

## Section

# 2

## Using Maps

### Main Ideas

1. Maps are useful tools for finding the locations of places.
2. The main parts of a map include a title, scale, legend, and compass rose.
3. Geographers create maps for many different purposes.

### Why It Matters Today

Maps are essential tools for geographers and many other professionals, but they can also be useful in your daily life. Use current events sources to find a recent news article that uses a map to explain a subject.

### Key Terms

- relative location
- absolute location
- latitude
- longitude
- equator
- prime meridian
- compass rose
- scale
- legend
- reference maps
- thematic maps
- map projections

## The Geographer's World

In 1724, engineer and mapmaker Francisco Álvarez Barreiro set off on a journey through Spanish lands in North America. In about four years, he traveled nearly 7,000 miles. As he traveled, he took careful notes and made sketches. From these, Barreiro created six maps, including one of Texas. He was the first professional mapmaker ever to see Texas for himself, and his map was prized for its accuracy.



**TEKS:** 8A, 9A, 9B, 21B, 21C, 22A

**myNotebook**

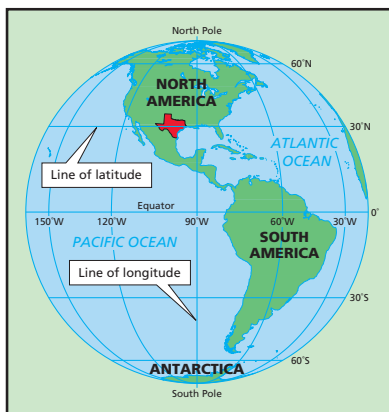
Use the annotation tools in your eBook to take notes on how to use maps to learn about the characteristics of places and regions.



## Maps and Models

Have you ever used a map to find your way to a location or through a park? If so, you understand how useful maps can be. Maps are important tools for geographers and historians. By representing a place in graphic form, maps can show information about its physical and human features. With maps, many types of information can be organized visually.

Maps can also be used to locate places. Geographers describe location in two ways. **Relative location** describes where a place is in relation to other places. The relative location of a place is noted by its distance and direction from another place. For example, Dallas is 225 miles northwest of Houston or 33 miles east of Fort Worth. **Absolute location** is the exact position of a place on Earth. The absolute location of the Texas Governor's Mansion can be expressed as 1010 Colorado Street in Austin or as 36°16'N latitude and 97°44'W longitude.



## Latitude and Longitude

**Interpreting Maps** Lines of latitude run east and west, while lines of longitude run north and south.

**Locate** What major line of latitude runs through Texas?

A model is similar to a map in that it shows the physical and human characteristics of a place. But where maps are flat and show locations in two dimensions, models show them in three dimensions. For example, look at the model of a Spanish mission on page 113 of this book. On a map the mission's walls would appear only as lines. Using the model, you can get a better sense of what the mission actually looked like.

**Reading Check Finding the Main Idea** Why do people use maps?



## Latitude and Longitude

To locate an exact spot on Earth, people use a more complex grid system. This system uses **latitude** and **longitude**, which are imaginary lines circling the globe. While latitude lines run east-west, longitude lines run north-south.

Lines of latitude and longitude measure distance in degrees—360 of which circle Earth. Each degree is divided into 60 minutes, and each minute is divided into 60 seconds. The symbol for degree is  $^{\circ}$ . Minutes are marked ' and seconds, '. Latitude lines measure distance north and south of the **equator**. The equator is an imaginary line circling the globe exactly halfway between the North and South Poles. Latitudes north of the equator are labeled N on maps. Those south of the equator are labeled S. Lines of latitude range from  $0^{\circ}$  at the equator to  $90^{\circ}\text{N}$  at the North Pole and  $90^{\circ}\text{S}$  at the South Pole.

Longitude lines measure distance east and west of the **prime meridian**. The prime meridian is an imaginary line that runs around the globe from the North Pole, through Greenwich, England, to the South Pole. Longitude lines range from  $0^{\circ}$  at the prime meridian to  $180^{\circ}$  at a line exactly halfway around the globe from the prime meridian. On maps, lines of longitude west of the prime meridian to  $180^{\circ}$  are labeled W. Those east of the prime meridian to  $180^{\circ}$  are labeled E.

The absolute location of any place on Earth can be given as a combination of latitude and longitude. For example, the latitude of San Antonio, Texas, is  $29^{\circ}25'\text{N}$ . The city's longitude is  $98^{\circ}30'\text{W}$ . Because Texas is a large state, it covers several degrees of latitude and longitude. North to south, Texas stretches from latitude  $36^{\circ}30'\text{N}$  to  $25^{\circ}50'\text{N}$ . East to west, the state extends from longitude  $93^{\circ}31'\text{W}$  to  $106^{\circ}36'\text{W}$ .

**Reading Check Comparing and Contrasting** Identify how latitude and longitude are different and the same.



## The Parts of a Map

In some ways, maps are like coded messages. Mapmakers provide elements that make maps easier to read, such as a map's title. The title for the map on the next page tells you that the map shows the state's

environmental regions. A map's directional indicator shows which directions are north, south, east, and west. North is usually at the top of a map. To show direction, some maps have a **compass rose** that points to all four cardinal points—north, south, east, and west.

