GEOGRAPHY SKILLS HANDBOOK

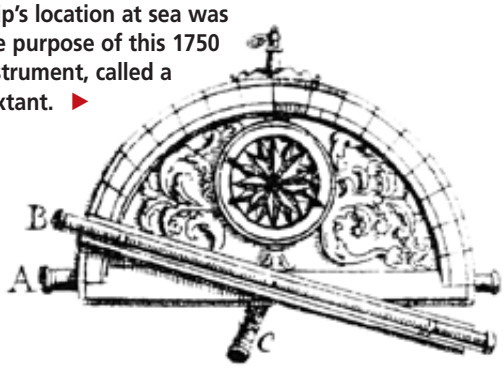
Map Basics

Maps are an important tool for studying the use of space on Earth. 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.

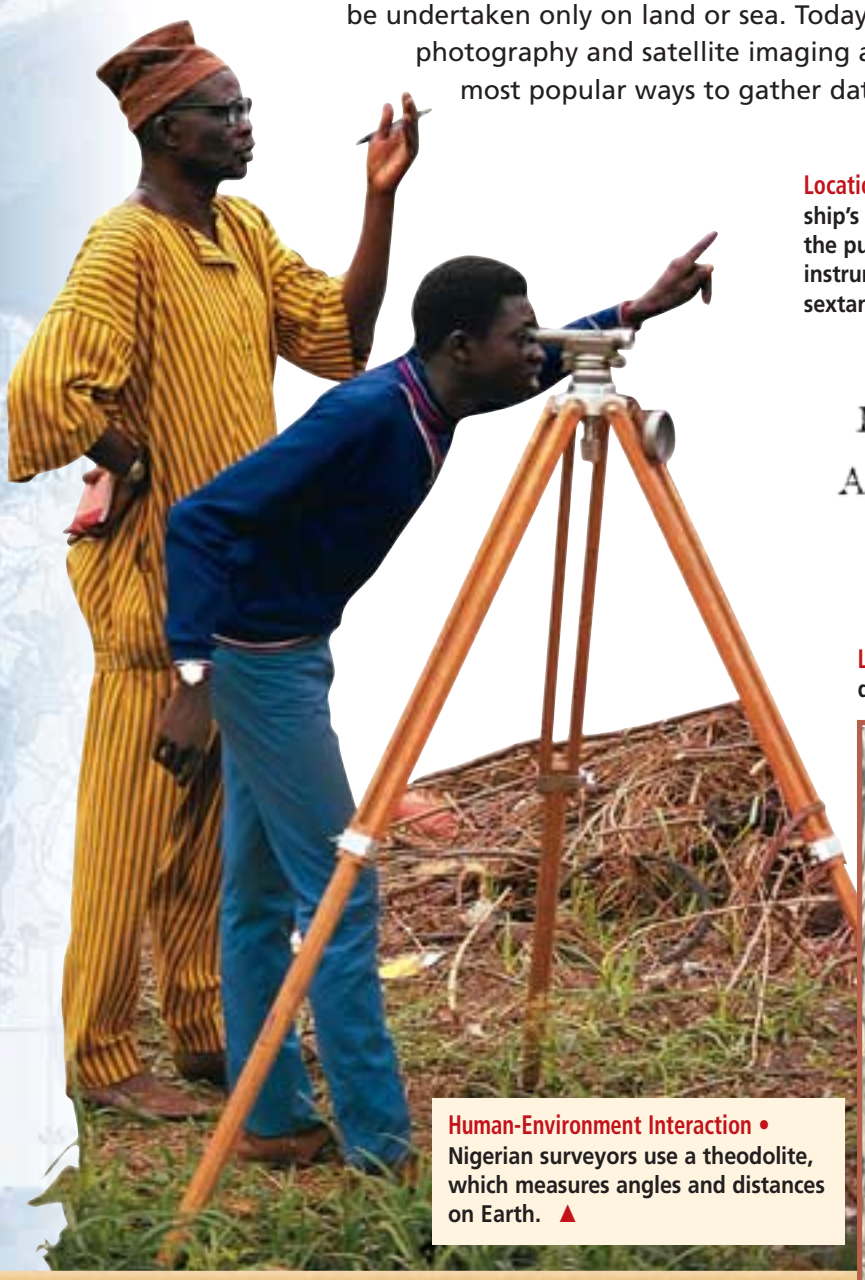
Mapmaking depends on surveying, or measuring and recording the features of Earth's surface. Until recently, this could be undertaken only on land or sea. Today, aerial photography and satellite imaging are the most popular ways to gather data.

Location • Magnetic compasses, introduced by the Chinese in the 1100s, help people accurately determine directions. ▲

Location • Determining a ship's location at sea was the purpose of this 1750 instrument, called a sextant. ▶



Location • An early example of a three-dimensional geographic grid. ▼



Human-Environment Interaction • Nigerian surveyors use a theodolite, which measures angles and distances on Earth. ▲

South America's Economic Activity

TITLE The title indicates the subject of the map and tells you what information it contains.

