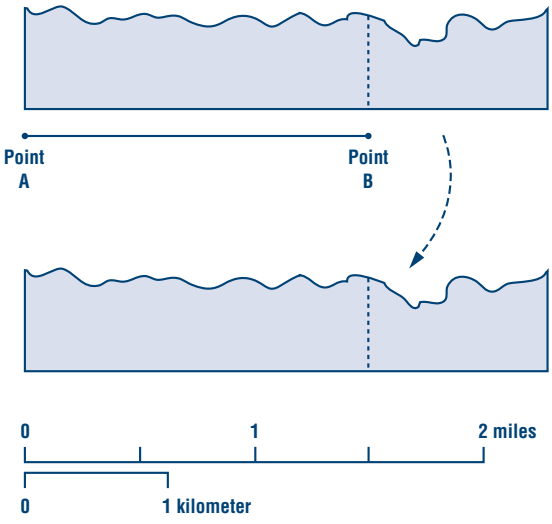
Not all maps are the size of this page, of course. Your classroom may have maps hanging on the wall. These maps are much larger than the ones in your book. But they both show the same earth. Maps have a **scale bar** to tell you what distance on the earth is represented by a certain distance on the map.

Using Map Scale Bars

Here are some examples of map scale bars. Notice that all lines are the same length, but that each line represents a different distance on the earth. Also notice that the same scale bar can represent distance in miles and kilometers on the map.



Using the scale bar to measure distances between places on a map is easy. Use a piece of paper. Put the edge of the paper between the two points you wish to measure. Make a mark on the paper at each point. Then put the piece of paper on the scale bar with one mark at zero. Note where the other point falls on the scale. This gives you the distance.



If the scale bar is not long enough, mark where it ends on the paper. Then slide the paper to the left to line up the new mark with zero. Do this as many times as necessary. Then multiply the number of spaces between marks by the distance each length of the scale bar represents. For example, if the scale bar represents 100 miles, and you marked off three spaces, then multiply 3 by 100. The distance between the two points on the map is 300 miles.

Using Your Skills

A Reviewing Key Terms

Place each phrase in the box under the correct heading.

helps you find directions on a map can be marked in miles	helps you find distances on a map may be marked N, S, E, W

Compass Rose

1. _____
2. _____

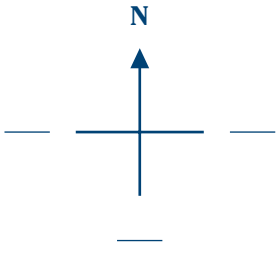
Scale

3. _____
4. _____

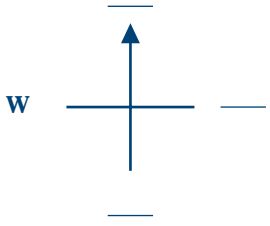
B Recalling Facts

Fill in the missing directions on these compass roses. Notice that north is not always in the same place.

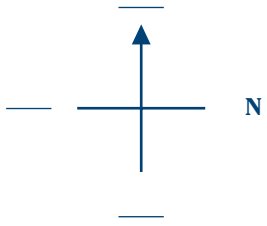
1.



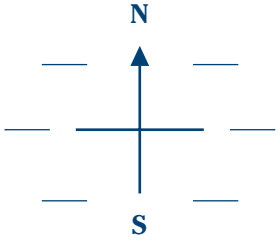
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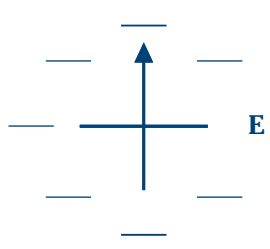
3.



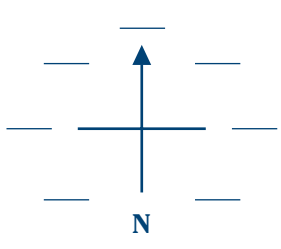
4.



5.



6.



Lesson 2

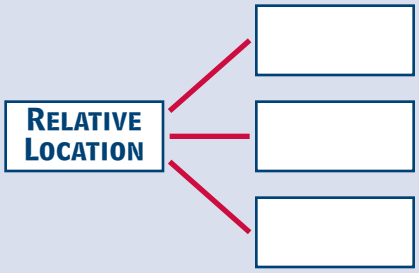
Importance of Distance and Relative Location

What You Will Learn

How to describe locations in terms of relationships with other locations

Reading Strategy

Create a chart like the one below. List three examples of the importance of relative location in your life.



Terms to Know

relative location, interdependence

Have you ever been lost? Or have you just not been sure about how to get somewhere you wanted to go?

From the specific spot where you stand on the earth, you are different directions and distances from many other spots on the earth. You may be 22 miles south of your home. At the same time you may be 150 miles northeast of the capital of your state. You may also be three feet from the front door of your favorite pizza place. Your location can, in fact, be compared to the location of any other spot on Earth. This is called **relative location.**

Distance and location affect your life in many ways. If you live eight miles from school, you must wake up earlier each morning than someone who lives eight blocks away. If you live 2,500 miles from the nearest volcano, you will be much less concerned about its latest eruption than someone who lives in the valley below it.

The story of Houston, Texas, is an example of the importance of distance and relative location. One of the greatest oil strikes in history took place near Houston in 1901. The Spindletop Field was the first great oil discovery in Texas. Within a few years Houston, Texas, was an important center for the oil industry. Why? Because Houston's relative location was near the early oil fields. It was also located near the Gulf of Mexico. This made it possible to ship oil and equipment by water. Many oil companies built plants near Houston to make products from oil. These products were then shipped to other parts of the country, and around the world by water. As a result, Houston became one of the largest ports in the United States.

Global Interdependence

Distance and relative location are important because we depend on people in other places for things we need. Depending on other people is called **interdependence.** We depend on them for certain goods and services, and they depend on us for others.

Interdependence links us together in the larger global community in many ways. For example, the United States imports and buys from other countries much of the oil that runs its cars and factories. A great deal of this oil comes from countries in Southwest Asia. This is why the United States is so interested in wars and other events in the region. Because of the location of oil fields in Southwest Asia, a war there could cut off the supply of oil to the United States. This could result in oil shortages and economic changes in the United States.

Using Your Skills

A Practicing Map Skills

Use Map 1-2: Panama below to decide whether each statement about relative location is true or false. Write *T* if the statement is true. Write *F* if the statement is false.

_____ **1.** Panama has water to the north and south.

_____ **2.** The country of Colombia is located to the west of Panama.

_____ **3.** The Caribbean Sea is located to the north of Panama.

_____ **4.** The Canal Zone is located in the central part of Panama.

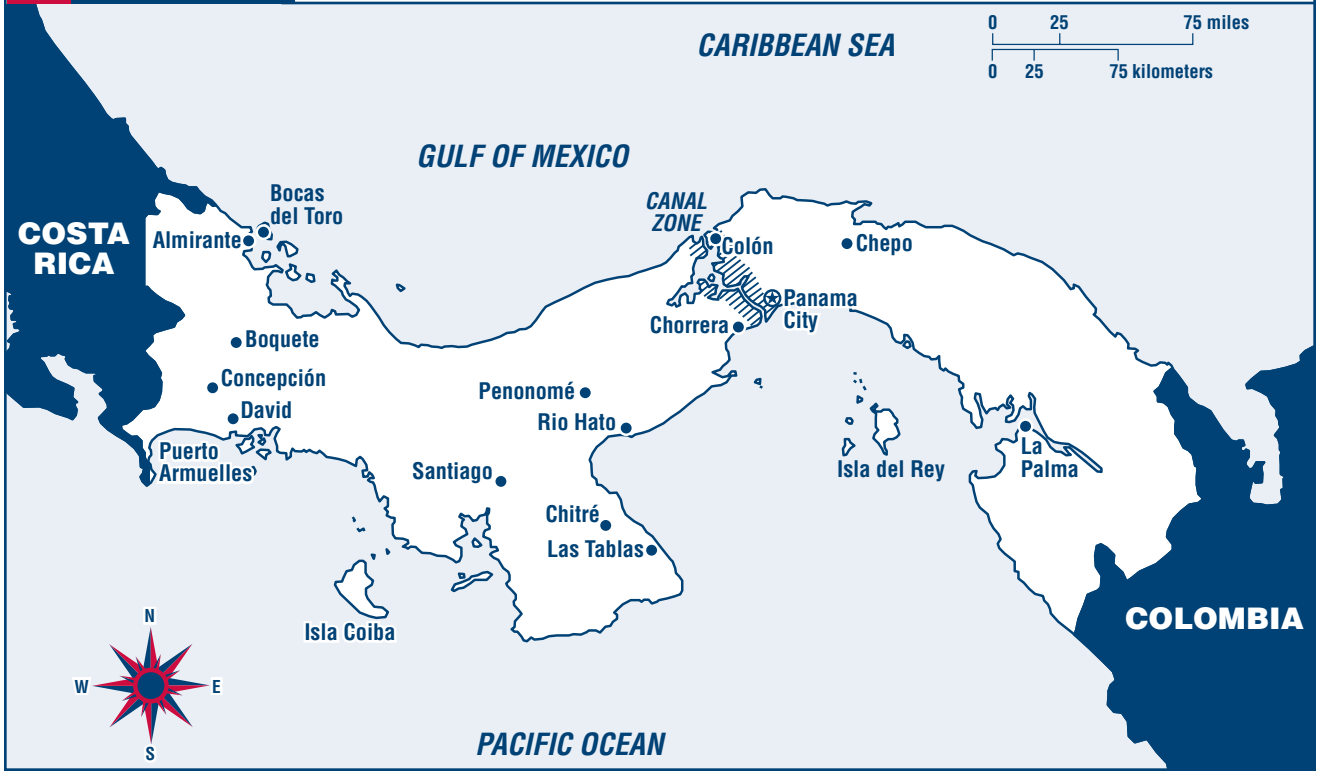
_____ **5.** When a ship enters the Panama Canal at Colón, it is northwest of the other end of the canal at Panama City.

