FIFTH EDITION

CULTURAL GEOGRAPHY

TEACHER EDITION

518753

ISBN 978-1-62856-648-2

Part 1

CONTENTS

CHAPTER OVERVIEW

CHAPTER QUESTION

How do we study the world?

CHAPTER OBJECTIVES

- Analyze the benefits and drawbacks of different tools of geography.
- Use geography tools.
- Analyze the basic elements of cultural geography based on biblical teaching.

RESOURCES

Visit TeacherToolsOnline.com for resources to enhance the lessons.

- Website of the United States Geologic Survey (USGS)

Unless otherwise noted, this Teacher Edition assumes that reading selections have been assigned as outside reading.

ENGAGE

EXTREME ENVIRONMENTS

Guide a **visual analysis** of the unit opener spread on the preceding two pages to help the students consider what it would be like to explore an extreme environment. Discuss the challenges involved in climbing a snow-covered mountain and the equipment that would be needed.

GETTING THE BIG IDEA

Guide a **discussion** of the study of geography using the Big Ideas on page 2 to help the students begin to understand the importance of geography.

Astronaut Kathryn Sullivan using binoculars for a magnified view of the earth from the space shuttle Challenger

SEEING THE EARTH FROM SPACE

"Kathy Sullivan, who in 1984 became the first American woman to perform a space walk, returned with an abiding awe for the intricate systems that come together to make Earth an improbable oasis. 'The thing that grew in me over these flights was a real motivation and desire . . . to not just enjoy these sights and take these pictures,' she says, 'but to make it matter.'

After retiring from NASA, Sullivan led the National Oceanic and Atmospheric Administration for three years, using the robotic eyes of orbiting satellites to pursue her passion. She says Earth from above is so captivatingly beautiful, she never grew bored looking at it. 'I'm not sure I'd want to be in the same room with someone who could get tired of that.'"

"They Saw Earth from Space. Here's How It Changed Them."
National Geographic, March 2018

The Bible begins with God's creation of the physical realm and the first humans. He creates a man and woman in His own image on the earth He has created. Geography then, is, the stage on which the human drama is acted out.

The earth, however, is more than a backdrop to the human story. God's very first words to Adam include a commission about mankind's role on the earth: "Be fruitful, and multiply, and replenish the earth, and subdue it: and have dominion . . . over every living thing that moveth upon the earth" (Gen. 1:28). These words are often called the **Creation Mandate.**

The Creation Mandate reveals that geography is not incidental to God's plan for Creation. God places Adam and Eve in a garden—a specific geographical place—from the beginning. The mandate also reveals that humans are to fill and subdue the entire earth. Knowledge of geography is required to carry out the Creation Mandate.

Nor does geography become irrelevant as the storyline of Scripture progresses. God chooses a nation to further His plan of redemption and promises it a land in a strategic geographic location. Even at the end of this age, the earth is not abandoned. Instead, the creation is renewed. Though some geographic features are different (Rev. 21:1), nations in specific geographic locations still exist on the new earth (Rev. 21:24). Geography is an important part of God's plan from Genesis to Revelation.

◂ Planet Earth, satellite view

▲ A cliff's-edge view of a Scottish cityscape, with Edinburgh Castle in the distance

▲ A differential GPS being used in a real-time kinematic survey to determine the extent of the Durham canyon flooding in the United Kingdom

SEEING THE EARTH FROM SPACE

Encourage the students to imagine they can afford to be a space tourist and visit the International Space Station. Invite them to do a **quick write** describing the fascinating perspectives of viewing the world from space.

ESSENTIAL QUESTION

What are the tools of geography?

OBJECTIVES

- Relate the Bible to the study of geography.
- Describe the parts of geography.
- Identify the features on a globe.
- Relate the features on a globe to those on a map.
- Describe technologies used in geography.
- Choose the right geography tool for the right purpose.

ACTIVITIES

Activity 1: *Find It*
Activity 2: *Exploring Map Projections*

MATERIALS

- NOVA video *Lost at Sea: The Search for Longitude*
- Issues of *National Geographic* magazine

ENGAGE

SETTING COURSE GOALS

Group the students and encourage **collaboration** on setting goals to be accomplished this year to enhance the study of geography.

Encourage the students to think of this subject as a tool to give them a greater understanding of the world and the diverse people who live in other lands.

INSTRUCT

GEOGRAPHY'S FEATURES AND TOOLS

Guide a **discussion** to distinguish absolute and relative location. Ask a volunteer to explain the difference between absolute and relative location. Clarify any misconceptions in the student's answer. Look up your city's latitude and longitude; write it for display. Explain that this is the city's absolute location. Then give an example of your city's relative location (e.g., east of another city, south of a mountain range). Allow time for the students to suggest other examples of absolute and relative location.

GUIDING QUESTIONS

- What are the five themes of geography?
- What are the two types of geography?
- What tools are used in geography?
- What are the features on a globe and a map?

GEOGRAPHY: ITS FEATURES AND TOOLS

What are the tools of geography?

In order to effectively study geography, you must understand its definition, develop a working knowledge of the five themes of geography, and practice using basic tools to develop the craft of being a student geographer.

Definition and Themes of Geography

The word **geography** comes from two roots meaning "earth" and "written description." It can be defined as the detailed study of the earth and the ways people relate to the earth and one another. An important aspect of geography is understanding how people fulfill their God-given role as stewards of God's creation.