▶▶ Reading a Map

Most maps have these parts, which help you to read and understand the information presented.

SYMBOLS Symbols may stand for capital cities, economic activities, or natural resources. Check the map legend for more details.

COLORS Colors show a variety of information on a map. The map legend tells what the colors mean.

LABELS Labels are words or phrases that name features on the map.

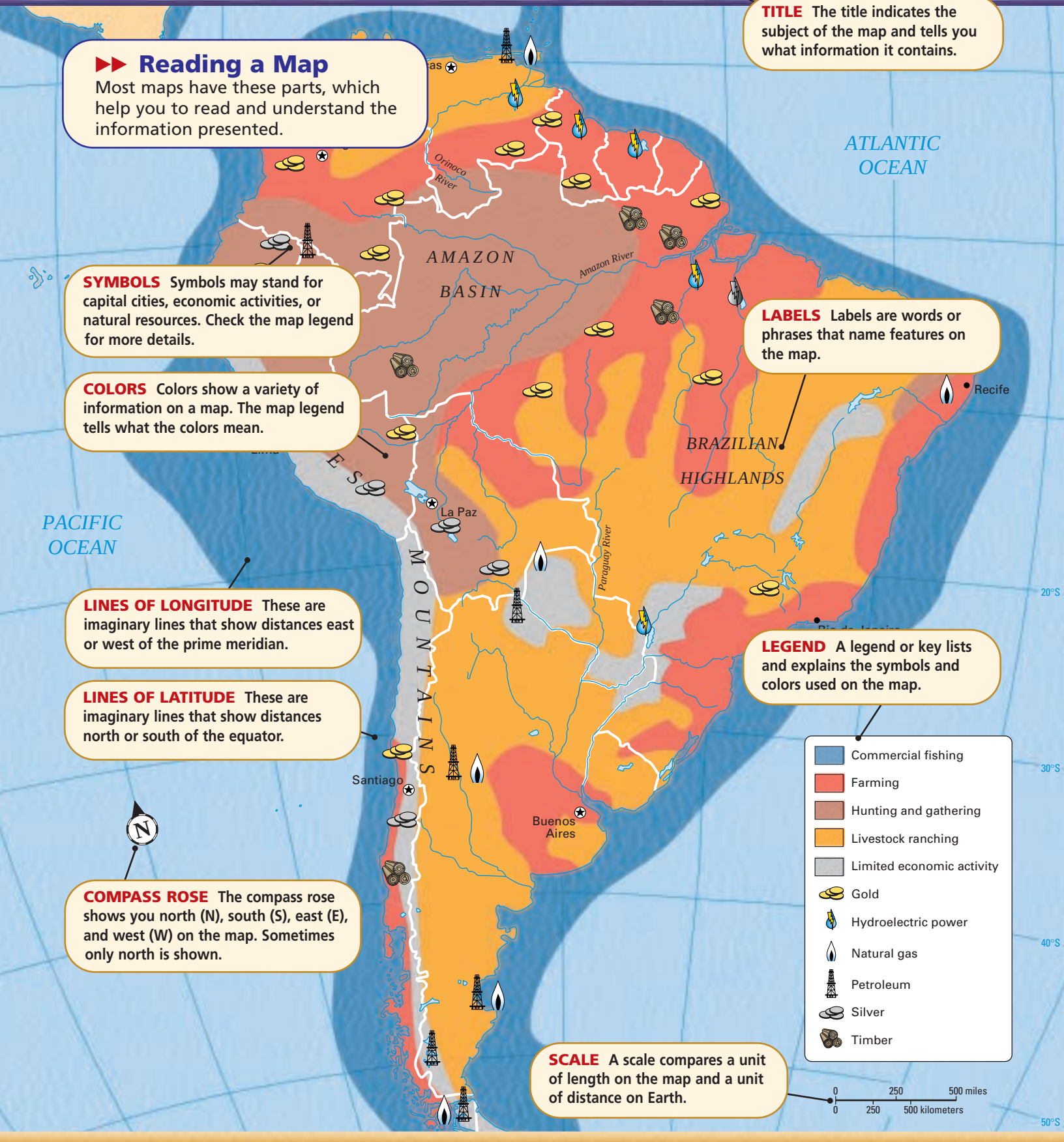
LINES OF LONGITUDE These are imaginary lines that show distances east or west of the prime meridian.

LINES OF LATITUDE These are imaginary lines that show distances north or south of the equator.

COMPASS ROSE The compass rose shows you north (N), south (S), east (E), and west (W) on the map. Sometimes only north is shown.

LEGEND A legend or key lists and explains the symbols and colors used on the map.

SCALE A scale compares a unit of length on the map and a unit of distance on Earth.