_____ **6.** Costa Rica is located northwest of Panama.

_____ **7.** According to this map, all parts of the Caribbean Sea are east of the Pacific Ocean.

_____ **8.** The city of Rio Hato is about 300 kilometers west of La Palma.

Map 1–2 **Panama**



B Practicing Map Skills

Use Map 1-3: The World below to answer the questions about relative location. Use intermediate directions where necessary.

1. Where is the United States located on this map?

   _____

2. What country is to the north of the United States? _____

3. What country is to the south of the United States? _____

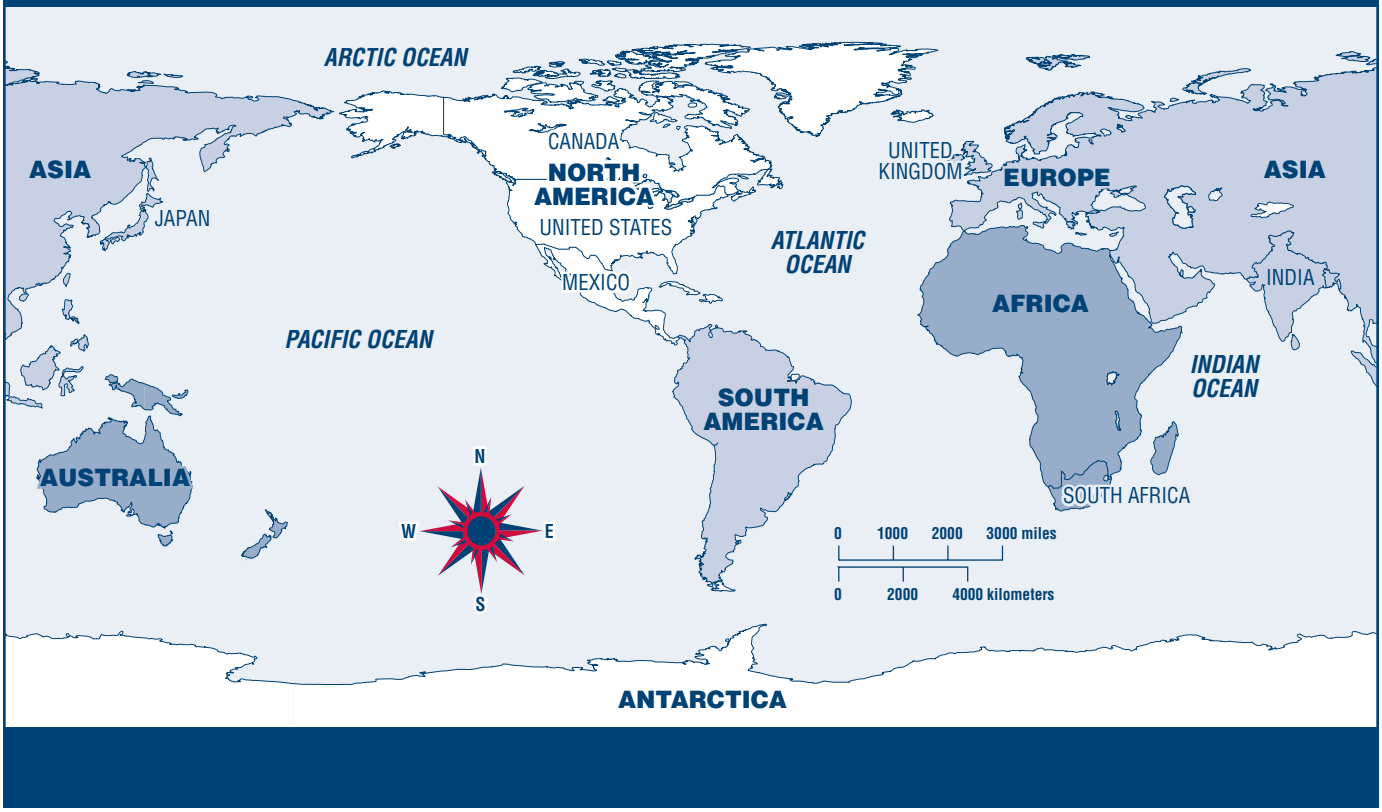
4. What direction is South Africa from the United States? _____

5. What direction is Australia from the United States? _____

6. In what direction would you travel to go from Japan to the United States? _____

7. In what direction would you travel to go from India to the United Kingdom? _____

Map 1-3 The World



Lesson 3

Locating Places Using a Grid

What You Will Learn

To locate places using grids

Reading Strategy

Use a table like the one below to list the major elements of a map grid.

Elements of Map Grids
•
•
•

Terms to Know

grid, cell, index

Imagine that you have just landed on this planet. You have been told to find the center of government for the place where you landed. Someone hands you a map, points out your current location, and identifies the city where the center of government is located. You have heard of maps, but you have never seen one. On your planet, you simply enter your destination into a tracking device in your vehicle and the course is automatically programmed.

As you examine the map, you notice that there are lines running vertically and horizontally on the map. You also notice many symbols, colors, and words on the map. You are fairly certain that the words tell the names of places, but you are not certain what all the labels and symbols mean. You need something that will tell you about where the center of government is located.

Using Map Grids

The something you need to help you find the center of government in this new place is called a **grid.** A grid is a set of vertical and horizontal lines used to identify locations on a map. An alpha-numeric grid uses letters and numbers around the edges of the map to label the areas marked off by the lines. Look at Figure 1-4 at the top of the next page for an example of an alpha-numeric grid.

Place your left index finger on the letter *B* on the left side of the grid. Place your right index finger on the number *3* at the bottom of the grid. Move your left finger straight across and your right finger straight up until they meet. There should be a star in the box at your fingertips.

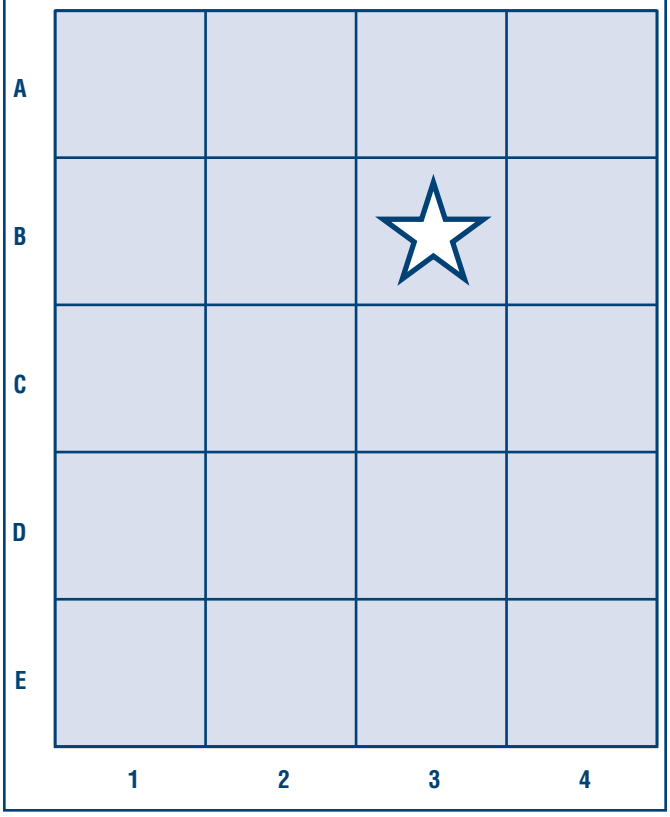
The four spaces to the right of the letter *B* form a *row.* We call this row B. The four spaces above the number *3* form a *column.* We call this column 3.

The area where a row and a column meet is called a **cell.** Notice that only one cell can be at the area where row B and column 3 meet. We call this cell B-3.

Practice using the grid in Figure 1-4. Which cell is closer to the top of the grid, cell A-1 or cell E-4? Now draw a star in cell C-2. Then draw a circle in cell A-4. Finally, write your name in cell D-1. You should be able to draw a straight line through all four cells on the grid that have something in them.

Many cities and towns are described as being built on a grid. This means that horizontal and vertical streets and roads cross

FIGURE 1–4 An Alpha-Numeric Grid



each other to form a grid. The names of the streets and roads are used to locate places in the city or town. For example, the high school may be located at the intersection of Main Street and Third Avenue. Or the post office is located on Sunset Boulevard between Fifth Avenue and Sixth Avenue. Is your town or city built on a grid?

Using a Grid Index

Mapmakers often use a grid to help us find places on maps. We use letters and numbers to identify cells on the map in which specific places are located. The grid is used with an **index.** The names of places on the map are listed in alphabetical order in the index. Following each name is the letter and number of the cell in which that place can be found.

Look at Map 1-4 and its index. Notice that the index is not complete. Use the map to help you fill in the name of the missing city for each cell number. Be sure you spell the name of each city correctly.

MAP 1–4 Kuwait



Index for Map 1-4

Abdali E-4

Al Jahra. D-4

Al Maqwa D-5

Burgan. E-5

Fahahil E-6

Kuwait City. C-5, D-5

Mina Abdullah E-6

_____ B-4

_____ C-6

_____ B-5

_____ D-1

_____ E-6

_____ D-5

_____ E-4

Using Your Skills

A Reviewing Key Terms

Match each term at left with its meaning.