Themes of Geography

The study of geography has five fundamental themes: location, place, movement, region, and human-environment interaction.

Location: either absolute or relative to one's environment

Place: physical characteristics such as mountains, rivers, soils, and plant and animal life, and human characteristics such as roads, buildings, agriculture, industry, and culture

Human-environment interaction: how people adapt to and modify their environment

Planting flowers during Pennsylvania's early spring

Movement: of people, goods, ideas, diseases, etc.

Region: defined by formal boundaries or functions

BACKGROUND INFORMATION

Until 1820 most knowledge about peoples and places appeared in travelogues and anecdotes. Geography was not considered a distinct discipline from earth science. In 1820, however, historian Carl Ritter became the chairman of the new geography department at the University of Berlin. He is considered the Father of Modern Geographical Science. Ritter believed that God had ordained the regions of the world. He proposed that by careful scientific investigation of each region's physical geography and human history people could discover God's purpose for their various regions.

As you study geography, remind yourself of these five themes. They will recur many times throughout this book and are essential to a proper understanding of geography. In the simplest terms, geography can be divided into *physical geography* and *human geography*. In this book you will also examine human interaction with the environment.

The Tools of Geography

Much of the visual information about geography appears in one of two forms: a globe or a map. Both of these tools seek to provide models of the earth's surface.

Globe

Globes show information about the earth's surface with almost perfect accuracy. Both a globe and the earth are spheres, and both can be divided easily with lines of latitude and longitude.

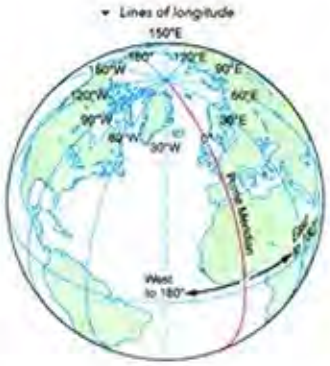
The **prime meridian** passes through Greenwich, England, and is designated 0°. Because scientists at the Royal Observatory in Greenwich made the original calculations for modern meridians, their meridian became the basis for all the others. It is also the reference point for the various time zones of the world. The 180° meridian lies directly opposite the prime meridian and is actually a continuation of the same line. Together, these lines form a **great circle** and cut the earth into two equal hemispheres. Every meridian except 0° and 180° is labeled as east (E) or west (W), depending on the hemisphere in which it lies.

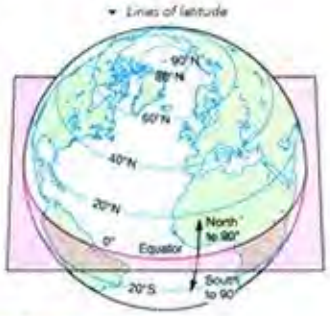
Longitude is the distance east or west of the prime meridian measured in degrees. The **equator** is the imaginary line that divides the earth into the Northern and Southern Hemispheres. **Latitude** is the distance north or south of the equator measured in degrees. Imaginary lines run east and west around the earth. They form circles that are parallel to the equator and are therefore called parallels of latitude.

Maps

Maps are generally flat, show much greater detail, and are more useful than globes. Any method used to show the earth's round surface on a flat map is called a map projection.

When a globe is transferred onto a map, a serious problem known as distortion occurs. The earth's surface is not a flat rectangle like a sheet of paper; it does not flatten without distorting the image. When cartographers (mapmakers) make a map, they try to avoid or reduce the distortion of four features of a globe: area, shape, distance, and direction.





BACKGROUND INFORMATION

Prior to the eighteenth century, sailors and explorers had no way to determine longitude at sea. It could be calculated on land, where coordinates were already known and scientists had a stable surface on which to place their instruments. But on the open seas, where waves caused ships to pitch and roll, such calculations were impossible. Devastating shipwrecks were the result, as crews inevitably lost their way and ships were either dashed on rocks or marooned. The discovery of a reliable means of calculating longitude at sea saved many lives.

THE SEARCH FOR LONGITUDE

Show a **video** to illustrate the importance of longitude in the history of exploration. A good option is the NOVA video *Lost at Sea: The Search for Longitude*, which tells the fascinating story of how a British clockmaker developed a way to calculate longitude at sea and thereby prevent many shipwrecks. This resource is available for purchase and may also be available in your local library. The video is based on the book *Longitude* by Dava Sobel.