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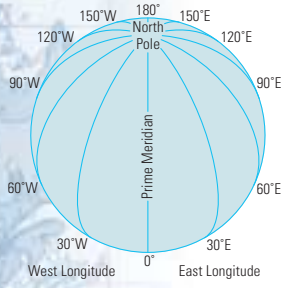
Longitude and Latitude Lines

Longitude and latitude lines appear together on a map and allow you to pinpoint the absolute locations of cities and other geographic features. You express these locations as coordinates of intersecting lines. These are measured in degrees.

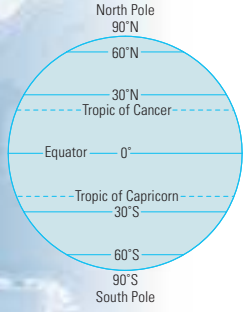
Longitude lines are imaginary lines that run north and south; they are also known as meridians. They show distances in degrees east or west of the prime meridian. The prime meridian is a longitude line that runs from the North Pole to the South Pole through Greenwich, England. It marks 0° longitude.

Latitude lines are imaginary lines that run east to west around the globe; they are also known as parallels. They show distances in degrees north or south of the equator. The equator is a latitude line that circles Earth halfway between the north and south poles. It marks 0° latitude. The tropics of Cancer and Capricorn are parallels that form the boundaries of the tropical zone, a region that stays warm all year.

Longitude Lines (Meridians)

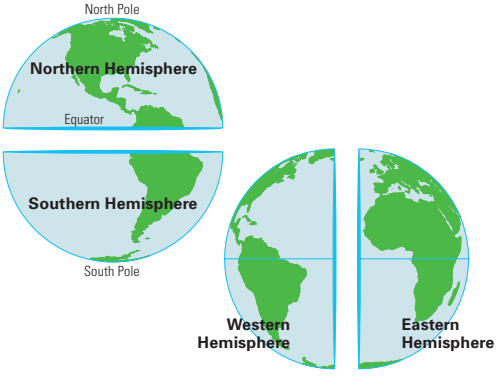


Latitude Lines (Parallels)



Hemisphere

Hemisphere is a term for half the globe. The globe can be divided into northern and southern hemispheres (separated by the equator) or into eastern and western hemispheres. The United States is located in the northern and western hemispheres.

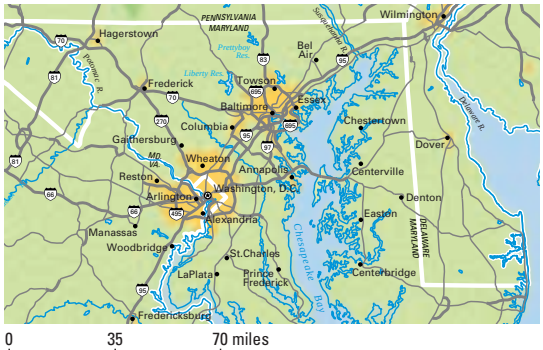


Scale

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.

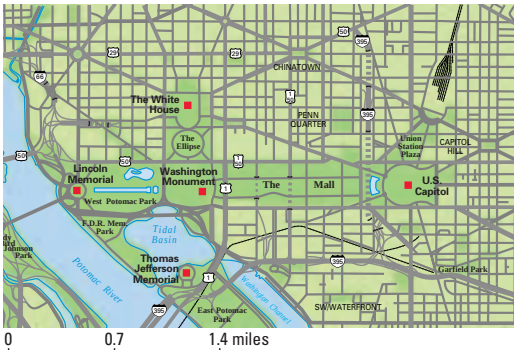
Small scale used, without a lot of detail. ▼

WASHINGTON, D.C., METRO AREA
Scale: 1:4,500,000
1 inch = 70 miles



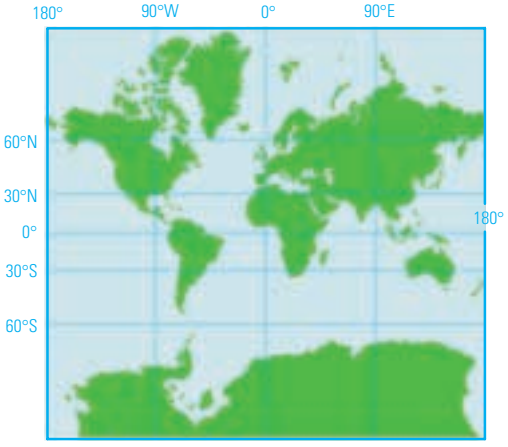
Larger scale used, with a lot of detail. ▼

