



Core Knowledge®

HISTORY AND GEOGRAPHY

World Lakes

Lake Tanganyika



Teacher Guide

Lake Titicaca



The Great Lakes



World Lakes

Teacher Guide



Core Knowledge®

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World Lakes

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World Lakes

Teacher Guide

Core Knowledge Sequence History and Geography 5

Introduction

ABOUT THIS UNIT

The Big Idea

Maps and globes are used to show location and other aspects of human and physical geography. Lakes are an important part of Earth's physical geography, providing water and other resources that help people live.

Lakes are one of Earth's most important sources of water. They serve as a habitat for many animals and provide water for drinking, irrigation, and hydroelectric power, as well as food, for human beings. Lakes are also valuable to human beings as travel routes and as sites for recreation.

What Students Should Already Know

Students in Core Knowledge schools should already be familiar with:

Kindergarten through Grade 4

- What maps and globes represent and how to use them
- What rivers, lakes, and mountains are and how they are represented on maps and globes
- The location of the Atlantic, Pacific, Indian, and Arctic Oceans, the North and South Poles, and the seven continents
- The name and location of their continent, country, state, and community
- The use of map keys and symbols and directions (east, west, north, south) on a map
- The location of the Northern American countries (Canada and the United States), Mexico, Central America, the equator, and the Northern and Southern Hemispheres
- The meaning of *peninsula, harbor, bay, island, coast, valley, prairie, desert, oasis, boundary, channel, delta, isthmus, plateau, reservoir, and strait*
- The use of scale, an atlas, and online resources
- Canada (French and British heritage; French-speaking Quebec; Rocky Mountains; Hudson Bay, St. Lawrence River, and the Yukon River; division into provinces; major cities including Montreal, Quebec, and Toronto)
- Important rivers of the world (terms including *source, mouth, tributary, and drainage basin*; Asia's Ob, Yellow or Huang He, Yangtze or Chang Jiang, Ganges, Indus, Tigris, and Euphrates rivers; Africa's Nile, Niger, and Congo rivers; South America's Amazon, Paraná, and Orinoco rivers; North America's Mississippi, Mackenzie, and Yukon rivers; Australia's Murray and Darling rivers; and Europe's Volga, Danube, and Rhine rivers)
- Measuring distances using map scales
- Reading maps and globes using longitude and latitude, coordinates, and degrees
- Time zones: prime meridian; Greenwich, England; international date line
- Reading relief maps for elevations and depressions
- Major mountain ranges by continent (South America: Andes; North America: Rockies and Appalachians; Asia: Himalayas and Urals; Africa: Atlas Mountains; Europe: Alps and Caucasus)

What Students Need to Learn

The first objective was previously taught in Grade 4 in Core Knowledge schools but is also included as a Grade 5 objective to ensure that this set of fundamental skills and concepts is reviewed and practiced.

- Review using longitude and latitude, coordinates, degrees, time zones, prime meridian (0° longitude, Greenwich, England), and the international date line (180° longitude) on maps or globes
- Tropic of Cancer and Tropic of Capricorn: relation to seasons and temperature
- Climate zones: arctic, tropical, temperate
- Imaginary lines and boundaries: Arctic Circle and Antarctic Circle
- From a round globe to a flat map: Map projections contain distortions.
- Major lakes by continent (Eurasia: Caspian Sea; Asia: Lake Baikal, Aral Sea; Africa: Victoria, Tanganyika, Chad; North America: Superior, Huron, Michigan, Erie, Ontario; South America: Maracaibo, Titicaca)

AT A GLANCE

The most important ideas in Unit 1 are the following:

- Students should recognize the grid pattern that parallels of latitude and meridians of longitude create on a map and globe.
- The land between the Tropic of Cancer and the Tropic of Capricorn (the tropics, in general) has hot weather and little or no change in seasons.
- The polar climate zone, which includes the Arctic and the Antarctic, is typically cold with little precipitation; the tropical zone is typically hot with a great deal of precipitation; and the temperate zone has more variation in temperature and amount of precipitation.
- The international date line, at 180° longitude, marks the shift in days between east and west.
- The Arctic Circle and the Antarctic Circle are lines of latitude that demarcate the extreme northern and southern areas of the planet—areas that experience up to twenty-four hours of daylight per day during the summer and up to twenty-four hours of darkness per day during the winter.
- Maps are representations of Earth that are made using different projections. Each projection distorts various areas of Earth in different ways.
- Lakes may be freshwater or saltwater and are used for recreation, fishing, and transportation.

WHAT TEACHERS NEED TO KNOW

Background

The study of geography embraces many topics throughout the *Core Knowledge Sequence*, including topics in history and science. Geographic knowledge includes a spatial sense of the world; an awareness of the physical processes to which people culturally adapt; a sense of the interactions between humans and their environment; an understanding of the relations between place and culture; and an awareness of the characteristics of specific regions and cultures. Many geographic topics are listed throughout the *Core Knowledge Sequence* in connection with historical topics.

Spatial Sense (Working with Maps, Globes, and Other Geographic Tools)

Measuring Distance Using Map Scale

All maps are drawn to scale; that is, they are smaller than the things they represent. Scale is the ratio between the representation and the thing it

represents. A map may be drawn so that one inch equals 250 miles or so that one inch equals one mile. Maps, as well as globes, almost always indicate the scale at which they are drawn.

The scale of a map makes a difference in the amount of detail shown on the map and the kinds of questions that can be asked and answered about what is shown. A large-scale map (i.e., one closest in size to what it represents) will show less area but provide more detail about the area shown than a small-scale map. For example, a road map of a state, with a scale of one inch per ten miles, may show public campgrounds, points of interest, and county roads, whereas a state map in an atlas with a smaller scale of one inch per sixty miles may show only major highways and major cities. This difference in detail is a function of the scale of the map.

Longitude and Latitude, Coordinates, and Degrees

Around the center of Earth is an imaginary line called the equator. It is 0° latitude and is located halfway between the North and South Poles. The equator divides Earth into the Northern and Southern Hemispheres.

Imaginary lines that run parallel to the equator are called parallels of latitude, or parallels. Latitude is measured north and south of the equator. The North and South Poles are at 90° N and 90° S, respectively. Any area between the equator and the North or South Pole is some measurement from 0° to 90° north or south.

The dividing lines for the Eastern and Western Hemispheres are the prime meridian (also called the Greenwich meridian) and the 180th meridian. These two imaginary lines are on opposite sides of Earth. The prime meridian refers to 0° longitude, an imaginary line that runs from the North Pole to the South Pole going through the Royal Observatory in Greenwich, a suburb of London, England. The international date line also runs from the North Pole to the South Pole, generally following the 180th meridian. (It deviates in a few places to avoid dividing Siberia and again to include the Aleutian Islands with Alaska.)

Longitude is measured east and west from the prime meridian, or 0° , at Greenwich, England. The international date line marks the difference in time between east and west. When crossing the international date line going west, a traveler moves forward to the next day (Tuesday becomes Wednesday). When going east, a traveler goes back one day (Wednesday becomes Tuesday).

Meridians of longitude are not parallel, because Earth is a sphere. The widest distance between lines measuring degrees of longitude is at the equator, and the lines converge as they approach the poles. You can see this clearly on a globe.

Parallels and meridians intersect on maps and globes in a grid pattern. To find a location on the grid, a person needs to know the coordinates of the location, that is, the point where the latitude and longitude intersect. For example, Washington, D.C., lies at $38^\circ 54'$ N latitude and $77^\circ 2'$ W longitude. If we wanted

to say these coordinates out loud, we would say “thirty-eight degrees and fifty-three minutes north latitude and seventy-seven degrees and two minutes west longitude.” The first set of numbers specifies a latitude north of the equator, and the second specifies a longitude west of the prime meridian. Although the *Sequence* only stipulates that students learn about degrees, you may want to mention minutes as well, since this will enable them to locate places more exactly.

Students need to practice finding coordinates on maps. The maps in the Student Reader of this unit provide an opportunity for such practice. Also, the Additional Activities included in this Teacher Guide will reinforce the geographical terms and concepts students are learning. Continue to practice all of these skills throughout the year by asking students to work with maps of countries they will study in later units in this grade (e.g., England, Russia, and Japan).

Note: Larger versions of the maps included in each chapter of the Student Reader are all reproduced in an atlas at the back of the Reader on pages 36–39. Some students may find the full-page size of these maps easier to use than the smaller maps in the Reader’s chapters.

Tropic of Cancer and Tropic of Capricorn

The area between the Tropic of Cancer (23° N latitude) and the Tropic of Capricorn (23° S latitude) is known as *the tropics* or *the low latitudes*. It has the warmest climate on Earth. The Tropic of Cancer is a parallel that measures 23° N (or 23.5° N) and runs through Mexico, the Bahamas, Egypt, Saudi Arabia, India, and southern China. The Tropic of Capricorn measures 23° S (or 23.5° S) and runs through Australia, Chile, southern Brazil, and northern South Africa. The Tropic of Cancer and the Tropic of Capricorn were so named because of the particular constellations that the sun is in at the time of their respective solstices, or the time when the vertical sun is the farthest north or south of the equator. The sun appears directly over the Tropic of Cancer during the Northern Hemisphere’s summer solstice and directly over the Tropic of Capricorn during the Southern Hemisphere’s summer solstice.

Earth rotates on its own axis, and at the same time, it revolves around the sun. Earth is tilted at an angle of 23°, which means that all locations on Earth do not receive the same amount of direct sunlight. The areas close to the equator receive the most direct sunlight and, therefore, have the hottest average temperatures year-round. As a result, the tropics have no sharply defined seasons. The North and South Poles, the areas farthest away from the equator have extreme cold temperatures year-round. The polar regions have two defined seasons. Because of the tilt of Earth, polar areas—and the high latitudes in general—have twenty-four hours of sunlight in the summer and twenty-four hours of darkness in the winter. The farther a place is from the equator, the more pronounced the differences will be between summer and winter in terms of length of the days and nights.

Climate Zones: Arctic, Tropical, and Temperate

There are three main categories of climate—arctic (also known as polar), tropical, and temperate.

- The arctic climate is often referred to as the polar climate by geographers because the term *polar* makes it clear that the climate includes both the Arctic and Antarctic areas. Polar climates have cool to cold summers and cold to very cold winters. Temperatures average below 32°F year-round on the Antarctic and Greenland ice caps and drop to well below 0°F during the long, dark winter months. Precipitation is scant, averaging only a few inches each year, and most of it falls in the form of snow. A band of subpolar climate stretches across northern North America and Eurasia. Here, one gets short summers with average temperatures above freezing for two or three months; then the temperature plunges below freezing throughout the remainder of the year. Most of this region receives between five and ten inches of precipitation, with some areas receiving up to twenty inches. Snowfall can occur during any month.
- Tropical climate includes some belts of climate with hot, wet weather year-round and some with hot weather that is dry part of the year and wet part of the year. Areas with wet weather all year are typically rainforests. Rainforests can receive as much as four hundred inches of rain annually. Hot areas with alternating wet and dry patterns are savannas, or plains with tall grasses. Savannas receive about fifty inches of precipitation a year. Temperatures average above 68°F throughout the year in the tropics. Tropical rainforests thrive around the equator in Africa and in South America, Southeast Asia, Indonesia, Borneo, and New Guinea. A large belt of savanna exists north and south of the rainforests in Africa.
- Temperate zones of climate are found in the middle latitudes, between the tropics and the polar areas. In general, temperate climates are characterized by warm to hot summers and cool to cold winters, with variations depending on latitude. Throughout much of these regions, temperatures can rise above 100°F in the summer and drop well below freezing in the winter. The temperate zones experience dramatic changes in seasons, with pronounced periods of spring and fall. Precipitation varies from a few inches in the midlatitude desert regions to more than one hundred inches in some areas. Snowfall occurs during winter months in many temperate zone locations. These are regions of considerable variability in both weather and climate. Large parts of the United States, Europe, and Asia have temperate climates.

Time Zones

Time zones were developed to bring uniformity to the hours of the day as the sun moves from east to west. Time zones generally follow the rule of one time zone for every fifteen degrees of longitude (360° of longitude

divided by fifteen equals twenty-four time zones, which correspond with the twenty-four hours of the day). However, the lines dividing time zones are not perfectly straight. Sometimes they zigzag to avoid dividing countries, states, or metropolitan areas.

To understand why time zones are important, consider this. Imagine there are three cities, City A, City B, and City C. City B is one hundred or so miles west of City A, and City C is one hundred miles west of City B.

CITY C

CITY B

CITY A

The sun rises first in the easternmost city, which is City A. In actuality, of course, the sun is not “rising”; rather, Earth is rotating. But from our position on Earth, it looks as if the sun is rising. After some time passes and the planet rotates a little more, the sun will rise in City B. Then, after a little more time and a bit more rotation, the sun will come up in City C. If each city based its time completely on its position relative to the sun, then the time would be slightly different in each city, and this could be very confusing. It might be 8:20 in City C, 8:10 in City B, and 8:00 in City A. And if you were on a train halfway between City B and City C, it would be 8:05. To avoid this kind of confusion, people have agreed to divide the globe into twenty-four time zones, each one hour apart. If City A, City B, and City C are all in the same time zone, this means that the people in these locations have agreed to refer to a particular moment in time as 8:00 a.m., even though the actual “solar time” may be a few minutes earlier than that in one of the cities and a few minutes later in another.

As noted earlier, longitude is measured east and west from the prime meridian, or 0°, located at Greenwich, England. The 180° line is in the Pacific Ocean; it is called the *international date line*. The international date line marks the difference in time between east and west. (The international date line actually zigs and zags from north to south to avoid running directly through settled islands.) When crossing the international date line going west, a traveler moves forward to the next day (Tuesday becomes Wednesday). When going east, a traveler goes back one day (Wednesday becomes Tuesday). The international date line is a hard concept to explain. At this age it is sufficient that students know the date line exists and understand that it is related to time zones and to the rotation of Earth. They do not need to understand exactly why the international date line was created.

Arctic Circle and Antarctic Circle

The Arctic Circle and the Antarctic Circle are imaginary lines that are drawn around Earth near the North and South Poles. The Arctic Circle is at 66.5° N (or 66°33' N) latitude, and the Antarctic Circle is at 66.5° S (or 66°33' S) latitude. The North Pole is within the Arctic Circle; the South Pole is within the Antarctic Circle.

Earth tilts slightly on its axis. As it makes its 365-day orbit around the sun, this tilt causes first the Northern Hemisphere and then the Southern Hemisphere to be tilted toward the sun for a period of months. When this occurs, the polar

area of the hemisphere—either the Arctic Circle or the Antarctic Circle—has six months of daylight, up to twenty-four hours per day. When the hemisphere is tilted away from the sun, the polar area has up to twenty-four hours of darkness per day. Only the poles have six months of continuous daylight and six months of continuous darkness. This effect lessens further from the poles, with the Arctic and Antarctic Circles experiencing just one day of complete light and dark per year. For the Southern Hemisphere, extended periods of daylight within the Antarctic Circle—and summer—begin on around December 22. For the Northern Hemisphere, this date marks the beginning of extended periods of night and winter within the Arctic Circle.

From a Round Globe to a Flat Map

Although globes are more accurate models of Earth than flat maps, you can't fold a globe up and take it with you on a trip. Maps—pictorial representations of the location of various places—are a way to make the information on a globe portable.

