

KIDS
DISCOVER

Mapping Our World



FINDING YOUR LOCATION

Where in the world are you? Can you tell someone exactly where you are?

Earth is a big place. You take up a small piece of it. Your location is where you are on Earth. It can be as local as the street you live on, as global as the continent, or somewhere in between.

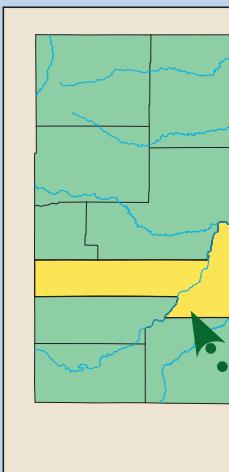
A general location can give you a rough idea of where something is. A specific address can pinpoint an exact location. Do you know your home address? Your school address?



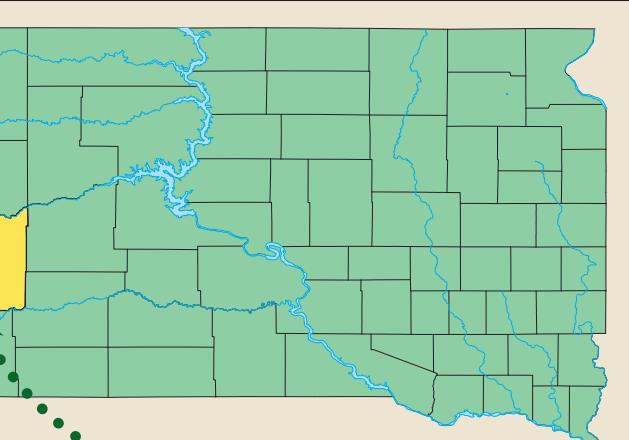
In what general area is Mount Rushmore? The national memorial is in the western part of South Dakota. South Dakota is in the midwestern part of the United States.



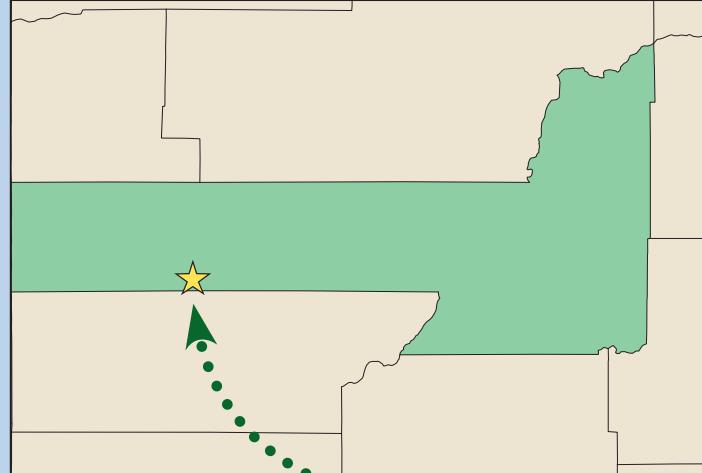
WHERE IS IT? GENERALLY SPEAKING



WHERE IS IT? SPOT ON!