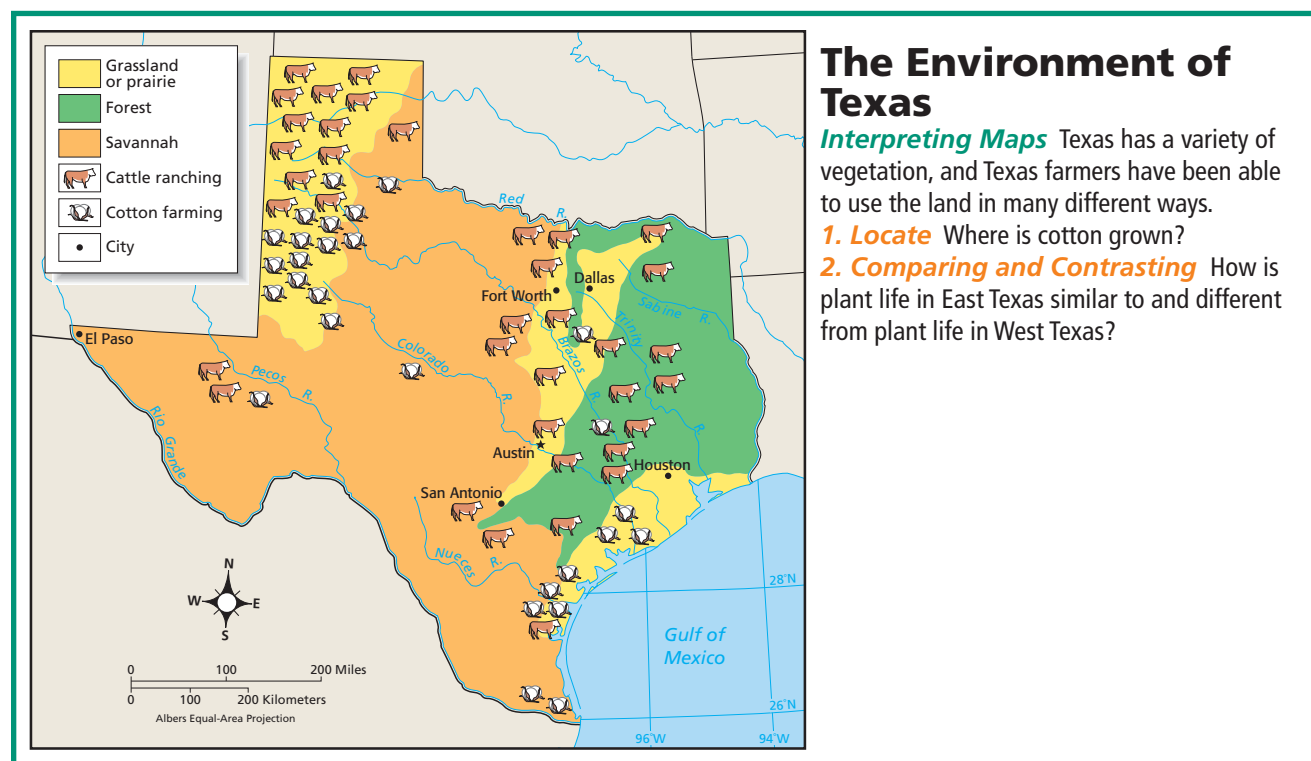
A map's **scale** is the relationship between a measurement on the map and the actual distance on Earth's surface. Perhaps the most useful part of a map is the **legend**, or key. The legend explains the meaning of all the symbols on a map. This information typically appears in a box near the edge of the map. Map symbols may include colors, numbers, patterns, or small drawings.

Some maps include additional inset maps or locator maps, which are smaller maps set inside or next to the main map. Inset maps show more detail than the main map. For example, a map of Houston might have an inset map showing downtown Houston. Locator maps place the area in a map in its larger geographic surroundings.

**Reading Check Summarizing** List the parts of a map and what they do.

## ★ Types of Maps

Mapmakers have developed many types of maps, including **reference maps** and **thematic maps**. Reference maps are used to find locations. Two common types of reference maps are political and physical. Political maps show information such as boundaries, capitals, and cities. Physical maps show natural features such as landforms, rivers, and other bodies of water. Some maps include both political and physical information.





## Interpreting Visuals

**Cartography.** Imagine you were peeling Earth like an orange. If you were to flatten Earth on a table, it would split and create gaps. **How does the shape of Earth affect mapmaking?**

Thematic maps show a specific topic, theme, or spatial distribution of an activity. Subjects might include cattle ranching, climates, population density, rainfall, soil types, or world religions.

With the exception of globes, maps are usually flat, but Earth is round. This difference makes it difficult to create accurate maps. To address this problem, mapmakers have developed **map projections**. Mapmakers use map projections to create a flat representation of Earth's surface. To create a Mercator projection, mapmakers first transfer an image of Earth's features onto a cylinder-shaped surface. This map projection is useful because it shows true direction and shape. However, landmasses near the North and South Poles appear larger than they really are. For example, the sizes of northern areas like Greenland, Canada, and Europe are enlarged while the sizes of tropical areas are diminished. Other types of projections show the sizes of landmasses more accurately but distort their shapes. The many types of map projections each have specific advantages and disadvantages.

**Reading Check Contrasting** How do reference maps and thematic maps differ?



## Section 2 Review



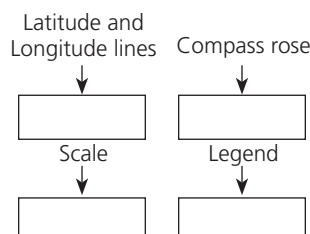
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**ONLINE QUIZ**

### 1. Define and explain:

- relative location
- absolute location
- latitude
- longitude
- equator
- prime meridian
- compass rose
- scale
- legend
- reference maps
- thematic maps
- map projections

### 2. Summarizing

Copy the graphic organizer below. Use it to describe how different map parts help decode a map.



### 3. Finding the Main Idea

- Why do people make maps?
- How do map grids differ from latitude and longitude, and when might a mapmaker use each?

### 4. Writing and Critical Thinking

myWriteSmart

**Evaluating** Imagine that you are preparing a report on farming in Texas. Describe some maps you might use. Consider the following:

- physical, political, and thematic maps
- titles and dates of possible maps
- the information you want to show