DIFFERENTIATED INSTRUCTION

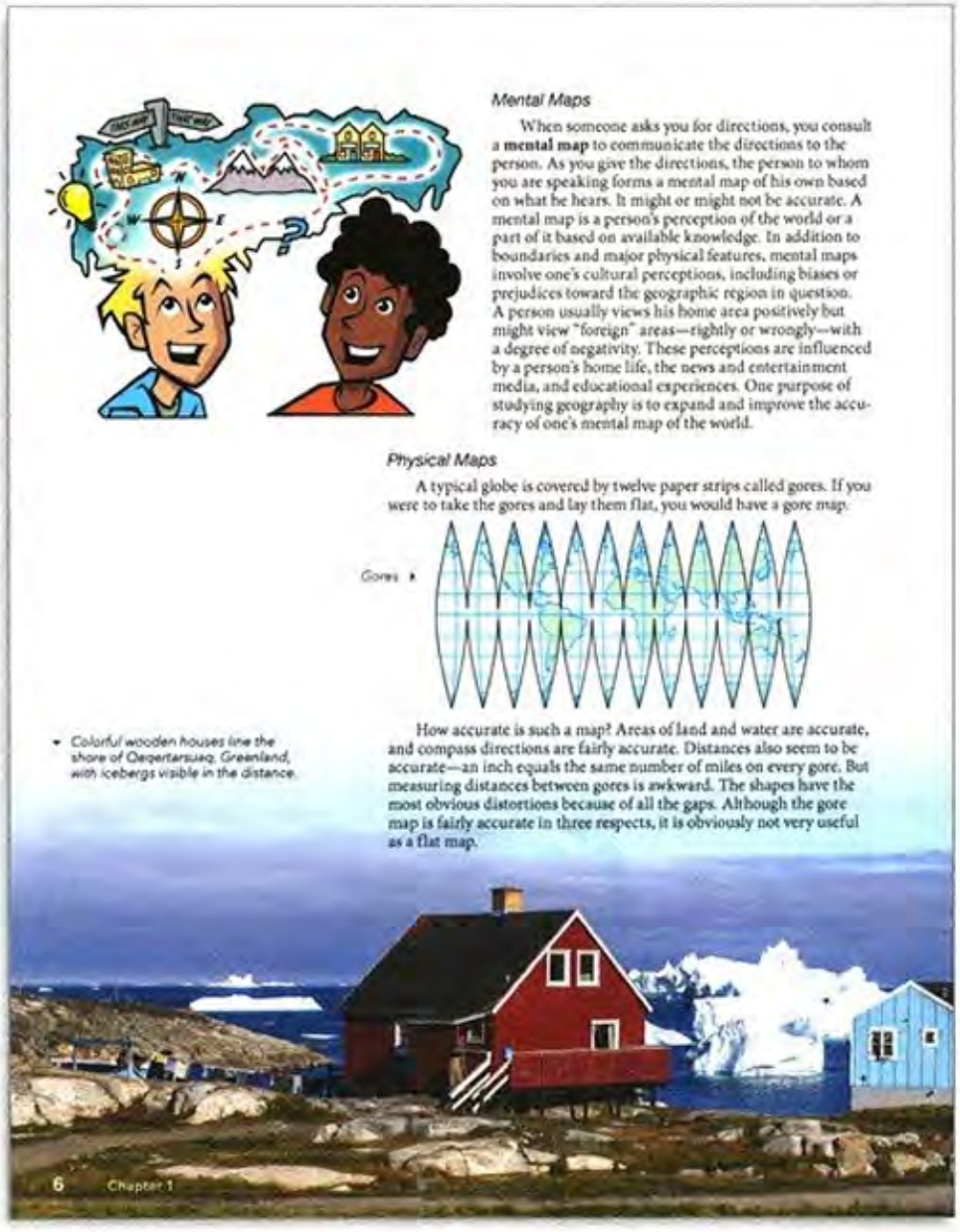
Targeted Reinforcement

To present the material using a different learning style, guide a globe activity that gives students hands-on practice using latitude and longitude. Call out coordinates for a major world city and allow a volunteer to use the globe to find the city located at those coordinates. After several students have had a turn finding a city, reverse the activity. Call out a city and allow a volunteer to find it on the globe and identify its coordinates.

MENTAL MAPS

Direct a **collaboration activity** to give the students practice in giving and receiving directions. Pair the students and direct them to take turns giving directions to a specific destination, such as one's home or church or a local place of business. This activity will highlight the importance of mental maps in navigating from place to place.

Point out that mental maps also include a person's perceptions and beliefs about a place or its inhabitants. Studying the different places and cultures in this textbook will greatly expand the students' mental maps



Mental Maps

When someone asks you for directions, you consult a **mental map** to communicate the directions to the person. As you give the directions, the person to whom you are speaking forms a mental map of his own based on what he hears. It might or might not be accurate. A mental map is a person's perception of the world or a part of it based on available knowledge. In addition to boundaries and major physical features, mental maps involve one's cultural perceptions, including biases or prejudices toward the geographic region in question. A person usually views his home area positively but might view "foreign" areas—rightly or wrongly—with a degree of negativity. These perceptions are influenced by a person's home life, the news and entertainment media, and educational experiences. One purpose of studying geography is to expand and improve the accuracy of one's mental map of the world.

Physical Maps

A typical globe is covered by twelve paper strips called gores. If you were to take the gores and lay them flat, you would have a gore map.

Gores

How accurate is such a map? Areas of land and water are accurate, and compass directions are fairly accurate. Distances also seem to be accurate—an inch equals the same number of miles on every gore. But measuring distances between gores is awkward. The shapes have the most obvious distortions because of all the gaps. Although the gore map is fairly accurate in three respects, it is obviously not very useful as a flat map.