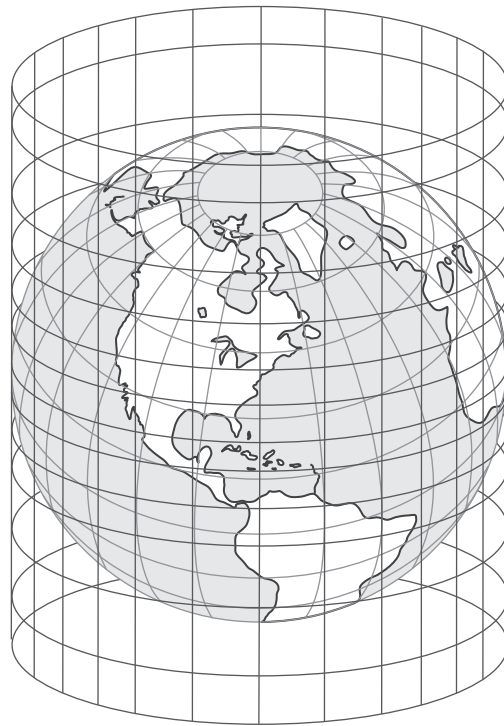
If Earth were flat, it would be easy to make a map of it on a flat sheet of paper. But Earth is shaped like a sphere. This poses certain difficulties for mapmakers and cartographers. Whenever you transfer information about a spherical planet onto a flat piece of paper, there will be a certain amount of distortion. The act of transferring information from a globe to a flat map is called *projection*. There are various ways of projecting information from a globe onto a flat page. Each way distorts the original information in a distinctive way.

To understand how projection works, take a long, blank sheet of paper, and wrap it around a globe in such a way that the paper touches the globe at the equator but not at the poles. Now imagine that the globe is made of transparent plastic with the continents and other features drawn on the plastic in a darker color. Also imagine that this transparent globe has a lightbulb in the center. If the lightbulb were turned on, the light would shine through the transparent orb, and the marked parts would cast shadows on the paper. You could trace the shapes cast by the shadows and then unroll the paper to make a rectangular map. In the places where the paper sits right next to the globe, the sizes and shapes of the continents and oceans on your map would be very accurate. However, in those areas where the paper is a long way from the globe, there would be distortion. Thus, the areas around the equator will be rendered very accurately, and the areas near the poles will be distorted and rendered less accurately.

Mercator Projection

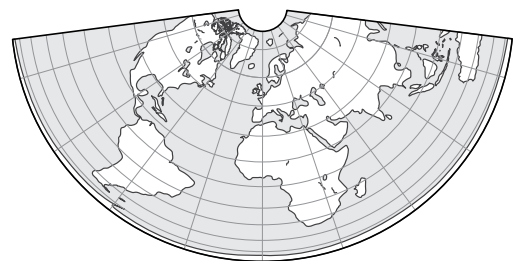
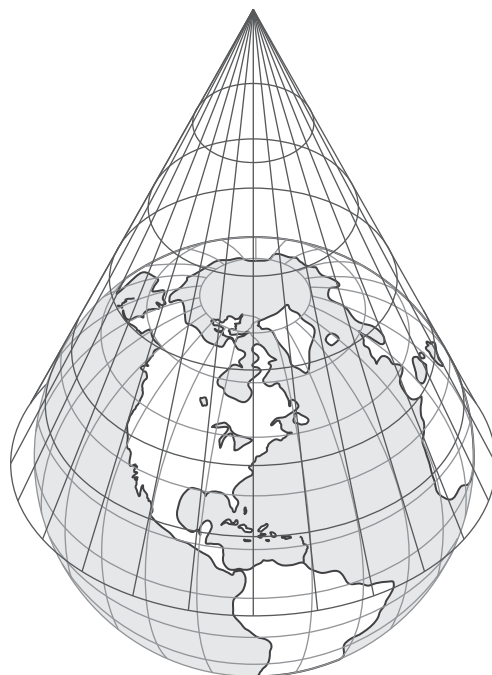
In 1569, the cartographer Gerardus Mercator developed a projection scheme that is still widely used today. Mercator projected the globe's features onto a cylinder, in roughly the way described above. The Mercator projection is accurate for the tropics but distorts the areas near the poles (such as Alaska and Greenland), making them look much larger on the resulting map than they are. The shapes of the landmasses are accurate, but the sizes and

distances between areas are not. Direction, however, is accurate, which is what Europeans moving east and west between Europe and the Americas during the Age of Exploration wanted to know.



Conic Projection

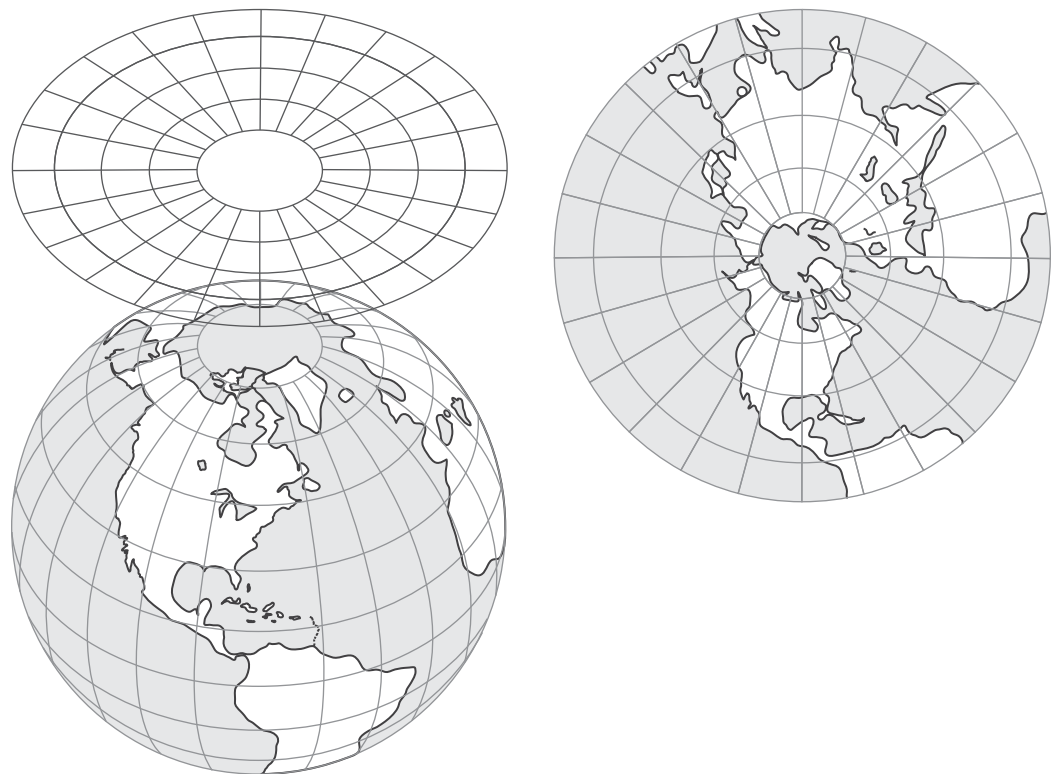
In a conic projection, a piece of paper is twisted into a cone and placed over the globe so that the circular “top” of the cone touches the globe. Features on the globe are then projected onto the paper. The resulting map is reproduced as a rectangular map with curved parallels and meridians. This is different than the Mercator projection, which has straight lines. A map made using



conic projection is most accurate for the areas on the globe that touch the cone. Conic maps are not good for showing large areas, like the whole globe. However, they are good for showing smaller areas, especially smaller areas in the middle latitudes. Direction and distance are also relatively accurate.

Plane Projection

In a plane projection, a flat sheet of paper is placed against the side of a globe so that it touches the globe at one point only. (Recall that in a Mercator projection, the paper was wrapped around the globe to make a cylinder and made contact with the globe all along the equator.) Plane projection produces a map that is accurate at the point where it touches but is less accurate as you move away from the point of contact. The plane projection is also called the azimuthal (/az*em*muth*al/) projection. A common form of this projection is a polar projection, in which the North or South Pole is used as the central point of contact.



Robinson Projection

The Robinson projection is the most commonly used representation in textbooks. It is called a *compromise projection* because it tries to strike a compromise among some of the other kinds of projection. The goal is to minimize the limitations and distortions inherent in the other schemes while capturing their strengths. In a Robinson projection, the shape and size of continents is somewhat distorted, but less so than with the Mercator projection. The areas around the poles appear somewhat flatter than they are on a globe, but the areas at the eastern and western edges of the projection are fairly accurate. As is the case with conic projections, the parallels and meridians on the resulting map are curved.

Great Lakes of the World

Background

A lake is a large inland body of water. A river may feed into a lake, and a river may flow out of it. The Great Rift Valley of East Africa has several lakes and rivers running through it. There are lakes on most continents, and most of them contain fresh water. Lakes are often important sources of water for irrigation and hydroelectric power, as well as for transportation and recreation.

Asia: Caspian Sea and Aral Sea

The Caspian Sea actually lies between Europe and Asia, in the area known as Eurasia. The Caspian borders the countries of Russia, Kazakhstan, Turkmenistan, Iran, and Azerbaijan. It is the world's largest inland, saltwater sea, spanning 143,000 square miles (370,368 sq. km), and has no natural outlets to the ocean; a canal links the Caspian Sea to the Black Sea. The sea lies 92 feet (28 m) below sea level and is fed by rivers such as the Volga. In recent years, the sea has been shrinking because water is being drawn off the rivers that feed it for use in irrigation. The Caspian Sea is used for fishing, especially in the northern regions, and is an important source of oil and natural gas.

The Aral Sea is bordered by Uzbekistan to the south and Kazakhstan to the north. The Aral Sea was once the world's fourth-largest lake. However, in recent decades, it, too, has been shrinking due to diversion of the rivers that feed it to irrigate fields devoted to cotton production. In fact, since the 1960s, it has lost seventy-five percent of its area and ninety percent of its volume. This has caused the water in the sea to become highly saline, killing large numbers of fish. The area around the sea is also heavily polluted, and the population suffers from high rates of cancer, tuberculosis, and other diseases. The Aral Sea is a good example of how human behavior can cause profound changes in nature. It can be taught as a cautionary tale.

Africa: Victoria, Tanganyika, and Chad

Lake Victoria is the second-largest freshwater lake in the world, second only to Lake Superior in North America. Victoria is the largest lake on the African continent at 26,828 square miles (69,484 sq. km). It borders Tanzania, Uganda, and Kenya in eastern central Africa. It is also known as Victoria Nyanza, its Bantu name. The lake was named after Queen Victoria of Great Britain by British explorer John Hanning Speke, the first European to reach it. It is the chief source of the Nile River and is in a depression between the Eastern Rift Valley and Western Rift Valley in East Africa. The lake contains more than two hundred species of fish. The completion of the Owen Falls Dam (now called Nalubaale Power Station) on the Nile raised the level of Lake Victoria and is an important source of hydroelectric power.

Lake Tanganyika (/tan*guh*nee*kuh/) is the second-largest freshwater lake on the African continent and is the longest (420 miles or 676 km) and second-deepest (4,700 feet or 1,433 m) lake in the world. It borders Tanzania, the Democratic Republic of the Congo (formerly Zaire), and Burundi. It is also part of the Great Rift Valley system in East Africa. Farmers grow rice and other crops along the shores of the lake. Animals who live around the lake include hippopotamuses and crocodiles.

Lake Chad is a shallow freshwater lake that borders the countries of Chad, Nigeria, Cameroon, and Niger. It has no outlets and is sometimes referred to as a drowned prairie because it is extremely shallow, with a large number of islands covered in grasses dotting its surface. In fact, Lake Chad is so shallow that it is in danger of drying up completely! Fishing is an important industry on Lake Chad, and a number of significant archeological discoveries have been made in the surrounding area.

North America: The Great Lakes

Lake Superior is bordered by Canada to the north and east and the states of Minnesota to the west and Wisconsin and Michigan to the south. It is the largest body of fresh water in the world, with a surface area of 31,700 square miles (82,103 sq. km), and is the largest of the North American Great Lakes. Some two hundred rivers drain into the lake, and it is a part of the St. Lawrence and Great Lakes Waterway. As such, it is a major transportation route. However, some parts freeze in winter, which limits its transportation season to about eight months. The shores around the lake are sparsely populated, and as a result, it is the least polluted of the Great Lakes. The lake is a popular recreation and fishing area. However, the introduction of foreign species, particularly the sea lamprey, as a result of the ships that travel the lake, has resulted in a serious decline in native fish populations. Scientists are now attempting to control the growth of foreign fish populations with chemicals that will not affect native species.

Lake Huron is the second-largest North American Great Lake (23,000 square miles or 59,570 sq. km) and is bordered by Canada to the north and east and the state of Michigan to the south and west. It is also part of the St. Lawrence and Great Lakes Waterway and is connected on its western side to Lake Superior by the St. Marys River and the Soo Canal and Locks and to Lake Michigan by the Strait of Mackinac. Fishing and lumbering are important economic activities, and the lake is used extensively for commercial transportation. However, as with Lake Superior, areas often freeze in the winter, limiting the shipping season to about eight months.

Lake Michigan is the third-largest Great Lake and the largest freshwater lake located entirely within the United States. The lake covers about 22,300 square miles (57,757 sq. km) and is bordered by Michigan to the north and east, Wisconsin to the west, Illinois to the southwest, and Indiana to the southeast. It is part of the St. Lawrence and Great Lakes Waterway, and the Chicago River links the lake to the Mississippi River and, via the river, to the Gulf of Mexico. Chicago and Milwaukee are important ports.

Lake Erie is the fourth-largest of the five Great Lakes. It is named for Erie Native Americans who once lived along its shores. Lake Erie forms the boundary between Canada and the United States (specifically, the states of Michigan, Ohio, Pennsylvania, and New York). It covers 9,910 square miles (25,667 sq. km). The lake lets out at its eastern end through the Niagara River. The water descends at Niagara Falls as part of its journey from Lake Erie to Lake Ontario. During the War of 1812, U.S. commodore Oliver H. Perry defeated a British squadron on Lake Erie and secured the Northwest for the United States. The Erie Canal, which students study in American history for this grade, connects Lake Erie with the Hudson River and the Atlantic Ocean. Today the steel industry depends upon the movement of iron ore and limestone across the Great Lakes to ports on Lake Erie, including Cleveland. The lake became badly polluted in the 1960s but has since improved.

Lake Ontario is the smallest of the Great Lakes. It covers 7,550 square miles (19,554 sq. km) and is fed by water from the Niagara River. The lake was explored by the French but came into British control after the French and Indian War. The name *Ontario* comes from an Iroquois word meaning either beautiful lake or sparkling water. The climate along the lake's shores is appropriate for fruit growing, and the region is a major producer of apples, pears, plums, peaches, and cherries.

South America: Maracaibo and Titicaca

Lake Maracaibo (/mar*uh*kie*boe/) is a large body of water in South America and is located in Venezuela. Experts disagree on whether Maracaibo should be considered a sea or a lake because of its connection via a strait to the Gulf of Venezuela on the Caribbean Sea. The water in the southern portion of the lake is fresh, but the part of the lake closer to the ocean is brackish.

The lake contains rich oil fields and is suffering from pollution from oil spills. Fishing is another major industry. A large portion (approximately twelve percent) of the lake's surface is now covered with a plant called duckweed. Despite efforts by the government to eradicate the weed, it reproduces so rapidly that the cleanup can barely keep pace with the new growth. Although the plant doesn't appear to harm marine life in the lake, it may become a hazard to fishing boats and other vessels that use the lake for transportation.