PENNINGTON COUNTY



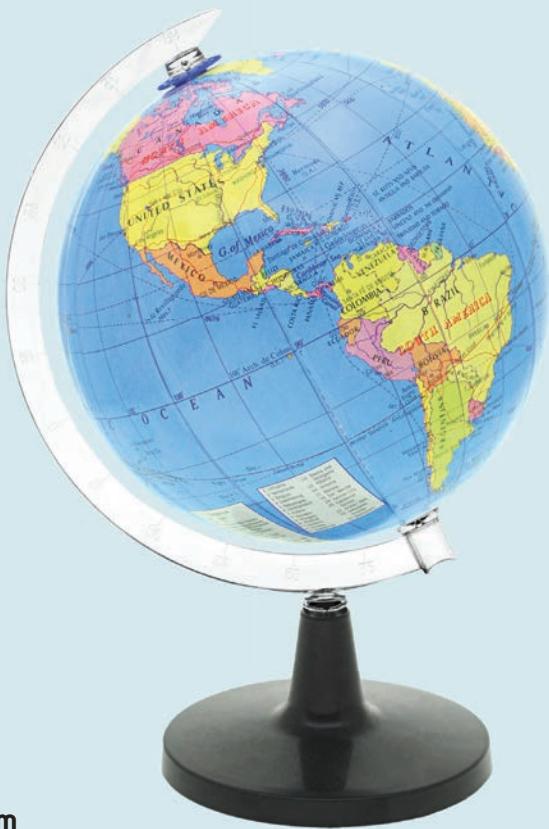
MOUNT RUSHMORE

MAPS AND GLOBES

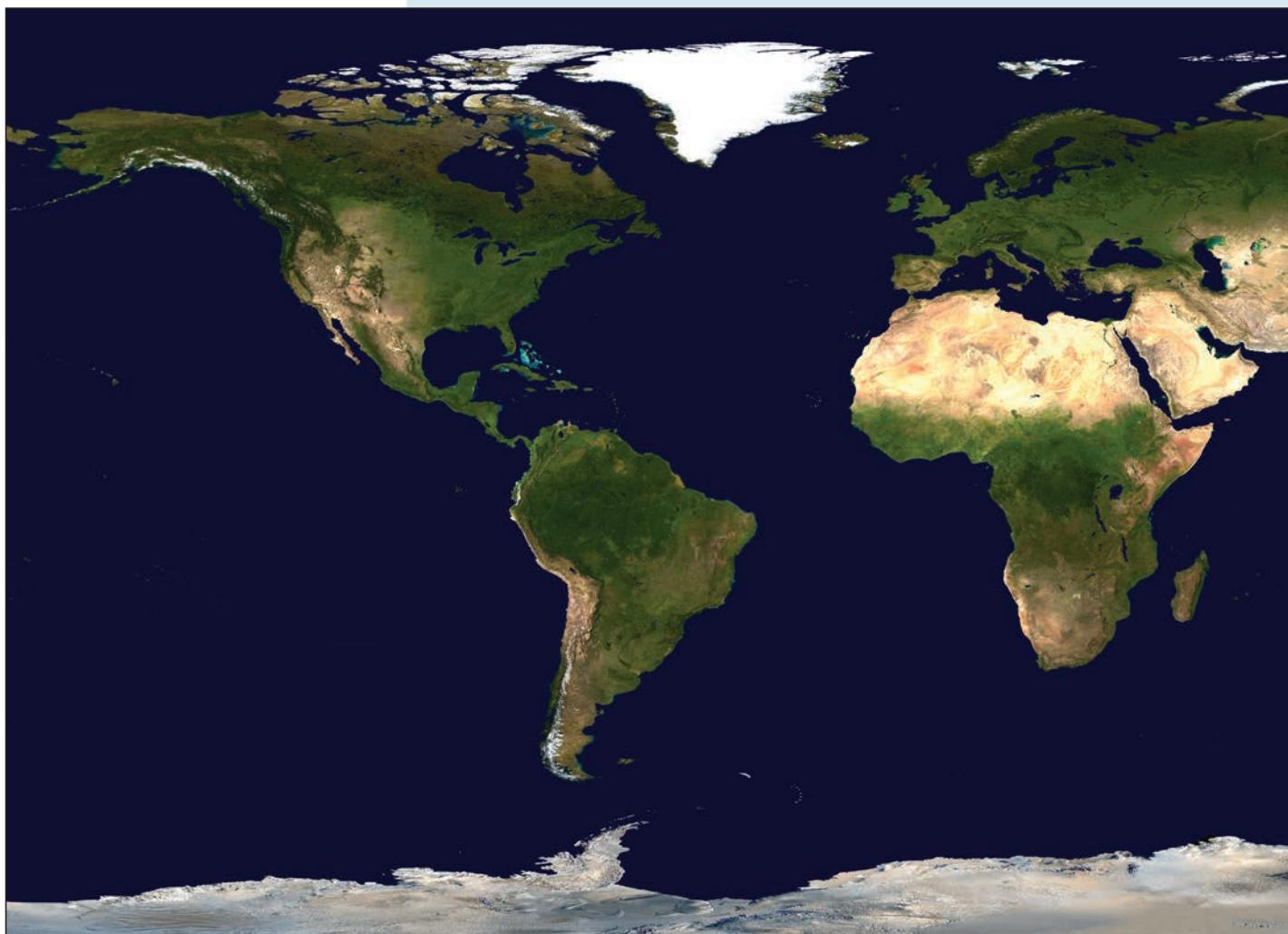
For thousands of years, geographers and mapmakers have known that we are on a planet, one that is shaped like a huge ball. People have developed globes and maps to help us understand our planet.

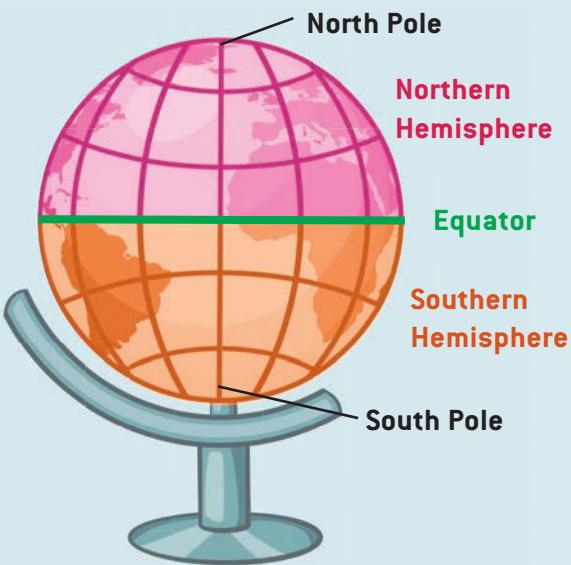
What's a globe?

A globe is a model of Earth. Like Earth, a globe is a sphere. A sphere is a round, solid figure. A globe shows the true shapes of the land and water on Earth.



▼ Pictures were taken from space to create this view of Earth.





↑ **Globe makers** and mapmakers have come up with some ways to describe Earth. They split it into sections. The imaginary line going right around

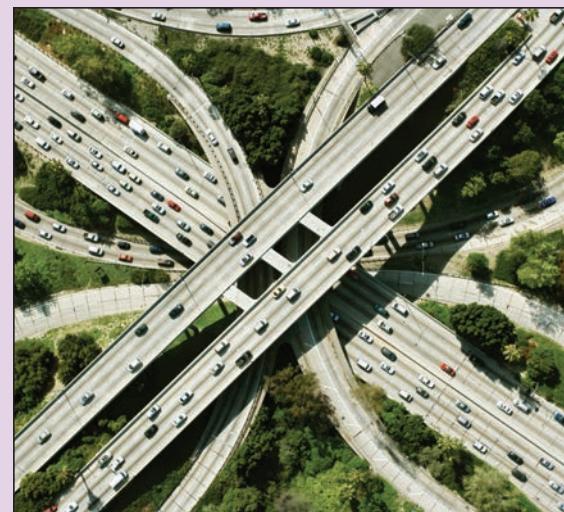
the middle of Earth is called the equator. The top half is called the Northern Hemisphere. The bottom half is called the Southern Hemisphere.



