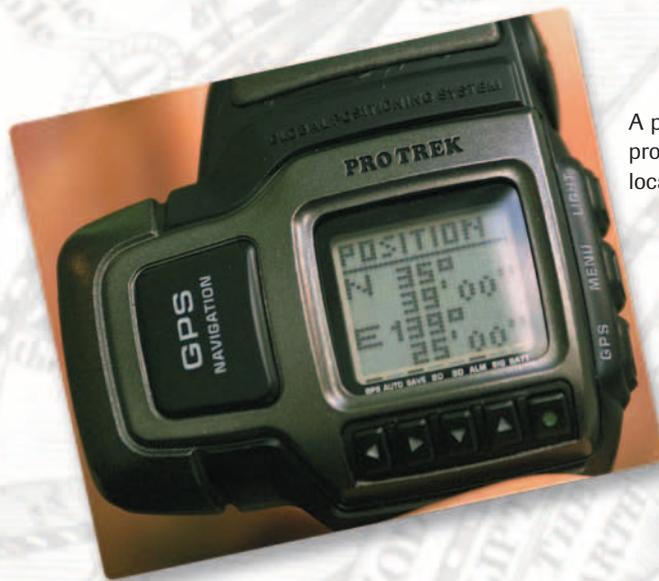


## GEOGRAPHY SKILLS HANDBOOK

This handbook covers the basic map skills and information that geographers rely on as they investigate the world—and the skills you will need as you study geography.

### Finding Location

Mapmaking depends on surveying the earth's surface. Until recently, that activity could only happen on land or sea. Today, aerial photography and satellite imaging are the most popular ways to gather data.



A personal **GPS** device provides the absolute location to the user.

**Magnetic compasses** introduced by the Chinese around the 1100s helped to accurately determine direction.



Nigerian surveyors use a **theodolite**, a type of surveying instrument. It precisely measures angles and distances on the earth.



## Economic Activities of Southwest Asia



## Reading a Map

Most maps have these elements, which are necessary to read and understand them.

- 1 TITLE** The title explains the subject of the map and gives you an idea of what information the map conveys.
- 2 COMPASS ROSE** The compass rose shows you the north (N), south (S), east (E), and west (W) directions on the map. Sometimes only north is indicated.
- 3 LABELS** Labels are words or phrases that explain features on the map.
- 4 LEGEND** A legend or key lists and explains the symbols and use of color on the map.
- 5 LINES OF LATITUDE** These are imaginary lines that measure distance north or south of the equator.
- 6 LINES OF LONGITUDE** These are imaginary lines that measure distance east or west of the prime meridian.
- 7 SCALE** A scale shows the ratio between a unit of length on the map and a unit of distance on the earth.
- 8 SYMBOLS** Symbols represent such items as capital cities, economic activities, or natural resources. Check the map legend for more details.
- 9 COLORS** Colors represent a variety of information on a map. The map legend indicates what the colors mean.

## Scale

A geographer decides what scale to use by determining how much detail to show. If many details are needed, a large scale is used. If fewer details are needed, a small scale is used.

### Ratio Scale

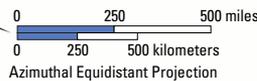
This shows the ratio of distance on the map compared to real earth measurement. Here, 1 inch on the map equals 30,000,000 inches (500 miles) in actual distance on the earth.

### Bar Scale

This bar shows the ratio of distance on the map to distance on the earth. Here, 1 inch equals 500 miles.

### EASTERN UNITED STATES

Scale: 1:30,000,000  
1"= 500 miles

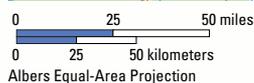


### Small Scale

A small scale map shows a large area but without much detail. A small scale is used to see relative location in a region or between regions.