_____	**1.**	cell	**a.**	an alphabetical list of places on a map, with cell numbers
_____	**2.**	row	**b.**	a set of lines used to identify locations on a map
_____	**3.**	column	**c.**	the space where a row and column meet
_____	**4.**	grid	**d.**	a set of spaces that goes across a map
_____	**5.**	index	**e.**	a set of spaces that goes up and down a map

B Practicing Map Skills

Use Map 1-5: London, England to answer these questions.

1. What is located in cell B-3?

_____

2. What is located in cell C-2?

_____

3. What is located in cells F-2, F-3, F-4, F-5, E-5, D-5, and C-5?

_____

4. What is located in cells B-3 and B-4?

_____

5. About how many miles is it from the London Zoo to the Planetarium?

_____

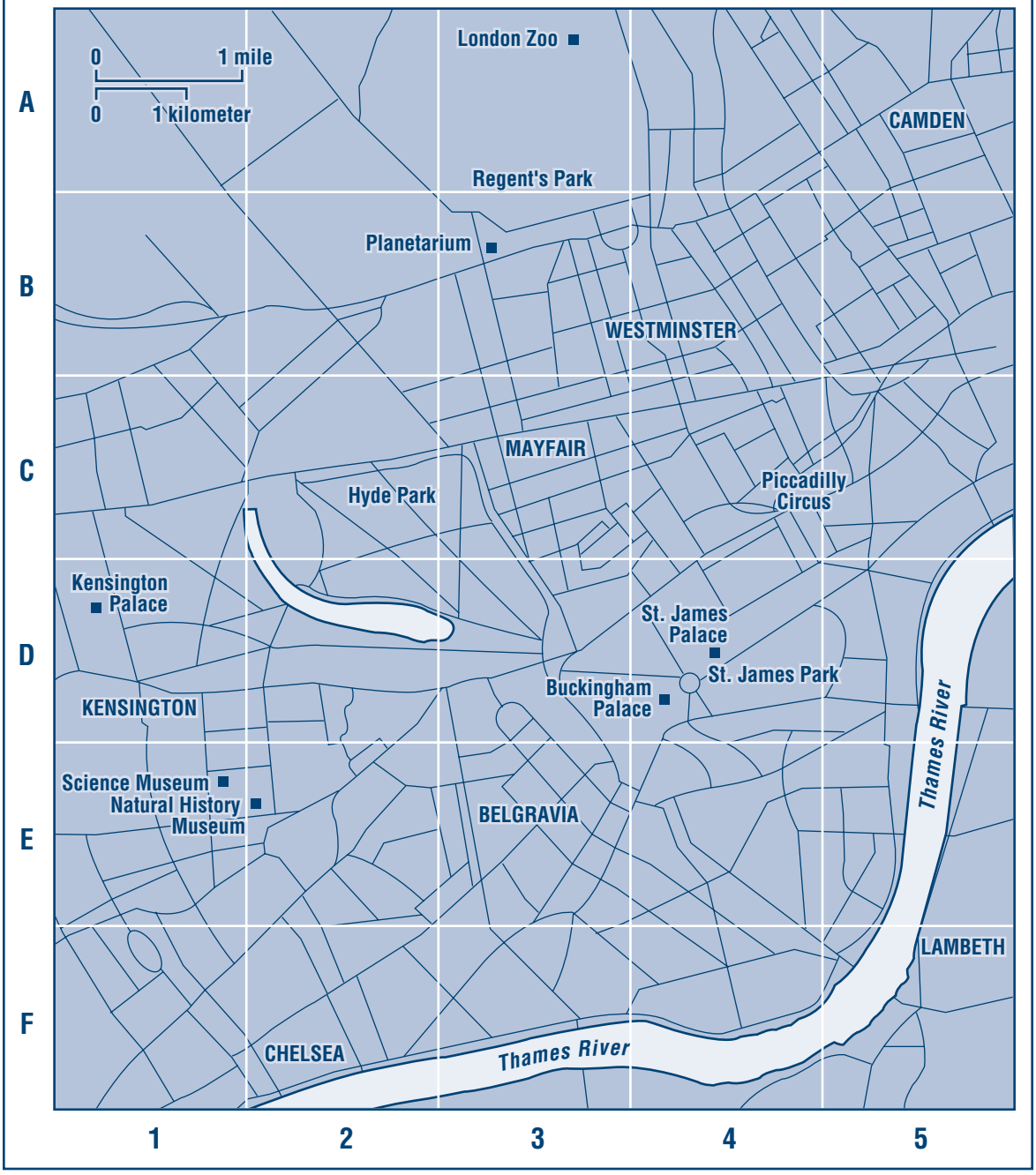
6. About how many miles is it from Buckingham Palace to Kensington Palace?

_____

7. Complete the following index for the map of London. Remember that all names in an index are in alphabetical order. If there is more than one possible answer for a cell, see which answer will fit in alphabetical order.

_____

Map 1-5 London, England



Index

Buckingham Palace E-3
Hyde Park D-4
Kensington Palace A-5
Natural History Museum F-2
Piccadilly Circus D-1
Regent's Park F-5
St. James Park A-3
St. James Palace C-3
Science Museum E-2
Thames River C-4
Thames River E-1

Lesson 4

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	
EQUATOR	
PRIME MERIDIAN	

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.

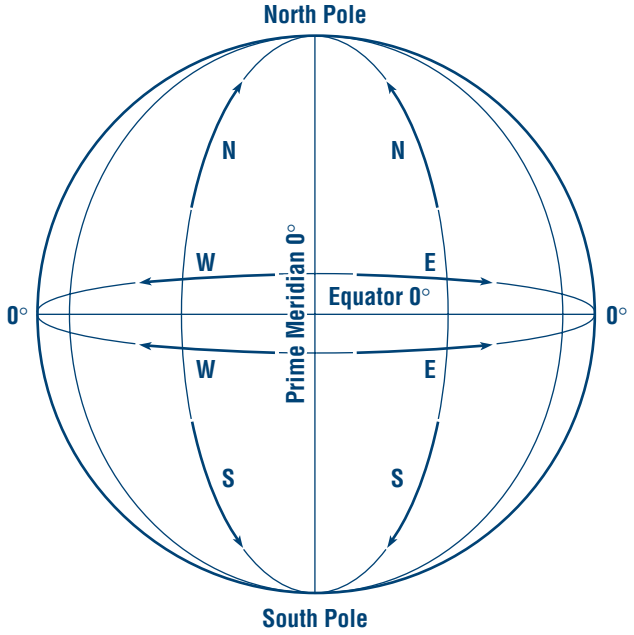
What they needed was a grid system that covered the entire earth. You know that a grid is made up of two sets of lines that cross each other. A grid system that covered the whole earth would let anyone find any location on Earth. We have such a grid today. We call it **latitude** and **longitude.**

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

FIGURE 1–5 Latitude and Longitude



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°.

FIGURE 1–6 Lines of Latitude

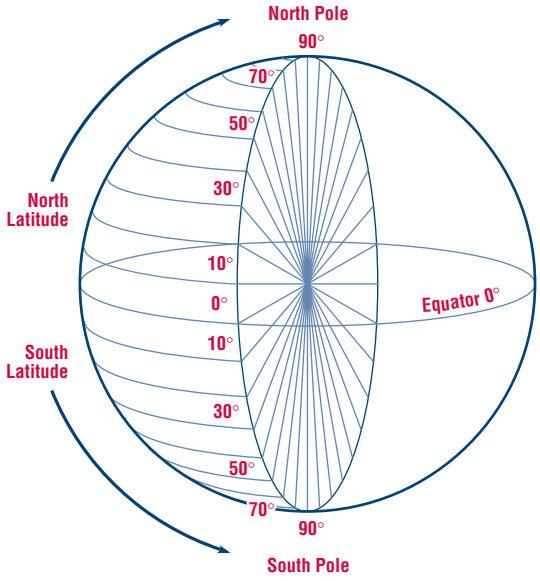
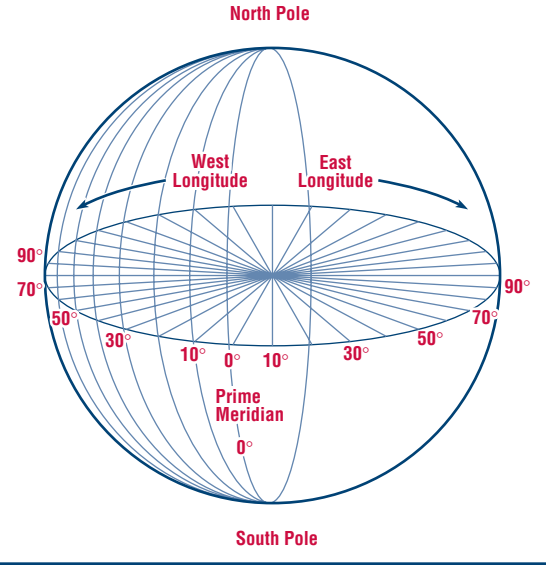


FIGURE 1–7 Lines of Longitude



Using Your Skills

A Reviewing Key Terms

Explain the meaning of each of the following terms.

