Main Idea
Globes and maps provide different ways of showing features of the earth.

Terms to Know
- hemisphere
- scale
- latitude
- relief
- longitude
- elevation
- scale bar
- contour line

What Is a Globe?
A globe is a model of the earth that shows the earth's shape, lands, distances, and directions as they truly relate to one another. A world globe can help you find your way around the earth. By using one, you can locate places and determine distances.

Hemispheres
To locate places on the earth, geographers use a system of imaginary lines that crisscross the globe. One of these lines, the Equator, circles the middle of the earth like a belt. It

### Hemispheres

#### Northern Hemisphere
- Asia
- North Pole
- Europe
- Pacific Ocean
- North America

#### Southern Hemisphere
- India
- Africa
- Atlantic Ocean
- Antarctica
- South America
- Pacific Ocean

#### Western Hemisphere
- North America
- Atlantic Ocean
- South America
- Pacific Ocean

#### Eastern Hemisphere
- Europe
- Asia
- Africa
- India
- Australia
divides the earth into “half spheres,” or **hemispheres**. Everything north of the Equator is in the Northern Hemisphere. Everything south of the Equator is in the Southern Hemisphere.

Another imaginary line runs from north to south. It helps divide the earth into half spheres in the other direction. Find this line—called the Prime Meridian or the Meridian of Greenwich—on a globe. Everything east of the Prime Meridian for 180 degrees is in the Eastern Hemisphere. Everything west of the Prime Meridian for 180 degrees is in the Western Hemisphere. In which hemispheres is North America located? It is found in both the Northern Hemisphere and the Western Hemisphere.

### Latitude and Longitude

The Equator and the Prime Meridian are the starting points for two sets of lines used to find any location. **Parallels** circle the earth like stacked rings and show **latitude**, or distance measured in degrees north and south of the Equator. The letter *N* or *S* following the degree symbol tells you if the location is north or south of the Equator. The North Pole, for example, is at 90°N (North) latitude, and the South Pole is at 90°S (South) latitude.

Two important parallels in between the poles are the Tropic of Cancer at 23½°N latitude and the Tropic of Capricorn at 23½°S latitude. You can also find the Arctic Circle at
66 1/2°N latitude and the Antarctic Circle at 66 1/2°S latitude.

Meridians run from pole to pole and crisscross parallels. Meridians signify longitude, or distance measured in degrees east (E) or west (W) of the Prime Meridian. The Prime Meridian, or 0° longitude, runs through Greenwich, England. On the opposite side of the earth is the 180° meridian, also called the International Date Line.

Lines of latitude and longitude cross each other in the form of a grid system. You can find a place’s absolute location by naming the latitude and longitude lines that cross exactly at that place. For example, the city of Tokyo, Japan, is located at about 36°N latitude and about 140°E longitude.

How Maps Are Made

For more than 4,000 years, people have made maps to organize their knowledge of the world. The reason for producing maps has not changed over the centuries, but the tools of mapmaking have. Today satellites located thousands of miles in space gather data about the earth below. The data are then sent back to the earth, where computers change the data into images of the earth’s surface. Mapmakers analyze and use these images to produce maps.

For modern mapmakers, computers have replaced pen and paper. Most mapmakers use computers with software programs called geographic information systems (GIS). With GIS, each kind of information on a map is kept as a separate electronic “layer” in the map’s computer files. Because of this modern technology, mapmakers are able to make maps—and change them—more quickly and easily than before.

How to Read a Map

Maps can direct you down the street, across the country, or around the world. An ordinary map holds all kinds of information. Learn the map’s code, and you can read it like a book.

Map Key The map key explains the lines, symbols, and colors used on a map. Look at the map of Spain below. Its key shows that dots mark major cities. A circled star indicates the national capital—in Spain’s case, the city of Madrid. Some keys tell which lines stand for national boundaries, roads, or railroads. Other map symbols may represent human-made or natural features, such as canals, forests, or natural gas deposits.