### WASHINGTON, D.C., METRO AREA

Scale: 1:3,000,000  
1"= 50 miles

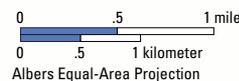
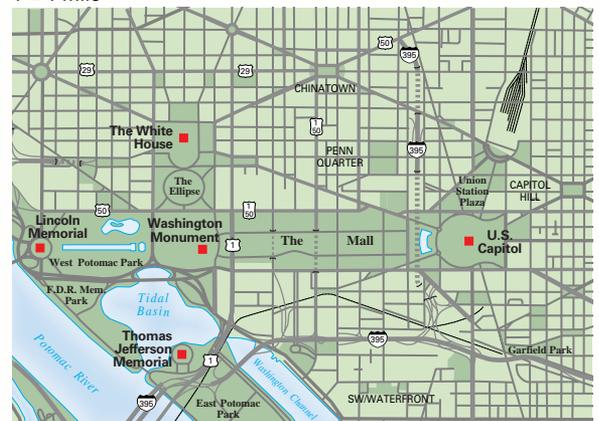


### Large Scale

A large scale map shows a small area with much more detail. A large scale is used to see relative location within a region.

### WASHINGTON, D.C.

Scale: 1:62,500  
1"= 1 mile



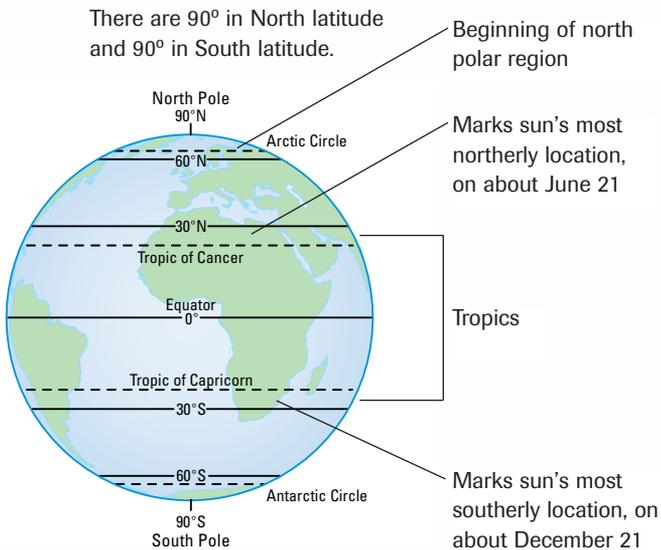
## Using the Geographic Grid

As you learned in Chapter 1, geographers use a grid system to identify absolute location. The grid system uses two kinds of imaginary lines:

- latitude lines, also called parallels because they run parallel to the equator
- longitude lines, also called meridians because, like the prime meridian, they run from pole to pole

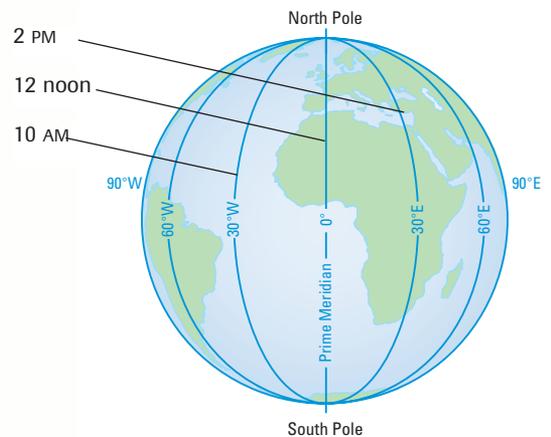
### Latitude

There are 90° in North latitude and 90° in South latitude.



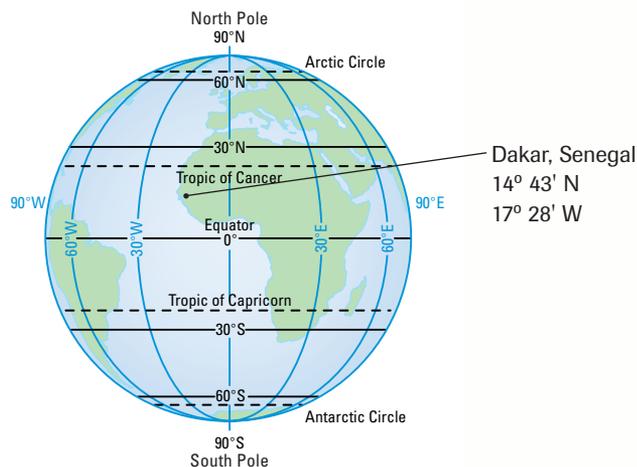
### Longitude

There are 180° in West longitude and 180° in East longitude. Lines also mark the hours of the day as the earth rotates. Every 15° east or west is equal to one hour.