WASHINGTON, D.C.
Scale: 1:88,700
1 inch = 1.4 miles

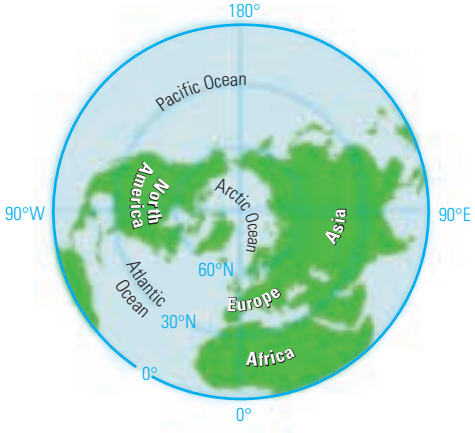


Projections

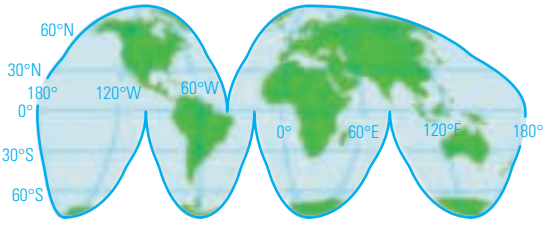
A projection is a way of showing the curved surface of Earth on a flat map. Flat maps cannot show sizes, shapes, and directions with total accuracy. As a result, all projections distort some aspect of Earth's surface. Below are four projections.



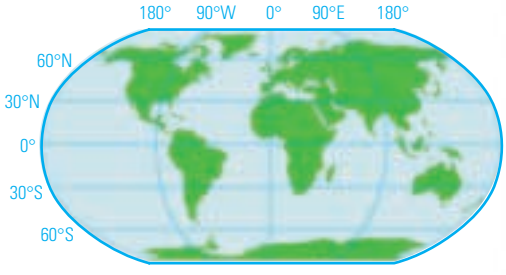
Mercator Projection • The Mercator projection shows most of the continents as they look on a globe. However, the projection stretches out the lands near the north and south poles. The Mercator projection is used for all kinds of navigation. ▲



Azimuthal Projection • An azimuthal projection shows Earth so that a straight line from the central point to any other point on the map corresponds to the shortest distance between the two points. Sizes and shapes of the continents are distorted. ▲



Homolosine Projection • This projection shows landmasses shapes, and sizes accurately, but distances are not correct. ▲



Robinson Projection • For textbook maps, the Robinson projection is commonly used. It shows the entire Earth, with continents and oceans having nearly their true sizes and shapes. However, the landmasses near the poles appear flattened. ▲

Map Practice

MAIN IDEAS

1. **(a)** What is the longitude and latitude of your city or town?
   (b) What information is provided by the legend in the map on page 5?
   (c) What is a projection? Compare and contrast the depictons of Antarctica in the Mercator and Robinson projections.

CRITICAL THINKING

2. **Making Inferences** Why do you think latitude and longitude are important to sailors?

Think About

- the landmarks you use to find your way around
- the landmarks available to sailors on the ocean