Lake Titicaca (/tit*ih*kah*kuh/) is bordered by Peru and Bolivia. It is the largest freshwater lake in South America, and if Maracaibo is considered a sea, it is the largest lake in South America. Located in the Andes Mountains, it is the world's highest large lake and is an important transportation route between Peru and Bolivia. Located more than 2.37 miles (3.8 km) above sea level, Lake Titicaca is the highest navigable lake in the world. Powered boats steam across the lake carrying passengers and freight. But Lake Titicaca is also home to ancient boats made of reeds by indigenous people called the Uru who predate the Inca. The Uru live in marshlands on platforms also made of reeds they harvest from the lake.

To learn more about specific topics in this unit, use this link to download the CKHG Online Resource "About World Lakes":

www.coreknowledge.org/ckhg-online-resources

UNIT RESOURCES

Student Component

The *World Lakes* Student Reader—four chapters. An atlas of maps showing the world lakes discussed in each chapter is included at the end of the Student Reader, immediately preceding the glossary.

Teacher Components

World Lakes Teacher Guide—four chapters. This includes lessons aligned to each chapter of the *World Lakes* Student Reader with a daily Check For Understanding and Additional Activities, such as map and vocabulary activities, designed to reinforce the chapter content. A Unit Assessment, Performance Task Assessment, and Activity Pages are included at the end of this Teacher Guide in Teacher Resources, beginning on page 47.

- » The Unit Assessment tests knowledge of the entire unit, using standard testing formats.
- » The Performance Task Assessment requires students to apply and share the knowledge learned during the unit through either an oral or written presentation.
- » The Activity Pages are designed to reinforce and extend content taught in specific chapters throughout the unit. These optional activities are intended to provide choices for teachers.

USING THE TEACHER GUIDE

Pacing Guide

The *World Lakes* unit is one of thirteen history and geography units in the *Grade 5 Core Knowledge Curriculum Series*.™ A total of seven days has been allocated to the *World Lakes* unit. We recommend that you do not exceed this number of instructional days to ensure that you have sufficient instructional time to complete all Grade 5 units.

At the end of this Introduction, you will find a Sample Pacing Guide that provides guidance as to how you might select and use the various resources in this unit during the allotted time. However, there are many options and ways that you may choose to individualize this unit for your students, based on their interests and needs. So we have also provided you with a blank Pacing Guide that you may use to reflect the activity choices and pacing for your class. If you plan to create a customized pacing guide for your class, we strongly recommend that you preview this entire unit and create your pacing guide before teaching the first chapter.

Reading Aloud

In each chapter, the teacher or a student volunteer will read various sections of the text aloud. When you or a student reads aloud, always prompt students to follow along. By following along in this way, students become more focused on the text and may acquire a greater understanding of the content.

Turn and Talk

In the Guided Reading Supports section of each chapter, provide students with opportunities to discuss the questions in pairs or in groups. Discussion opportunities will allow students to more fully engage with the content and will bring “to life” the themes or topics being discussed.

Big Questions

At the beginning of each Teacher Guide chapter, you will find a Big Question, also found at the beginning of each Student Reader chapter. The Big Questions are provided to help establish the bigger concepts and to provide a general overview of the chapter. The Big Questions, by chapter, are:

Chapter	Big Question
1	What resources and benefits does each of the three African lakes provide to people?
2	In what ways are these South American lakes important natural resources?
3	Why are the Great Lakes of North America such important transportation routes?
4	Why do some lakes contain fresh water and some salt water?

Core Vocabulary

Domain-specific vocabulary, phrases, and idioms highlighted in each chapter of the Student Reader are listed at the beginning of each Teacher Guide chapter, in the order in which they appear in the Student Reader. Student Reader page numbers are also provided. The vocabulary, by chapter, are:

Chapter	Vocabulary
1	lake, rift valley, resource, “transportation route,” dock, source, game reserve, papyrus
2	natural resource, plateau, gulf, petroleum, derrick, industry, “trading hub”
3	mineral, cargo ship, canal, lock, strait, smokestack
4	optical illusion, evaporate, outlet, volume, divert

Activity Pages

Activity Pages



AP 1.1
AP 1.2
AP 1.3
AP 1.4
AP 1.5
AP 4.1

The following activity pages can be found in Teacher Resources, pages 60–66. They are to be used after students read the chapter(s) specified, during class time or for homework. Be sure to make sufficient copies for your students prior to conducting the activities.

- Chapter 1—World Map (AP 1.1)
- Chapter 1—Imaginary Lines (AP 1.2)
- Chapter 1—Latitude as Climate Indicator (AP 1.3)
- Chapter 1—Three Different Map Projections (AP 1.4)
- Chapter 1–4—Cool Facts About World Lakes (AP 1.5)
- Chapter 4—*World Lakes* Domain Vocabulary (AP 4.1)

Additional Activities and Website Links

An Additional Activities section, related to material in the Student Reader, may be found at the end of each chapter in this Teacher Guide. While there are many suggested activities, you should choose only one or two activities per chapter to complete based on your students' interests and needs. Many of the activities include website links, and you should check the links prior to using them in class.

CROSS-CURRICULAR CONNECTIONS

Mathematics

Numbers and Number Sense

- Order and compare numbers

Geometry

- Lines, measuring degrees, angles

BOOKS

Holling, Holling C. *Paddle-to-the-Sea*. Orlando: Houghton Mifflin Harcourt, 1980.

Lewin, Ted and Betsy. *Top to Bottom*. New York: Lee and Low, 2014.

Marx, Trish. *Everglades Forever: Restoring America's Great Wetland*. New York: Lee and Low, 2008.

Mora, Pat. *Water Rolls, Water Rises: El Agua Rueda, El Agua Sube*. New York: Lee and Low, 2014.

Veregin, Howard. (ed.) *Goode's World Atlas 22nd Edition*. Chicago: Rand McNally, 2009.

WORLD LAKES SAMPLE PACING GUIDE

For schools using the *Core Knowledge Sequence* and/or CKLA.

TG—Teacher Guide; SR—Student Reader; AP—Activity Page

Week 1

Day 1

Day 2

Day 3

Day 4

Day 5

World Lakes

<p>"World Geography: World Map & Imaginary Lines" (TG—Chapter 1, Additional Activities, AP 1.1–1.2)</p>	<p>"World Geography: Latitude as Climate Indicator" and "Three Different Map Projections" (TG—Chapter 1, Additional Activities, AP 1.3–1.4)</p>	<p>"Lakes of Africa" and "Cool Facts About World Lakes" Core Lesson (TG & SR—Chapter 1, TG—AP 1.5)</p>	<p>"Lakes of South America" and "Cool Facts About World Lakes" Core Lesson (TG & SR—Chapter 2, TG—AP 1.5)</p>	<p>"The Great Lakes of North America" and "Cool Facts About World Lakes" Core Lesson (TG & SR—Chapter 3, TG—AP 1.5)</p>
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CKLA

"Personal Narratives"	"Personal Narratives"	"Personal Narratives"	"Personal Narratives"	"Personal Narratives"
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Week 2

Day 6

Day 7

World Lakes

<p>"Lakes of Eurasia" and "Cool Facts About World Lakes" Core Lesson (TG & SR—Chapter 4, TG—AP 1.5)</p>	<p>Unit Assessment (TG)</p>
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CKLA

"Personal Narratives"	"Personal Narratives"
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WORLD LAKES PACING GUIDE

_____’s Class

(A total of seven days has been allocated to the *World Lakes* unit in order to complete all Grade 5 history and geography units in the *Core Knowledge Curriculum Series™*.)

TG–Teacher Guide; SR–Student Reader; AP–Activity Page

Week 1

Day 1

Day 2

Day 3

Day 4

Day 5

World Lakes

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Week 2

Day 6

Day 7

World Lakes

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Lakes of Africa

The Big Question: What resources and benefits does each of the three African lakes provide to people?

Primary Focus Objectives

- ✓ Read maps and globes using longitude and latitude, coordinates, and degrees.
- ✓ Identify the Tropic of Cancer and Tropic of Capricorn, describing the climate and lack of change in seasons.
- ✓ Describe the three climate zones: arctic, tropical, and temperate.
- ✓ Identify the Arctic Circle and Antarctic Circle as imaginary lines on a map and the relative locations of the North and South Poles.
- ✓ Understand that maps created to represent Earth contain distortions.
- ✓ Define the term *lake* and understand how lakes differ from other bodies of water. (RI.5.4, RI.5.2)
- ✓ Describe Lake Tanganyika, Lake Victoria, and Lake Chad, including the continent on which they are located and characteristics unique to each lake. (RI.5.2)
- ✓ Understand the meaning of the following domain-specific vocabulary: *lake, rift valley, resource, dock, source, game reserve, and papyrus*; and of the phrase “transportation route.” (RI.5.4)

What Teachers Need to Know

For background information, download the CKHG Online Resource “About Great Lakes of the World”:

www.coreknowledge.org/ckhg-online-resources

Note: Prior to conducting the Core Lesson, in which students read Chapter 1 of the *World Lakes Student Reader*, we strongly recommend that you first conduct the series of World Geography activities (AP 1.1, AP 1.2, AP 1.3, AP 1.4) in Teacher Resources (pages 60–63) and described at the end of this chapter under Additional Activities. We suggest that you allocate two instructional days to the completion of these activities, as per the Sample Pacing Guide on page 18. Providing students with an understanding of maps as geographic tools will help students better understand the locations of the lakes studied in this unit. Providing students with an understanding of latitude and climate will help deepen students’ understanding of the human and physical geography of lakes.

Materials Needed

Activity Pages



AP 1.1

AP 1.2

AP 1.3

AP 1.4

AP 1.5

- World Map (AP 1.1), Imaginary Lines (AP 1.2), Latitude as Climate Indicator (AP 1.3), Three Different Map Projections (AP 1.4), Cool Facts About World Lakes (AP 1.5) (**Note:** Cool Facts About World Lakes will be used again in Chapters 2, 3, and 4)
- Enlarged versions of AP 1.1, AP 1.2, AP 1.3, AP 1.4, and AP 1.5
- Globe
- Orange(s) (**Note:** Be sure to follow your school's policy regarding food distribution and allergies.)
- Blue, red, and yellow markers, colored pencils, or crayons

Core Vocabulary (Student Reader page numbers listed below)

lake, n. a body of water surrounded by land (2)

Example: Lake Chad is one of many lakes on the continent of Africa.

Variation(s): lakes

rift valley, n. a long, deep, narrow valley in East Africa (4)

Example: Cracks in Earth's surface created Africa's Great Rift Valley.

resource, n. something that people can use (5)

Example: Lakes can be an important resource because they provide water and fish for people to drink and eat.

Variation(s): resources

“transportation route,” (phrase), a path for traveling from one place to another (5)

Example: A lake can be used as a transportation route by allowing people to travel by boat from one part of the shore to another.

Variation(s): transportation routes

dock, n. a platform where boats can load and unload people and goods (5)

Example: Fishermen leave from the dock in the morning and unload their catch at the dock in the evening.

Variation(s): docks

source, n. a starting point or beginning of a river's water (6)

Example: Lake Victoria in East Africa is the source of the famous Nile River.

Variation(s): sources

game reserve, n. an area set aside by the government where animals are protected from hunters (7)

Example: A tourist might see lions, elephants, and giraffes on a visit to a game reserve in East Africa.

Variation(s): game reserves

papyrus, n. a tall grasslike plant that grows in swamps or wetland areas (10)

Example: An area of shallow water filled with many papyrus plants may look like solid land or a field of tall grass from the distance.

Variation(s): papyruses, papyri

THE CORE LESSON 40 MIN

Introduce the *World Lakes Student Reader*

5 MIN

Distribute copies of the *World Lakes Student Reader*, and suggest students take a few minutes to look at the cover and flip through the Table of Contents and images in the book. Ask students to brainstorm individual words or simple phrases describing what they notice in the Table of Contents and various images; record this information in a list on the board or chart paper. Students will likely mention water, fish or fishing, boats or ships, and the continents of Africa, South America, North America, and so on.

Display a copy of the World Map (AP 1.1), and explain to students that they will be reading about lakes on different continents—Africa, South America, North America, Europe, and Asia. Students will learn about the physical features of the different lakes and how people use them.

Introduce “Lakes of Africa”

5 MIN

Ask students if they are familiar with the word *lake*. Explain that a lake is a body of water surrounded by land. If there is a lake in relatively close proximity to your community, point it out to students. Ask students who have visited a lake to recall their impressions and any intriguing facts they remember.

Remind students who are in a Core Knowledge school that they studied rivers in Grade 3. Ask students what the difference is between a river and a lake. (*A river is a body of water that flows or moves and follows a set path, but a lake is a body of water that is surrounded by land and that does not flow elsewhere.*)

Tell students that they will be reading about lakes found in Africa in this chapter. Call attention to the Big Question, and encourage students to look for ways people benefit from these lakes.

Guided Reading Supports for “Lakes of Africa”

30 MIN

When you or a student reads aloud, **always** prompt students to follow along. By following along, students may acquire a greater understanding of the content. Remember to provide discussion opportunities.

“Lake Tanganyika,” Pages 2–6

Scaffold understanding as follows:

Read the title of this section, “Lake Tanganyika” (/tan*guh*nee*kuh/), aloud, asking students to repeat the name of the lake after you model the pronunciation.

Call attention to the map of Africa on page 6. Point out the location of Lake Tanganyika and each of the countries that surround it: Democratic Republic of the Congo, Tanzania, Burundi, and Zambia.

Now have students turn to page 36 in the back of their Readers. Point out that this map is a larger version of the same map of Africa included in Chapter 1; it may be easier for students to examine details and practice their map-reading skills using this larger map.

Note: Larger versions of the maps included in each chapter are all reproduced in the atlas in the back of the Student Reader on pages 36–39. Some students may find the full-page size maps easier to use than the smaller maps in each chapter.

Have students use their map-reading skills to identify the direction a boat would travel if sailing on the lake from Zambia to Burundi (*north*) and from Democratic Republic of the Congo to Tanzania (*east*).

Read page 2 of “Lake Tanganyika” out loud.

SUPPORT—Point to the image of the children, and explain that they are scuba diving. Explain that scuba divers use tanks of air to be able to breathe underwater. Tell students that people scuba dive both for fun and also for certain types of work.

SUPPORT—Point to the image of the fish, and explain that this fish is an example of the types of fish found in Lake Tanganyika.

CORE VOCABULARY—Continue to read the remainder of the section aloud. Stop to explain the meaning of the vocabulary terms *rift valley*, *resource*, “transportation route,” and *dock* as you encounter them in the text.

SUPPORT—Call attention to the box “Cool Facts About Lake Tanganyika” on page 5. Invite a volunteer to read the list aloud. Remind students that a border is an imaginary line that marks the edge of a country or other piece of land. Explain that there are freshwater lakes and saltwater lakes. Saltwater lakes are salty because the lake water evaporates more quickly than new water can enter the lake. When the water evaporates, it leaves behind salt and other minerals. When water enters the lake as quickly as or more quickly than it evaporates, then the lake has fresh, or non-salty, water.

Chapter 1
Lakes of Africa

Lake Tanganyika Ready? Your air tank is strapped on your back and ready to go. Set? You make sure your scuba mask is tight on your face, covering your eyes and nose. Your friend Stephanie gives you a smile. Go! Together you jump off the boat into the lake.

The Big Question
What resources and benefits does each of the three African lakes provide to people?

Vocabulary
You're scuba diving in Lake Tanganyika (/tan*guh*nee*kuh/), Africa's deepest and longest lake. You've come to the home of many of the tropical fish you've seen in the aquarium in your school.

Page 2



The Protodon is a species of fish common to Lake Tanganyika.