Compass Rose An important step in reading any map is to find the direction marker. A map has a symbol that tells you where the cardinal directions—north, south, east, and west—are positioned. Sometimes all of these directions are shown with a compass rose. An intermediate direction, such as southeast, may also be on the compass rose. Intermediate directions fall between the cardinal directions.
Latitude and Longitude Lines
Like globes, maps have lines of latitude and longitude that form a grid. Every place on the earth has a unique position or “address” on this grid. Knowing this address makes it easier for you to locate cities and other places on a map. For example, what is the grid address of Madrid, Spain? The map on page 6 shows you that the address is about 41°N latitude and about 4°W longitude.

Scale
A measuring line, often called a scale bar, helps you determine distance on a map. The map’s scale tells you what distance on the earth is represented by the measurement on the scale bar. For example, 200 miles on the earth may be represented by 1 inch on the map. Knowing the scale allows you to see how large an area is. Map scale is usually given in both miles and kilometers.

Each map has its own scale. What scale a mapmaker uses depends on the size of the area shown on the map. If you were drawing a map of your backyard, you might use a scale of 1 inch equals 5 feet. In contrast, the scale bar on the inset map above of Austin, Texas, shows that about \( \frac{3}{4} \) inch represents 8 miles. Scale is important when you are trying to compare the size of one area to another.

General Purpose Maps
Maps are amazingly useful tools. You can use them to preserve information, to display data, and to make connections between seemingly unrelated things. Geographers use many different types of maps. Maps that show a wide range of general information about an area are called general purpose maps. Two of the most common general purpose maps are political and physical maps.
Political Maps  Political maps show the names and boundaries of countries, the location of cities and other human-made features of a place, and often identify major physical features. The political map of Spain on page 6, for example, shows the boundaries between Spain and other countries. It also shows cities and rivers within Spain and bodies of water surrounding Spain.

Physical Maps  Physical maps call out landforms and water features. The physical map of Sri Lanka above shows rivers and mountains. The colors used on physical maps include brown or green for land, and blue for water. These colors and shadings may show relief—how flat or rugged the land surface is. In addition, physical maps may use colors to show elevation—the height of an area above sea level. A key explains what each color and symbol stands for.

Contour Maps  One kind of physical map, called a contour map, also shows elevation. A contour map has contour lines—one line for each major level of elevation. All the land at the same elevation is connected by a line. These lines usually form circles or ovals—one inside the other. If contour lines come very close together, the surface is steep. If the lines are spread apart, the land is flat or rises very gradually. Compare the contour map of Sri Lanka above to its physical map.

Special Purpose Maps

Some maps are made to present specific kinds of information. These are called thematic or special purpose maps. They usually show themes or patterns, often emphasizing one subject or theme. Special purpose maps may present climate, natural resources, and population density. They may also display historical information, such as battles or territorial changes. The map’s title tells what kind of special information it shows. Colors and symbols in the map key are especially important on these types of maps.
One type of special purpose map uses colors to show population density, or the average number of people living in a square mile or square kilometer. As with other maps, it is important to first read the title and the key. The population density map of Egypt to the right gives a striking picture of differences in population density. The Nile River valley and delta are very densely populated. In contrast, the desert areas east and west of the river are home to few people.

### Defining Terms
1. **Define** hemisphere, latitude, longitude, scale bar, scale, relief, elevation, contour line.

### Recalling Facts
2. Why do people make maps?
3. What are the four cardinal directions?
4. What are two of the most common types of general purpose maps?

### Critical Thinking
5. **Comparing and Contrasting** Describe the similarities and differences between physical maps and contour maps.
6. **Synthesizing Information** What imaginary line divides the earth into the Eastern and Western Hemispheres?

### Graphic Organizer
7. **Organizing Information** Create a diagram like the one below. In each of the outer ovals, write an example of a feature that you would find on a typical physical map.

### Applying Social Studies Skills
8. **Analyzing Maps** Look at the map of Egypt above. At what latitude and longitude is Alexandria located? Use the key to describe the population density of Alexandria and its surrounding area.