### Global Grid

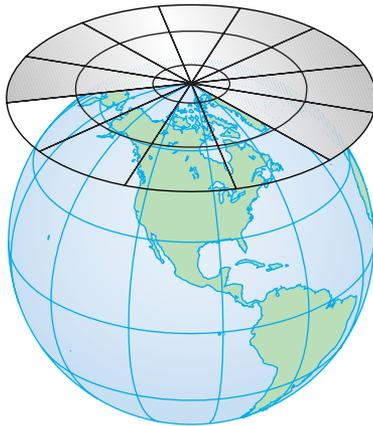
Absolute location can be determined by noting where latitude and longitude lines cross. For more precision, each degree is divided into 60 minutes.



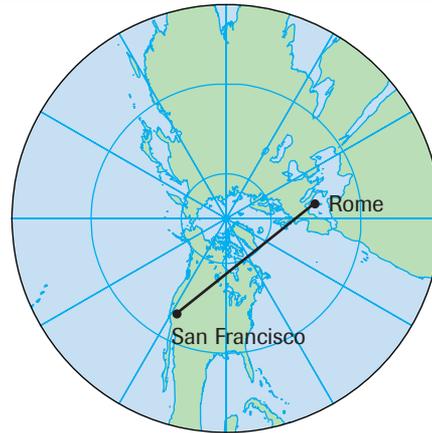
## Projections

A projection is a way of showing the curved surface of the earth on a flat map. Because the earth is a sphere, a flat map will distort some aspect of the earth's surface. Distance, shape, direction, or area may be distorted by a projection. Be sure to check the projection of a map so you are aware of how the areas are distorted.

### PLANAR PROJECTIONS

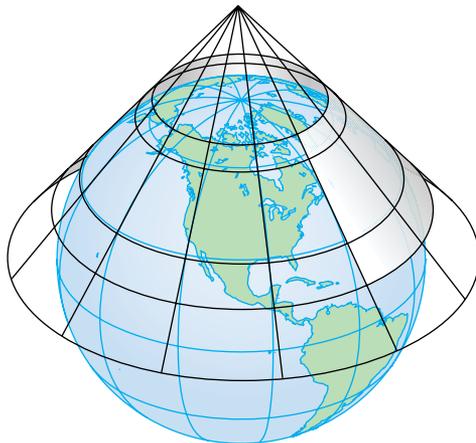


A planar projection is a projection on a flat surface. This projection is also called an azimuthal projection. It distorts size and shape. To the right is a type of planar projection.



The **azimuthal** projection shows the earth so that a line from the central point to any other point on the map gives the shortest distance between the two points. Size and shape are distorted.

### CONICAL PROJECTIONS

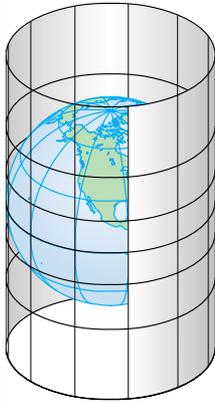


A conical projection is a projection onto a cone. This projection shows shape fairly accurately, but it distorts landmasses at the edges of the map.