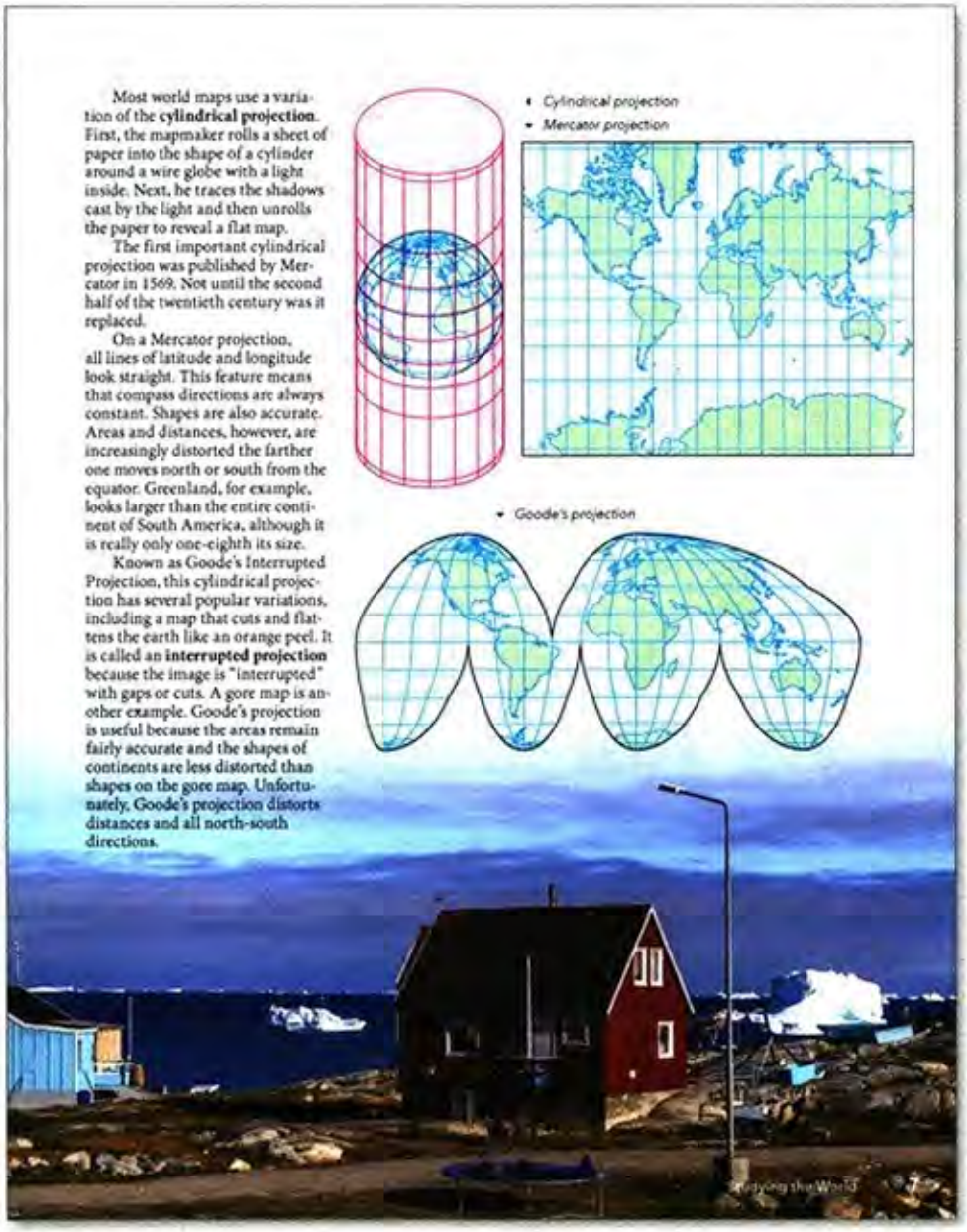
▼ *Colorful wooden houses line the shore of Qeqertarsuaq, Greenland, with icebergs visible in the distance.*

6 Chapter 1

DIFFERENTIATED INSTRUCTION

ELL

English language learners may lack the necessary English vocabulary to comfortably complete the Mental Maps activity above. If so, allow them to observe a pair of students completing the activity. Give the English language learners an opportunity to ask questions about the activity if they wish. Guide them to an understanding of what it means to have a mental map.



Most world maps use a variation of the **cylindrical projection**. First, the mapmaker rolls a sheet of paper into the shape of a cylinder around a wire globe with a light inside. Next, he traces the shadows cast by the light and then unrolls the paper to reveal a flat map.

The first important cylindrical projection was published by Mercator in 1569. Not until the second half of the twentieth century was it replaced.

On a Mercator projection, all lines of latitude and longitude look straight. This feature means that compass directions are always constant. Shapes are also accurate. Areas and distances, however, are increasingly distorted the farther one moves north or south from the equator. Greenland, for example, looks larger than the entire continent of South America, although it is really only one-eighth its size.

Known as Goode's Interrupted Projection, this cylindrical projection has several popular variations, including a map that cuts and flattens the earth like an orange peel. It is called an **interrupted projection** because the image is "interrupted" with gaps or cuts. A gore map is another example. Goode's projection is useful because the areas remain fairly accurate and the shapes of continents are less distorted than shapes on the gore map. Unfortunately, Goode's projection distorts distances and all north-south directions.

Cylindrical projection

Mercator projection

Goode's projection

IDENTIFYING MAP PROJECTIONS

Guide an **internet activity** to give the students practice in identifying map projections. Pair the students and direct them to search online for different world maps. Instruct them to identify the map projection used for each. Ask the following questions as they work.

- What differences do you see among the maps?
- Which type of projection is most common?
- Are any of these projections the same as the ones discussed in the student edition?

Explain how the projections are derived and what their advantages and disadvantages are.

APPLY

Conduct a **problem-solving activity** to identify which map projection would be more useful in the following situations.

