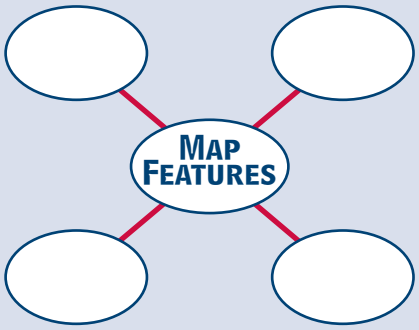
Lesson 11 Comparing Types of Maps

What You Will Learn

To use maps with different themes

Reading Strategy

Create a diagram like the one below. In each of the outer circles, write an example of a feature you would find on a typical physical map.



Terms to Know

physical map, relief map, political map, special-purpose map

Suppose you are planning a trip to another country. What would you like to know about that country before you leave home? What language is spoken there? Where are the country's interesting places to visit located? Should you take clothes for warm weather, or cold?

These are just a few of the things you can learn from maps. In fact, there are almost as many kinds of maps as there are kinds of information to show on them. Let's look at some of the different kinds of maps and what they can tell us about our world.

Using Physical Maps

A **physical map** shows how the land looks. Mountains, rivers, plains, and lakes—the physical features of the land—are shown on a physical map. Sometimes a physical map shows the height of the land above sea level. It may use colors and shading to show *relief*—or how flat or rugged the land surface is. This kind of physical map is called a **relief map.**

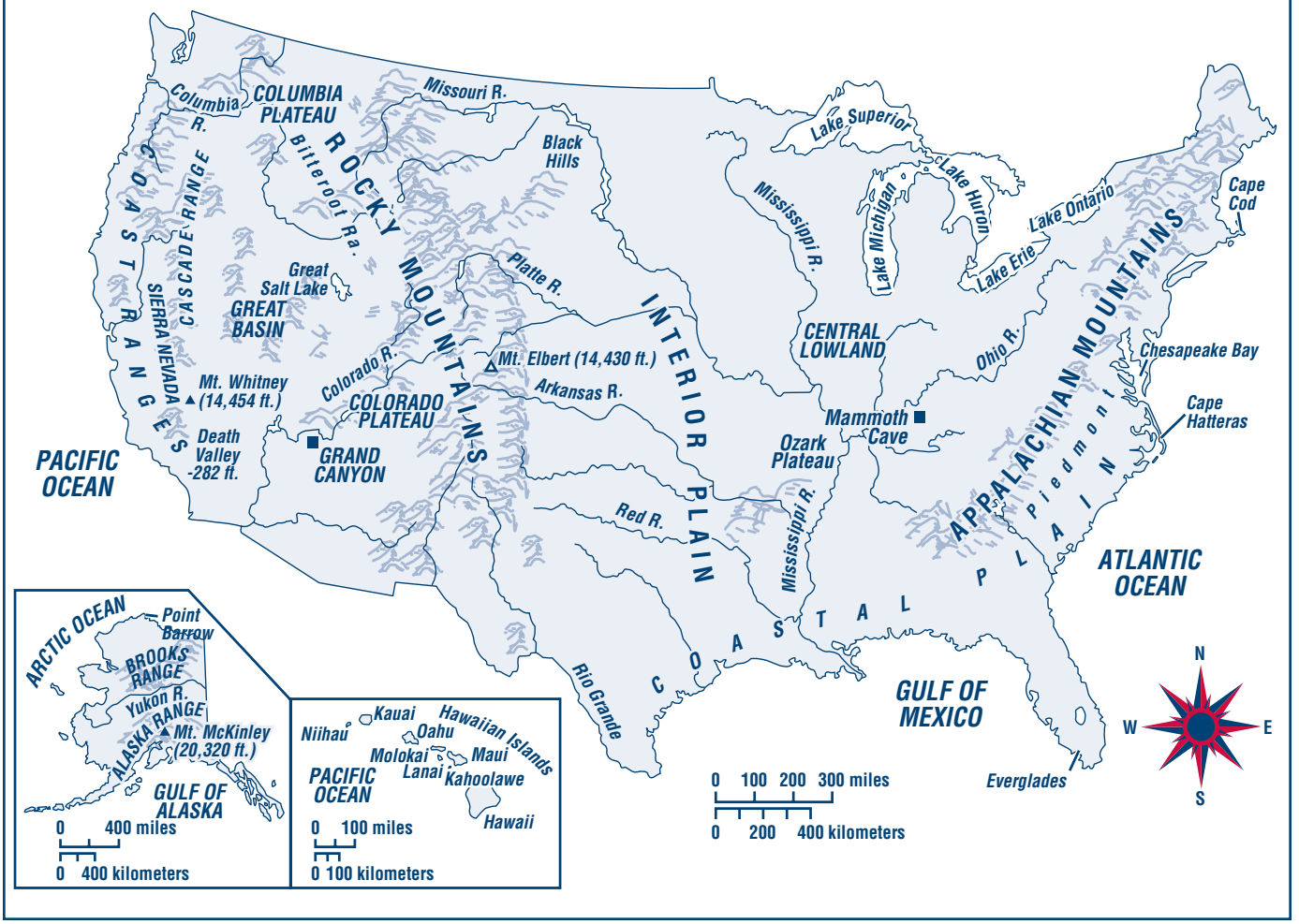
Look at Map 1-13: United States: Physical on page 44. Find the Rocky Mountains. What physical feature lies just east of the Rocky Mountains? Into what river do the Ohio and Missouri rivers flow? Into what body of water does the Mississippi River flow? What ocean lies east of the United States? These are all kinds of information you can find on physical maps.