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Different Types of Maps

Physical Maps

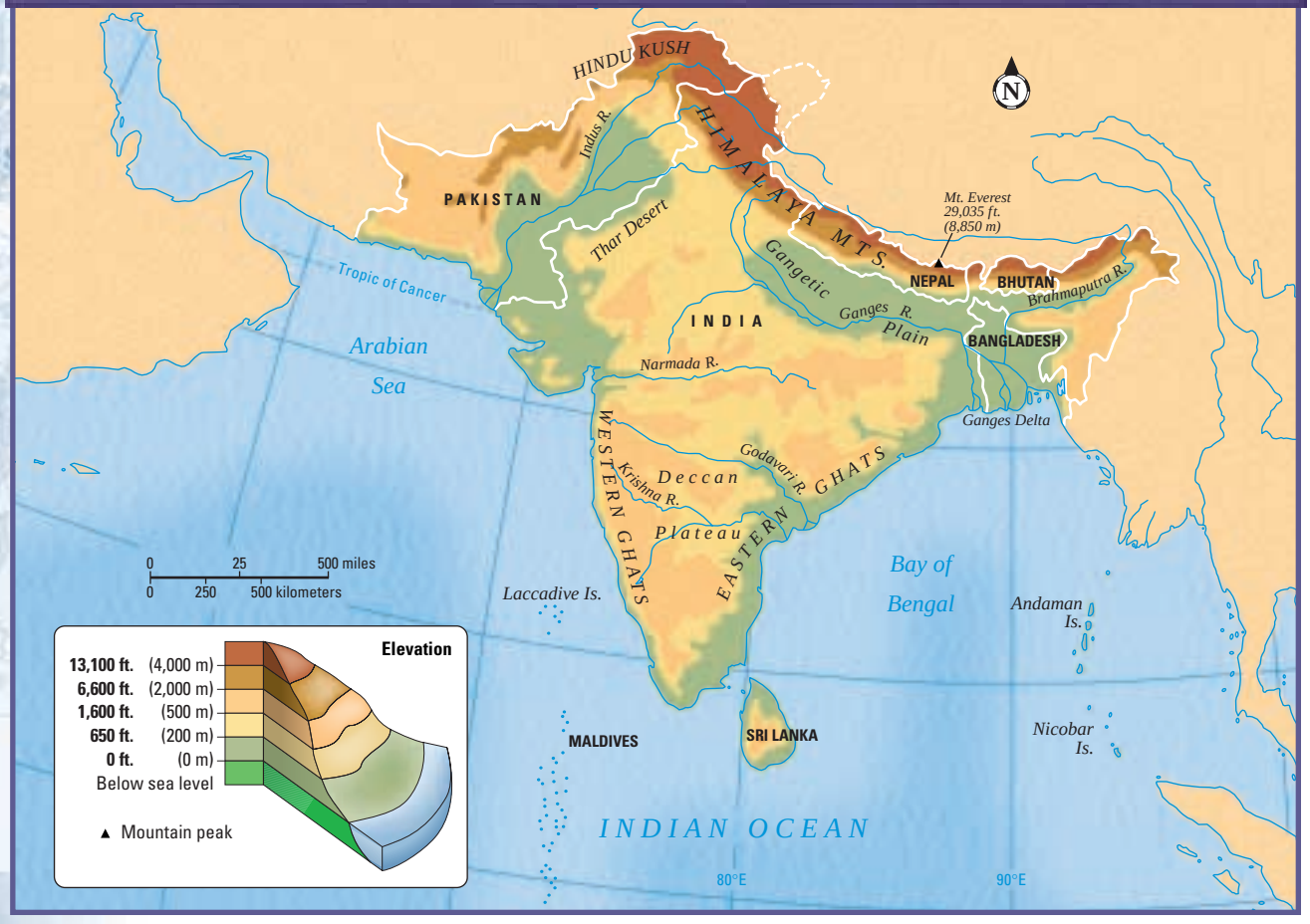
Physical maps help you see the landforms and bodies of water in specific areas. By studying a physical map, you can learn the relative locations and characteristics of places in a region.

On a physical map, color, shading, or contour lines are used to show elevations or altitudes, also called relief.

