Why Is This Skill Important?
To answer questions about the world around you, you need information. You can get this information by reading this atlas, by looking at its pictures and charts, and by studying its maps. Maps tell you about the five themes of geography—location, place, human-environment interactions, movement, and regions. Knowing how to read maps is an important skill both for learning social studies and for taking action as a citizen.

The Parts of a Map
Most maps have several things in common. To help you read maps, mapmakers usually include a title, a key, a compass rose, a locator, and a scale on the maps they draw.

The map title tells you the subject of the map. Look the map below. What is the title of this map?

The map title may also help you understand what kind of map is shown. There are many kinds of maps. One kind is a physical map. It
shows mostly landforms and bodies of water. Another kind of map is a political map. It shows mostly cities and state or national boundaries. **Boundary** is another word for **border**, or the outside edge of a place. What two countries share a national border with the United States?

<table>
<thead>
<tr>
<th>National capital</th>
</tr>
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<tbody>
<tr>
<td>State capital</td>
</tr>
<tr>
<td>National border</td>
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<tr>
<td>State border</td>
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</tbody>
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The **map key**, which is sometimes called a map legend, explains what the symbols on the map stand for. A **symbol** is something that stands for something else. On a map, a symbol represents a real object in the world. Symbols on maps may be colors, patterns, lines, or other special marks. On the map on page 6, a star is used to show a state capital. What symbol is used to show the national capital?

The **compass rose**, or direction marker on a map, shows the main directions, or cardinal directions. The **cardinal directions** are north, south, east, and west. The compass rose also helps you find the **intermediate directions**, or the directions between the cardinal directions. Intermediate directions are northeast, southeast, southwest, and northwest.

The **locator** is a small map or globe that shows where the place on the main map is located in a state, in a country, or in the world. The locator on the map of the United States is a globe that shows North America. The United States is shown in red.

The **map scale** compares a distance on a map with a distance in the real world. A map scale helps you find the real distance between places on a map. Each map in this atlas has a scale that shows both miles and kilometers.

Find Alaska and Hawaii on the map of the United States. These states are not shown where they really are. Hundreds of miles separate them from the other 48 states. To show the whole area between Alaska, Hawaii, and the other states, the map would have to be much larger, or each part of the map would have to be much smaller. Instead, Alaska and Hawaii are each shown in an **inset map**, or a small map within a larger map. The boxes around Alaska and Hawaii show that they are inset maps.

An inset map often has its own map scale. Look at Alaska on the map of the United States. On the Earth, Alaska is more than twice the size of Texas, but on the map, Alaska is much smaller than Texas. This is because the scales on the inset map and the main map are different.
Understand the Process

To help you find places on a map, mapmakers sometimes add lines that cross each other to form a pattern called a grid. Study the map of Arkansas below. Around the grid are letters and numbers. In this grid the columns, which run up and down, have numbers. The rows, which run left and right, have letters. Each square on the map can be identified by its letter and number.

A map with a grid may have an index such as the one you see beside this map. The index helps you find the names of the places you are looking for. It lists them in alphabetical order. The index also gives the grid letter and number for each place.

1. Find Little Rock, Arkansas’s capital, in the map index. What are Little Rock’s grid letter and number?

2. Find the letter B and the number 2 on the grid. Put a finger of one hand on the letter B and a finger of your other hand on the number 2. Move your fingers toward each other, along row B and column 2. You will find Little Rock in the square where your fingers meet.

3. Now find Fayetteville on the map. In what square is it located? In what square is the city of Fort Smith located?

4. What city is located in square C-3? Check your answer with the map index.

Think and Apply

Look at the map of Arkansas again. Identify the parts of the map, and discuss with a partner what the map tells you about the state. Then take turns using the map grid to find different places in the state.
Why Is This Skill Important?

Just as the numbers of your home address describe where you live in your town, the numbers of your global address tell where your town is located on the Earth. The numbers in a global address stand for lines of latitude and lines of longitude. You can use these lines to help you describe the absolute, or exact, location of any place on the Earth.