1. degree

2. latitude

3. longitude

4. Equator

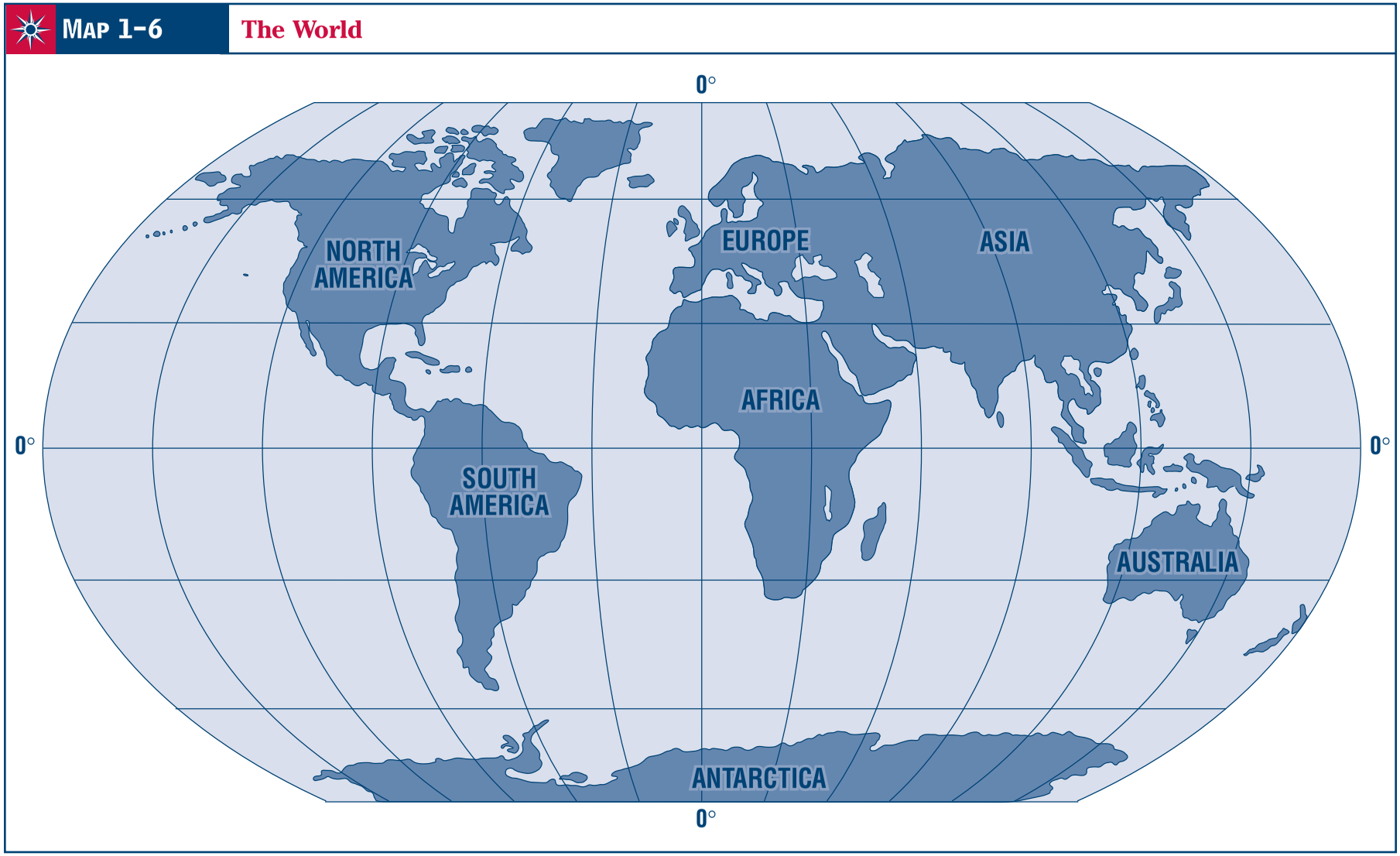
5. Prime Meridian

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



C 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
EUROPE
N
W
E
S
40°N
30°N
20°N
10°N
0°
10°S
20°S
30°S
30°W
20°W
10°W
0°
10°E
20°E
30°E
40°E
50°E
60°E
MEDITERRANEAN SEA
SOUTHWEST ASIA
TUNISIA
MOROCCO
ALGERIA
LIBYA
EGYPT
Cairo
WESTERN SAHARA
Tropic of Cancer
RED SEA
MAURITANIA
CAPE VERDE
SENEGAL
MALI
NIGER
CHAD
SUDAN
ERITREA
GAMBIA
BURKINA FASO
GUINEA-BISSAU
GUINEA
DJIBOUTI
GHANA
BENIN
NIGERIA
Freetown
CÔTE D'IVOIRE
ETHIOPIA
CENTRAL AFRICAN REPUBLIC
SIERRA LEONE
Abidjan
TOGO
CAMEROON
Gulf of Guinea
LIBERIA
SOMALIA
Equator
EQUATORIAL GUINEA
GABON
UGANDA
KENYA
CONGO
Kigali
RWANDA
SÃO TOME AND PRINCIPE
BURUNDI
INDIAN OCEAN
TANZANIA
DEMOCRATIC REPUBLIC OF THE CONGO
COMOROS
ATLANTIC OCEAN
ANGOLA
MALAWI
ZAMBIA
MOZAMBIQUE
MADAGASCAR
ZIMBABWE
NAMIBIA
BOTSWANA
Tropic of Capricorn
SWAZILAND
SOUTH AFRICA
Durban
LESOTHO
Cape Town

Lesson 6

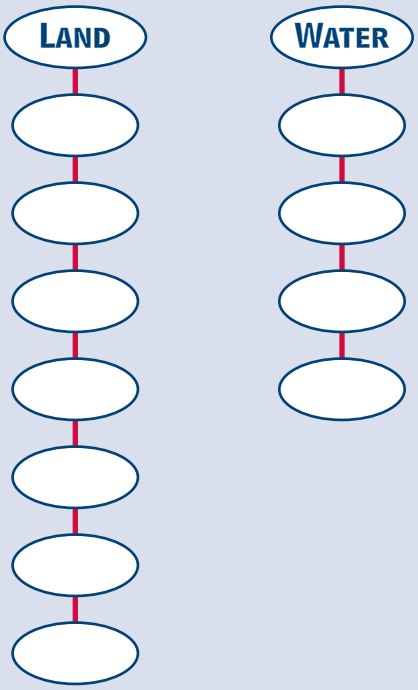
Locating Continents and Oceans

What You Will Learn

To locate major landmasses and bodies of water in many parts of the world

Reading Strategy

Create a diagram like the one below to list the world's continents and oceans.



The surface of the earth is covered with land and water. The land is divided into seven continents: North America, South America, Europe, Asia, Africa, Australia, and Antarctica. The continents are divided into more than 190 countries. The water is divided into four oceans and a number of seas. The four oceans are the Atlantic, Pacific, Indian, and Arctic.

Before you proceed with this lesson, you should study the locations of the seven continents, major countries, and four oceans on a world map.

Using Your Skills

A Practicing Map Skills

The continents and oceans are labeled with letters on Map 1-9: The World: Physical. Write the name of each continent or ocean beside the correct letter below.

1. A _____
2. B _____
3. C _____
4. D _____
5. E _____
6. F _____
7. G _____
8. H _____
9. I _____
10. J _____
11. K _____
12. L _____
13. M _____

Map 1–9 The World: Physical



B Recalling Facts

Fill in the blanks to complete the following sentences correctly.

1. South America is bordered by the _____ Ocean on the west and the _____ Ocean on the east.
2. Africa is _____ of Europe.
3. The most direct route from Australia to Africa is across the _____ Ocean.
4. North America is _____ of Europe.
5. Asia is bordered by the _____ Ocean on the east and the _____ Ocean on the south.
6. Africa is bordered by the _____ Ocean on the east and the _____ Ocean on the west.
7. Europe is _____ of the Arctic Ocean.
8. The most direct route from South America to Asia is across the _____ Ocean.
9. Asia is _____ of Europe.
10. Europe is _____ of South America.

Lesson 7

Understanding Map Symbols and Legends

What You Will Learn

To use map legends to interpret symbols commonly used on maps

Reading Strategy

Create a chart like the one below. Fill in examples of the kinds of information each type of map symbol is used to represent.

PICTURE SYMBOL	• • •
COLORS OR SHADING	• • •

Terms to Know

symbol, legend, key

Maps can be used to show many different kinds of information. One of the main uses of maps is to show the locations of towns and cities. However, maps can also show where cotton is grown, cattle are raised, and where different species of wild animals are found. The possibilities are almost endless.

Often one map shows more than one kind of information. This means that some way must be used to help the person reading the map understand several kinds of information shown on the map. For example, if a map shows the locations of towns, roads, and parks, there must be some way to know which is which.

Using Map Legends

Maps use **symbols** to help the reader distinguish different kinds of information. The meaning of each symbol is explained in the map's **legend,** or **key.** Each symbol used on the map is shown, along with an explanation of what the symbol means.

Look at Figure 1-8. What symbol is used to show the location of a city? What symbol is used to show the location of a city that is a state capital? What symbol is used to show the location of a park?

There can be many different symbols. Some maps show the kinds of products a state or country produces. Often these maps use picture symbols to show where goods are produced. For example, a small picture of an oil derrick ( ) may be used to show where oil is found. A picture of a sheep may be used to show where sheep are raised.

Figure 1-8 Map Legend 1

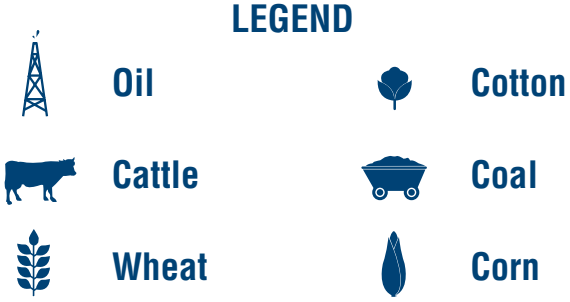


Look at Figure 1-9. What symbol shows where wheat is grown? What is grown where you see the symbol ( )?