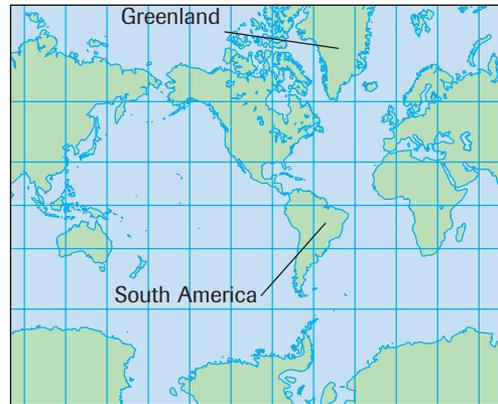


Conical projections are often used to show landmasses that extend over large areas going east and west.

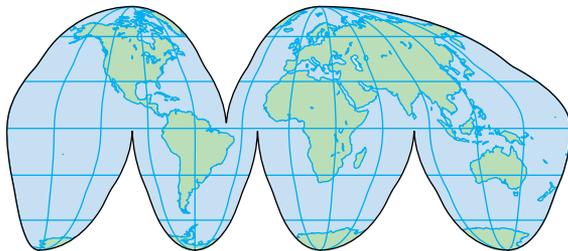
## COMPROMISE PROJECTIONS



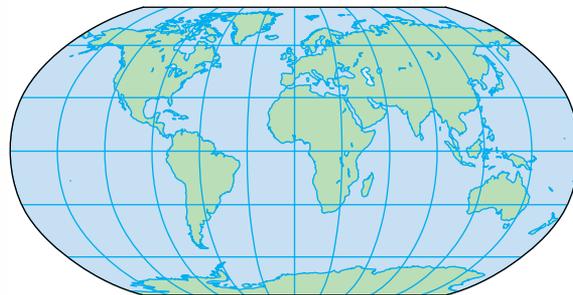
A compromise projection is a projection onto a cylinder. This projection shows the entire earth on one map. Included here are three types of compromise projections.



In the compromise projection called **Mercator**, the shapes of the continents are distorted at the poles and somewhat compressed near the equator. For example, the island of Greenland is actually one-eighth the size of South America.



The compromise projection called **homolosine** is sometimes called an “interrupted map,” because the oceans are divided. This projection shows the accurate shapes and sizes of the landmasses, but distances on the map are not correct.



A **Robinson** projection is a type of compromise projection, commonly used in textbooks. It shows the entire earth with nearly the true sizes and shapes of the continents and oceans. However, the shapes of the landforms near the poles appear flat.



### Map Practice

Use pages 14–19 to help you answer these questions. Look at the map on page 15 to answer questions 1–3.

1. How are colors used on this map?
2. Is the map a large-scale or a small-scale map? How do you know?
3. What is the approximate longitude of Tehran?
4. What are the names of three lines of latitude besides the equator?
5. Which projections show shape of landmasses most accurately?

**GeoActivity**

**MAKING COMPARISONS** Look at the maps in the atlas in this book. Create a **database** that shows the projection and scale of each map. Write a summary of your findings.

## Using Different Types of Maps

**PHYSICAL MAPS** Physical maps help you see the types of landforms and bodies of water found in a specific area. By studying the map, you can begin to understand the relative location and characteristics of a place or region.