Lines of Latitude

Mapmakers use a system of imaginary lines to form a grid on maps and globes. The lines that run east and west are the **lines of latitude**. Lines of latitude are also called **parallels**. This is because they are parallel, or always the same distance from each other. Parallel lines never meet.

Lines of latitude are measured in degrees north and south from the equator, which is labeled 0°, or zero degrees. The parallels north of the equator are marked **N** for **north latitude**. This means they are in the Northern Hemisphere. The parallels south of the equator are marked **S** for **south latitude**. This means they are in the Southern Hemisphere. The greater the number of degrees marking a parallel, the farther north or south of the equator it is.

Lines of Longitude

The lines that run north and south on a map are the **lines of longitude**, or **meridians**. Each meridian runs from the North Pole to the South Pole. Unlike parallels, which never meet, meridians meet at the poles. Meridians are farthest apart at the equator.

Meridians are numbered in much the same way as parallels are numbered. The meridian marked 0° is called the **prime meridian**. It runs north and south through Greenwich, near the
city of London in Britain. Lines of longitude to the west of the prime meridian are marked W for west longitude. They are in the Western Hemisphere. The meridians to the east of prime meridian are marked E for east longitude. They are in the Eastern Hemisphere.

Understand the Process

The map above shows the four voyages of Christopher Columbus to the Americas. The map has a grid of lines of latitude and longitude drawn over it. The crossing lines of latitude and longitude make it possible to describe absolute location.

Like most maps, this one does not show every parallel and meridian. Every fifteenth parallel is shown from 15°N to 45°N, and every fifteenth meridian is shown from 0° to 90°W.

Now that you know about lines of latitude and longitude, you can use them to find some locations. At either side of the map, find 30°N. At the top or bottom, find 15°W. Use a finger of each hand to trace these lines to the point where they cross each other. The Canary Islands are not far from this point. So you can say that the location of the Canary Islands is near 30°N, 15°W.

Look for the latitude and longitude that describe the location of Columbus's first landing in the Americas. The closest parallels are 15°N and 30°N. The closest meridian is 75°W. So you can say that the location of the first landing is about 22°N, 75°W.

Think and Apply

Think about what you just learned about latitude and longitude. Use the map to answer these questions.

1. What line of latitude is closest to Hispaniola?
2. What line of longitude is closest to the Bahama Islands?
3. What islands are located near 15°N, 30°W?
4. Which location is farther north, 45°N, 60°W or 30°N, 90°W?
5. Which location is farther east, 45°N, 60°W or 30°N, 90°W?
Why Is This Skill Important?

Over the centuries Arab, Chinese, and European mapmakers have developed different ways to show the round Earth in the form of a flat map. These different representations of the Earth are called projections. Every map projection has distortions, or parts that are not accurate. This is because the shape of the round Earth needs to be split or stretched to make it flat. Identifying these distortions will help you understand how map projections can best be used.

Map Projections and Their Uses

Different kinds of map projections have different kinds of distortions. Some map projections distort the shape or the size of the area shown. Some show distances to be greater or less than they actually are. One way that mapmakers classify map projections is by the properties that are distorted the least.

- **Map A** is an equal-area projection. Notice that the prime meridian and the equator divide the hemispheres so that their areas are equal. An equal-area projection shows the sizes of regions in correct relation to one another, but it distorts shapes. Because an equal-area projection shows correct size relations of regions, it is useful for comparing information about different parts of the world. The projection on Map A below is just one of the many different kinds of equal-area projections.

- **Map B** is a conformal projection. Notice that the lines of longitude are all an equal distance apart. On a globe the lines of longitude get closer together as they near the poles, where they meet. Also notice on Map B that the lines of latitude closer to the poles are farther apart.
On a globe the lines of latitude are an equal distance apart. A conformal projection shows directions correctly, but it distorts sizes, especially of places near the poles. The Miller projection, shown above on Map B, is just one example of a conformal projection. Another that you may see is the Mercator (mer-KEY-ter) projection. Still another type of map, the Robinson projection, is a combination of equal-area and conformal projections. Map C is an example of a Robinson projection.