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

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

South Asia: Physical

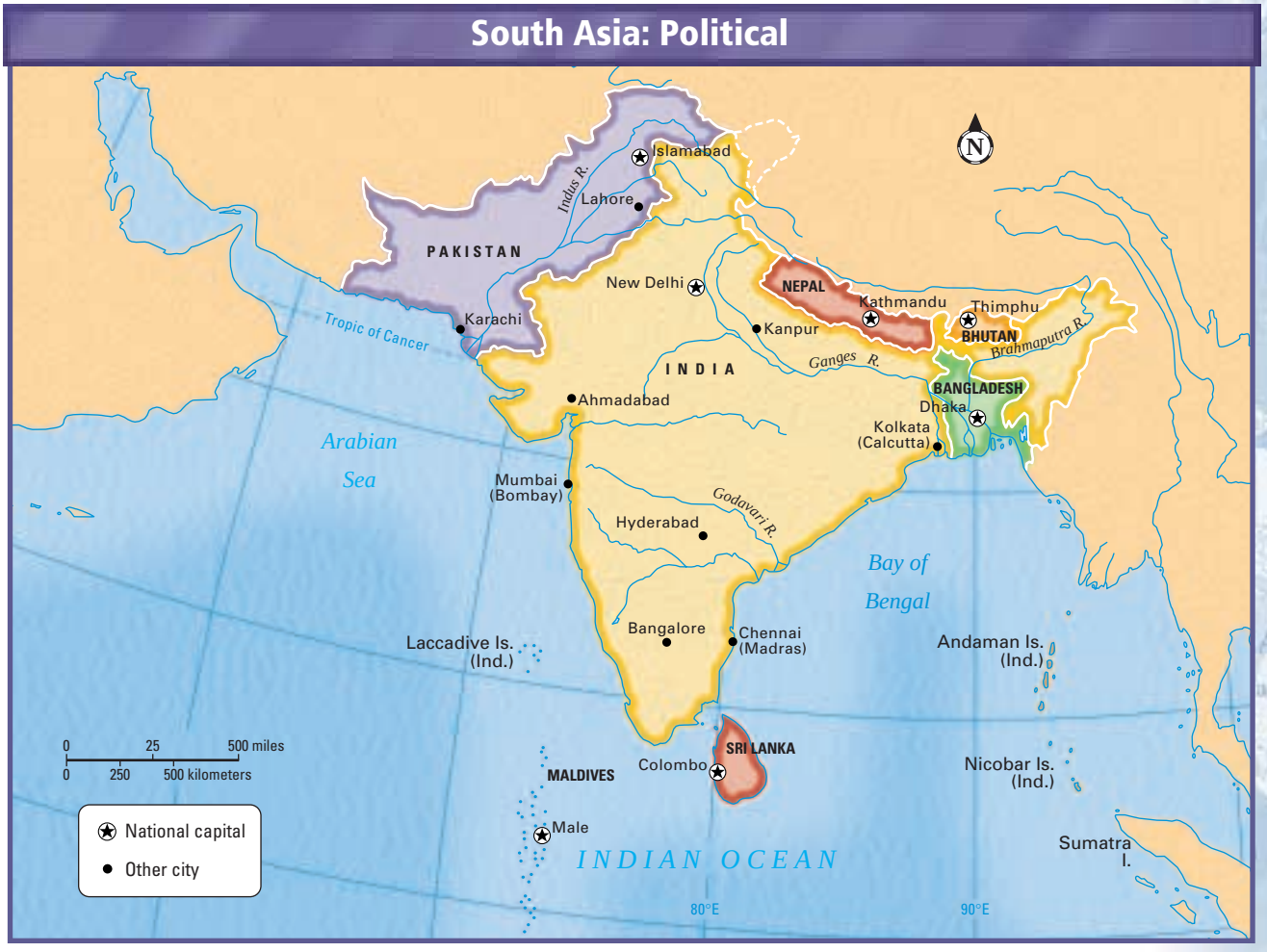


Political Maps

Political maps show features that humans have created on Earth's surface. Included on a political map may be cities, states, provinces, territories, and countries.

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

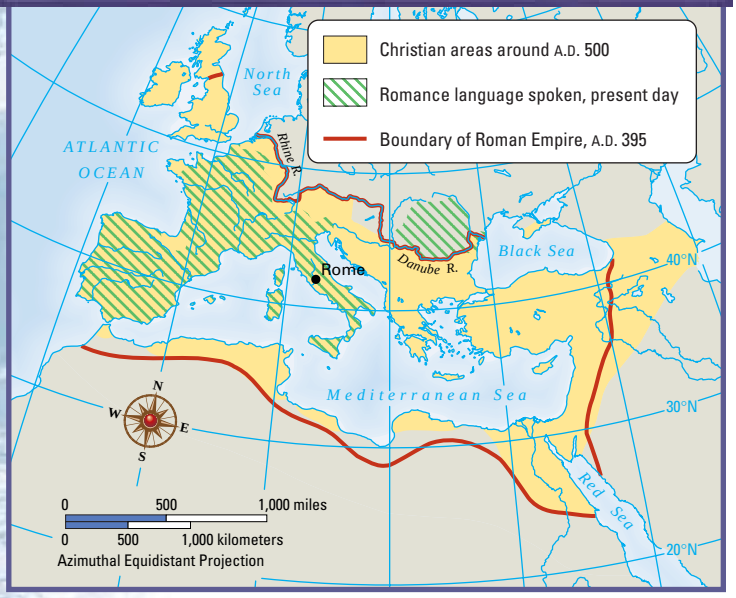
- Where on Earth's surface is this area located?
- What is its relative location? How might a country's location affect its economy and its relationships with other countries?
- What is the shape and size of the country? How might its shape and size affect the people living in the country?
- Who are the region's, country's , state's, or city's neighbors?
- 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 ideas. For example, in this textbook you will see thematic maps that show climates, types of vegetation, natural resources, population densities, and economic activities. Some thematic maps show historical trends; others may focus on movements of people or ideas. Thematic maps may be presented in a variety of ways.

Cultural Legacy of the Roman Empire

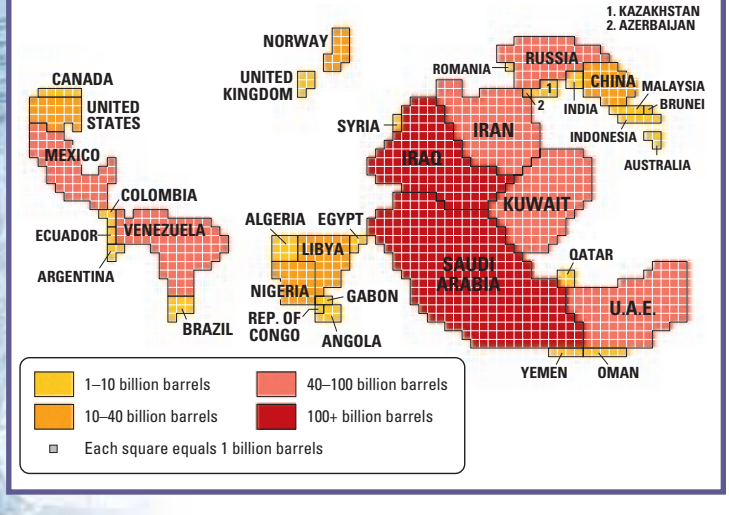


Qualitative Maps On a qualitative map, colors, symbols, dots, or lines are used to help you see patterns related to a specific idea. The map shown here depicts the influence of the Roman Empire on Europe, North Africa, and Southwest Asia.