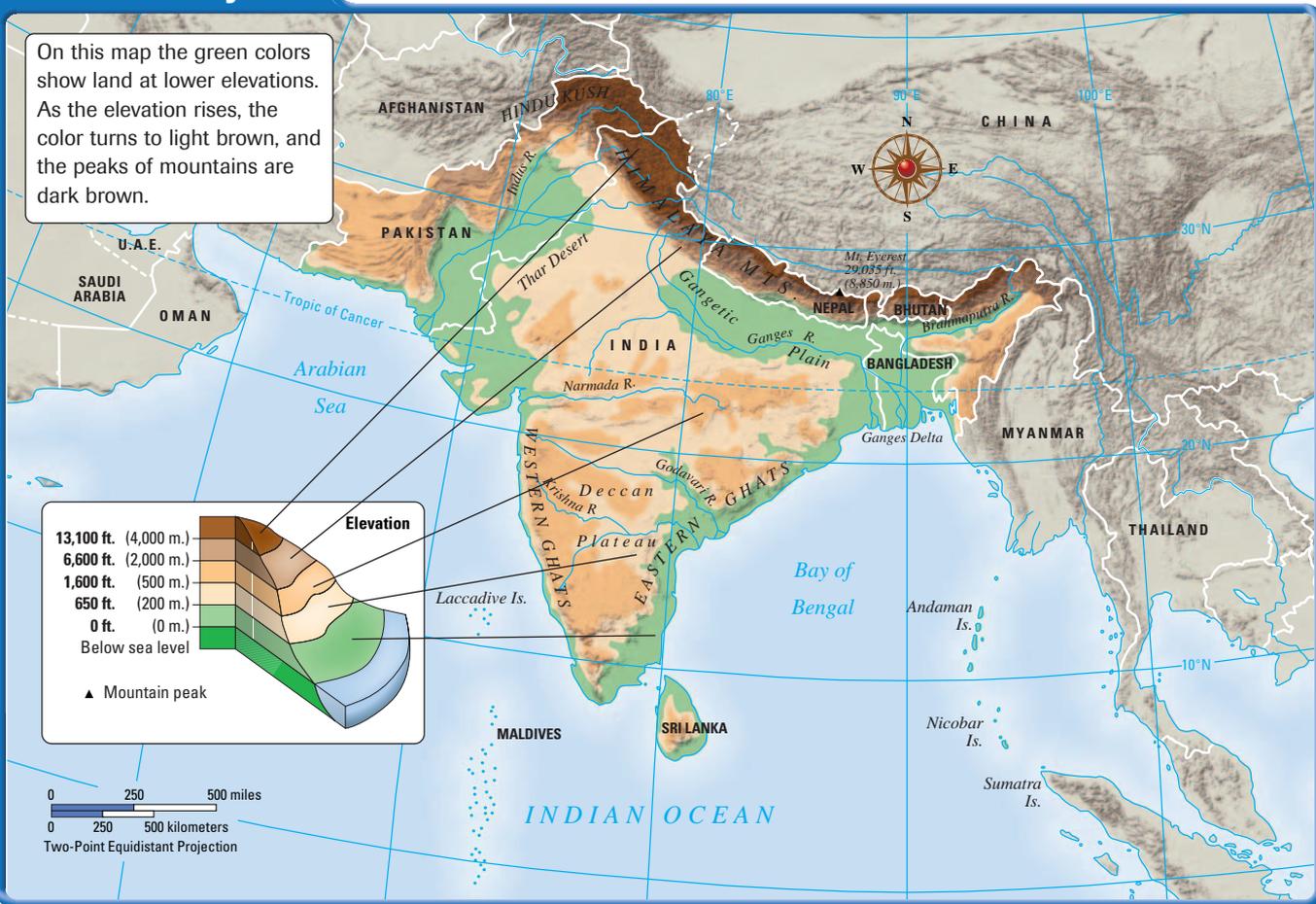
On a physical map, color, shading, or contour lines are used to indicate elevation or altitude, also called relief.

Ask these questions about the physical features shown on a map:

- Where on the earth's surface is this area located?
- What is its relative location?
- What is the shape of the region?
- In which direction do the rivers flow? How might the direction of flow affect travel and transportation in the region?
- Are there mountains or deserts? How do they affect the people living in the area?

### South Asia: Physical

On this map the green colors show land at lower elevations. As the elevation rises, the color turns to light brown, and the peaks of mountains are dark brown.



**POLITICAL MAPS** Political maps show features on the earth's surface that humans created. Included on a political map may be cities, states, provinces, territories, or countries.