Using Political Maps

A **political map** shows how humans have divided the surface of the earth into countries, states, and other political divisions. Often, a political map will show some physical features, such as lakes and rivers, because these are sometimes used as political boundaries. A political map will show where the boundaries between countries, states, or counties are located. It may also show the locations of cities. Unlike physical maps, which remain fairly constant over time, political maps change as political relationships shift.

Look at Map 1-14: Australia and New Zealand: Political on page 45. Notice the dashed lines on the map. These show the boundaries between states. The letters in SMALL CAPITALS are the names of the states. Queensland is the name of one state. Can you name

Map 1-13 United States: Physical



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

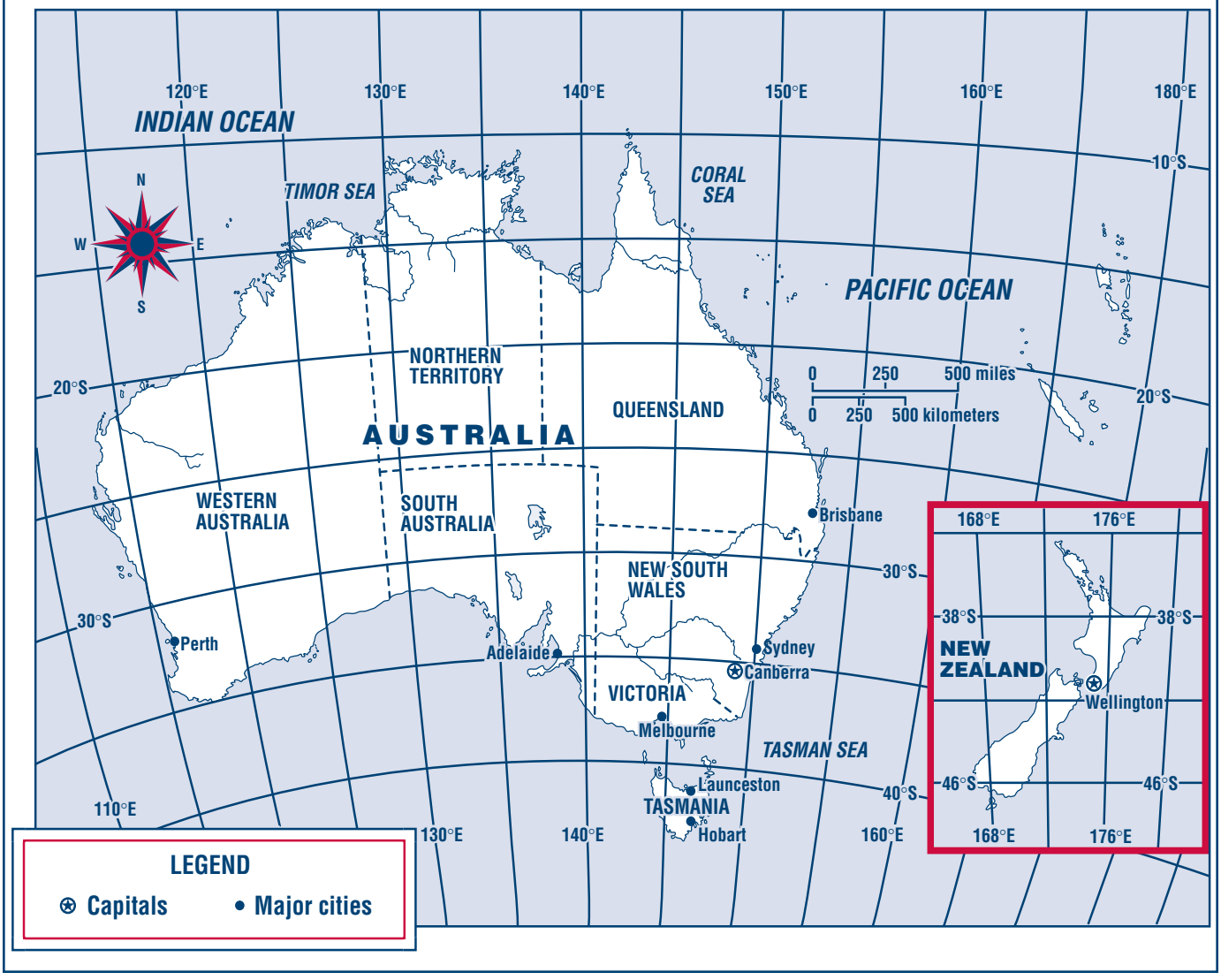
Maps that emphasize a single idea or a particular kind of information about an area are called **special-purpose maps.** There are many kinds of special-purpose maps, each designed to serve a different need. Population density maps, time zone maps, and climate maps are among the different kinds of special-purpose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