Sometimes maps use colors or areas of shading as symbols. This is often used when the feature being shown covers a wide area. For example, Map 1-10 uses one color to show the area covered by the Amazon River basin. Population density maps use several colors to indicate different levels of population per square mile or kilometer. Here are some examples of shading: When you are reading a map that uses shading, you must be very careful to read the map correctly. It is easy to get shading like the following mixed up.

If you have trouble telling such patterns apart, try this. Look at part of the map you wish to read. Then look at the legend and pick the pattern you think is correct. Cover the others with your fingers or a piece of paper. Look at the legend and then at the map. This should help you decide if you have picked the correct pattern.

FIGURE 1-9 Map Legend 2



Using Your Skills

A PRACTICING MAP SKILLS

Use the map legends in Figures 1-8 and 1-9 to match each symbol below with its meaning.

_____	**1.**		**a.**	wheat
_____	**2.**		**b.**	airport
_____	**3.**		**c.**	corn
_____	**4.**		**d.**	oil
_____	**5.**		**e.**	railroad
_____	**6.**		**f.**	state capital

B Practicing Map Skills

Use Map 1-10: The Amazon Basin and its legend to answer the questions that follow.

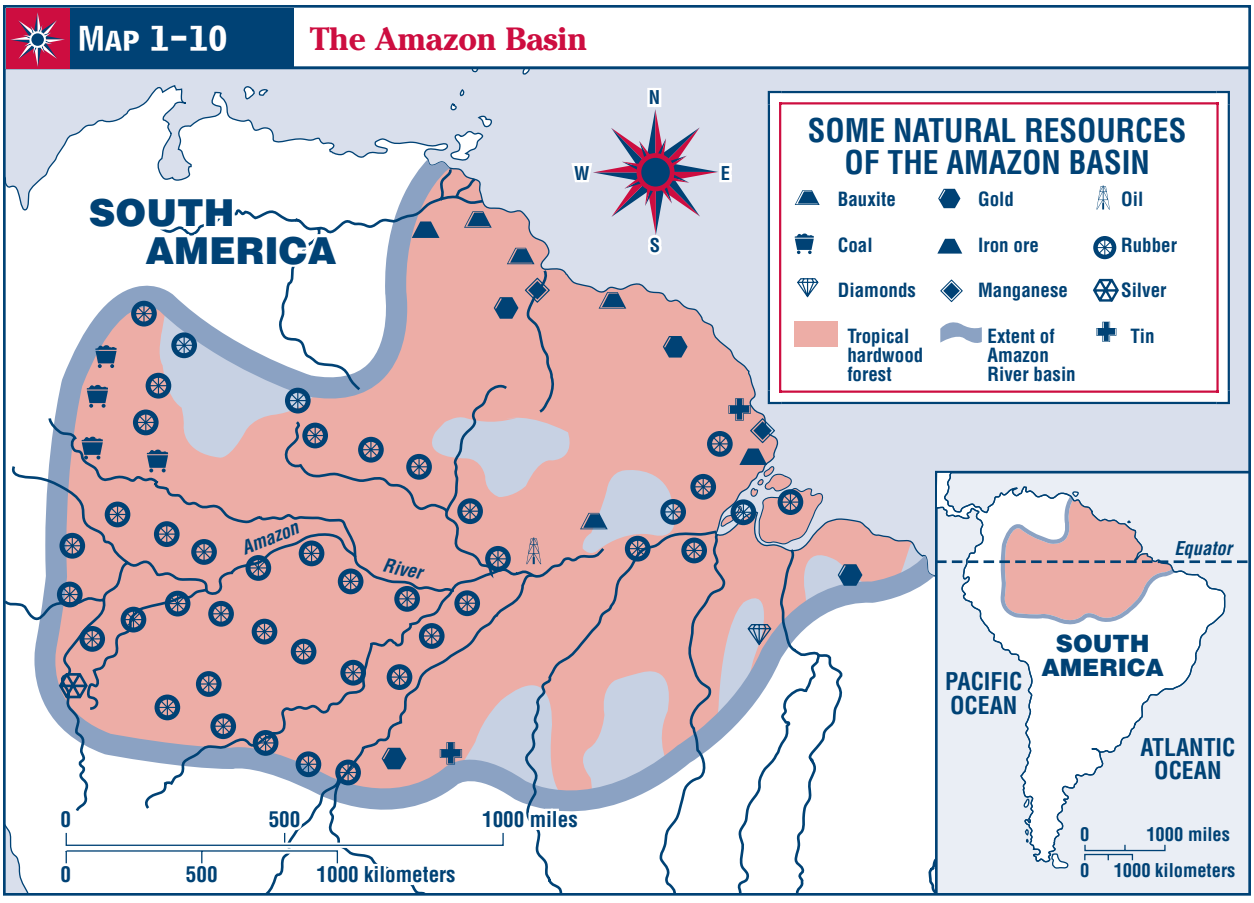
1. What covers most of the Amazon River basin?

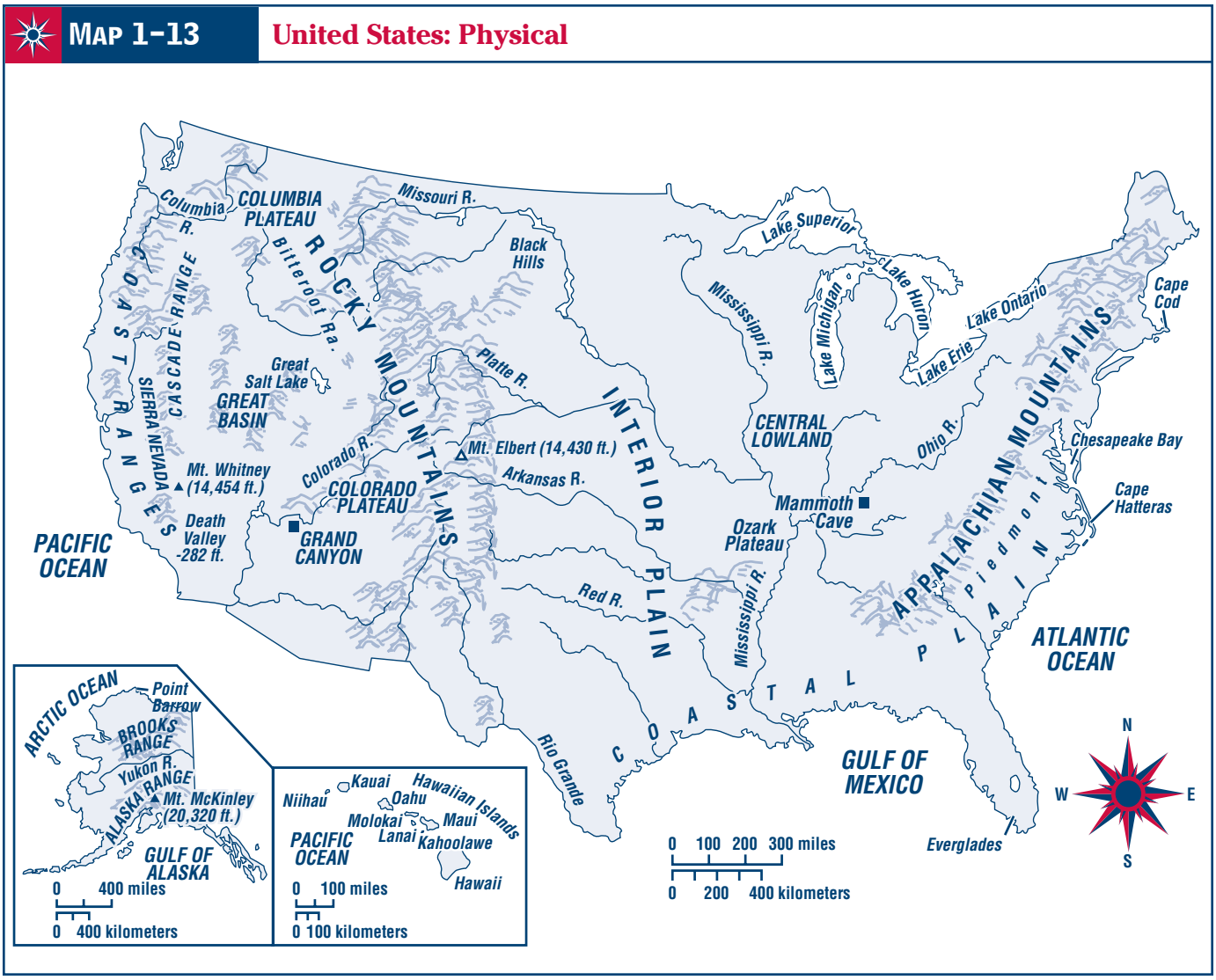
2. In how many places in the Amazon River basin is gold found?

3. In what part of the Amazon River basin is coal found?

4. About how many miles apart are the deposits of tin in the Amazon River basin?

5. In what part of the Amazon River basin is oil found? Diamonds?





the others? What is the capital of Australia? What tells you it is the capital? What are some other cities shown on the map?