Ask these questions about the political features shown on a map:

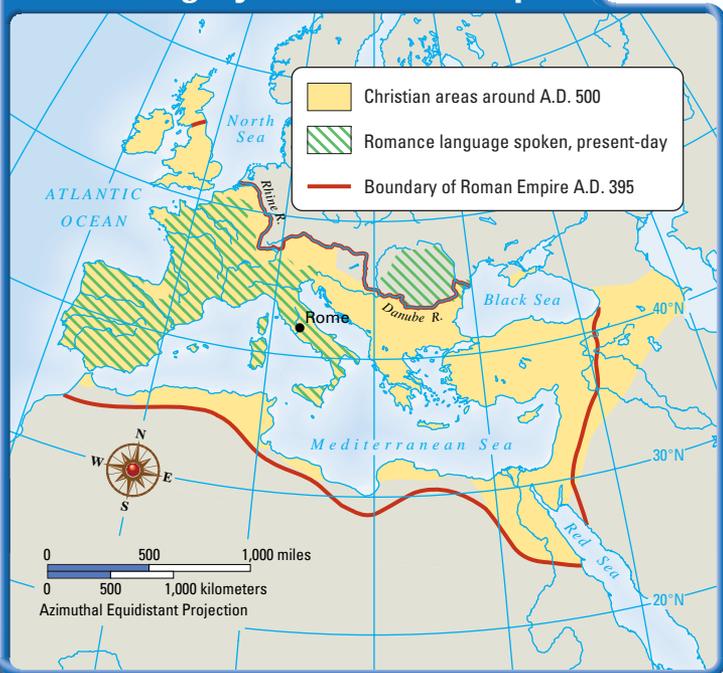
- Where on the earth's surface is this area located?
- What is its relative location? How might the location affect the economy or foreign policy of a place?
- What is the shape and size of the country? How might shape or size affect the people living in the country?
- Who are the neighbors in the region, country, state, or city?
- How populated does the area seem to be? How might that affect activities there?



## Thematic Maps

Geographers also rely on thematic maps, which focus on specific types of information. For example, in this textbook you will see thematic maps that show climate, vegetation, natural resources, population density, and economic activities. Some thematic maps illustrate historical trends, and others may focus on the movement of people or ideas. These maps may be presented in a variety of ways.

### Cultural Legacy of the Roman Empire



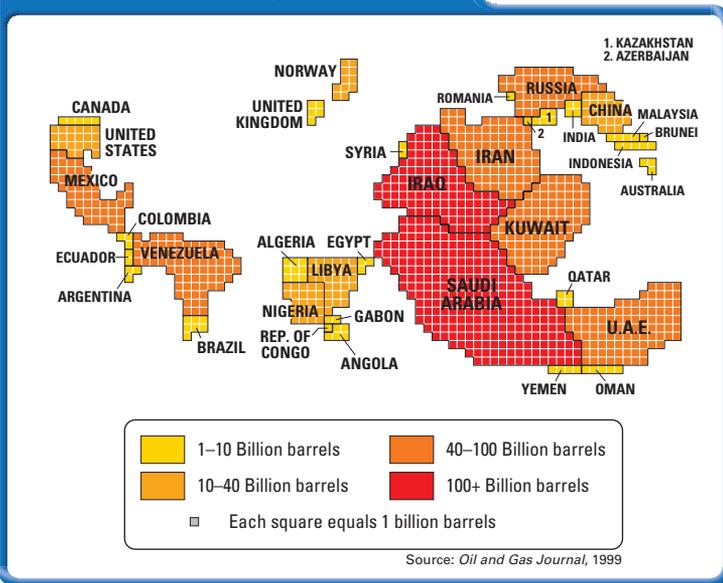
**QUALITATIVE MAPS** Qualitative maps use colors, symbols, dots, or lines to help you see patterns related to a specific idea. The map shown to the left shows the influence of the Roman Empire on Europe, North Africa, and Southwest Asia. Use the suggestions below to help you interpret a map.

- Check the title to identify the theme and data being presented.
- Study the legend to understand the theme and the information presented.
- Look at physical or political features of the area. How might the theme of the map affect them?
- What are the relationships among the data?

**CARTOGRAMS** In a cartogram, geographers present information about a country based on a set of data other than land area. The size of each country is drawn in proportion to that data rather than to its land size. On the cartogram shown to the left, the countries are represented on the basis of their oil reserves. Use the suggestions below to help you interpret a cartogram.