1. Scientists are tracking the distance of penguin movement at the South Pole. Should they use a Mercator projection or an azimuthal projection? *(The azimuthal projection most accurately portrays distances in a compact area like Antarctica.)*
2. Sailboat racers are following compass directions from north to south. Should they use a Mercator projection or Goode's Interrupted Projection? *(The Mercator projection accurately portrays compass directions.)*
3. Bicyclists are navigating trails through a city. Should they use a conic projection, Robinson's projection, or some other type of map? *(Some other type of map, because projections aren't necessary for small areas where little distortion occurs.)*

ACTIVITY 1
FIND IT!

Activities page 1 will give the students practice in locating specific places using latitude and longitude. The students will need access to Google® Earth or similar software to complete this activity.

ACTIVITY 2
EXPLORING MAP PROJECTIONS

Activities page 2 uses drawings of map projections to reinforce the concepts discussed in the chapter.

FIFTH EDITION

CULTURAL GEOGRAPHY

TEACHER EDITION

518753

ISBN 978-1-62856-648-2

90000

9 781628 566482

Part

2

CHAPTER OVERVIEW

CHAPTER QUESTION

How do the people of North Africa shape their land?

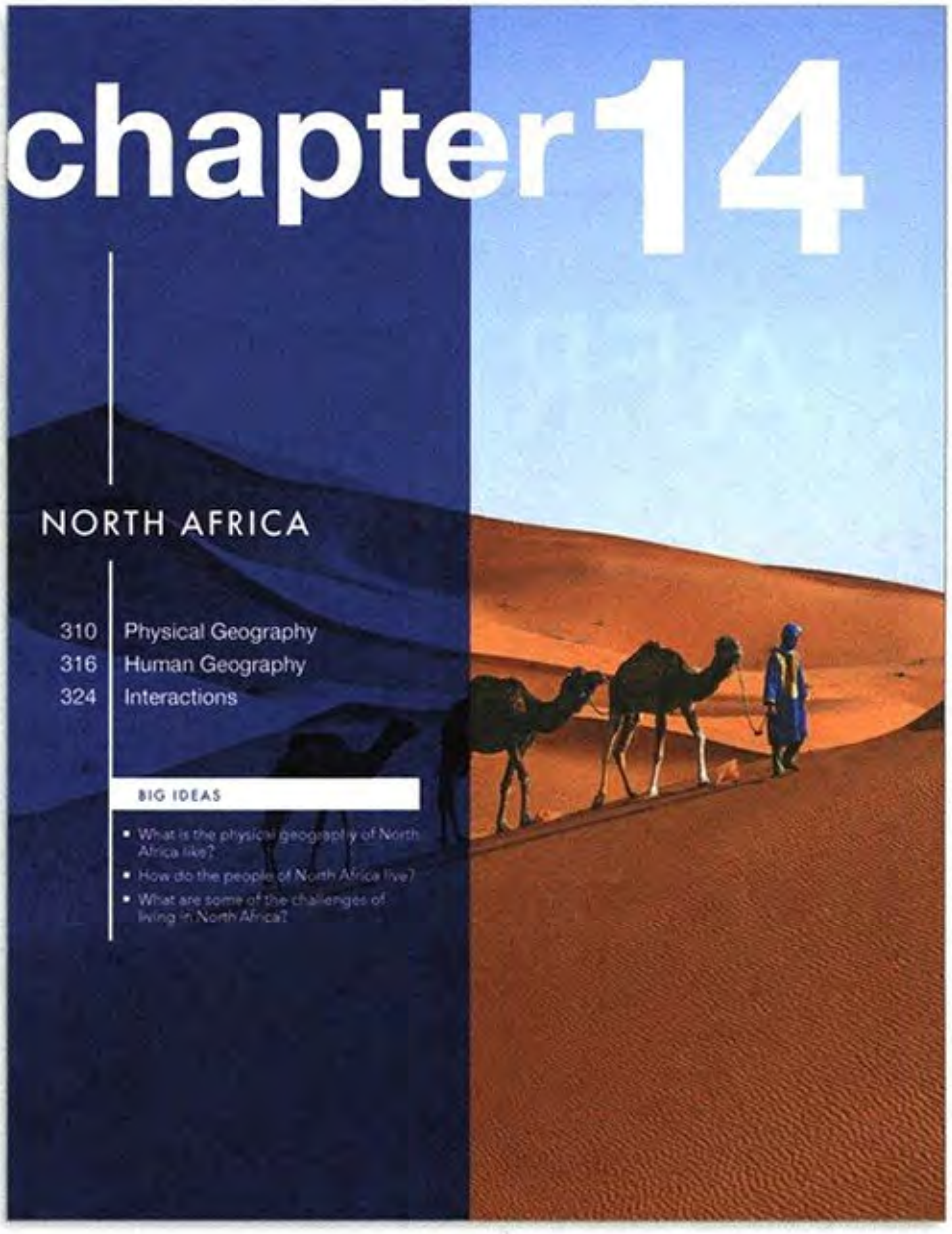
CHAPTER OBJECTIVES

- Use maps to describe the physical geography of North Africa.
- Evaluate North African culture based on biblical teaching.
- Relate the cultures, economies, and governments of North Africa to its history.
- Analyze environmental issues in North Africa.

RESOURCES

Visit TeacherToolsOnline.com for resources to enhance the lessons.

chapter 14



NORTH AFRICA

BIG IDEAS

- What is the physical geography of North Africa like?
- How do the people of North Africa live?
- What are some of the challenges of living in North Africa?