Types of Maps			
Type of Map	Features	Uses	Visual Representation
Physical Map			
Political Map			
Special Purpose (Thematic Map)			

Task - Use what you have learned about different types of maps and their uses to respond to the following question.

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

_____
_____
_____
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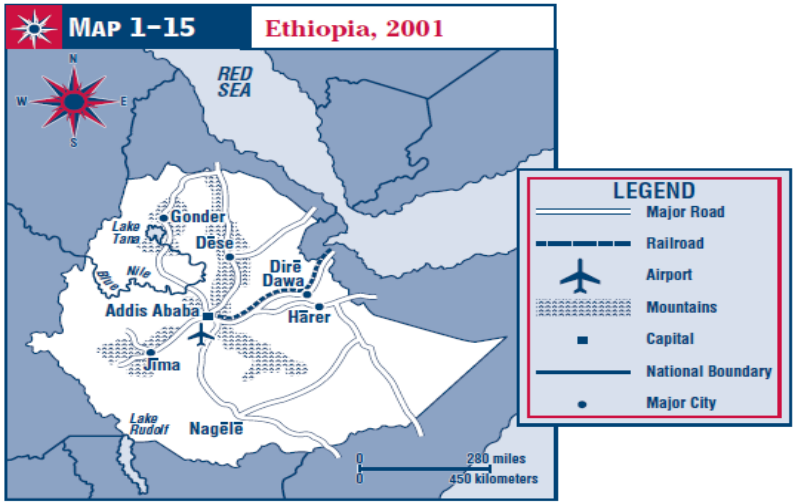


Lesson 12 Comparing Map Projections

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.