What's a map?

A map is a picture or drawing made to show a place in the real world in a smaller way. Most lines and pictures

on a map stand for things in the real world. Maps use two dimensions – length and width.



↑ **This is a** photograph of roads leading on

and off a highway in Los Angeles, California.



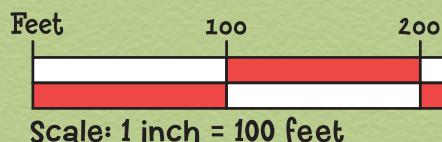
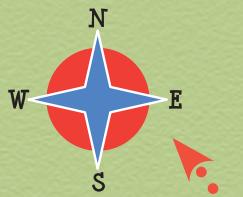
↑ **This is a map of** the same area. Mapmakers have to decide what to show – and what

not to show! What did they add? What did they leave out?

READING MAPS

Legends and scales. Are we talking about dragons or about maps? Both! Hundreds of years ago, mapmakers drew the parts of the world that they knew. Some drew legendary creatures – dragons, monsters, and sea serpents – beyond the places they knew. One globe even has the words “There Be Dragons.” Today, people know much more about the world.

On a map, the legend is a key. Small pictures or symbols on the map represent things, and the legend tells you what those things are. Many maps use the same symbols. A red cross may mean a hospital. A dollar sign may indicate a bank. And, on a map, a scale is not part of a dragon. It’s a way to show the real distance.



Compass Rose

This is a direction marker. Arrows or lines point to north, south, east, west, and the places in between.

Scale

The scale shows what a distance on the map is equal to in the real world. One inch on the map is the same as 100 feet on Earth.

TRY THIS!

Use a ruler to figure out distance on the map. How many inches is it from the Ferris wheel to the entrance? How far is that in the real world? How far is it from the parking lot to the carousel?

TRY THIS!

To get from the ticket booth to the roller coaster, in which direction would you have to walk? Is the entrance east or west of the bumper cars?

Legend

	Restrooms		Cash Machine
	Telephone		First Aid
	Water Fountain		Parking
	Tickets		Food

Legend

The legend shows what the symbols, or small pictures, on the map mean.

TRY THIS!

Use this legend to find a water fountain. How many are there? Find the water fountain that is closest to the first aid station.



CRAZY DAYS AMUSEMENT PARK

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Inset

Sometimes you want a closer look at something. You need an inset map, a small map set inside a larger one, to get more detail. Can you find the sand castle in the mini golf course?

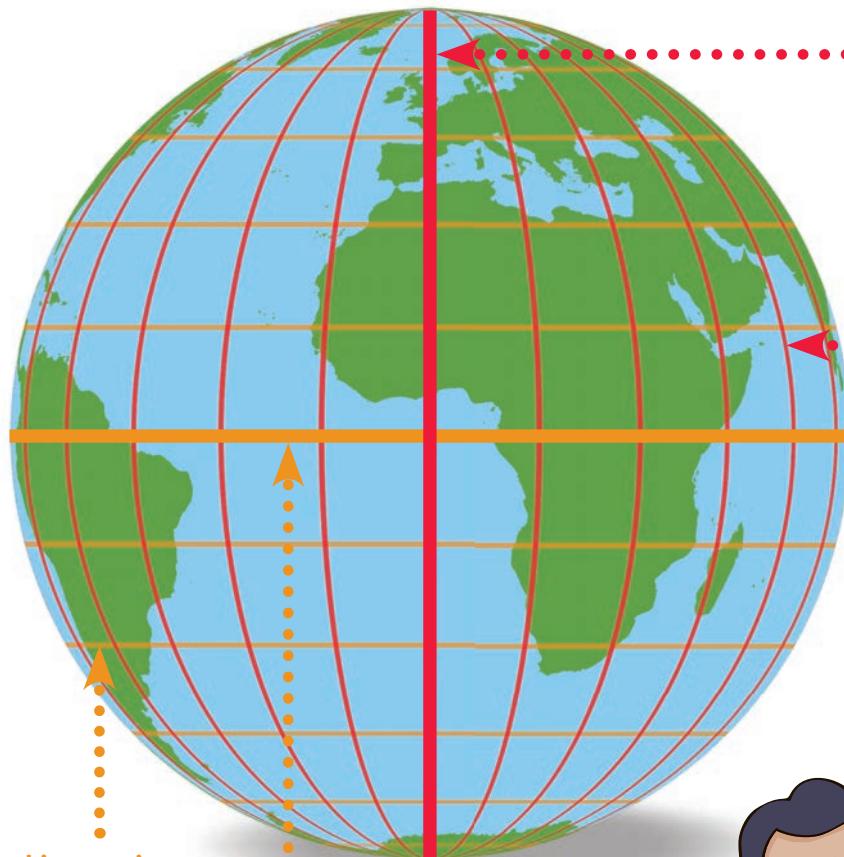
DIVIDING THE EARTH

You might know exactly where you are. But how do you explain that to someone else? How can you tell them where your home is, on a map? Think of a football field. It has lines going across the field, marking every five yards. If the referee tells you to line up at the 20-yard line, you know right where to go. Mapmakers use the same idea, using these two common techniques: grids, and latitude and longitude.

→ **Mapmakers put grids – lines that go across and lines that go down, forming boxes – over a map.** You can find things on the map by what box they are in. The boxes going across usually have letters. The boxes going up and down usually have numbers.

Look at this grid map. What do you see at B4?

It's hard to make a grid of boxes on a sphere like Earth. So mapmakers draw imaginary lines going up, down, and around the globe.



Lines going around – running east and west – are called lines of latitude.