◂ *A Hausa village in Tahoua, Niger*

▸ *A Berber-Roman arch in Djemila, Algeria, which dates to the third century AD*

◂ *The Valley of the Kings, Luxor City, Egypt*

▸ *Hassan II Mosque, Casablanca, Morocco*

VALLEY OF THE KINGS

The desolate valley west of the Nile in southern Egypt contains more than sixty tombs of the pharaohs and their families. Most of the tombs were robbed long before archaeologists explored them, but in 1922 an English archaeologist discovered fabulous riches in the tomb of nineteen-year-old Tutankhamen, or King Tut. The most recent discovery, that of the mummy of Queen Hatshepsut, was in 2007. Archaeologists believe there are many undiscovered tombs yet to be found. The tombs were furnished with everything the pharaoh would need to enter the afterlife. They included treasures such as golden masks and jewelry but also common items such as furniture, clothes, food, and even pets. Other reminders of the ancient kings' glory are the ruins of their temples. The Temple of Karnak is the most well-known of these sites. Sphinxes once lined the avenue leading to the front gateway, flanked by towers 143 feet high.

◂ *Tuareg tribesman with camels, western Sahara, Morocco*

BACKGROUND INFORMATION

Leptis Magna is one of the most complete ancient Roman ruins in Northern Africa. It was a Carthaginian trading post and later became part of the Roman Empire. The city enjoyed wealth and prestige as the hometown of a Roman emperor. Thus, there are more classical buildings in Leptis Magna than in other Roman cities. The Roman theater, which is around 230 feet in diameter, retains much of its original ornamentation, including statues. The bath house at Leptis Magna is one of the largest built outside Rome. Preserved by enormous sand dunes that covered most of the site, Leptis Magna was not excavated until Libya became an Italian colony between 1920 and 1945.

ENGAGE

EGYPT'S ANCIENT WONDERS

Guide a **virtual Egyptian tour** using Google Earth to help the students better understand these two sites.

Direct the students to explore the Great Pyramid and then direct them to go to Luxor and virtually visit the Valley of the Kings.

Ask volunteers to share their observations and what was different from their impressions about these locations.

Discuss how the climate in Egypt has contributed to the preservation of the pyramids and other ancient wonders.

RUINS OF ANCIENT CARTHAGE

Direct the students to use **Google Earth** to explore Leptis Magna, a trading post in ancient Carthage. The amphitheater and some of the ruins are clearly visible.

Share portions of the Background Information below as needed.

GEOGRAPHY JOURNAL

Allow the students to write their impressions of North Africa in their notebooks. What countries do they know the most about? Which ones have they visited? What do they know about the region's history and culture?

ESSENTIAL QUESTION

What is the physical geography of North Africa like?

OBJECTIVES

- Label the regions of North Africa on a map.
- Relate physical landforms of North Africa to earth-shaping processes.
- Associate specific bodies of water with North Africa.
- Connect the climates of North Africa to its location on the globe.
- Identify natural resources in North Africa.
- Employ geography tools to gather data on Africa and to communicate key ideas about this region.

ACTIVITIES

Activity 1: *Africa Geodata*
Activity 2: *North Africa*

MATERIALS

- Online video *Egypt's Geographic Challenge* (Stratfor)
- Online video *Mali's Geographic Challenge* (Stratfor)
- Online video *Chad's Geographic Challenge* (Stratfor)
- Slide show of images from the different regions of North Africa
- Online video *How Does an Oasis Form?* (Atlas Pro)
- An article about aquaculture

GUIDING QUESTIONS

- What are the regions of North Africa?
- What caused the landforms of North Africa?
- What bodies of water are important to North Africa?
- What is the climate of North Africa, and how does it relate to its location on the globe?
- What are the natural resources of North Africa?

Though Africa is the second-largest continent, its size is not as important as its location. Eighty percent of Africa's land is between the Tropic of Cancer and the Tropic of Capricorn. This position makes the climate mainly warm, and it makes the climate in most areas consistent—there are no great temperature fluctuations. This position also determines the patterns of rainfall for the continent. The amount of rainfall decreases as you move north or south away from the equator, and near each end of the continent there are great deserts, the Sahara in the north and the Kalahari in the south. The Sahara is perhaps the single most important geographic factor in the history of Africa, dividing the continent into two regions with very different peoples and histories. Saharan Africa shows the strong imprint of Islam, while sub-Saharan Africa's history involves many tribal groups.

ATLAS MOUNTAINS

The Atlas Mountains are a fifteen-hundred-mile chain which lies along the northwest coast of Africa. These mountains cover most of Morocco, northern Algeria, and northern Tunisia.

SINAI PENINSULA

Although most of Egypt lies in Africa, the Sinai Peninsula is part of Asia. It is divided from African Egypt by the Isthmus of Suez, a bridge of land between the Gulf of Suez and the Mediterranean Sea.

PHYSICAL GEOGRAPHY

What is the physical geography of North Africa like?

Regions of North Africa

North Africa has more in common with the Middle East than with the rest of Africa. They share the same landforms, people, and religion.

310 Chapter 14

ENGAGE

FACING CHALLENGES

Show three Geographic Challenge **videos:** Egypt, Mali, and Chad, since these countries represent two of the subregions. The videos will help the students understand the physical regions with their associated advantages and challenges.

Ask follow-up questions to gauge student understanding.