Page 3

A cloud of shimmering colors swirls past Stephanie and moves slowly toward you. Suddenly shiny blues, bright yellows, and neon greens sparkle all around you. You can practically hear Stephanie thinking, “Unbelievable!”

You stop and watch a thousand tiny fish darting around. Most of them are only as long as your finger, about two or three inches. Some fish are covered with bold black stripes. Others have polka dots on their backs and fins. These fish have strange names. Some are called giraffes. Others are called jobras, daffodils, gold faces, and six stripes. Because of the unusual beauty of these fish, people all over the world pay hundreds of dollars to buy only one or two of them.

You could watch the fish for hours. You glance over at Stephanie. She motions upward, as if to say, “Let’s go back up to the boat and get on with our trip!” You swim to the surface.

Back on the boat, you try to remember what else is unusual about Lake Tanganyika. You look at your map. Lake Tanganyika is one of a group of lakes that point like long fingers down the side of the map.

“Why are these lakes so long, deep, and narrow?” you ask Stephanie.

“They’re in the rift valley,” she answers. You both look across Lake Tanganyika toward the shore, where mountains rise up from the water’s edge.

Vocabulary
rift valley, a long, deep, narrow valley in East Africa.

Page 4

“I read that many centuries ago,” continued Stephanie, “Earth’s surface cracked and began separating between those mountain ranges. Gradually the edges of the cracks pulled farther and farther away from each other. The ground between the edges dropped down many hundreds of feet, forming deep valleys that filled up with water to form the lakes.”

Cool Facts About Lake Tanganyika

- Lake Tanganyika is Africa’s second largest lake.
- Lake Tanganyika is the second deepest freshwater lake in the world.
- Lake Tanganyika is part of the border between eastern and central Africa.

“That’s very interesting! Hey! I have an idea. Why don’t we eat fish for dinner tonight?” you suggest to Stephanie. You don’t mean the sparkling green and blue fish; you mean the bigger fish that people catch from this lake to eat. Fish are a valuable resource from Lake Tanganyika.

Lake Tanganyika is a long lake. It touches the boundaries of four different countries—Democratic Republic of the Congo, Tanzania, Burundi, and Zambia. This makes Lake Tanganyika a good transportation route. Along the lake’s shores are several towns and small cities, with docks for ferries and boats.

Vocabulary
resource, a something that people can use
transportation route, (plural), a path for traveling from one place to another
dock, a platform where boats can load and unload people and goods

Page 5

Major African Lakes

The map shows the five African lakes featured in this chapter.

"Fish for dinner, and then tomorrow we leave for Lake Victoria," Stephanie says.

Lake Victoria

Africa has many other large lakes. These lakes include Lake Nasser, Lake Volta, Lake Chad, and Lake Victoria. Lake Victoria is northeast of Lake Tanganyika. It's the largest lake in Africa. You and Stephanie have decided to visit Lake Victoria because it is the source of the famous Nile River. To get from Lake Tanganyika to Lake Victoria, you cross through the country of Tanzania (tan'zahn'ee'ah). First your jeep climbs up over the mountains along the edge of Lake Tanganyika. Then you cross the flat, grassy lands of Tanzania.

Vocabulary
source, *n.* a starting point or beginning of a river's water

Page 6

After you read the text, ask the following questions:

LITERAL—Why is Lake Tanganyika so long and narrow?

- » It is in an area known as a rift valley, where Earth's surface cracked and began separating.

LITERAL—How do people make use of Lake Tanganyika?

- » People fish on the lake and use it as a transportation route.

“Lake Victoria,” Pages 6–8

Scaffold understanding as follows:

CORE VOCABULARY—Read aloud the first paragraph of the section “Lake Victoria” on page 6. Point out the vocabulary term *source* and its meaning in the text. Explain that this meaning is specific to the study of rivers. The word *source* has different meanings in other contexts.

SUPPORT—Return students’ attention back to the map of Africa on page 6 (or on page 36 in the back of the Reader). Have students trace the route across Tanzania from Lake Tanganyika to Lake Victoria as described in the first paragraph of the section. Ask students to give the longitude and latitude for Lake Victoria.

You pass through many villages and towns. The road is often quite crowded with people, bicycles, and motor vehicles. People carry bundles or babies, talk with each other, and busily do errands.

Tanzania and its neighbor, Kenya, are famous for their game reserves and national parks. Tourists visit these parks to see elephants, giraffes, and other wildlife. Other tourists climb Mount Kilimanjaro (kil'uh'manj'oh). Africa's highest peak. Even though Lake Victoria is near these interesting places, probably few tourists see what you are about to see.

"We really want to see where the Nile begins," you tell Paul, your guide. "In school we learned about the Nile River and how the ancient Egyptians built the pyramids near it."

"No problem!" Paul says. "Did you know that Lake Victoria is named for Queen Victoria of Great Britain? She was queen in the 1850s. That's when the first Europeans came to this lake!" Paul continues.

Many beautiful islands dot this lake. Some of them are quite large. In one area steep cliffs rise from the shore. In another area the shore is more like a marsh or swamp. It takes you several days as you travel from the southern part of the lake in Tanzania to the northern part of the lake in Uganda. Finally, you reach the place where water drains out of Lake Victoria.

Vocabulary
game reserve, *n.* an area set aside by the government where animals are protected from hunters

Page 7

Invite volunteers to take turns reading aloud the rest of the section “Lake Victoria” on pages 7–8.

CORE VOCABULARY—Point out the vocabulary term *game reserve*. Explain that hunting is forbidden in game reserves. The reserves are meant to help protect endangered species and help prevent threatened species, such as African elephants, from becoming endangered.

SUPPORT—Have students turn back to the map of Africa on page 6 (or on page 36 in the back of the Reader). Point out the location of the Nile River. Have students trace the river’s route south to its source in Lake Victoria, including the path of the White Nile. Have students also follow the route of the Blue Nile to its source in Ethiopia.

Note: Students in Core Knowledge schools learned about the Nile River in Grade 1’s *Ancient Egypt* unit and in Grade 3’s *World Rivers* unit.

SUPPORT—Call attention to the box “Cool Facts About Lake Victoria” on page 8. Invite a volunteer to read the list aloud. Review what it means for a place to be tropical. Ask students to remember the three climate zones they learned about while completing Activity Page 1.3 prior to reading this chapter. Remind students that the tropics are found between the Tropic of Cancer and the Tropic of Capricorn.

"Is this the beginning of the Nile River?" you ask.

"Actually, one of the small rivers that flows into Lake Victoria is the very beginning of the Nile River," Paul explains. "But the water flowing out of the lake is called the Victoria Nile River."

"The river is still quite small here," Paul says. "But by the time it gets to the country of South Sudan, it's much bigger. It's called the White Nile there."

"Yes," Stephanie nods. "I remember learning about the White Nile. In Sudan, it joins with the Blue Nile. The Blue Nile flows from Ethiopia (ee'oh'bee'oh'pee'uh). Together they form the river called the Nile, the one that flows northward through Egypt."

"Right," Paul says. "The Nile is the longest river in the world. Here we are only at the beginning of it!"

Cool Facts About Lake Victoria

- Lake Victoria is Africa's largest lake.
- Lake Victoria is the largest tropical lake in the world.
- Lake Victoria is home to more than two hundred different kinds of fish, including the Nile perch which can grow up to six feet in length, and weigh more than four hundred pounds.

Lake Chad

The last African lake on your tour, Lake Chad, is in western Africa. To get there, you have to fly from Uganda to Nigeria and then lake Victoria and Lake Tanganyika.

Page 8

After volunteers have finished reading the section, ask the following questions:

LITERAL—How did Lake Victoria get its name?

- » It was named for Queen Victoria, who was queen of Great Britain in the 1800s when the first Europeans came to the lake.

LITERAL—In addition to visiting Lake Victoria, what else might a tourist to Tanzania or Kenya do?

- » Tourists might also visit a game reserve or climb Mount Kilimanjaro.

Note: Students in the Core Knowledge program learned about Mount Kilimanjaro as part of their Grade 4 study of world mountains. Invite volunteers to share what they remember about the mountain.

LITERAL—What famous river begins at Lake Victoria?

- » The Nile River begins at Lake Victoria.

“Lake Chad,” Pages 8–11

Read aloud the first paragraph of the section “Lake Chad” on pages 8–9.

SUPPORT—Return students’ attention back to the map of Africa on page 6 (or on page 36 in the back of the Reader). Have students use the map to trace the journey to Lake Chad as described in the first paragraph of the section.

CORE VOCABULARY—Read the rest of the section on pages 9–10 aloud. Stop to explain the vocabulary term *papyrus*. Explain that the ancient Egyptians used the papyrus plant to make a material similar to paper. That material was also called *papyrus*.

SUPPORT—Call attention to the box “Cool Facts About Lake Chad” on page 11. Invite a volunteer to read the list aloud. Point out the cause and effect between the two facts: because the lake is shrinking, there is not enough water to adequately support farming on the surrounding land.

After you read the text, ask the following questions:

EVALUATIVE—How is Lake Chad different from the other lakes in this chapter?

- » Possible answers: It is in a flat, dry area, and the other lakes are in mountainous areas. Lake Chad is a very shallow lake, and the other lakes are deep.

LITERAL—Why is Lake Chad deeper from June to September than during the rest of the year?

- » That is the region’s rainy season.

“Is this the beginning of the Nile River?” you ask.

“Actually, one of the small rivers that flows into Lake Victoria is the very beginning of the Nile River,” Paul explains. “But the water flowing out of the lake is called the Victoria Nile River.”

“The river is still quite small here,” Paul says. “But by the time it gets to the country of South Sudan, it’s much bigger. It’s called the White Nile there.”

“Yes,” Stephanie nods. “I remember learning about the White Nile. In Sudan, it joins with the Blue Nile. The Blue Nile flows from Ethiopia (ee-eth-ee-ee-ee-ee-ee-ee). Together they form the river called the Nile, the one that flows northward through Egypt.”

“Right,” Paul says. “The Nile is the longest river in the world. Here you are only at the beginning of it!”

Cool Facts About Lake Victoria

- Lake Victoria is Africa’s largest lake.
- Lake Victoria is the largest tropical lake in the world.
- Lake Victoria is home to more than four hundred different kinds of fish, including the Nile perch which can grow up to six feet in length, and weigh more than four hundred pounds.

Lake Chad

The last African lake on your tour, Lake Chad, is in western Africa. To get there, you have to fly from Uganda to Nigeria and then take a boat to Lake Chad.

Page 8

Lake Chad is shared by several countries: Chad, Niger, Nigeria, and Cameroon each touch the shores of Lake Chad.

“This is really different from the other lakes we saw,” Stephanie says. “It’s not mountainous here, and the weather is pretty dry.” You look at the land around the lake. It’s mostly flat. The bright sun overhead makes the air very hot, about 100°.

“Ah,” you remind her, “people have lived around this lake for thousands of years.”

Two men in a fishing boat stop and ask if you need directions. They’re brothers who make their living from catching and selling fish. The brothers, Abdul and Moussa, know the lake well.

“Lake Chad is very shallow,” Abdul says.



ing for many people in the area.

Page 9

"It is deeper from June to September," says Mousa. "That's our rainy season."

"Look over there," Abdul says. He points to the edge of the lake near where you are standing. "It looks like solid ground, doesn't it?"

You nod in agreement. The area is completely covered with reeds and other plants.

"It's not solid ground," Mousa says. "Those are papyrus and cattails. They're actually growing in shallow water, right in the lake."

"Now look out there toward the middle of the lake," Abdul says. You see some places where the water's surface looks rough and lumpy with spots of color.

"What is that?" Stephanie asks.

"Waterlilies," says Mousa. "Hundreds of them. They're so crowded together that they form a mat that is almost solid."

Like Abdul and Mousa, many people make their living by fishing in the lake. Others have farms or graze livestock nearby. But it's fish that you see for sale everywhere. In fish markets, on the docks, and along the streets, people sell dried fish, fresh fish, salted fish, and smoked fish.

Page 10

Cool Facts About Lake Chad

- Lake Chad is getting smaller. Six thousand years ago, Lake Chad was twenty times bigger!
- Farming is becoming more difficult around Lake Chad. The lake's water used to support neighboring farmland. As the lake has shrunk, the water available for farming has become scarce. This water shortage affects thousands of people.

Page 11

Activity Page



AP 1.5

LITERAL—How do people use Lake Chad to make a living?

» They fish or have farms nearby.

Display a copy of the activity page Cool Facts About World Lakes (AP 1.5), found in Teacher Resources, page 64, and distribute individual copies to each student. Explain that, after reading each chapter in this unit, students will record notes about each lake on this activity page.

Ask students to locate the names of the three lakes discussed in this chapter (Lakes Tanganyika, Victoria, and Chad) on the activity page. Point out that some information has already been completed for Lake Tanganyika as an example.

Ask students to refer to the Major African Lakes map on page 36 in the back of the Reader while also looking at AP 1.5. Discuss the information recorded in the first three cells about Lake Tanganyika while demonstrating how to use the map to obtain this information. Make especially sure that students understand how to find and record latitude and longitude.

Next, explain that in order to verify whether Lake Tanganyika is a freshwater or saltwater lake, students will need to scan the chapter. (The Cool Facts box on page 5 indicates that Lake Tanganyika is a freshwater lake.)

Now, tell students to scan the remainder of the chapter and jot down several interesting facts about Lake Tanganyika in the Characteristics column. If time permits, allow students to complete the information for Lake Victoria and Lake Chad. Alternatively, you may ask students to complete these sections for homework.

Be sure students save AP 1.5 for future reference. Tell students they will add more details to the chart as they learn about different lakes in later chapters.

 **CHECK FOR UNDERSTANDING 5 MIN**

Ask students to:

- Write a short answer to the Big Question, "What resources and benefits does each of the three African lakes provide to people?"
 - » Key points students should cite in their answers include: the lakes provide fish for people to sell and eat; they serve as transportation routes between African countries; Lake Chad provides water for nearby farms; Lake Victoria provides water for the Nile River.
- Choose one of the Core Vocabulary words (*lake, rift valley, resource, dock, source, game reserve, or papyrus*) or the phrase "transportation route," and write a sentence using the word or phrase.

To wrap up the lesson, ask several students to share their responses.

Additional Activities



World Geography

90 MIN

Activity Pages



- AP 1.1
- AP 1.2
- AP 1.3
- AP 1.4

Materials Needed: Display copies of World Map (AP 1.1), Imaginary Lines (AP 1.2), Latitude as Climate Indicator (AP 1.3), and Three Different Map Projections (AP 1.4); sufficient student copies of the activity pages; a globe; an orange(s); and blue, red, and yellow markers, colored pencils, or crayons

Note: The four activity pages will require two class periods of 45 minutes each. Be sure to follow your school's policy regarding food distribution and allergies.

World Map (AP 1.1)

Display the World Map. Review the locations and names of the oceans and continents.

Imaginary Lines (AP 1.2)

Review the following terms and definitions, which students in Core Knowledge schools studied in Grade 4:

latitude—the distance between the equator and a place north or south of the equator; measured in degrees

longitude—the distance east or west of an imaginary line on the globe that goes from the North Pole to the South Pole and passes through Greenwich, England; measured in degrees

coordinates—a pair of numbers on a globe or map that shows where something is located

degree—unit used to measure the distance between parallels and meridians

Use the globe and the World Map to point out the following examples:

Latitude	
Location	Degree
Equator	0°
North Pole	90°N
South Pole	90°S
Tropic of Cancer	23.5°N
Tropic of Capricorn	23.5°S
Arctic Circle	66.5°N
Antarctic Circle	66.5°S

Longitude	
Location	Degree
Prime meridian	0°
International date line	180°

Explain that the prime meridian runs through Greenwich, England, which is why it is sometimes called the Greenwich meridian. Then explain the

significance of the international date line: it marks the shift from one day to the next (e.g., from Monday to Tuesday) when traveling east to west and from one day to the previous (e.g., from Tuesday to Monday) when traveling west to east.