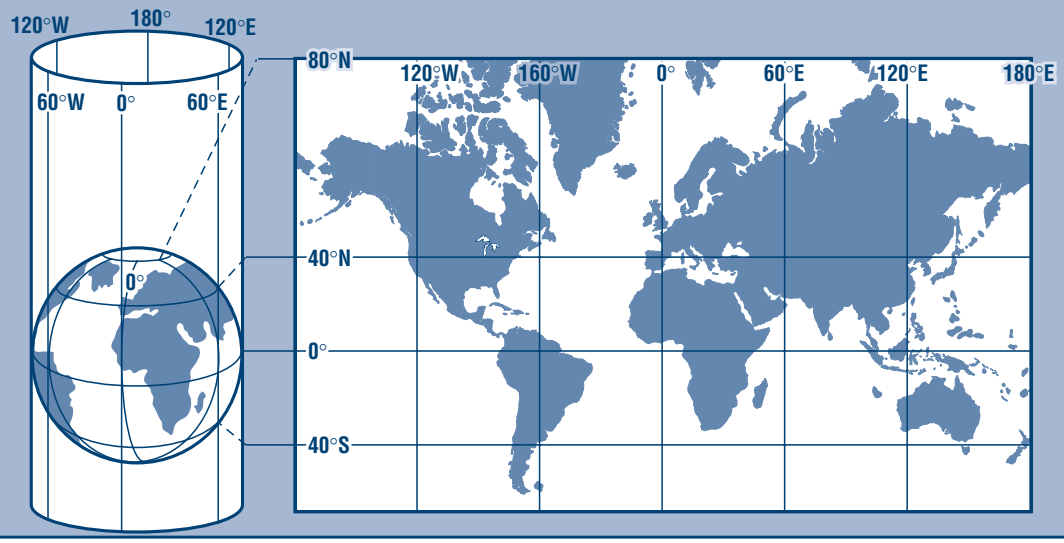
Cylindrical Projections

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.

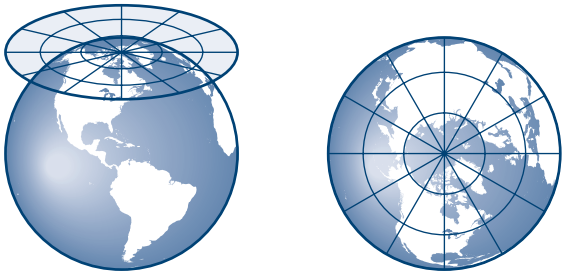
FIGURE 1–14 Mercator Projection



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.

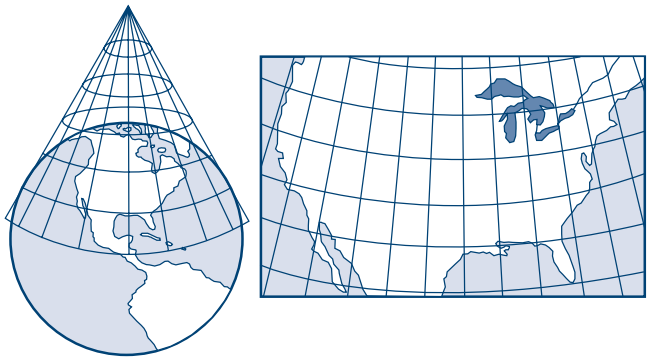
FIGURE 1–15 Planar Projection



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

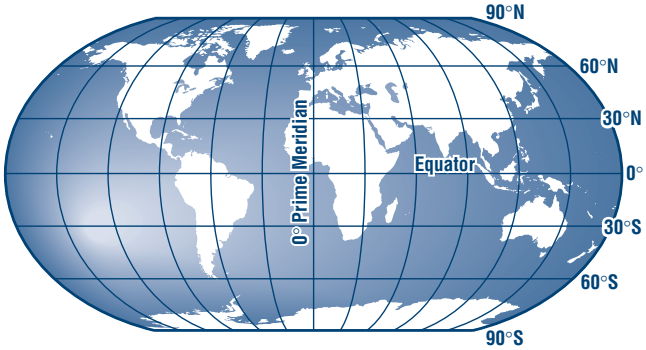
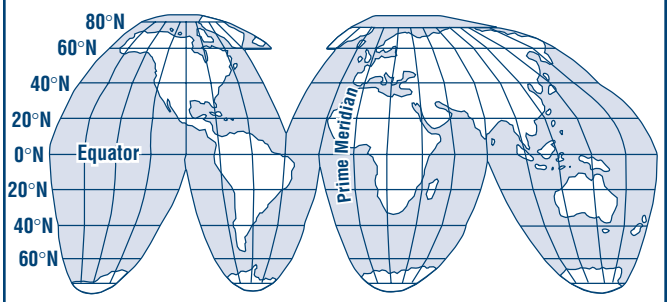