- What percentage of people live along the Nile in Egypt? *(99%)*
- Why does Egypt have a strong central state? *(because the geography requires heavy public spending for infrastructure)*
- What are the regions the of Mali? *(It has a southern savanna and a northern desert.)*
- What are Chad's geographic challenges? *(ethno-regional divisions, imposition of colonial borders, terrorists, being landlocked, isolation)*
- What is Chad's one advantage? *(discovery of oil)*
- What are commonalities of the countries? *(They have desert-dwelling people who are nomads and savanna dwellers who are farmers. These governments cannot project power into the desert.)*

SAHARA

The **Sahara** is the world's largest desert. It is about the same size as the United States and is the only desert in the world that spans an entire continent from shore to shore. The Arabs looked at this vast, barren expanse and called it simply the "desert," or Sahara. Every country presented in this chapter is covered in large part by the Sahara.

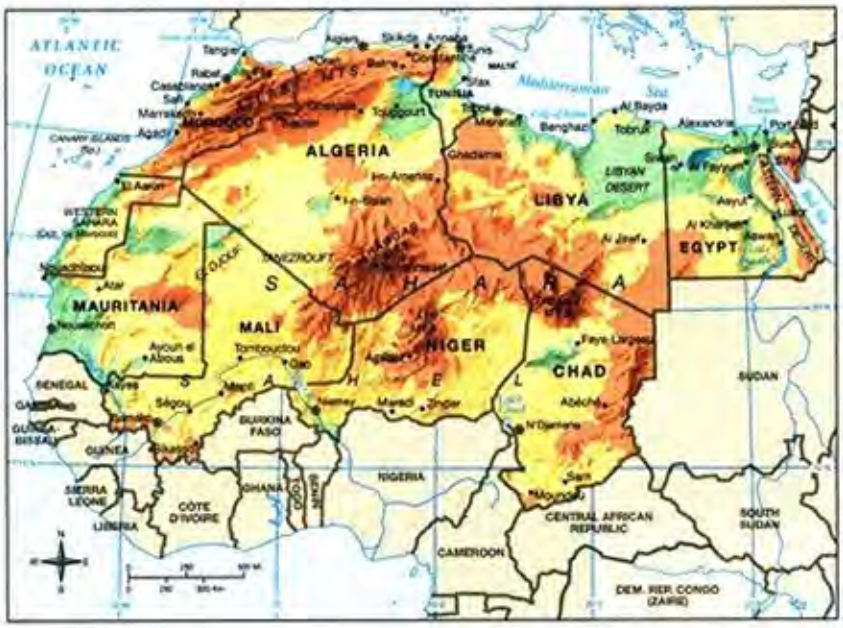
Endless sand **dunes** like those found in the Grand Erg in central Algeria are what come to mind when one thinks of the Sahara. The dunes cover thousands of square miles, with only a few large oases to break the monotony. But the Sahara is not totally flat; it is interspersed with hamadas, which are elevated flat and rocky areas mainly devoid of sand. There are three main regions of these: the Tibesti Mountains in southern Libya and northern Chad, the Ahaggar Mountains in southern Algeria, and the Air Mountains in central Niger.

NORTHERN SAHEL

Between the Sahara and the jungles of Central Africa lies a transitional region called the **Sahel**. This band of grass-covered plains is about three hundred miles wide. The southern regions of four countries—Mauritania, Mali, Niger, and Chad—are part of the Sahel in North Africa.

NILE RIVER VALLEY

The Sahara ferns in the Nile Valley on both sides. The Western Desert is a low plateau with hills, salt flats, and depressions. It covers two-thirds of Egypt. The Eastern Desert is rugged and covered by barren mountains reaching almost seven thousand feet. Although sometimes called the Arabian Desert, it is not the larger Arabian Desert that covers the Arabian Peninsula. The Nile River Valley averages ten miles wide in the south. The valley begins in Upper Egypt just north of the Aswan dam. Vegetation and farmland border the river. The valley is around 150 miles wide at the Nile Delta in Lower Egypt. This whole region resembles a lotus flower, the national flower of Egypt.



INSTRUCT

REGIONS OF NORTH AFRICA

Display a **slide show** of images of the different regions to help the students visualize the differences.

Direct the students to analyze the map to learn where the different countries are and to improve their map-reading skills. The students should now be able to interpret maps of completely new areas and draw inferences, or reasonable conclusions, from what they see. Ask questions such as the following.

- What African capitals lie on the Mediterranean coast? *(Algiers, Tunis, Tripoli)*
- Why do you think they are located there? *(These three cities offer the best ports and a mediterranean climate.)*
- How many nations touch Lake Chad? *(four)*
- Why were so many borders drawn to include this lake? *(Each country wanted access to some of the precious water.)*
- Where are the geometric boundaries in North Africa? *(in the Sahara)*
- Why are they used here and not in other places? *(Straight lines are more frequent here because of the remote desert terrain, with no rivers and few distinctive natural landmarks.)*

Point out the locations of Upper and Lower Egypt to distinguish the locations. It will seem backward at first to the students that Upper Egypt is to the south and Lower Egypt is to the north. Explain that Upper and Lower refer to elevation of the land, not direction. Southern Egypt is higher than northern Egypt, thus causing the Nile to flow downhill northward.

ACTIVITY 1
AFRICA GEODATA

Activities pages 111–12 will give the students a form to record vital information about each of the countries in this unit. Researching and writing down the information are ways to increase student retention. This activity is designed to help the students learn more about Africa.