Then use coordinates and degrees to identify the following locations:

	Latitude	Longitude
Greenwich, England	51°29' N	0°
Lake Victoria (Africa)	1°2' S	32°57'E
Washington, D.C.	38°54' N	77°2'W

Point to the approximate location of your town on the map or globe. Guide students to estimate the latitude and longitude coordinates of the town.

Have students complete the Imaginary Lines (AP 1.2) activity page with a partner. Alternatively, you may assign the activity page for homework.

Latitude as Climate Indicator (AP 1.3)

Explain that *climate* is the typical weather pattern in a region. Earth can be divided into different climate categories and zones. There are three general climate categories: arctic (or polar), tropical, and temperate. Zones can often be identified by latitude.

Display the World Map. Point out each climate zone as you describe the climate category.

Arctic (polar)—The arctic climate is often referred to as the polar climate because the term *polar* makes it clear that the climate includes both the Arctic and Antarctic areas (north of the Arctic Circle and south of the Antarctic Circle). Polar climates have cool to cold summers and cold to very cold winters. Temperatures average below 32°F year-round on the Antarctic and Greenland ice caps and drop to well below 0°F during the long, dark winter months. Precipitation is scant, averaging only a few inches each year, and most of it falls in the form of snow. A band of subpolar climate stretches across northern North America and Eurasia. Here, one gets short summers with average temperatures above freezing for two or three months; then the temperature plunges below freezing throughout the remainder of the year. Most of this region receives between five and ten inches of precipitation, with some areas receiving up to twenty inches. Snowfall can occur during any month.

Tropical—The area between the Tropic of Cancer and the Tropic of Capricorn is called the *tropics*. Tropical climate includes some belts of climate with hot, wet weather year-round and some with hot weather that is dry part of the year and wet part of the year. Temperatures average above 68°F throughout the year in the tropics. Areas with wet weather all year are typically rainforests. Rainforests can receive as much as four hundred inches of rain annually. Tropical rainforests thrive around the equator in Africa and in South America, Southeast Asia, Indonesia, Borneo, and New Guinea. Hot areas with alternating wet and dry patterns are savannas, or plains with tall

grasses. Savannas receive about fifty inches of precipitation a year. A large belt of savanna exists north and south of the rainforests in Africa.

Temperate—Temperate zones of climate are found in the middle latitudes, between the tropics and the polar areas. In general, temperate climates are characterized by warm to hot summers and cool to cold winters, with variations depending on latitude. Throughout much of these regions, temperatures can rise above 100°F in the summer and drop well below freezing in the winter. The temperate zones experience dramatic changes in seasons, with pronounced periods of spring and fall. Precipitation varies from a few inches in the midlatitude desert regions to more than one hundred inches in some areas. Snowfall occurs during winter months in many temperate-zone locations. These are regions of considerable variability in both weather and climate. Large parts of the United States, Europe, and Asia have temperate climates.

Distribute the Latitude as Climate Indicator activity page (AP 1.3) and have students complete it. Students might also complete the activity page for homework.

Three Different Map Projections (AP 1.4)

With the World Map still on display, hold up the globe, and ask students which one is a more accurate model of Earth. Students should recognize that round globes are more accurate than flat maps. Explain that one advantage to maps is that they are more portable. However, there are problems with converting a spherical Earth onto a flat sheet of paper.

To demonstrate, draw a simple picture on an orange with a pen or marker. Then, peel the orange, and attempt to flatten the orange peel to create a flattened shape. Notice how flattening the peel creates distortions, or errors, in the drawing. (If possible, have students work in small groups to each draw on and peel an orange. If time is short, prepare the orange by drawing on it and peeling it before class.)

The conversion of information from a globe to a map is called a projection. Geographers use many different kinds of projections. Each projection has its own distortions or errors. Some show the size of continents correctly, but do not show the correct shapes. Some are more accurate near the equator than near the poles.

Display the Three Different Map Projections activity page. Explain that each of these images shows a different type of projection used by mapmakers to represent a round Earth on a flat sheet of paper. Have students examine the projections and answer the following questions (aloud or in writing):

- How are the continents' sizes different in the various projections? Which ones are the most different from the globe? Which ones are the most similar to the globe?
- How are the continents' shapes different in the various projections? Which ones are the most different from the globe? Which ones are the most similar to the globe?
- How are the longitude and latitude lines different in the various projections? Which ones are the most different from the globe? Which ones are the most similar to the globe?

Lakes of South America

The Big Question: In what ways are these South American lakes important natural resources?

Primary Focus Objectives

- ✓ Describe Lake Titicaca and Lake Maracaibo, including the continent on which they are located and particular characteristics unique to each lake. **(RI.5.2)**
- ✓ Identify the resources provided by Lake Titicaca and Lake Maracaibo. **(RI.5.2)**
- ✓ Understand the meaning of the following domain-specific vocabulary: *natural resource*, *plateau*, *gulf*, *petroleum*, *derrick*, and *industry*; and of the phrase “trading hub.” **(RI.5.4)**

Materials Needed

Activity Pages



AP 1.1
AP 1.5

- World Map (AP1.1), Cool Facts About World Lakes (AP 1.5) **(Note:** Cool Facts About World Lakes will be used again in Chapters 3 and 4)
- Enlarged versions of AP 1.1 and 1.5

Core Vocabulary (Student Reader page numbers listed below)

natural resource, n. something from nature that is useful to humans **(12)**

Example: Trees are a valuable natural resource because of the lumber and fruit that they provide.

Variation(s): natural resources

plateau, n. a large area of high, flat ground **(12)**

Example: The train traveled more easily crossing the plateau than climbing the mountain.

Variation(s): plateaus

gulf, n. a part of an ocean extending into land **(16)**

Example: Lake Maracaibo is really a gulf because it is not completely surrounded by land like other lakes.

Variation(s): gulfs

petroleum, n. a naturally occurring oil found in certain rock layers under Earth’s surface used to make plastics and fuels, such as gasoline (16)

Example: Lake Maracaibo is a rich source of petroleum, which is why Venezuela sells so much oil.

derrick, n. a framework tower that supports a drill over an oil well (16)

Example: Visitors to Lake Maracaibo might see oil derricks standing tall in the water.

Variation(s): derricks

industry, n. a business that manufactures a product or provides a service (17)

Example: Because of Lake Maracaibo’s petroleum deposits, the oil industry is an important part of Venezuela’s economy.

Variation(s): industries

“trading hub,” (phrase), a place that is a center for the buying and selling of goods and services (17)

Example: Lake Maracaibo’s location near the coast helped make it an important trading hub.

Variation(s): trading hubs

THE CORE LESSON 40 MIN

Introduce “Lakes of South America”

5 MIN

Display a copy of the World Map (AP 1.1), pointing out and naming each continent.

Remind students that in the previous chapter, they read about lakes located in Africa. Ask students to name the lakes (Tanganyika, Victoria, and Chad) and to name one interesting fact about each lake. Tell students that today, they will read about lakes located in South America.

Introduce the Big Question for this chapter. Ask students to recall the definition of *resource* from Chapter 1. Point out the term *natural resource* in the Big Question for this chapter. Explain that the word *natural* comes from the word *nature*. Help students use this information to define *natural resource*. Tell students, as they read this chapter, to pay particular attention to the types of natural resources that South American lakes provide.

Guided Reading Supports for “Lakes of South America”

35 MIN

When you or a student reads aloud, **always** prompt students to follow along. By following along, students may acquire a greater understanding of the content. Remember to provide discussion opportunities.

“Lake Titicaca,” Pages 12–16

Scaffold understanding as follows:

CORE VOCABULARY—Read the first two sentences of the section “Lake Titicaca” on page 12 out loud. Call students’ attention to the vocabulary box, and discuss the meaning of *plateau*.

Note: Students who completed the Core Knowledge program in Grade 4 may recall the word *plateau* from their study of world mountains. Ask volunteers to briefly share what they remember about plateaus. (*Possible responses: they are high and flat; they are easier to farm than mountainsides.*)

Invite volunteers to take turns reading the rest of the section on pages 12–16.

SUPPORT—Call attention to the map of South America on page 15 (or on page 37 in the back of the Reader). Prompt students to identify the mountain range on the west coast of South America. Point out the location of Lake Titicaca in the Andes Mountains and countries that surround it: Peru and Bolivia. Help students notice that more of the lake lies in Peru than in Bolivia.

SUPPORT—Call attention to the box “Cool Facts About Lake Titicaca” on the top of page 16. Invite a volunteer to read the list aloud. Explain that the rivers carry the rainwater and melting glacier water into the lake.

After volunteers read the text, ask the following questions:

INFERENTIAL—How do we know people have been living on the shore of Lake Titicaca for thousands of years?

- » There are ruins left by a civilization hundreds of years older than the Inca.

LITERAL—How do people near Lake Titicaca use llamas?

- » Farmers raise llamas for wool. The wool is used to make sweaters, scarves, hats, gloves, and blankets.

LITERAL—What are *papas*?

- » *Papas* are potatoes, an important crop for farmers who live near Lake Titicaca.

LITERAL—What natural resources does Lake Titicaca provide to the people who live nearby?

- » The lake provides fish to eat, water to drink and to irrigate crops, and reeds for making furniture, roofs, and boats.

Chapter 2
Lakes of South America

Lake Titicaca Our train chugged across the flat plateau of southern Peru. In the distance, I could see the snow-covered peaks of the Andes in Peru and Bolivia.

The Big Question
In what ways are these South American lakes important natural resources?

Vocabulary
natural resources, n. something from nature that is useful to humans.
plateaus, n. a large area of high, flat ground.

I was writing postcards after visiting Lake Titicaca (tee-tee-kah-tee-kah), one of the world's highest lakes. Lake Titicaca is located high in the Andes. It is bordered by the countries of Peru and Bolivia.

I asked my Peruvian friend, Ricardo, what I should write. I was visiting Ricardo for several weeks. He used to go to my school when he lived in the United States. I was happy that I could visit with him and that we could explore some of the lakes of South America together.

"You should tell your friends at home about the ruins we saw," Ricardo suggested.

Now the ruins are almost gone. Some ruins stand on the shores of a civilization that lived in the area

Page 12



Page 13


Some boats made of reeds to travel on the lake.

hundreds of years before the Inca. Standing among the ancient stones, I had imagined what it looked like thousands of years ago.

"What about those llamas (lah-mahz)? We raise them?" Ricardo asked.

Llamas are animals that are like camels but smaller. One had looked me straight in the eye. They have really long necks, sort of like short giraffes. Farmers near Lake Titicaca raise llamas for the animals' wool. The farmers fasten ribbons or tiny bells onto the llamas' ears to show who owns them. Everywhere I went, I saw people selling colorful goods made from llama wool: I saw llama-wool sweaters, scarves, hats, gloves, and blankets. They come in handy at night when it gets very cold.

"Tell them you ate a lot of *papas*," Ricardo continued.



carrying goods, and they use their wool too!


Page 14

That's what they call potatoes in Peru and Bolivia. The cool climate near Lake Titicaca is great for growing potatoes. People who live around the lake grow many different kinds. In fact, the first potatoes in the world were grown in this part of South America. We wouldn't have the french fries all of us enjoy today if it weren't for those first *papas*.

"And don't forget the lake!" Ricardo said.

That's right! We took a short cruise on Lake Titicaca. We saw that people get practically everything they need from the lake. They get fish to eat, water for their crops, and of course water to drink. The reeds that grow in the lake are incredibly strong. People make furniture, roofs, and even boats with them.

Lakes and Rivers of South America



In this map, notice that Lake Titicaca is completely landlocked. It has no outlet to the Caribbean Sea.

Page 15

“Lake Maracaibo,” Pages 16–17

Cool Facts About Lake Titicaca

- More than twenty-five rivers feed into Lake Titicaca.
- Lake Titicaca's water comes from melting glaciers and rainwater.
- No one knows for certain what Lake Titicaca's name means.

Lake Maracaibo

A few days later, Ricardo and I traveled to Venezuela. There we visited Lake Maracaibo (mar*uh*kei*boe!), one of the most important lakes in South America. We discovered that Lake Maracaibo is not really a lake. It is not completely surrounded by land. Instead it is a gulf.

The area is rich with petroleum deposits under Lake Maracaibo's waters, along its shores, and out along the Atlantic Coast. We saw oil derricks in the water and oil tanks on the water. There were oil storage tanks on the land and oil company offices in many places.

Vocabulary

gulf is a part of an ocean extending into land.

petroleum is a naturally occurring oil found in certain rock layers under Earth's surface used to make plastics and fuels, such as gasoline.

derrick is a framework tower that supports a drill tower at oil well.

“You should tell your friends about how important petroleum, or oil, is in Venezuela,” Ricardo suggested.

“Yes, I could tell them that,” I say.

“Remember what products are made with petroleum?” Ricardo asks.

Page 16

“Sure! Petroleum is used in all kinds of everyday goods: plastic, paint, gasoline, cosmetics, and fabrics,” I answer. “I could also explain how the city of Maracaibo has grown. It now has many different industries.”

“That’s right,” Ricardo agreed. “The growth of the city is largely due to petroleum.”

Lake Maracaibo is different from Lake Titicaca. Lake Titicaca is a quiet lake where people make their living farming and fishing. Lake Maracaibo is a bustling trading hub and center of industry.

Cool Facts About Lake Maracaibo

- Lake Maracaibo gets more lightning than anywhere else on Earth. Each year, the lake experiences more than 200 lightning flashes per square kilometer.

Vocabulary

industry is a business that manufactures a product or provides a service.

trading hub (tray-d), a place that is a center for the buying and selling of goods and services.

Page 17

Scaffold understanding as follows:

CORE VOCABULARY—Read the first paragraph of the section “Lake Maracaibo” on page 16 out loud. Stop to explain the meaning of the vocabulary term *gulf*. Use the board or chart paper to draw diagrams that illustrate the difference between a lake, which is completely surrounded by land, and a gulf, which only has land on three sides.

SUPPORT—Return students’ attention to the map of South America on page 15 (or on page 37 in the back of the Reader). Point out the location of Venezuela and Lake Maracaibo, noting their proximity to the Caribbean Sea. Ask students if Lake Maracaibo is north, south, east, or west of Lake Titicaca. (*north*)

Read aloud the next four paragraphs in the section “Lake Maracaibo” on page 16.

CORE VOCABULARY—Review the meanings of the vocabulary terms *petroleum* and *derrick*. Explain that a derrick allows people to drill deep down to get the petroleum deposits under the lake.

Finish reading the section “Lake Maracaibo” on page 17.

CORE VOCABULARY—Review the meanings of the vocabulary term *industry* and of the phrase “trading hub.” Identify industries that students might be familiar with, such as the automobile industry, the clothing industry, or the electronics industry. Explain that having many different industries helps Maracaibo serve as a trading hub.

SUPPORT—Call attention to the box “Cool Facts About Lake Maracaibo” on page 17. Invite a volunteer to read the fact aloud. Explain that many tourists come to watch the lightning.

After you have read the section, ask the following questions:

LITERAL—What natural resource is found under Lake Maracaibo?

» petroleum

LITERAL—How is petroleum used?

» It is used to make plastic, paint, gasoline, cosmetics, and fabrics.