Using Special-Purpose Maps

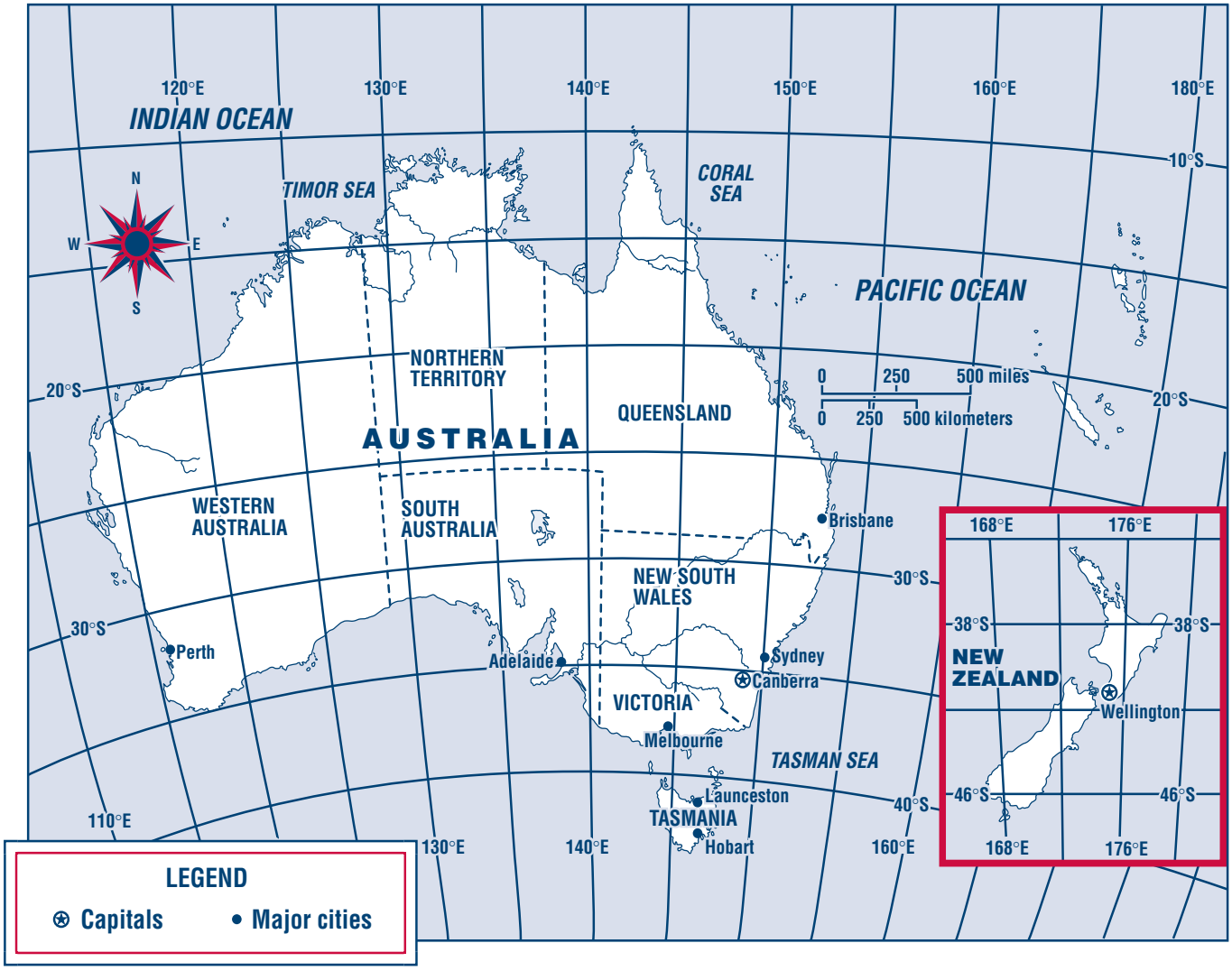
Maps that emphasize a single idea or a particular kind of information about an area are called **special-purpose maps.** There are many kinds of special-purpose maps, each designed to serve a different need. Population density maps, time zone maps, and climate maps are among the different kinds of special-purpose maps. You will learn to read these and other kinds of special-purpose maps later in this book.

Some special-purpose maps—such as economic activity maps and natural resource maps—show the distribution of particular activities, resources, or products in a given area. Colors and symbols represent the location or distribution of activities and resources.

Many times maps will be a combination of physical, political, and special-purpose. For example, a special-purpose map that shows what products are produced in the United States will usually have state boundaries shown. What kind of map shows boundaries? A land-use map may also show major rivers. What kind of map shows rivers?

When you read a map, what should you look at first? In order to know what the map is about, you must first look at the map's title. The title may be at the top or bottom of the map, or it may be in a box with the legend.

Map 1-14 Australia and New Zealand: Political



Using Your Skills

A Reviewing Key Terms

Match each term with its meaning. Draw a line from each term to its definition.

1.	political map	**a.**	a kind of map that shows features of the land
2.	physical map	**b.**	a kind of map that gives one particular kind of information
3.	special-purpose map	**c.**	a kind of map that shows how humans have divided the earth into countries and states

B Practicing Map Skills

Use Map 1-15: Ethiopia, 2001 below to answer the questions.

1. What is the title of this map? _____

2. What part of the map tells you what the symbols on the map mean? _____

3. What do the solid black lines on the map stand for? _____

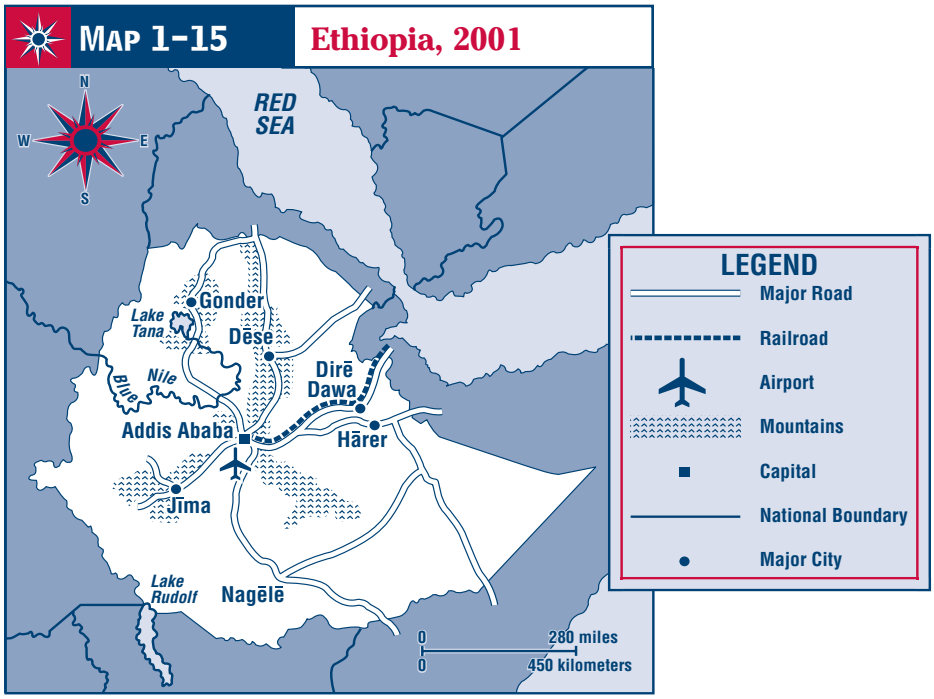
4. What does ▒▒▒ on the map stand for? _____

5. What does ---------- on the map stand for? _____

6. Would you call this a physical map, a political map, a special-purpose map, or a combination of all three? Why?

_____

_____



Lesson 12 Comparing Map Projections

What You Will Learn

To compare and contrast different map projections

Reading Strategy

Create a chart like the one below. On the left, list three words or phrases that describe globes. On the right, do the same for maps.

Globes	Maps

Terms to Know

map projection, Mercator projection, cylindrical projection, planar projection, conic projection, Winkel Tripel projection

Have you ever heard the saying, "You can't have your cake and eat it, too"? It's a way of saying that when we get one thing, often we must give up something else.

Choosing a map sometimes means giving up one thing in order to get another. Maps show four things: *direction, distance, shape,* and *size.* Only a globe can show all four with accuracy at the same time. Maps, however, cannot. A map may show direction well, but the shapes of landmasses may be quite inaccurate. Or, if shapes are shown correctly, distances may not be.

You might think that the way to get around this problem would just be to use globes all the time. However, think how hard it would be to get a globe in your pocket or inside the covers of a book.

Understanding Map Projections

There are many different kinds of **map projections.** A map projection is a way of showing the rounded earth on a flat piece of paper. Where does the word "projection" come from? Imagine a clear globe with latitude and longitude lines and the outlines of the landmasses on it. Suppose there was a lightbulb inside the globe. If you wrapped a piece of paper around the globe and turned on the lightbulb, the outlines of the grid and landmasses would be projected onto the paper. The three basic categories of map projections are cylindrical, planar, and conic.