FIGURE 1–18 **Goode's Interrupted Equal-Area Projection**



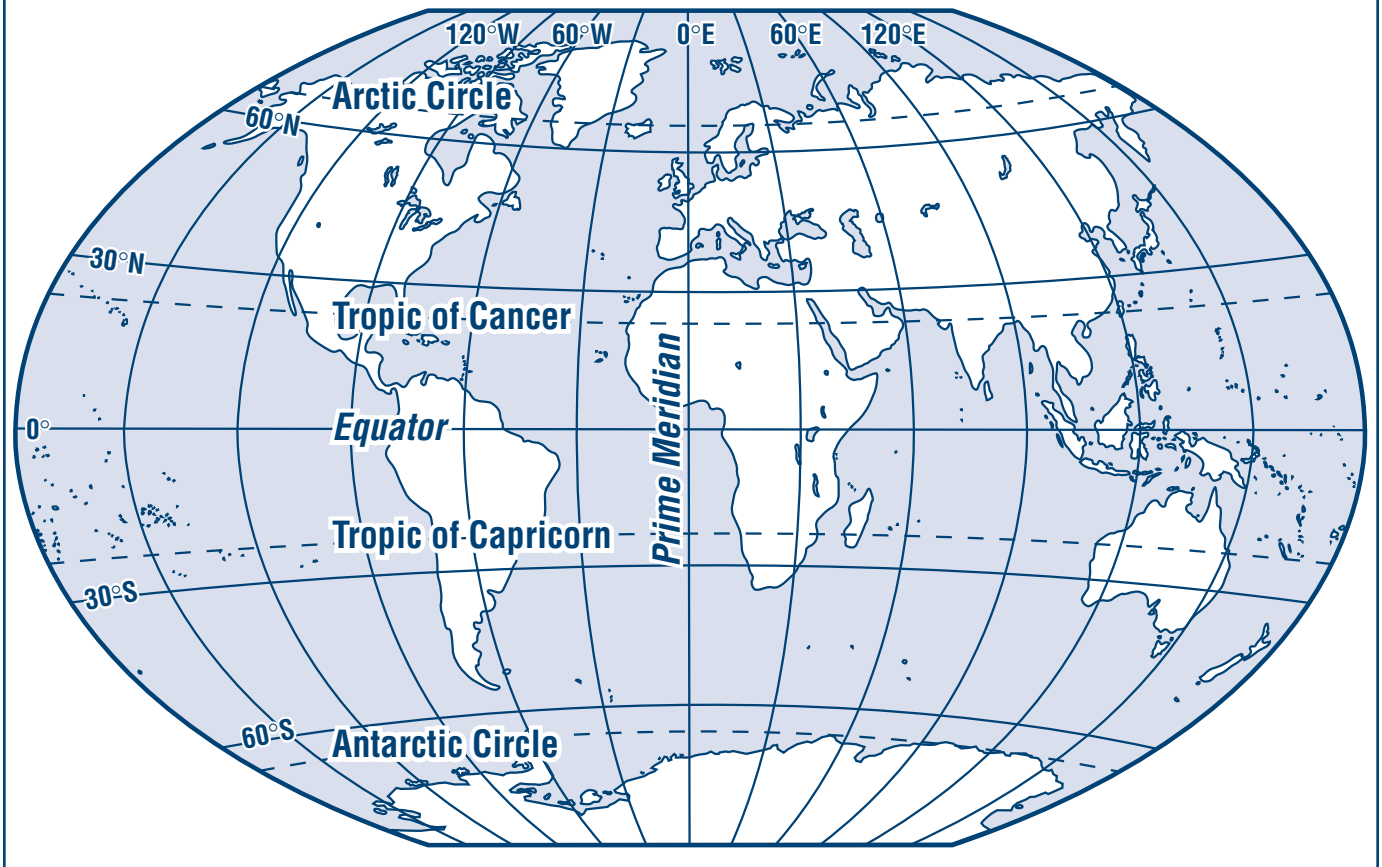
accurately. Look at Figures 1-17 through 1-19. Notice that each has a particular shape. The Robinson projection shows only minor distortions in true size, distance, and shape of landmasses. Goode's Interrupted Equal-Area projection allows the shapes and sizes of landmasses to be depicted with a high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



Maps vs Globes

Map Projections

Projection Name	True Size (yes/no?)	True Distance (yes/no?)	True Shape (yes/no?)
1. Cylindrical (Mercator Projection)			
2. Planar			
3. Conic			
4. Robinson			
5. Goode's Interrupted Equal Area			
6. Winkel Tripel			