EVALUATIVE—How is Lake Maracaibo different from Lake Titicaca?

» Lake Maracaibo is more of a gulf than a lake. It is also busier with more modern industries, such as the petroleum industry. Lake Titicaca is a real lake. It is quieter, and its people make their living farming and fishing.



Ask students to take out the activity page Cool Facts About World Lakes (AP 1.5) and locate Lakes Titicaca and Maracaibo on the chart. Tell students to refer to the Lakes and Rivers of South America map at the back of their Reader on page 37 and to skim the chapter so they can complete the information on the chart for each lake.

If time permits, review students' responses after completing the chart.

Note: While the chapter does not explicitly state whether the lakes are freshwater or saltwater lakes, students may infer that Lake Titicaca is a freshwater lake since the text says that people drink water from the lake; they may infer that Lake Maracaibo contains at least some salt water since it is actually a gulf, not a lake.



CHECK FOR UNDERSTANDING 5 MIN

Ask students to:

- Write a short answer to the Big Question, "In what ways are these South American lakes important natural resources?"
 - » Key points students should cite in their answers include: The lakes provide ways for people to make a living. Lake Titicaca provides water for people to farm and raise llamas with. It provides fish for people to sell and eat. Lake Maracaibo provides petroleum that is used to make many different everyday products.
- Choose one of the Core Vocabulary words (*natural resource, plateau, gulf, petroleum, derrick, or industry*) or the phrase "trading hub," and write a sentence using the word or phrase.

To wrap up the lesson, ask several students to share their responses.

The Great Lakes of North America

The Big Question: Why are the Great Lakes of North America such important transportation routes?

Primary Focus Objectives

- ✓ Describe the Great Lakes, including the continent on which they are located, characteristics unique to each lake, and why they are important. **(RI.5.2)**
- ✓ Describe how ships travel from lake to lake. **(RI.5.2)**
- ✓ Understand the meaning of the following domain-specific vocabulary: *mineral, cargo ship, canal, lock, strait, and smokestack*. **(RI.5.4)**

Materials Needed

Activity Pages



AP 1.1

AP 1.5

- World Map (AP 1.1), Cool Facts About World Lakes (AP 1.5)
- Display copies of AP 1.1 and 1.5

Core Vocabulary (Student Reader page numbers listed below)

mineral, n. a naturally occurring substance found in Earth's crust **(18)**

Example: Gold is a valuable mineral.

Variation(s): minerals

cargo ship, n. a large boat used to carry goods **(20)**

Example: The *Edmund Fitzgerald* was a cargo ship carrying minerals across the Great Lakes.

Variation(s): cargo ships

canal, n. a channel dug by people, used by boats or for irrigation **(21)**

Example: A canal was built to connect Lake Huron and Lake Superior.

Variation(s): canals

lock, n. a part of a canal that has gates for lowering and raising the water level (21)

Example: Locks help ships move from a lake where the surface of the water is high to a lake with a lower surface.

Variation(s): locks

strait, n. a narrow body of water that connects two larger bodies of water (23)

Example: Ships sail through the strait that connects Lake Huron and Lake Michigan.

Variation(s): straits

smokestack, n. a tall chimney on a factory or ship (25)

Example: Industrial cities have many buildings with smokestacks.

Variation(s): smokestacks

THE CORE LESSON 40 MIN

Introduce “The Great Lakes of North America”

5 MIN

Display a copy of the World Map (AP 1.1), pointing out and naming each continent.

Remind students that in the previous chapter, they read about lakes located in South America; ask students to name the lakes (*Titicaca, Maracaibo*) and to give one interesting fact about each lake. Tell students that today, they will read about lakes in North America.

Read the title of the chapter. Point out the word *great*, and ask students what it means. Briefly discuss the question, “What could make a lake ‘great?’”

Explain that one reason the Great Lakes are called “great” is because of their size. They are so big that when you stand on one shore, you can’t see across to the other side of the lake.

Draw students’ attention to the Big Question. Review the meaning of the phrase “transportation route.” Encourage students, as they read, to look for ways that people and goods travel across the Great Lakes and reasons why the Great Lakes are important transportation routes.

Guided Reading Supports for “The Great Lakes of North America” 35 MIN

When you or a student reads aloud, **always** prompt students to follow along. By following along, students may acquire a greater understanding of the content. Remember to provide discussion opportunities.

“A Shipwreck,” Pages 18–20

Chapter 3
The Great Lakes of North America

A Shipwreck icy winds roared across the lake. A ship as long as two football fields struggled. Enormous waves washed over the ship's deck. Late in the afternoon the ship's captain radioed to say that the ship was taking on heavy waters.

The crew of a nearby ship was watching this ship, which was carrying thousands of tons of minerals. At 7:10 p.m. the captain radioed to say that the ship was holding its own.

But five minutes later, the ship had simply vanished. Afterward, a rescue team found it on the floor of the lake, broken in half. The captain and all the crew members died.

This shipwreck occurred in 1975. People were shocked. How could such a disaster happen?

The Big Question
Why are the Great Lakes of North America such important transportation routes?

Vocabulary
mineral, n. a naturally occurring substance found in Earth's crust.

Fitzgerald was sailing on Lake Superior. States, Lake Superior is a very pleasant.

Page 18



Scaffold understanding as follows:

CORE VOCABULARY—Call students' attention to the vocabulary box, and preview the meaning of the vocabulary term *mineral*.

Note: Students who completed the Core Knowledge program in Grade 4 may recall the word *mineral* from their study of world mountains.

Ask students to quietly read the section “A Shipwreck” on pages 18–20 to themselves.

After they finish reading the section, ask the following questions:

LITERAL—What was the *SS Edmund Fitzgerald*, and what happened to it?

- » The *SS Edmund Fitzgerald* was a very large cargo ship that was carrying tons of minerals, sailing on Lake Superior. It got caught in a storm and sank. A door collapsed, and water flooded inside the ship.

LITERAL/EVALUATIVE—What else do you know so far about Lake Superior?

- » Lake Superior is the largest lake in the United States. It is pleasant during the summer but experiences wild storms with strong winds in the winter.

“Locks and Straits,” Pages 20–24

place to sail and fish in the summer. In the winter, though, this lake experiences wild storms and hurricane-force winds. Even the largest and heaviest ships can be tossed around. The area where the shipwreck occurred is sometimes called the Graveyard of Ships. Investigators discovered that a cover door over the ship's cargo area had collapsed. Then water from the crashing waves flooded inside the ship.

Locks and Straits

What do crews on ships such as the *SS Edmund Fitzgerald* see as they cross the Great Lakes? To find out, my friend Tameeka and I asked the captain of a large sailboat to take us on a journey around Lake Superior, Lake Michigan, Lake Huron, Lake Erie, and Lake Ontario. These five lakes not only provide drinking water, they are also used for fishing, shipping, and for recreation. Our trip will take several weeks. We ask the captain to point out the most interesting places along the way.

Each lake is so large that when you stand along the shore and look across the water, you cannot see the other side of the lake. It's almost like looking out at the ocean. The captain points far out across the water. Tameeka and I squint and look hard. Finally we see a bump on the flat gray horizon. We might not have seen it if the captain hadn't pointed it out. The captain says, “That little bump out there is probably a very large ship. A lot of things across ships travel on.”

Vocabulary
cargo ship, n. a large boat used to carry goods.

Page 20

Scaffold understanding as follows:

CORE VOCABULARY—Before reading the section, explain the terms *lock* and *strait* in the section title. Explain that while *lock* usually refers to an object that secures a door, it also has another meaning when we discuss waterways on which ships sail: *lock* can mean a series of gates that help ships travel between water of different heights. Call attention to and explain the chart on page 22.

Next, draw attention to the spelling of the word *strait*. Write the words *strait* and *straight* on the board or chart paper. Explain that even though the words are pronounced the same, they have different meanings and are not connected. A strait is a narrow body of water that connects two larger bodies of water. It isn't necessarily straight. It can be narrow and twisty.

the Great Lakes. They carry grain, iron ore, steel, timber, and other products to and from port cities along the lakes.”

Sooner or later nearly all the big ships on Lake Superior have to go through Sault Ste Marie (/soo/saint/muh/ree/), Michigan. That’s where the ships use a canal to get from Lake Superior to Lake Huron. On this windy day, our sailboat arrives at Sault Ste Marie quickly. The canal has a series of locks, sections of the canal that are closed off with gates. The captain explains how they work.

“Locks help a ship move from a lake where the surface of the water is high, such as Lake Superior to a lower lake, such as Lake Huron.”

Vocabulary
canal, a a channel dug by people, used by boats or for irrigation
lock, a part of a canal that has gates for lowering and raising the water level



Page 21 to travel from Lake Superior to Lake Huron.

Note: Students who completed the Core Knowledge program in Grade 3 might recall the word *strait* from their study of ancient Rome. Invite volunteers to share the name of a strait they have studied previously. (*Students might remember studying the Bosphorus Strait in Turkey.*)

Invite volunteers to read aloud the first three paragraphs of the section “Locks and Straits” on pages 20–21.

CORE VOCABULARY—Review the terms *cargo ship* and *canal*. Remind students that the *Edmund Fitzgerald* was a cargo ship. Its cargo—or the goods it was carrying—was minerals.

Note: Students who completed the Core Knowledge program in Grade 3 might recall the word *canal* from their study of world rivers.

Point out and discuss the image and caption on page 21.

Have students read the next three paragraphs on pages 21–23 with a partner.

SUPPORT—Use the chart on page 22 to review how locks work.

Read aloud the last two paragraphs of the section, on pages 23–24.

After reading the last two paragraphs, ask the following questions:

LITERAL—How many Great Lakes are there, and what are their names?

- » There are five Great Lakes: Superior, Michigan, Huron, Erie and Ontario.

LITERAL—How do people use the Great Lakes?

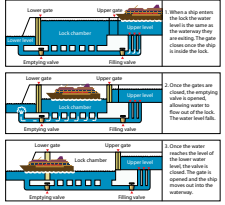
- » People use the Great Lakes for drinking water, fishing, shipping goods or cargo, and recreation.

LITERAL—What is the purpose of locks such as those at Sault Ste Marie?

- » Locks help change the level of water to raise or lower boats from one water depth to another.

LITERAL—How do ships get from Lake Huron to Lake Michigan?

- » They go through the Straits of Mackinac (/mak*in*aw/).



Locks help ships move between two bodies of water at different heights.

he says, Our sailboat leaves Lake Superior, and we enter the first lock. The gates shut behind us. We feel a little rudge as our sailboat stops. We hear a lot of rushing water. Then the sailboat begins moving downward very, very slowly.

“Don’t worry!” the captain says. “We’re not sinking! Some of the water in the lock is being removed. This lowers the water level so that it matches the water level in the next lock.”

open. Our boat moves into the next number of locks, our sailboat is in


Page 22

lower water. We enter Lake Huron. The whole process took less than an hour.

Next, the captain takes us to another interesting part of the Great Lakes, the Straits of Mackinac (/mak*in*aw/). (A strait is a narrow body of water that connects two larger bodies of water.) Ships and boats pass through this waterway to get from Lake Huron to Lake Michigan.

Tameeka and I want to see the Straits of Mackinac from one of the most famous bridges in America, the Mackinac Bridge. This is among the longest bridges ever built. It is one of the strongest, too. It has to survive the ice and winter winds of the Great Lakes. The captain docks the sailboat, and we drive the five miles across the bridge. Through the windows we see water everywhere. We also see islands, a ferryboat, and some sailboats. The body of

Vocabulary
strait, a narrow body of water that connects two larger bodies of water



Page 23 span bridges ever built, crosses the Straits of Mackinac.

water is not nearly as wide as one of the Great Lakes, therefore ships have to move more carefully.

Sailing on Lake Michigan and Lake Huron

Back on the sailboat, the captain has brought us to Lake Michigan, the only Great Lake entirely inside the United States. We head toward the other end of the lake, to Chicago, Illinois.

There, products are loaded onto ships and carried to other cities on the Great Lakes or through the Great Lakes to the ocean. Chicago is an important inland port in America.

After admiring the Chicago skyline, we head north. We pass under the Mackinac Bridge again and enter Lake Huron. The captain asks us a question.

“Did you ever notice that the southern part of Michigan is shaped like a mitten?”

Tameeka and I look at a map. Michigan does look like a mitten! Lake Huron makes that possible. Michigan’s “thumb” and “index finger” are separated by Saginaw Bay, a large bay of Lake Huron. The main part of the lake continues south toward the next of the Great Lakes, Lake Erie.

The captain gave us a riddle. “Name a large U.S. city on the Great Lakes from which you can travel south to get to Canada.”

We’re puzzled. Tameeka checks the map again.

“Detroit, Michigan!” Tameeka shouts. Detroit is a large industrial

Page 24 between Lake Huron and Lake Erie.

“Sailing on Lake Michigan and Lake Huron,” Pages 24–25

water is not nearly as wide as one of the Great Lakes, therefore ships have to move more carefully.

Sailing on Lake Michigan and Lake Huron

Back on the sailboat, the captain has brought us to Lake Michigan, the only Great Lake entirely inside the United States. We head toward the other end of the lake, to Chicago, Illinois.

There, products are loaded onto ships and carried to other cities on the Great Lakes or through the Great Lakes to the ocean. Chicago is an important inland port in America.

After admiring the Chicago skyline, we head north. We pass under the Mackinac Bridge again and enter Lake Huron. The captain asks us a question.

“Did you ever notice that the southern part of Michigan is shaped like a mitten?”

Tameeka and I look at a map. Michigan does look like a mitten! Lake Huron makes that possible. Michigan’s “thumb” and “index finger” are separated by Saginaw Bay, a large bay of Lake Huron. The main part of the lake continues south toward the next of the Great Lakes, Lake Erie.


The captain gave us a riddle. “Name a large U.S. city on the Great Lakes from which you can travel south to get to Canada.”

We’re puzzled. Tameeka checks the map again.

“Detroit, Michigan!” Tameeka shouts. Detroit is a large industrial city located between Lake Huron and Lake Erie.

Page 24

Map of the Great Lakes



The Great Lakes border eight U.S. states, as well as a portion of Canadian provinces, and provide a way for these states and provinces to ship their products by water.

“And what is Detroit’s nickname?” the captain asks. I remember that ships carry iron ore and steel across the Great Lakes. Many of these materials are shipped to cities, such as Gary, Indiana. The automobile industry began near Detroit. That’s how the city got its nickname. “Motor City!” I shout. The captain gives up trying to stump us, at least for a while.

Two Lakes and a Waterfall

We sailed past Detroit, and now we’re in Lake Erie, the shallowest of the Great Lakes. From the shore, we see smokestacks, and loading.

Vocabulary
smokestack, n. a tall chimney on a factory or ship

Page 25

Scaffold understanding as follows:

SUPPORT—Draw students’ attention to the Map of the Great Lakes on page 25 (or on page 38 in the back of the Reader). Point out the location of Lake Superior, the first lake students read about in this chapter, and the locations of the canal at Sault Ste Marie and the Strait of Mackinac. Then ask them to find Lake Huron and Lake Michigan, the lakes they will read about in this section. Call students’ attention to the fact that both Lake Superior and Lake Huron extend into Canada. Lake Michigan, however, is located entirely within the United States.

Have students read the section to themselves. Encourage them to refer to the map on page 25 (or on page 38 in the back of the Reader) as they read.

After students have finished reading, ask the following questions:

LITERAL—Why is Chicago an important city on the Great Lakes?

- » It is the largest inland port in America. Products are shipped from Chicago across the Great Lakes to other cities on the Great Lakes or to the ocean.