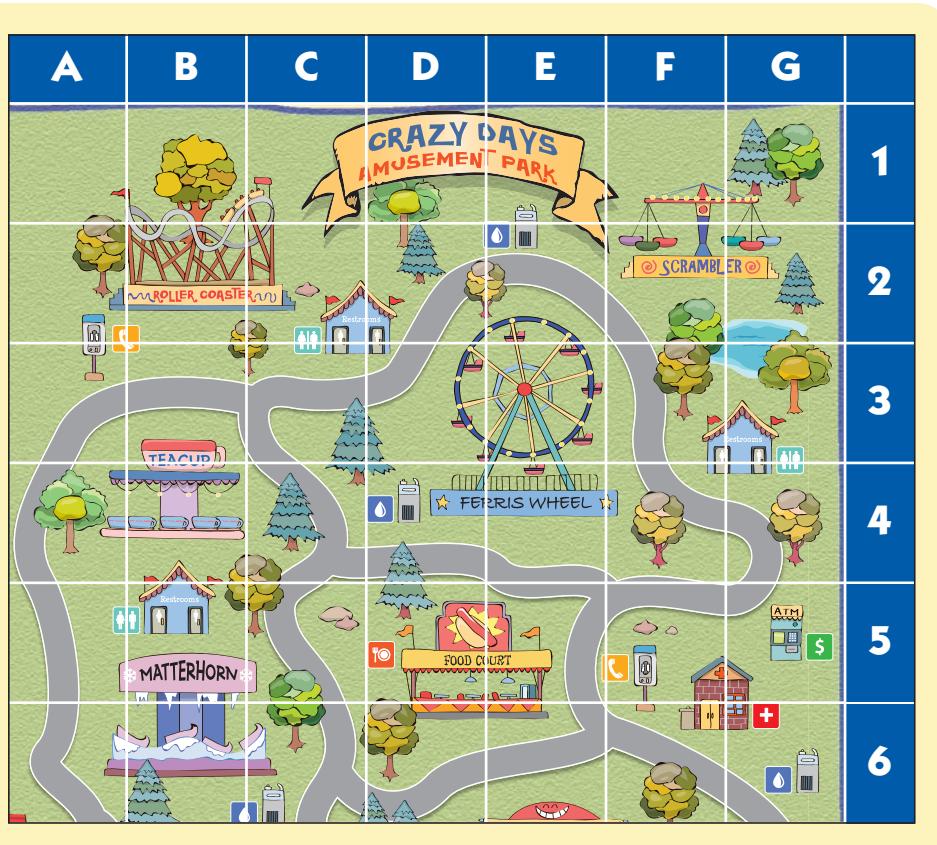
The equator, a line drawn around the middle of Earth, is the starting line for latitude.

The prime meridian – an imaginary line dividing the globe from north to south – is the starting line for longitude.

Lines going up and down – running north and south – are called lines of longitude.

Let's climb a ladder of latitude!





↑ **The Capitol building** in Washington, D.C., is about 39 degrees north of the equator. It is about 77 degrees west of the prime meridian. So its location is written as 39°N, 77°W. Those numbers are called its coordinates.

→ You can describe location in different ways. One way is to give an absolute, or exact, location. Coordinates are an absolute location. They tell exactly where something is. "My town is 43°N, 74°W." You can also describe a place using relative location. That's when you describe one place by referring to another place. "My town is about 35 miles north of Albany, N.Y." "It is in the eastern part of the state of New York." Those are relative locations.



THE WORLD IS NOT FLAT?

Peel an orange and try to set it down flat. What does it look like? You have to cut the peel and leave out spaces, or mush it together. It doesn't work so well!

When you try to make a flat picture of a sphere, something ends up distorted – not quite true to life. Maps try to show size, distance, shape, and

direction correctly. But when mapmakers project, or place, the world onto a flat map, at least one of those four things is distorted.

Here are three common projections, or ways to project Earth onto a flat map. As you'll see, not all maps are created equal!

Mercator (conformal)

This projection keeps direction and shape pretty accurate, especially near the equator. But sizes of large areas are not correct. For instance, Greenland appears larger than South America. South America is actually eight times larger than Greenland.



Robinson (compromise)

This projection combines a mix of all other projections. Nothing is exactly right, but nothing is terribly wrong!



Mollweide (equal area)

This projection tries to keep continents the correct size, but the shapes are not true to life.