Map D is an equidistant projection. It shows accurate distances from a central point. Any
place on the Earth can be chosen as the central point. Often the central point chosen is one of the poles. That kind of map is called a polar projection. Either the North Pole or the South Pole can be the center of a polar projection. Notice on Map D that the North Pole is at the center of the map. The lines of latitude are circles, and the circles farther from the center are larger. Lines of longitude on Map D are straight lines that extend from the center in all directions, like the spokes of a wheel.

A great circle is any imaginary circle that divides the Earth into equal parts. The equator is a great circle. Lines of longitude are great circles, too. Because the Earth’s surface is curved, the shortest distance between any two places is not really a straight line but part of a great circle. An equidistant projection is useful for finding the distance from the central point to other places on the map. Another projection, the gnomonic projection, is also important when studying great circle routes. In this projection all straight lines are great circle routes. Therefore, these lines show the shortest routes between two places. Distances on this projection are not accurate, however.

**Understand the Process**

Compare and contrast Maps A, B, C, and D by answering the questions below. As you answer the questions, think about the advantages and disadvantages of each map projection.

1. South America is much larger than Greenland. Which projection shows Greenland’s size more accurately, Map A or Map B?
2. The greatest east-west distance in Africa is about the same as the greatest north-south distance. Which projection shows Africa’s shape more accurately, Map A or Map B?
3. The North Pole is a single point. Which projections show the North Pole accurately?
4. Which map can be called a polar projection?
5. On which map do the lines of longitude get closer together toward both poles?
6. On which map or maps are the lines of longitude parallel, or equally far apart?

**Think and Apply**

Write a paragraph about the advantages and disadvantages of using each kind of map.
basin - bowl-shaped area of land surrounded by higher land
bay - body of water that is part of a sea or ocean and is partly enclosed by land
bluff - high, steep face of rock or earth
canyon - deep, narrow valley with steep sides
cape - a point of land that extends into water
waterfall - large waterfall
cliff - high, steep face of rock or earth
coast - land along a sea or ocean
coastal plain - area of flat land along a sea or ocean
delta - triangle-shaped area of land at the mouth of a river
desert - dry land with few plants
dune - hill of sand piled up by the wind
fall line - area along which rivers form waterfalls or rapids as the rivers drop to lower land

fjord - deep, narrow part of a sea or ocean, between high, steep banks
floodplain - flat land that is near the edges of a river and is formed by the silt deposited by floods
foothills - hilly area at the base of a mountain
glacier - large ice mass that moves slowly down a mountain or across land
gulf - body of water that is partly enclosed by land but is larger than a bay
hill - land that rises above the land around it
island - land that has water on all sides
isthmus - narrow strip of land connecting two larger areas of land
lagoon - body of shallow water
lake - body of water with land on all sides
marsh - lowland with moist soil and tall grasses
mesa - flat-topped mountain with steep sides
mountain highest kind of land
mountain pass gap between mountains
mountain range row of mountains
mouth of river place where a river empties into another body of water
oasis area of water and fertile land with desert on all sides
ocean body of salt water, larger than a sea
peak top of a mountain
peninsula land that is almost completely surrounded by water
plain flat land
plateau area of high, flat land with steep sides
reef ridge of sand, rock, or coral that lies at or near the surface of a sea or ocean
river large stream of water that flows across the land
riverbank land along a river
savanna large area of grassland containing scattered trees
sea body of salt water, smaller than an ocean
sea level the level that is even with the surface of an ocean or sea
source of river place where a river or stream begins
strait narrow channel of water connecting two larger bodies of water
swamp area of low, wet land with trees
timberline line on a mountain above which it is too cold for trees to grow
tributary stream or river that empties into a larger river
valley low land between hills or mountains
volcano opening in the Earth, often raised, through which lava, rock, ashes, and gases are forced out