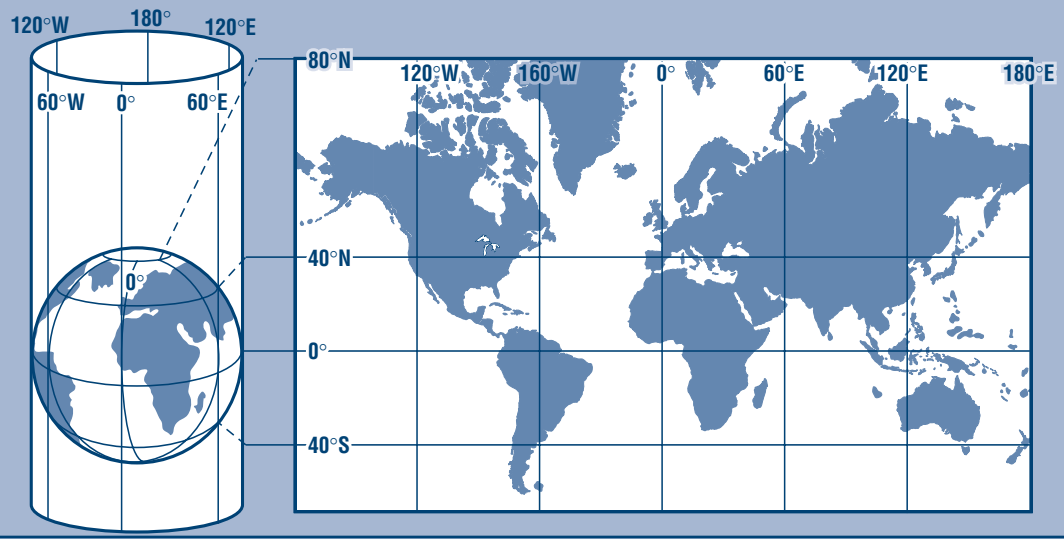
Cylindrical Projections

Look at Figure 1-14 of a **Mercator projection.** This type of projection is a **cylindrical projection.** It shows how the earth would look if a piece of paper were wrapped to form a tube or cylinder around the globe. You will recall that lines of latitude are the same distance apart on a globe. But look at what happened to lines of latitude on a Mercator projection. The lines get farther apart as you move away from the Equator. This means that distances are not true. It also means that the sizes of landmasses near the North and South Poles are greatly exaggerated in size.

Planar Projections

Some maps are round; they look like a flattened disk of the earth's surface. Longitude lines on these maps are straight and meet in the center of the circle. Latitude lines form a series of circles that get smaller as they reach the center of this kind of map.

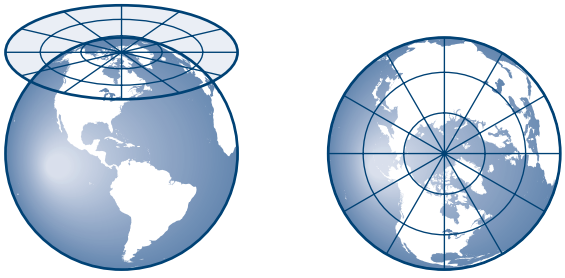
FIGURE 1–14 Mercator Projection



This is called a **planar projection.** Also known as an *azimuthal projection,* it comes from the idea of projecting the globe onto a plane that is touching the globe at one point. A common form of planar projection is a polar projection. Polar projections show the North Pole or the South Pole as the center of the map.

Although size and shape are distorted on planar projections, distances and directions are accurate when the line of travel passes through the center of the map.

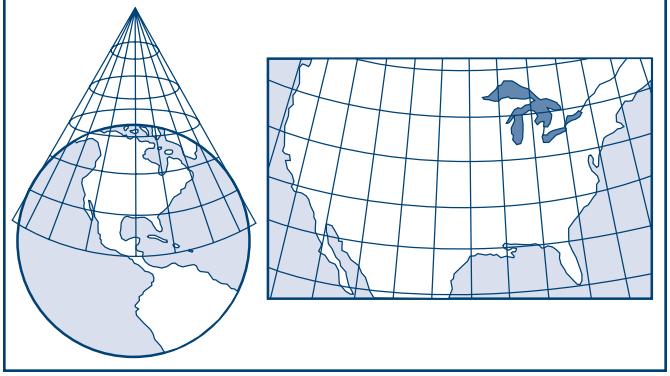
FIGURE 1–15 Planar Projection



Conic Projections

Often you will see maps on which the longitude lines are straight and get closer together toward the north, or top of the map. Latitude lines are curved on this kind of map. It is called a **conic projection.** It comes from the idea of placing a cone over part of a globe.

FIGURE 1–16 Conic Projection



A conic projection is good for showing small areas midway between the Equator and the Poles. Size, distance, and direction are fairly accurate.

There are a number of other kinds of projections that show the sizes of landmasses fairly

FIGURE 1–17 Robinson Projection

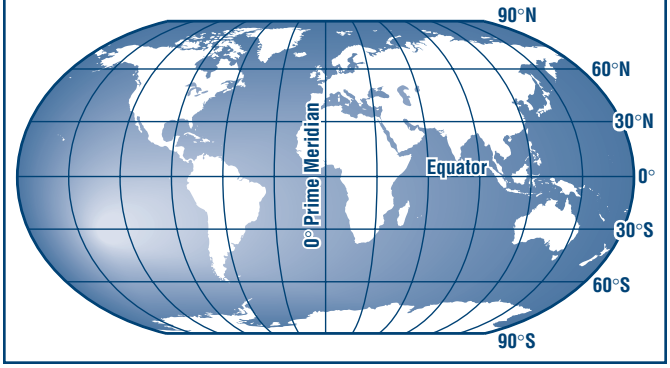
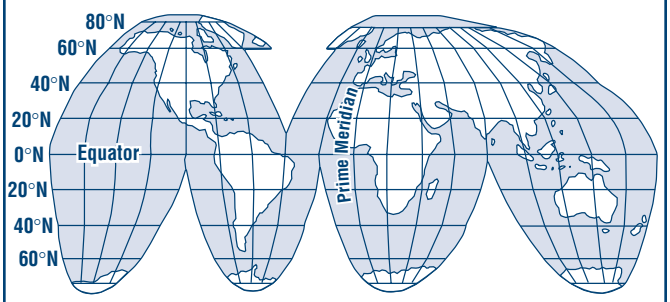


FIGURE 1–18 **Goode's Interrupted Equal-Area Projection**



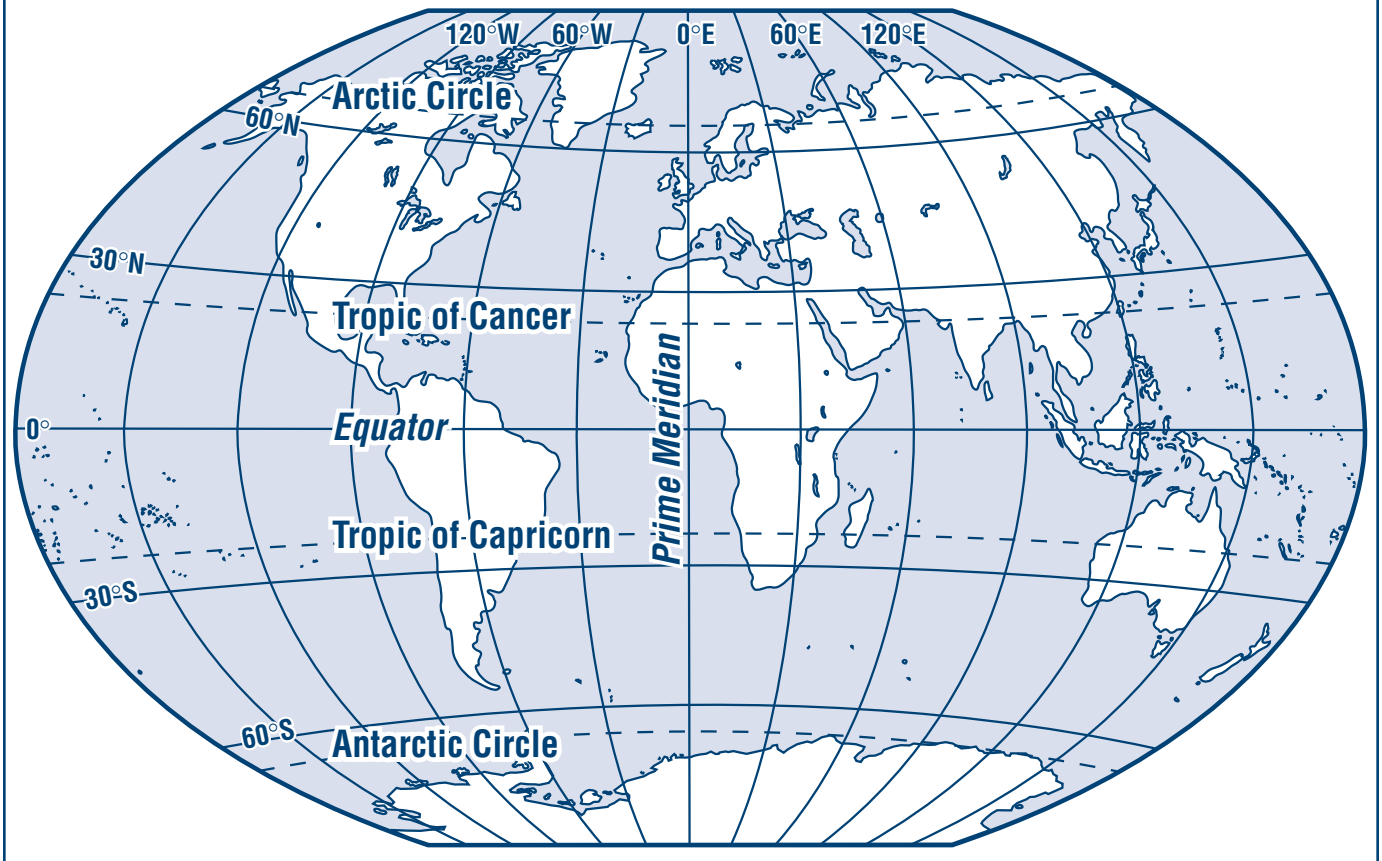
accurately. Look at Figures 1-17 through 1-19. Notice that each has a particular shape. The Robinson projection shows only minor distortions in true size, distance, and shape of landmasses. Goode's Interrupted Equal-Area projection allows the shapes and sizes of landmasses to be depicted with a high degree of accuracy.