- Check the title and legend to identify the data being presented.
- What do sizes represent?
- Look at the relative sizes of the countries shown. Which is largest? smallest?
- How do the sizes of the countries on the physical map differ from those in the cartogram?
- What are the relationships among the data?

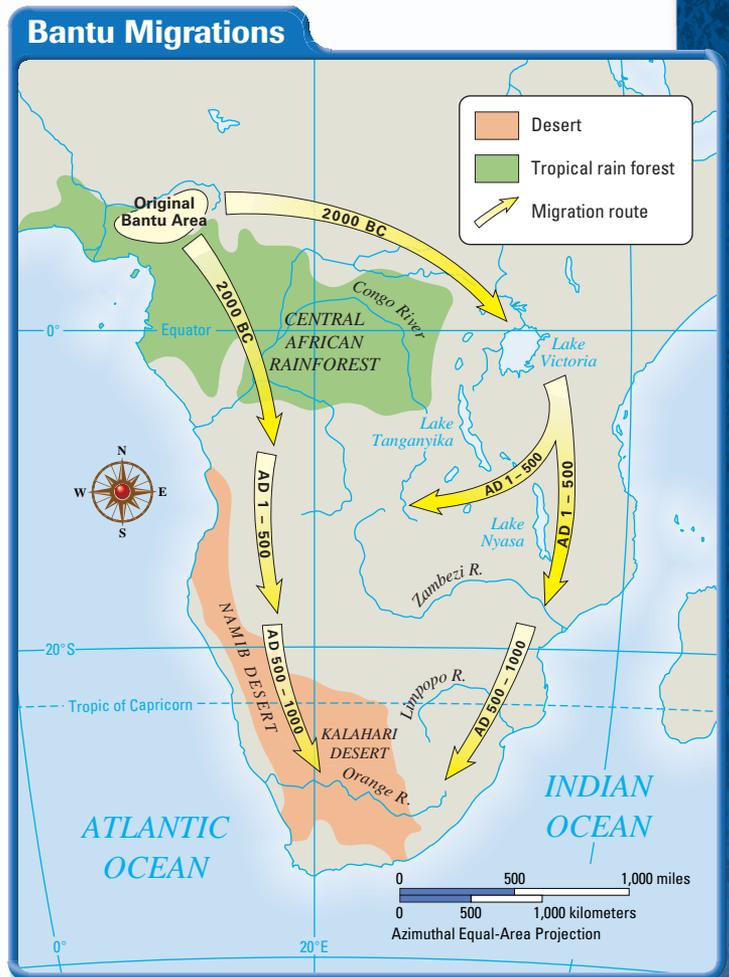
### Estimated World Oil Reserves



**FLOW-LINE MAPS** Flow-line maps illustrate movement of people, goods, ideas, animals, or even glaciers. The information is usually shown in a series of arrows. Location, direction, and scope of movement can be seen. The width of the arrow may show how extensive the flow is. Often the information is given over a period of time. The map shown to the right portrays the movement of the Bantu peoples in Africa. Use the suggestions below to help you interpret a flow-line map.

- Check the title and legend to identify the data being presented.
- Over what period of time did the movement occur?
- In what direction did the movement occur?
- How extensive was the movement?

Remember that the purpose of a map is to show a location and provide additional information. Be sure to look at the type of map, scale, and projection. Knowing how maps present the information will help you interpret the map and the ideas it presents.



### Map Practice

Use pages 20–23 to help you answer these questions. Use the maps on pages 20–21 to answer questions 1–3.

1. In what direction does the Ganges River flow?
2. China is the northern neighbor of which countries?
3. Which city is closer to the Thar Desert—Lahore, Pakistan or New Delhi, India?
4. Why are so few nations shown on the cartogram?
5. Which of the thematic maps would best show the location of climate zones?

### GeoActivity

**EXPLORING LOCAL GEOGRAPHY** Obtain a physical–political map of your state. Use the data on it to create two separate **maps**. One should show physical features only, and one should show political features only.