PHYSICAL LANDFORMS

Guide a **visual analysis** of the physical landform pictures and then guide the students as they locate these places on Google Earth so they understand how the landforms relate to the larger region.

Physical Landforms

While North Africa has three main physical and cultural regions, it also has three types of landforms. Rocky mountains are in the northwest, the Sahara in the center, and flat grasslands in the south.

▲ *The Atlas Mountains rise to a maximum elevation of 13,661 feet at Jebel Toubkal in Morocco.*

▲ *Much more common than the dunes (ergs) are regs, which are flat desert areas covered with pebbles. The Tanezrouft Reg, on Algeria's southern border, is a monotonous plain that stretches hundreds of miles.*

▼ *The Qattara Depression in northwest Egypt drops to 436 feet below sea level. Covering an area almost as large as New Jersey, it was created through salt weathering and wind erosion. Salt weathering occurs when saline gets into cracks in the rocks, breaking them down.*

▲ *The Richat Structure, called the "eye of the Sahara," is located in central Mauritania. It is a geological dome made of sedimentary rock that was formed through differential erosion, which occurs when rocks erode at different rates due to their degree of hardness.*

312 Chapter 14

Bodies of Water

The large bodies of water that surround North Africa are the Atlantic Ocean to the west, the Mediterranean Sea to the north, and the Red Sea to the east. Most of North Africa's people live along the coast of the Mediterranean Sea.

The Nile River is the lifeblood of Egypt. It is the longest river in the world, at 4,160 miles. It is one of the few large world rivers that flow north. The Nile Delta, where the river empties into the Mediterranean, is called Lower Egypt because it has the lowest elevation of the river. *Delta* is the term for the area at the mouth of a river where sediment accumulates called **alluvial deposits**. Nearly all of Egypt's population lives along the river where palm trees shade the houses and villages in the valley.

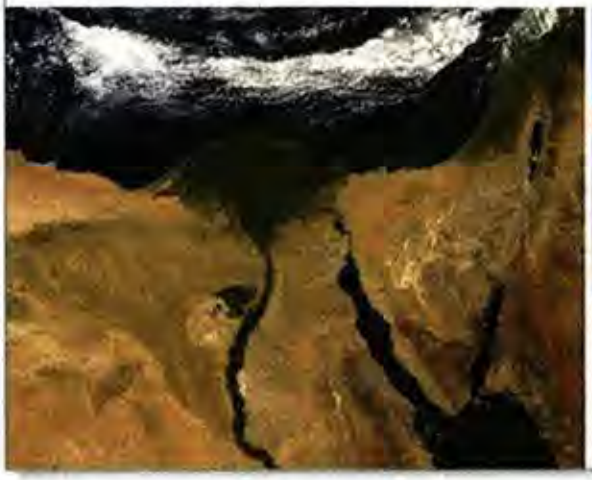
The Niger River is the third-longest in Africa and the most important river in the Sahel. It begins in the Guinea Highlands. The river lies mostly in Mali before finally emptying into the Atlantic in Nigeria. Most ancient and modern cities of Mali lie on this river. Bamako, the largest city in the Sahel and capital of Mali, is on the river, as is Niger's capital, Niamey. The Senegal River is the ninth-longest river in Africa; it flows through parts of Mauritania and Mali.

The Chari River and its tributaries, navigable only during the rainy season, provide a fertile region for agriculture in southern Chad. The Chari is fed by rivers that start in the jungles of the Central African Republic. The Chari flows into Lake Chad on the western border of Chad. The capital, N'Djamena, lies near the lake at the confluence of the Chari River and the Logone River.

Lake Chad is the most important body of water in the Sahel. Lake Chad once had a surface area of approximately 9,600 square miles, or roughly the size of Lake Erie. Since 1963, however, Lake Chad has shrunk to one-twentieth of its former size.

Oases are vital for life in the desert. They are areas of fertile land watered by a natural spring or other water sources like aquifers. They were places of rest for traders crossing the Sahara. They are home to farmers who grow dates, rice, corn, cotton, and other crops.

▲ *Satellite images taken in 1973 (top) and 2017 (bottom) show how much Lake Chad has shrunk. The combination of visible and infrared light helps to differentiate vegetation (red) and water (blue and slate gray).*



▲ *An oasis in the Sahara*

◀ *The Nile Delta from space*

BODIES OF WATER

Assist the students as they locate Lake Chad on **Google Earth** to better understand how the lake's disappearance has affected the region.

Direct the students to locate towns and villages that were once on the lake shore. Ask what seems to have happened to them.

Guide a visual analysis of the map on page 311 to locate the Niger River. Point out that the route of the Niger River is one of the most unusual river routes in the world. The river flows northeast, east, and southeast, following a boomerang-like shape. Because the portion that flows east signals the change in the course of the river, it is referred to as the Niger Bend. At its bend, the Niger is the closest river to the Sahara and thus has always been an important source of water in the region. Encourage the students to explore the river on Google Earth.

OASIS

Show the **video** *How Does an Oasis Form* to give the students an idea of the natural processes that form an oasis. Ask follow-up questions to gauge student understanding.

- How do oases form? *(At areas of low elevation, rainwater can collect in the underground aquifer and cause the water table to rise. The water table may rise to a level that causes the water to come up through the surface, thus forming an oasis.)*

(*Note:* Take time to correct the mention of millions of years in this video.)