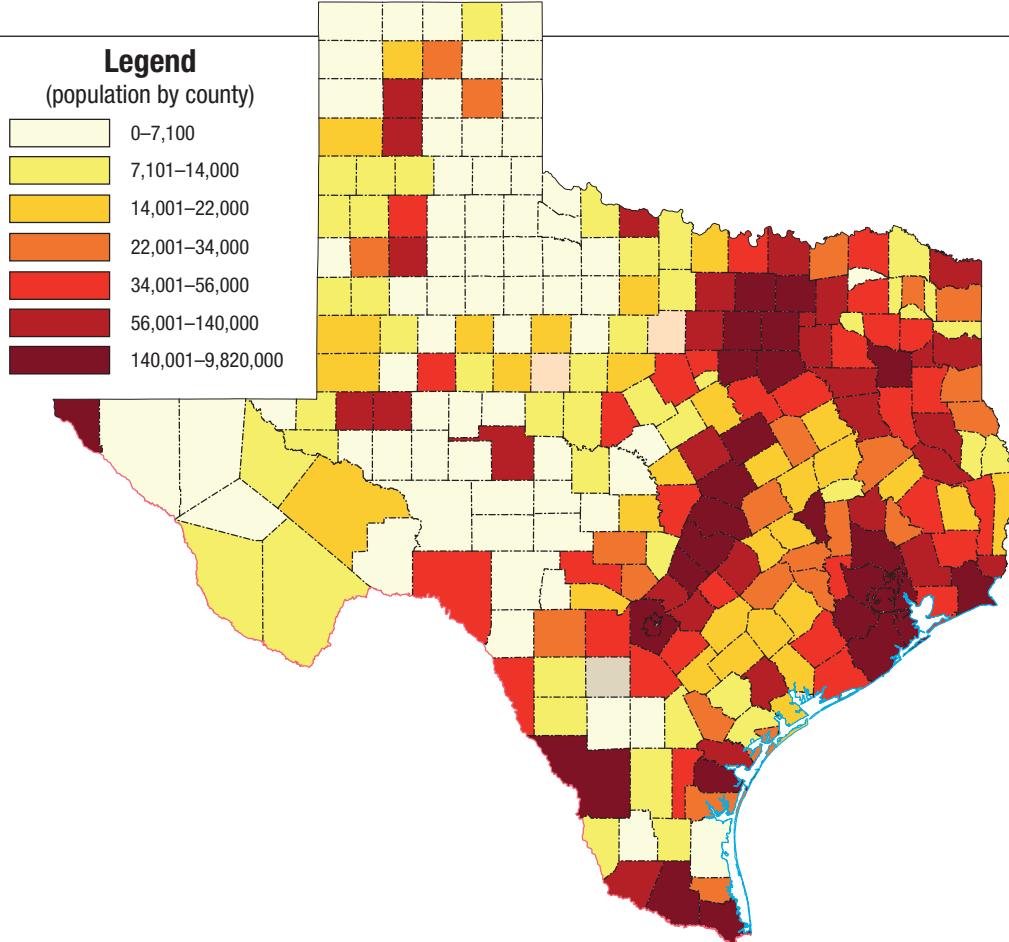


MORE MAPS

Maps contain all sorts of information. Look at all the different things you can learn about the same state.

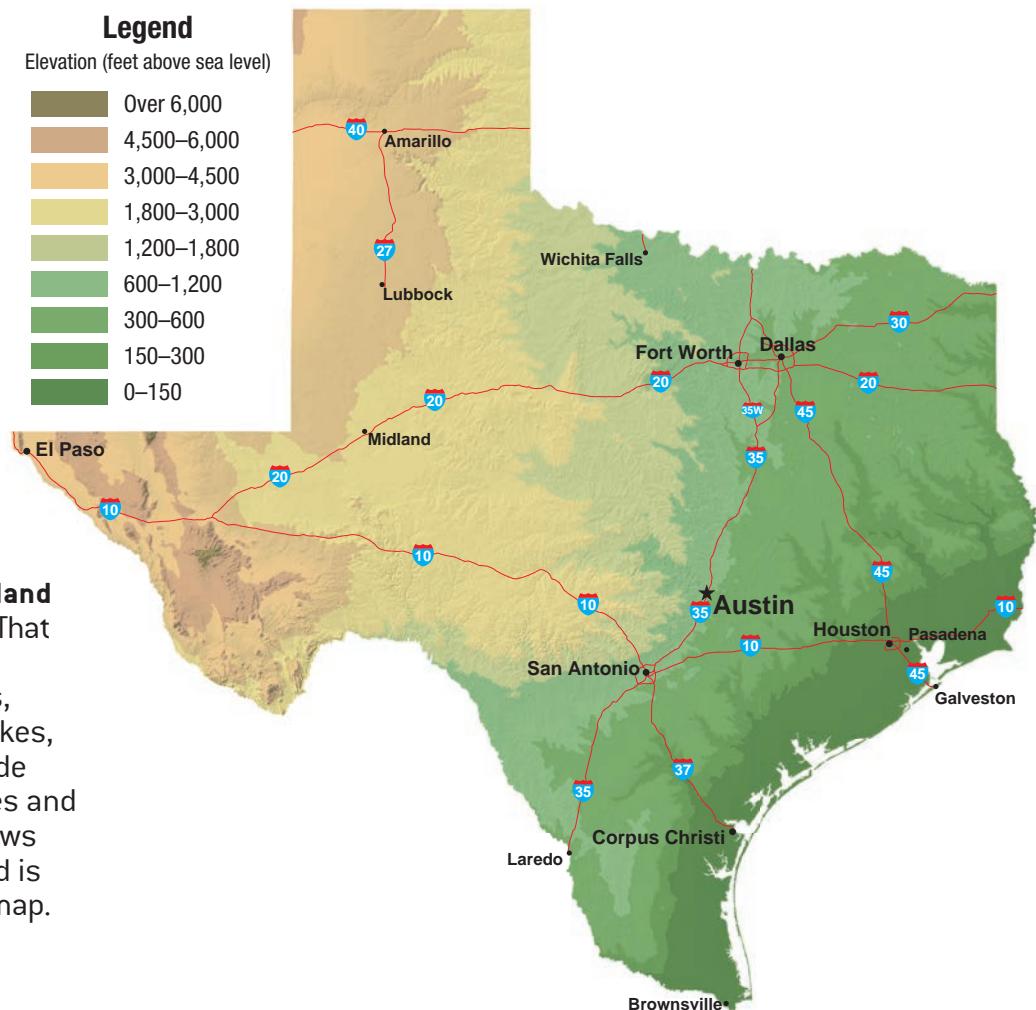


↑ Maps often show borders. Inside the state border of Texas, you can see the borders of all the counties. Texas has 254 counties, more than any other state!



What is population density? Here's an example. Thirty people live in a building at 10 Main Street. Four people live in a building at 12 Main Street that is the exact same size. The building at 10 Main Street is more densely populated than 12 Main Street.