INFERENTIAL—How does the automobile industry use the Great Lakes?

- » Materials used to make cars, such as iron ore and steel, are shipped across the lakes to cities such as Detroit, Michigan, where steel factories are located.

“Two Lakes and a Waterfall,” Pages 25–27

Scaffold understanding as follows:

CORE VOCABULARY—Read the first paragraph of the section on page 25–26 out loud. Stop to explain the meaning of the vocabulary term *smokestack*.

SUPPORT—Draw students’ attention to the Map of the Great Lakes on page 25 (or on page 38 in the back of the Reader). Reread the description of the journey described in the first paragraph, and have students trace its path: from Detroit, across Lake Erie, to Niagara Falls.

Invite volunteers to take turns reading the rest of the section “Two Lakes and a Waterfall” on pages 26–27.

When students have finished reading the section, ask the following questions:

LITERAL—How do boats avoid Niagara Falls when traveling between Lake Erie and Lake Ontario?


- » They use the Welland Canal.

docks. These are in some of the important industrial cities, such as Cleveland, Ohio. Finally we reach Buffalo, New York. Here we leave our sailboat for a day to visit the great Niagara Falls, one of the world's largest waterfalls. The falls are created by the Niagara River, which flows from Lake Erie into Lake Ontario.

"How will you get the sailboat over Niagara Falls?" Tameeka asks the captain. He laughs and gets out the map again.

"I'm going to take this boat around the falls, down the Welland Canal," he says. "If I took the boat over Niagara Falls, you might never see me or the boat again! Luckily the canal allows ships to travel between Lake Erie and Lake Ontario."

When we get to Niagara Falls, we see what he means. A giant wall of water crashes over a huge cliff. The roar of the falls is so loud we can



Page 26

hardly hear each other. On our four-hour ride along the bottom of the falls, everyone wears raincoats. The spray gets us wet anyway!

On Lake Ontario we again meet the captain and board the sailboat. The day is sunny, and the wind is brisk. We almost fly along the water, feeling the wind tugging at the sails. The captain points out rows of trees along the shore. They are apple, peach, and cherry trees.

Finally our journey is over. The captain says that up ahead is the St. Lawrence Seaway, which connects Lake Ontario to the St. Lawrence River. The river flows into the Atlantic Ocean. Cargo ships are able to use the lakes, locks, canals, the seaway, and the river to travel from Lake Superior all the way to the Atlantic Ocean.

Tameeka and I say goodbye to the captain. He's become our friend. "The Great Lakes really are pretty great," he says. And we agree.

Cool Facts About the Great Lakes

- Lake Superior is so deep, the water of the other four great lakes would fit inside!
- Ten percent of Earth's unfrozen fresh water is in Lake Superior.
- Beneath Lake Huron there are ancient structures believed to be nine thousand years old.
- In the 1800s, pirates were a regular threat on Lake Michigan.
- The lake on Saturn's moon Titan is named after Lake Ontario.

Page 27

LITERAL—How do boats reach the ocean from the Great Lakes?

- » They use the St. Lawrence Seaway, which connects Lake Ontario to the St. Lawrence River. They then travel the river to the Atlantic Ocean.

SUPPORT—Tell students that until the opening of the St. Lawrence Seaway in 1959, there was no continuous water route for large ships from the Atlantic Ocean to the Great Lakes. Now oceangoing ships can carry agricultural and industrial products all the way from Duluth, Minnesota, to Quebec, Canada, and on to Europe. The seaway has caused Buffalo, Cleveland, Toledo, Detroit, Chicago, Milwaukee, Duluth, and Toronto to become profitable ports. The seaway was paid for by Canada and the United States, who share responsibility for it.

SUPPORT—Invite a volunteer to read the box Cool Facts About the Great Lakes on page 27.

Ask students to take out Cool Facts About World Lakes (AP 1.5) and locate the names of each of the Great Lakes. If time permits, allow students to begin to fill in information about each lake. Students may complete this assignment for homework.



CHECK FOR UNDERSTANDING 5 MIN

Ask students to:

- Write a short answer to the Big Question, "Why are the Great Lakes of North America such important transportation routes?"
 - » Key points students should cite in their answers include: people ship goods between states using cargo ships on the lakes; people ship goods to the ocean using the lakes and the St. Lawrence Seaway; people sail on the lakes for fun and to visit cities and tourist spots, such as Niagara Falls, located between Lakes Erie and Ontario.
- Choose one of the Core Vocabulary words (*mineral, cargo ship, canal, lock, strait, or smokestack*), and write a sentence using the word or phrase.

To wrap up the lesson, ask several students to share their responses.

Lakes of Eurasia

The Big Question: Why do some lakes contain fresh water and some salt water?

Primary Focus Objectives

- ✓ Describe Lake Baikal, the Caspian Sea, and the Aral Sea, including their locations in relation to the European and Asian continents, characteristics unique to each, and why they are important. **(RI.5.2)**
- ✓ Explain the differences between a freshwater lake and a saltwater lake. **(RI.5.2)**
- ✓ Understand the meaning of the following domain-specific vocabulary: *optical illusion*, *evaporate*, *outlet*, *volume*, and *divert*. **(RI.5.4)**

Materials Needed

Activity Pages



AP 1.1
AP 1.5

- World Map (AP 1.1), Cool Facts About World Lakes (AP 1.5)
- Enlarged versions of AP 1.1 and 1.5

Core Vocabulary (Student Reader page numbers listed below)

optical illusion, n. something that appears to be different from what it really is **(28)**

Example: A car's side-view mirror creates an optical illusion by making objects appear smaller and farther away than they really are.

Variation(s): optical illusions

evaporate, v. to change a liquid to a vapor or gas **(31)**

Example: When water evaporates from a lake, it leaves behind salts and other minerals.

Variation(s): evaporates, evaporation

evaporation, n. the process by which a liquid changes to a vapor or gas

outlet, n. a stream that flows out of a larger body of water **(31)**

Example: Although fresh water flows into the Caspian Sea, it has no outlet, and so it has a lot of built-up salt.

Variation(s): outlets

volume, n. the amount of space that something fills (33)

Example: The volume of water in the lake increased after a full day of heavy rain.

divert, v. to change the path of a river (33)

Example: People might divert a river to make it easier for farmers to get water to their crops.

Variation(s): diverts, diverting, diverted

THE CORE LESSON 40 MIN

Introduce “Lakes of Eurasia”

10 MIN

Display a copy of the World Map (AP 1.1). Quickly review and name the seven continents.

Remind students that, in the last chapter, they read about the Great Lakes, which are located in North America. Ask them to name each of the lakes and provide several interesting facts about them.

Tell students that in this chapter, they will learn about two lakes on the continent of Asia, as well as one lake that is located between the continents of Asia and Europe. Call attention to the fact that the continents of Asia and Europe are next to one another on the map, i.e., the eastern part of the European continent is adjacent to the western part of the Asian continent.

Now call students’ attention to the title of this chapter, “Lakes of Eurasia,” and explain that *Eurasia* is a term used to refer to the combined area of both Europe and Asia. These are the only continents that share a land mass. Be sure that students understand that Eurasia is not a new or separate continent; it is an abbreviated way of referring to this region, rather than saying “Europe and Asia.”

Draw students’ attention to the Big Question. Remind students that in other chapters most of the lakes they have learned about are freshwater lakes. However, one of the “lakes” they read about in South America was not really a lake, but a gulf; ask students if they remember the name of this lake (*Lake Maracaibo*). The water in Lake Maracaibo is salt water. Encourage students to look for details about freshwater and saltwater lakes as they read this chapter.

Guided Reading Supports for “Lakes of Eurasia”

30 MIN

When you or a student reads aloud, **always** prompt students to follow along. By following along, students may acquire a greater understanding of the content. Remember to provide discussion opportunities.

Chapter 4
Lakes of Eurasia

Lake Baikal “Be careful! Don’t lean over so far!” Valentin shouts. He is my guide on Russia’s Lake Baikal (Bai-kal’). “You’ll fall out of the boat!”

“I just want some of those pebbles on the bottom of the lake,” I explain.

Valentin laughs. “You’ll never reach them. Those pebbles may look like they’re just below the surface, but really they are many feet away. And they’re probably not pebbles.”

Valentin sees my expression of disbelief. He explains. He tells me that Lake Baikal is a very deep lake—the deepest in the world. It’s also a very clear lake. Because it is so clear, things seem closer to the surface than they really are. It’s an optical illusion (op’trik’uhl’ /trōp’zhūz’).

“Those ‘little pebbles’ you saw are probably huge rocks,” Valentin says. “The pebbles that everybody makes this mistake when they

The Big Question
Why do some lakes contain fresh water and some salt water?

Vocabulary
optical illusion, appears to be different from what it really is

Page 28



Valentin tells our tour group many interesting facts about Lake Baikal. For instance, this one lake contains enough water to fill all five of the Great Lakes until they overflow.

Lake Baikal is sometimes called the Pearl of Siberia. That’s because it’s located in a region of Russia called Siberia. And, like a pearl, the lake is a great treasure to Russians. People also call this lake “the sacred lake” or “the sacred water.” They believe it is mysterious, magical, and majestic. Lake Baikal is so deep that people imagine it has great mysteries down below.

Cool Facts About Lake Baikal

- Lake Baikal contains twenty percent of the world’s unfrozen fresh water.
- The water in Lake Baikal is the most transparent of all the freshwater lakes in the world.

The land surrounding Lake Baikal is also a great natural treasure. Many Russians feel that the natural beauty around Lake Baikal is magical. High cliffs and forest-covered mountains rise above the lake. Reindeer, elk, deer, and bears live in the dense woods. Wild rivers empty their waters into the lake. Parks and game reserves around Lake Baikal protect the rivers and animals.

Things may not stay this wild and natural forever. Timber companies are cutting down some of the forest to make lumber and paper. Ships are built on the lake’s shore, and fishing boats come and go. A railroad connects mines and industries to towns along the shore.

For now, I am happy to breathe the fresh air and imagine the world’s deepest lake.

Page 30

Scaffold understanding as follows:

CORE VOCABULARY—Preview and explain the meaning of the vocabulary term *optical illusion*. Explain that the tricks performed by magicians are often based on optical illusion, i.e., that what we “see” is different from what it really is; for example, a person who seems to disappear but is, in fact, merely hidden.

Explain that in this chapter, the term *optical illusion* is used to describe the change in the way things that are underwater may appear; water distorts, or changes, the way things appear. For example, when you are standing in a swimming pool and look down at your feet, your feet will look larger than they really are. That is an optical illusion. Ask students as they read to pay attention to the optical illusion created by Lake Baikal.

Tell students to quietly read to themselves the section “Lake Baikal” on pages 28–30.

When students finish reading this section, read aloud the information in the box “Cool Facts About Lake Baikal” on page 30. Explain that *transparent* means see-through. It is the lake’s transparency that creates the optical illusion described in the first part of the section. Discuss the manner in which the transparent water of Lake Baikal creates an optical illusion.

SUPPORT—Point out the map of central Eurasia on page 31 (or on page 39 in the back of the Reader). Have students find Lake Baikal on the map and identify the continent on which it is located (*Asia*). Take this opportunity to remind students about your earlier explanation of Eurasia. You may also want to point out that the western part of Russia is located on the European continent, and the eastern part of Russia is located on the Asian continent. Russia is located in Eurasia.

Then, ask the following questions:

LITERAL—What are some threats to the wild natural beauty of Lake Baikal?

- » Possible answers: timber companies are cutting down trees to make lumber and paper; ships are being built on its shores; fishing boats are coming and going; a railroad connects mines and industries to towns along the shore.

LITERAL—What efforts are being made to protect the wild natural beauty of Lake Baikal?

- » People have created parks and game reserves around the lake to protect the area’s rivers and animals.

"The Caspian Sea," Pages 31–32

Scaffold understanding as follows:

CORE VOCABULARY—Read aloud the first three paragraphs of the section "The Caspian Sea" on pages 31–32. Explain the meaning of the vocabulary terms *evaporate* and *outlet*.

Continue reading aloud the last two paragraphs of the section "The Caspian Sea" on page 32.

SUPPORT—Point out the box "Cool Facts About the Caspian Sea" on page 32. Invite a volunteer to read the facts aloud.

SUPPORT—Ask students to refer to the map of central Eurasia on page 31 (or on page 39 in the back of the Reader) and to locate the Caspian Sea. Call students' attention to the borders of Europe and Asia on this map in relation to the Caspian Sea, and ask them to identify the location of the Caspian Sea (*Eurasia, i.e., the Caspian Sea is located between Europe and Asia*).

After reading the section, ask the following questions:


LITERAL—How does a lake become a saltwater lake?

- » Water evaporates faster than it is replaced. Evaporated water leaves behind salt, which builds up in the lake.

EVALUATIVE—How is the Caspian Sea similar to Lake Maracaibo in South America?

- » Both lakes are rich sources of oil.

Major Lakes of Eurasia



Use the scale of miles on this map to measure the distances between the Caspian Sea, the Aral Sea, and Lake Baikal.

The Caspian Sea

Most of the world's lakes are freshwater lakes, but a few contain salt water. A lake has salt water if its water evaporates more quickly than rivers or rain can bring in new water. When water evaporates, it leaves behind salts and other minerals.

You can see how this works on a hot summer day. If you let the sweat on your arm evaporate and then lick your arm, your skin will taste a little salty.

Fresh water comes into the Caspian Sea from a number of streams and rivers. There is no outlet for the water because it has no outlet. The Caspian Sea is located in a very dry climate.

Vocabulary
evaporate, *v.* to change a liquid to a vapor or gas
outlet, *n.* a stream that flows out of a larger body of water

Page 31



Oil derricks are a common sight in the Caspian Sea.

Its water evaporates, leaving behind salt and other minerals. After thousands of years, a lot of salt has built up in the Caspian Sea.

The Caspian Sea is a very large body of water. It has long been a good trade route. In the past, traders traveled between lands far to the east in Asia and lands far to the west in Europe. Many traders carried their goods by boat or ship across the lake during their travels.

Then people discovered how valuable oil is. Some of the world's largest oil deposits are located around and under the Caspian Sea. The Caspian Sea became more than just a trade route.

Cool Facts About the Caspian Sea
 • The Caspian Sea is the world's largest inland body of water.
 • It is a saltwater lake in the world.

Page 32

"The Aral Sea," Pages 33–34

Scaffold understanding as follows:

CORE VOCABULARY—Read aloud the first two paragraphs of the section "The Aral Sea" on page 33. Explain the meaning of the vocabulary term *volume*, after reading both paragraphs, using the map "The Shrinking of the Aral Sea" on page 33. Also ask students to refer back to the map on page 31 (or on page 39 in the back of the Reader), to locate the Aral Sea on this map, and to identify the continent on which it is located.

Invite volunteers to take turns reading the rest of the section, "The Aral Sea," on pages 33–34.

CORE VOCABULARY—Point out the Core Vocabulary word *divert*, and explain its meaning.

The Aral Sea

From the Caspian Sea, our group travels to the next stop on our trip, the Aral Sea. Sadly, the Aral Sea is shrinking. The volume of the lake has decreased by ninety percent in the past few decades. The Aral Sea is a saltwater lake in the Central Asian nations of Uzbekistan and Kazakhstan.


The Aral Sea was once the fourth largest lake in the world. Now its shoreline has receded up to seventy-five miles in places; the sea level has dropped more than fifty feet. The southeastern part of the lake has dried up completely.

I ask our new guide, Kodie, what caused this.