Remember that no map can show direction, distance, shape, and size at the same time as accurately as a globe. Every kind of map has a special use, but none is perfect. When you look at a map, keep in mind that the sizes of landmasses may not be correct, or distances or directions may not be true. Be careful not to make judgments about the world based only on maps.

Winkel Tripel Projection

The **Winkel Tripel projection,** Figure 1-19, is used in most general reference maps today. It provides a balance between the size and shape of land areas as they are shown on the map. Even the polar areas are shown with little distortion of size and shape.

FIGURE 1–19 **Winkel Tripel Projection**



Using Your Skills

A Reviewing Key Terms

Match each term at left with its meaning.

_____	**1.**	planar projection	**a.**	based on the projection of the globe onto a cone
_____	**2.**	conic projection	**b.**	based on the projection of the globe onto a cylinder
_____	**3.**	cylindrical projection	**c.**	based on the projection of the globe onto a plane

B Recalling Facts

Decide whether each statement is true or false. Write *T* if the statement is true. Write *F* if the statement is false.

_____ **1.** Only globes can show true distance, direction, size, and shape of landmasses all at the same time.

_____ **2.** No map can show true distance and direction.

_____ **3.** All maps show the surface of the earth in the same way.

_____ **4.** All maps can show accurate size, but inaccurate distance.

_____ **5.** A map can show that a landmass is much larger than it really is.

C Recalling Facts

Fill in the blanks to correctly complete the following sentences.

1. On a Mercator projection, the sizes of landmasses near the North and South Poles are greatly exaggerated in _____.

2. On a planar projection, the size and shape of the landmasses are _____, but distance and direction are _____.

3. A conic projection is good for showing _____ areas midway between the _____ and the Poles.

4. A planar projection is also known as a(n) _____ projection.

5. A _____ projection provides a balance between size and shape of land areas as shown on the map.

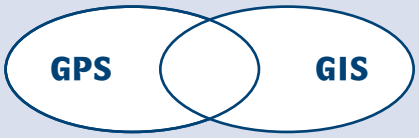
Lesson 14 Understanding GPS and GIS

What You Will Learn

To understand how a Global Positioning System and geographic information systems work

Reading Strategy

Draw a diagram like the one below. In the left circle list facts about a GPS. In the right circle list facts about GIS. In the overlapping area write facts that are true about both.



Terms to Know

Global Positioning System (GPS), geographic information system (GIS)

Millions of salmon return to Bristol Bay in Alaska to spawn each July. Hundreds of fishermen with boats and long nets wait for them. To ensure that there will be future generations of salmon, the Alaska Department of Fish and Game (ADFG) monitors the fishing grounds and sets limits on when and where the fishermen can fish. As Map 1-18 shows, ADFG has drawn two boundary lines in the water, one at each end of the bay. The Alaska Department of Fish and Game imposes heavy fines on fishermen who fish outside those boundary lines.

Fishermen cannot see the lines with their eyes. They know, however, where the lines are. They use Global Positioning System (GPS) receivers to monitor their positions, allowing them to stay within the limits set by the Alaska Department of Fish and Game.

Map 1-18 Bristol Bay, Alaska

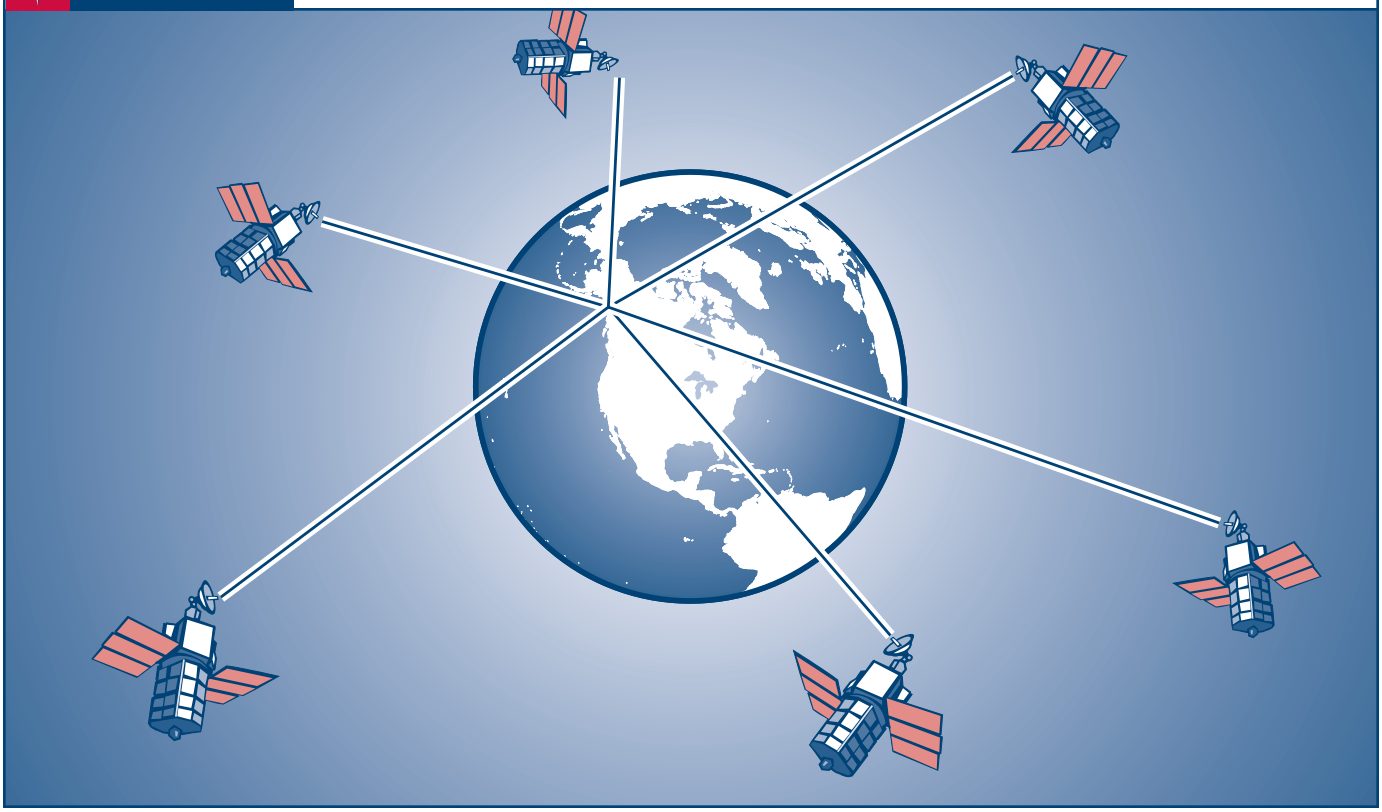


How GPS Works

The **Global Positioning System (GPS)** consists of three elements: the *satellites, receivers,* and *ground stations.* There are 24 satellites in fixed orbit around the earth. Over 11 nautical miles out in space, these giant "eyes in the sky" complete an orbit of the earth every 12 hours. The satellites transmit data at the speed of light continually, regardless of weather conditions, to the receivers.

Receivers, located anywhere on Earth, receive signals from at least six satellites at any one time. Even though the satellites send

FIGURE 1–20 GPS Satellites



the signals at the speed of light, it still takes a measurable amount of time for the signals to reach the receivers. To give an accurate reading of a location, the receivers first calculate the distance to the satellites by measuring the difference between the time the signal was sent from the satellite and the time it was received, multiplied by the speed of light. Using data received from the satellites, the receiver can determine its exact location on the earth.

Originally developed by the U.S. military, GPS receivers now come in all shapes and sizes; most are the size of a cellular phone. Some are handheld; others are installed in cars, trucks, ships, and planes. Their job is to receive and decode signals from the satellites and present the results on a screen.

The third element of the GPS is the five large control stations and many unmanned ground stations located around the world. Their job is to stay in constant contact with the satellites. They track their courses and monitor their output.

Uses of Geographic Information Systems (GIS)

A **geographic information system (GIS)** is sophisticated software that combines and analyzes different types of information relevant to a specific geographic location. After information about an area is entered into the GIS database, the computer can create maps showing any combination of the data. Each type of data is stored as a separate "layer" of the map. So numerous combinations of data can be combined to build a very specialized map.

Farmers use GIS when they combine various types of data about their fields. Traditionally, farmers find out too late when pests damage their crops. Since they do not know how deep the pests have penetrated their fields, they often over-spray with expensive pesticides. Maps produced by GIS analysis can be used to pinpoint problem areas in the farmers' fields. Instead of treating the whole field, farmers are able to spot treat the problem.

Using Your Skills

A Reviewing Key Terms

Match each term with its meaning.

_____	**1.** receiver	**a.**	geographic information system
_____	**2.** GPS	**b.**	place that tracks the orbits and monitors the output of satellites
_____	**3.** ground station	**c.**	machines in space that transmit data to Earth
_____	**4.** GIS	**d.**	Global Positioning System
_____	**5.** satellites	**e.**	small device that decodes and processes data from satellites

B Recalling Facts

Use the reading and Figure 1-20 to answer these questions.

1. At what speed does the satellite transmit data?

2. How many times does a GPS satellite orbit the earth in a week?

3. How many satellites broadcast to receivers at any one time?

4. How many satellites make up the GPS?

5. How many nautical miles are the GPS satellites out in space?

6. Describe one use of data from a geographic information system.