This map shows the population in Texas by county. Lighter colored areas have fewer people. Darker colored areas are more densely populated. You can guess where big cities are!



THE KNOWN WORLD

Long ago, people could only draw maps of places they could see with their own eyes. Early mapmakers used both their own observations and stories, told by explorers, to draw maps. Now, we've got eyes in the sky and computers to sort through mountains of information for us. Does the world seem smaller or larger now?



Tools and Rules

People have been making maps for thousands of years. They use many different tools. They apply rules from math and science to draw and map Earth.

Astronomy started it all. Early mapmakers used the movements of the sun, moon, and stars to figure out how Earth moved.

Telescopes helped astronomers see these objects.

Compasses, devices that show you which way north is, helped explorers and mapmakers.



↑ About 2,500 years ago:

The very first maps were made on clay tablets. This shows the known world as a circle surrounded by a “bitter river” and “four shores,” like the points of a compass. The center of the world was the ancient kingdom of Babylonia (the region that is now Iraq).

Clocks that were accurate made the difference! Sailors and travelers could calculate correct latitude and longitude only with very precise clocks. They had to know exactly how long it took to get from one point to another. Only then could they figure out the distance between those points.

Math really is useful! If you know the length of two sides of a triangle, you can figure out the length of the third side. Once mathematicians figured this out, mapmakers could then use this to make better maps.



About 1,850 years ago:

This map was made using data collected by Claudius Ptolemy [TALL-uh-mee]. He was the first to use the ideas of latitude and longitude. Ptolemy did get one thing wrong: He thought Earth was the center of the solar system, not the sun!

About 450 years ago:

Gerardus Mercator, a European scholar, was one of the first to try to make a flat but accurate map of a round Earth. He made globes and maps. His collection of maps was published in the first-ever atlas.



About 200 years ago:

By the 1700s, several explorers had sailed around the world. English explorer and mapmaker James Cook did it three times! He used very scientific methods. That led to even more accurate world maps. His voyages especially helped with making maps of the Pacific Ocean and the Americas.



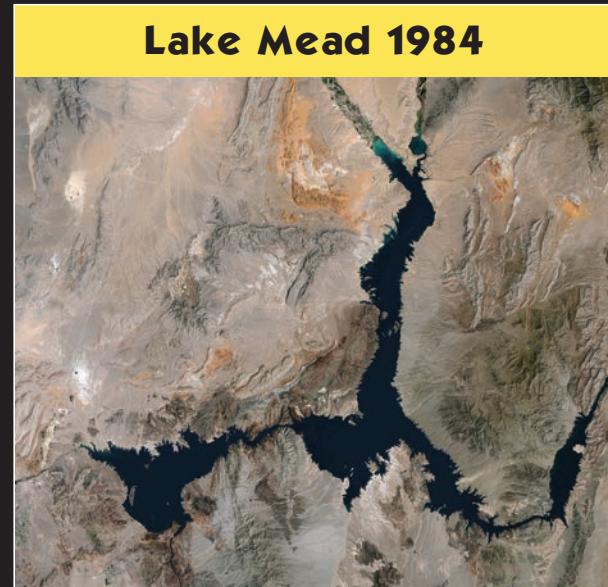
HIGH-TECH MAPPING

Denali —

First we made kites and hot-air balloons to rise above Earth. Now, with planes, satellites, and computer technology, we have information about the world that we never had before. We can see things about Earth besides just its shape and landforms. We can see how hot or cold it is, where there's rain, where rivers flow or dry up, and how Earth changes over time. If you could look down on the world, what would you want to see?

▼ **A Global Positioning System**, or GPS, is a network of about 30 satellites that orbit Earth. Once it gets information from four satellites, it can

pinpoint your exact location. If you want to go somewhere, GPS can find that location, and tell you the fastest way to get there.



↑ Some satellites carry cameras. The cameras take pictures that are sent back to us on Earth. These pictures

help us see many things, including how the world is changing. Did this lake get bigger or smaller?

▲ **Satellites can carry** remote sensors. These are tools that can sense change in things like light, heat, and radio waves. By studying the changes, geographers can track hurricanes, see how cities are growing, or watch forests shrink.