Use the suggestions below to help you interpret the map.

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

Oil Reserves Cartogram



Cartograms A cartogram presents information about countries other than their shapes and sizes. The size of each country is determined by the data being presented, not its actual land size. On the cartogram shown here, the countries, sizes show the amounts of their oil reserves.

Use the suggestions below to help you interpret the map.

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

Flow-Line Maps Flow-line maps illustrate movements of people, goods, or ideas. The movements are usually shown by series of arrows. Locations, directions, and scopes of movement can be seen. The width of an arrow may show how extensive a flow is. Often the information is related to a period of time. The map shown here portrays the movement of the Bantu peoples in Africa.

Use the suggestions below to help you interpret the map.

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

Map Practice

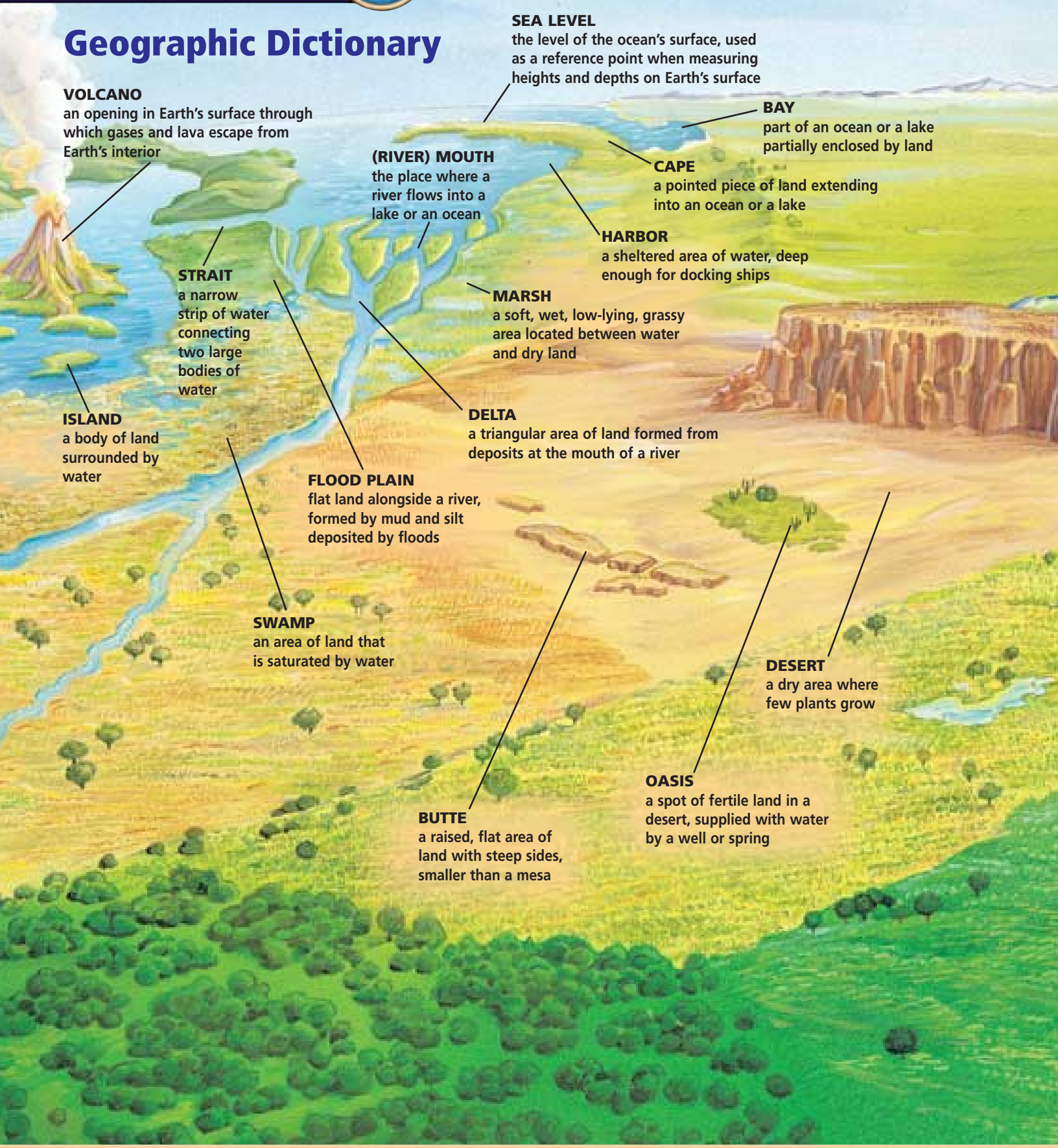
Use pages 8–11 to help you answer these questions. Use the maps on pages 8–9 to answer questions 1–3.