Remote sensing

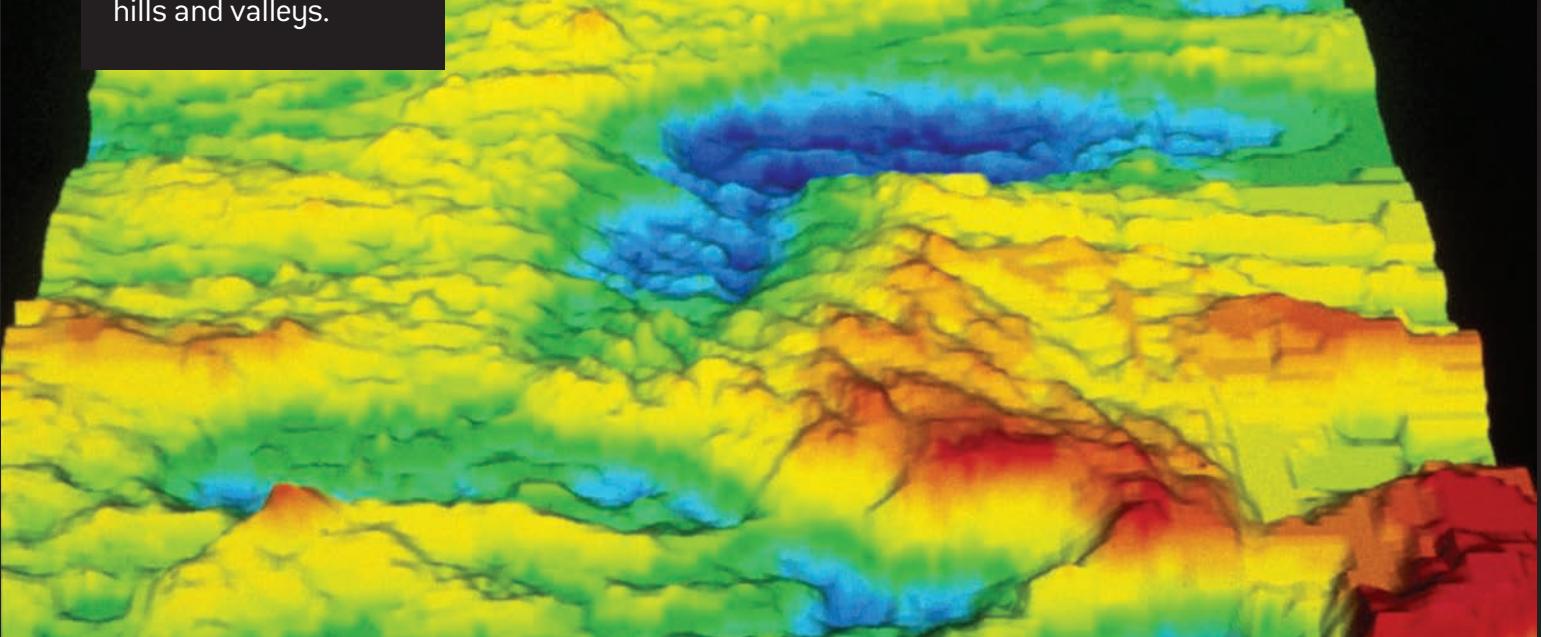
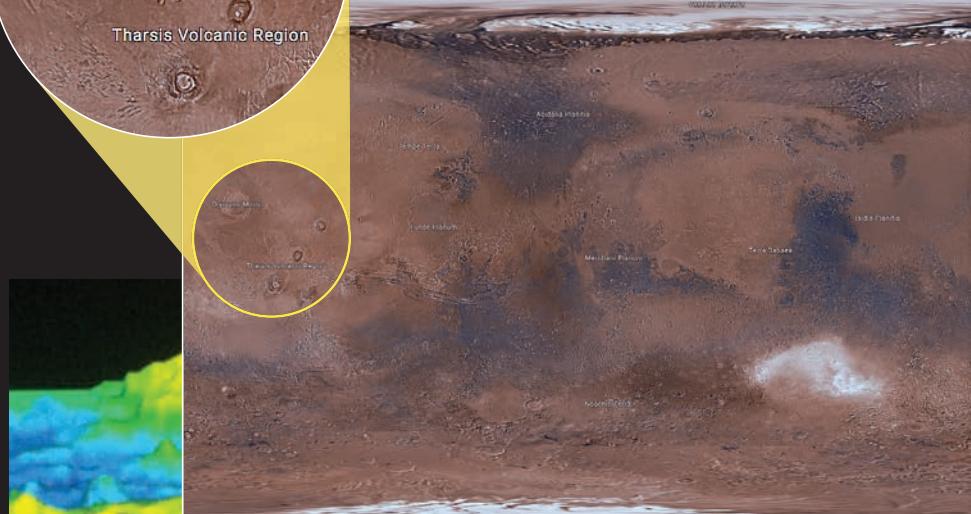
helped scientists measure the highest point in the United States: Denali, in Alaska.

US Air Force Aerial Image of Mount McKinley
August 13, 1952

▼ **The age of** exploration is not over! One part of the world that is still a mystery is the ocean floor. New technology is helping. Scientists send sound waves from the bottom of ships to the bottom of the ocean, and back. This helps them map underwater hills and valleys.

▼ **Scientists want** to know about the physical world beyond Earth. Human-made satellites have been

sent to orbit other planets. The satellites send back photos. That's how we've been able to map the surface of Mars!



Activities



WHERE IN THE WORLD?

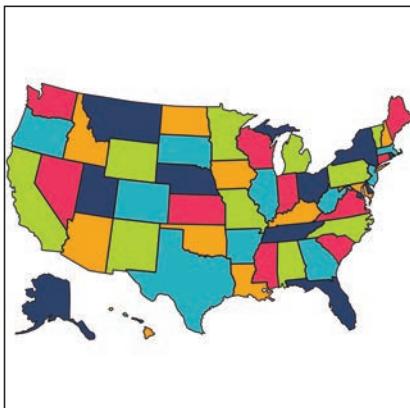
The exact coordinates of your community are unique. No other place on Earth has them. Even so, your community shares its lines of latitude and longitude with communities around the world. Find out what they are. Use a map or a globe to find the lines of latitude and longitude nearest your community. Then, find three cities or towns in the world with the same latitude. Find three cities or towns with the same longitude. Imagine what your community might have in common with them.

AREA ATLAS

Work with two or three classmates to make an atlas, or book of maps, for your area. Your atlas should include a physical map, a population map, a land use or resource map, and a political map that shows the different counties and/or municipalities in the area. It can also include charts and other information. Together, decide which group member will create each map, chart, or page of information. When you're finished, put the pages together to make the atlas.