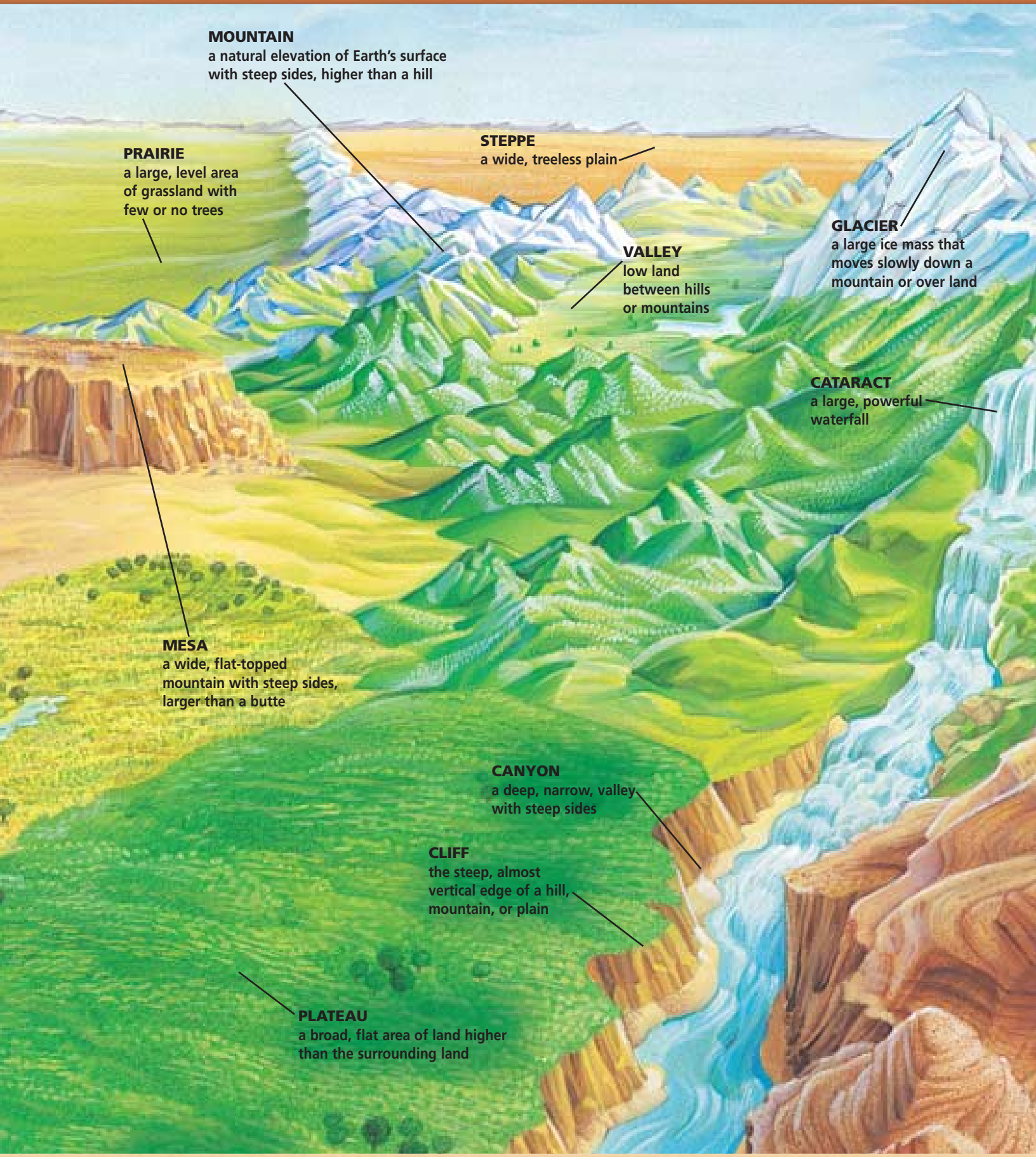
1. In what direction does the Ganges River flow?
2. Kathmandu is the capital of which South Asian nation?
3. Which city is closer to the Thar Desert—Lahore, Pakistan, or New Delhi, India?
4. Why are only a few nations shown in the cartogram?
5. Which kind of thematic map would be best for showing the locations 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 the other should show political features only.

Geographic Dictionary




MOUNTAIN
a natural elevation of Earth's surface with steep sides, higher than a hill
PRAIRIE
a large, level area of grassland with few or no trees
STEPPE
a wide, treeless plain
GLACIER
a large ice mass that moves slowly down a mountain or over land
VALLEY
low land between hills or mountains
CATARACT
a large, powerful waterfall
MESA
a wide, flat-topped mountain with steep sides, larger than a butte
CANYON
a deep, narrow, valley with steep sides
CLIFF
the steep, almost vertical edge of a hill, mountain, or plain
PLATEAU
a broad, flat area of land higher than the surrounding land