MAKE CONNECTIONS WITH THESE RELATED TITLES



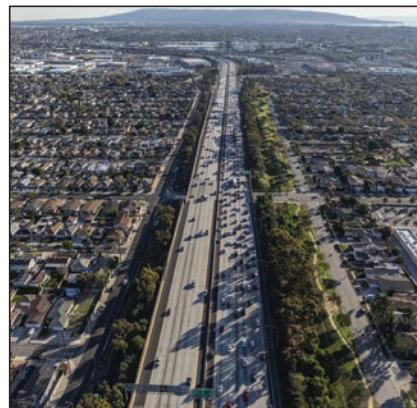
U.S. Geography

From flowing rivers to towering mountains, the study of geography helps explain where and why people live where they do. Learn about the regions and landforms of the United States, with a focus on California geography, through maps, charts, and breathtaking photographs.



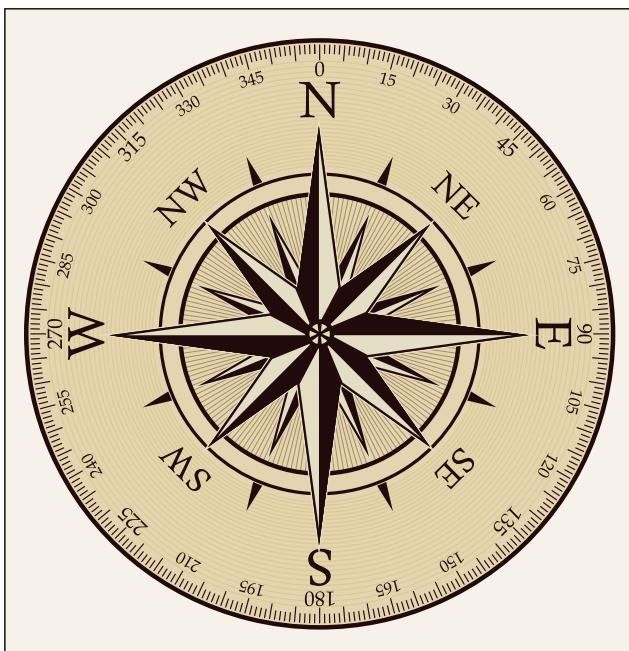
People and the Environment

All of the living and nonliving things around you are part of your environment. People live all over the Earth, in all types of environments. The connection we share with our surrounding environment shapes the way we live, from the resources we use to the activities we do.



Communities Change

Every community has a history. And all communities change in some ways and stay the same in other ways. Sometimes change happens slowly, and sometimes it happens fast. Learn about how changes within a community's economy, population, and even topography can have a lasting impact on its citizens.



LEARN MORE ONLINE!

- There are many kinds of maps with many different uses, such as trail maps, weather maps, and physical maps.
- Not everything can be located with four points! Sometimes you need to locate places that are in between. These are called intermediate directions: northeast, southeast, northwest, and southwest.
- An atlas is a book of maps that gives information about a particular place, such as a state or country.



CALIFORNIA STANDARDS

HSS 3.1 Students describe the physical and human geography and use maps, tables, graphs, photographs, and charts to organize information about people, places, and environments in a spatial context.

Historical and Social Sciences Analysis Skills

Chronological and Spatial Thinking

4. Students use map and globe skills to determine the absolute locations of places and interpret information available through a map's or globe's legend, scale, and symbolic representations.

Historical Interpretation

2. Students identify the human and physical characteristics of the places they are studying and explain how those features form the unique character of those places.



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On the Cover: This spectacular "blue marble" image is the most detailed true-color image of the entire Earth to date. **NASA Goddard Space Flight Center:** Reto Stöckli.

Picture Credits: **Alamy:** Natural History Museum, London: p.15 bottom right (Cook world map, 1784). **British Museum, London:** p.14 top right (Babylonian tablet map). **Getty Images:** Thinkstock: p.5 top right (Los Angeles freeways). **Granger Collection, NYC:** p.15 top left (Ptolemy world map). **NASA:** Earth Observatory: Joshua Stevens: p.16 right (Lake Mead comparison); JPL: p.17 middle right (map of Mars); NASA Goddard Space Flight Center: pp.4–5 (Earth from space). **Public Domain:** p.15 center (Mercator world map, 1569). **Science Source:** p.17 bottom right (mid-ocean ridge). **Shutterstock:** Alpha_7D: p.19 top left (map of United States); Billion Photos: p.14 bottom left (compass); BlueRingMedia: p.18 top (globe); Chris Parry Photography: p.9 top right (U.S. Capitol); design56: p.4 top right (plastic globe); Lorelyn Medina: p.18 bottom (kids making an atlas); Maleo: p.16 bottom left (GPS navigation); Orgus88: p.19 bottom (vintage compass); Rvector: p.5 top left (simple globe); Tatiana Bobkova: p.19 top center (kids fishing); Trekandshoot: p.19 top right (San Diego freeway). **U.S. Geological Survey:** pp.16–17 top (Denali, Alaska); The National Atlas of the United States of America: p.12 and p.13 top left (maps of Texas counties).

Original Illustrations:

Brobel Design: Maps: Close Enough!, pp.2–3, Los Angeles Freeway, p.5 bottom, Globe, p.8, Map of New York State, p.9, Texas Elevation Map, p.13.

Michael Kline Illustration: Earth to You, p.2; Spot On!, p.3; Cartoon Faces, p.2, p.3; Crazy Days Amusement Park, pp.6–7, p.9, Ladder of Latitude, p.8.

Wood Ronsaville Harlin, Inc.: Maps: Mercator, Robinson, Mollweide, pp.10–11.

GRADE 3 TITLES

Mapping Our World

U.S. Geography

People and the Environment

Protecting Resources

The First People

Settling the Land

Communities Change

Role of Citizens

How America Works

America: Heritage and Culture

Producers and Consumers

Saving and Spending

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Printed in the U.S.A.

ISBN 978-1-328-79948-7

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ISBN 978-1-328-79948-7



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