"Unfortunately this was not a natural change," he answers. "People diverted rivers that flowed into the Aral Sea. They needed the water to grow cotton crops for export. A canal was planned to guide water from other rivers into the sea, but the canal was..."

Vocabulary
volume, *n.* the amount of space that something fills
divert, *v.* to change the path of a river

The Shrinking of the Aral Sea



This map shows how the Aral Sea has shrunk from the world's fourth largest lake to almost nothing.

Page 33



SUPPORT—Point out the box “Cool Facts About the Aral Sea” on page 34. Invite a volunteer to read the facts aloud. Ask students how diverting the rivers might have affected trade in the area around the lake. (*Trade might have dropped because the loss of the rivers meant the loss of transportation routes.*)

After volunteers have finished reading the section, ask the following questions:

LITERAL—What has happened to the Aral Sea since 1960?

- » It has shrunk. It is no longer the world’s fourth-largest lake.

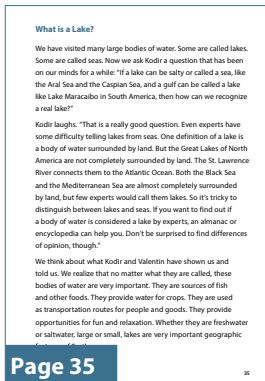
LITERAL—What caused the Aral Sea to shrink?

- » People diverted, or changed the path of, the rivers that once fed it.

LITERAL—How have people’s lives changed because of the shrinking of the Aral Sea?

- » Farmers have a shorter growing season. People who used to live on the shore now live far away from the water. Many people who relied on fishing can no longer do so.

“What Is a Lake?” Page 35



Have students read the section with a partner.

After students have finished reading, ask the following questions:

LITERAL—How can we determine if a large body of water is a lake or sea?

- » Even if you use the definition provided in this unit for determining whether a body of water is—or is not—a lake, i.e., a body of water surrounded by land, there are inconsistencies in the way different bodies of water around the world are named. You can check the Internet or an almanac or encyclopedia for a specific body of water to see what most experts think.

LITERAL—Why are lakes important?

- » They provide food, water, transportation routes, and opportunities for fun and relaxation.

Activity Page



AP 1.5

Ask students to take out Cool Facts About World Lakes (AP 1.5) and locate the names of Lake Baikal, the Caspian Sea, and the Aral Sea. If time permits, allow students to begin to fill in information about each lake.

Students may complete this assignment for homework.



CHECK FOR UNDERSTANDING 5 MIN

Ask students to:

- Write a short answer to the Big Question, “Why do some lakes contain fresh water and some salt water?”
 - » Key points students should cite in their answers include: Some lakes, like the Caspian Sea, are in a dry climate and do not have an outlet. When water from the lake evaporates, it leaves behind salt and other minerals. Over time, the salt builds up, creating a saltwater lake.
- Choose one of the Core Vocabulary words (*optical illusion*, *evaporate*, *outlet*, *volume*, or *divert*), and write a sentence using the word or phrase.

To wrap up the lesson, ask several students to share their responses.

Additional Activities

World Lakes Domain Vocabulary

45 MIN

Activity Page



AP 4.1

Materials Needed: Sufficient copies of the *World Lakes Domain Vocabulary* activity page (AP 4.1)

Distribute AP 4.1, *World Lakes Domain Vocabulary*, and direct students to match the definitions to the vocabulary terms they have learned in their reading about *World Lakes*.

This activity page may also be distributed for homework.

Teacher Resources

Unit Assessment: <i>World Lakes</i>	48
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• Latitude as Climate Indicator (AP 1.3)	62
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Name _____

Date _____

Unit Assessment: *World Lakes*

Circle the letter of the best answer.

1. A lake
 - a) always contains fresh water.
 - b) stays the same size forever.
 - c) is a body of water surrounded by land.
 - d) is the same depth as the rivers that run into it.

2. Why is Lake Tanganyika so long and narrow?
 - a) It is really a river.
 - b) Not many rivers empty into it.
 - c) It is in a rift valley.
 - d) No one knows.

3. Who or what was Lake Victoria named after?
 - a) Uganda's victory over Kenya in a war
 - b) Queen Victoria of England
 - c) the city of Victoria in Canada
 - d) the Australian who discovered the lake

4. Which of the following lakes is *not* in Africa?
 - a) Lake Chad
 - b) Lake Baikal
 - c) Lake Victoria
 - d) Lake Tanganyika

5. Which lake is the source of the Nile River?
 - a) Lake Victoria
 - b) Lake Chad
 - c) Lake Baikal
 - d) Lake Titicaca

6. On what continent is Lake Maracaibo located?
 - a) Africa
 - b) South America
 - c) Asia
 - d) North America

7. A strait is
- a) a small rift-valley lake.
 - b) a kind of canal that was built during the 1800s.
 - c) a narrow body of water that connects two larger bodies of water.
 - d) a process engineers use to straighten rivers.
8. Which Great Lake is entirely in the United States?
- a) Lake Michigan
 - b) Lake Ontario
 - c) Lake Huron
 - d) Lake Superior
9. On which lake did the *Edmund Fitzgerald* sink?
- a) Lake Michigan
 - b) Lake Huron
 - c) Lake Superior
 - d) Lake Ontario
10. Why do things on the bottom of Lake Baikal appear close?
- a) The water is shallow.
 - b) The lake has magnifying water.
 - c) The water is clear.
 - d) The lake has lots of pebbles.
11. Traders used the Caspian Sea to get from Asia to
- a) North America.
 - b) Africa.
 - c) Europe.
 - d) South America.
12. The Caspian Sea is located between which two continents?
- a) Europe and Asia
 - b) North America and South America
 - c) Europe and Africa
 - d) Russia and Kazakhstan

- 13.** The Aral Sea is located on which continent?
- a)** Europe
 - b)** Asia
 - c)** Africa
 - d)** South America
- 14.** The Aral Sea
- a)** is the largest lake in the world.
 - b)** is a popular tourist destination.
 - c)** is growing.
 - d)** is shrinking.
- 15.** How are lakes important to people all over the world?
- a)** They provide water for crops.
 - b)** They provide recreational opportunities.
 - c)** They provide sources of food.
 - d)** all of the above

Match each term to its definition.

Terms

- 16. _____ evaporate
- 17. _____ divert
- 18. _____ gulf
- 19. _____ lock
- 20. _____ outlet
- 21. _____ natural resource
- 22. _____ source
- 23. _____ canal
- 24. _____ transportation route
- 25. _____ petroleum

Definitions

- a) starting point or beginning of a river's water
- b) something from nature that is useful to humans
- c) to change the path of a river
- d) a path for traveling from one place to another
- e) to change a liquid to a vapor or gas
- f) a naturally occurring oil found in certain rock layers under Earth's surface used to make plastics and fuels, such as gasoline
- g) a part of a canal that has gates for lowering and raising the water level
- h) a part of an ocean extending into land
- i) a stream that flows out of a larger body of water
- j) a channel dug by people, used by boats or for irrigation

Performance Task: World Lakes

Teacher Directions: Lakes are an important geographical resource, and maps are important geographical tools. In this activity, students will use their understanding of maps to demonstrate their knowledge of world lakes.

Ask students to first refer to the Performance Task Notes Table, noting that it lists each of the lakes studied in this unit, along with a corresponding letter of the alphabet. Ask students to annotate the Performance Task Activity map with the locations of the lakes using the letter name of each lake. Then, using the Performance Task Notes Table, ask students to write the name of the continent on which each lake is located and at least one interesting fact about each lake.

A sample table, completed with possible notes, is provided below to serve as a reference for teachers, should some prompting or scaffolding be needed to help students get started. **Note:** This table is very similar to Activity Page 1.5, which students have already completed. They are being asked to recall the location and at least one additional, accurate fact about each lake. Individual students are not expected to provide a comparable finished table. Their goal is to provide the location and at least one fact about each lake.

Name	Location (Continent)	Salt Water or Fresh Water?	Resources It Provides	Unique Characteristics
A. Lake Tanganyika	Africa	Fresh water	<ul style="list-style-type: none">• fish• transportation routes	<ul style="list-style-type: none">• formed in a rift valley
B. Lake Victoria	Africa	Fresh water	<ul style="list-style-type: none">• transportation routes	<ul style="list-style-type: none">• islands• close to source of Nile River• nearby game reserves
C. Lake Chad	Africa	Fresh water	<ul style="list-style-type: none">• fish• papyrus, cattails, and waterlilies• water for nearby farms and livestock	<ul style="list-style-type: none">• shallow water• flat surrounding land• dry climate

D. Lake Titicaca	South America	Fresh water	<ul style="list-style-type: none"> • water for llamas, farming, and drinking • fish • reeds for making furniture, roofs, and boats 	<ul style="list-style-type: none"> • ancient ruins on the shore
E. Lake Maracaibo	South America	Some salt water and some fresh water	<ul style="list-style-type: none"> • petroleum 	<ul style="list-style-type: none"> • trading hub • industrial center • more lightning than anywhere else
F. Lake Superior	North America	Fresh water	<ul style="list-style-type: none"> • drinking water • transportation routes 	<ul style="list-style-type: none"> • Graveyard of Ships • Sault Ste Marie canal • deepest of the Great Lakes
G. Lake Michigan	North America	Fresh water	<ul style="list-style-type: none"> • drinking water • transportation routes 	<ul style="list-style-type: none"> • only Great Lake entirely in the United States
H. Lake Huron	North America	Fresh water	<ul style="list-style-type: none"> • drinking water • transportation routes 	<ul style="list-style-type: none"> • lower than Lake Superior • creates Michigan's "mitten" shape
I. Lake Erie	North America	Fresh water	<ul style="list-style-type: none"> • drinking water • transportation routes 	<ul style="list-style-type: none"> • shallowest of the Great Lakes • important industrial cities

Name	Location (Continent)	Salt Water or Fresh Water?	Resources It Provides	Unique Characteristics
J. Lake Ontario	North America	Fresh water	<ul style="list-style-type: none"> • drinking water • fruit trees on shore • transportation routes 	<ul style="list-style-type: none"> • Welland Canal • Niagara Falls • access to St. Lawrence Seaway
K. Lake Baikal	Asia	Fresh water	<ul style="list-style-type: none"> • natural beauty • fish • transportation routes 	<ul style="list-style-type: none"> • clear water creates optical illusion • larger than all Great Lakes combined • called “Pearl of Siberia”
L. Caspian Sea	Eurasia	Salt water	<ul style="list-style-type: none"> • oil 	<ul style="list-style-type: none"> • has no outlet • formerly used as a trade route
M. Aral Sea	Asia	Salt water		<ul style="list-style-type: none"> • used to be world’s fourth-largest lake • lost nearly all of its volume since 1960

Performance Task Scoring Rubric

Note: Students should be evaluated on the basis of their completed map and notes table, using the rubric.

Students should not be evaluated on the overall completion of the notes table, which is intended to be a support for students as they first think about their maps.

Above Average	10–13 lakes are accurately labeled on the map. Beyond location, many other boxes of the notes table contain accurate information.
Average	6–9 lakes are accurately labeled on the map. The location (continent) and at least one accurate fact have been provided for 6–9 lakes on the Performance Task Notes Table.
Below Average	0–5 lakes are accurately labeled on the map. Less than half of the boxes of the notes table contain accurate information.

Performance Task Activity: *World Lakes*

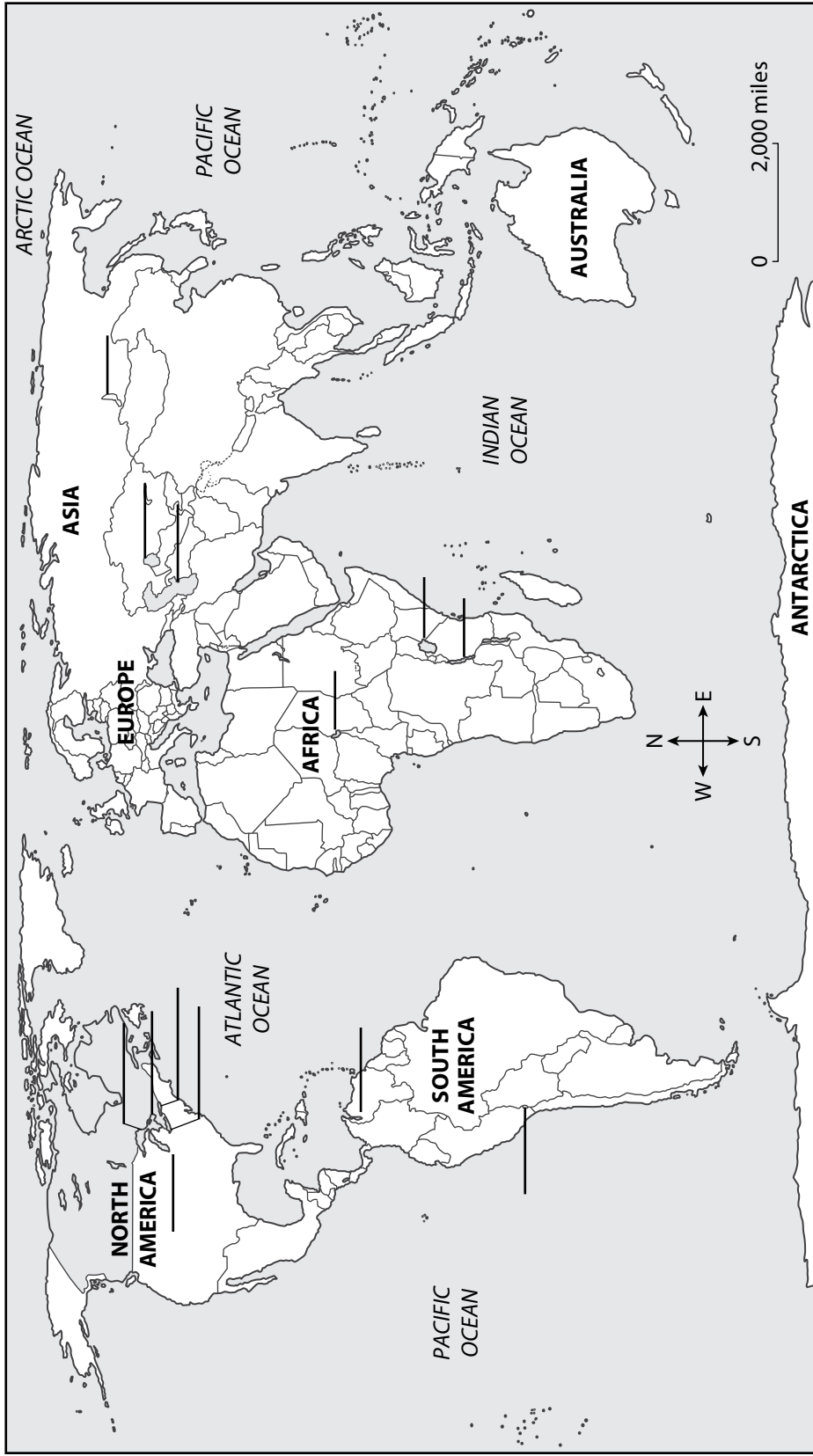
As a student of geography, you know that maps are important geographic tools. In this unit, you learned that lakes are an important geographic resource. Use your knowledge of maps and lakes to complete the map on the next page.

On the map on the following page, mark the corresponding letter in the appropriate location for each lake studied in this unit. (The lakes and their corresponding letters are listed in the table that follows the map.)

Also, use the table on the following pages to indicate the location (continent) for each lake, as well as at least one additional fact about each lake. If you can think of more information about each lake, add it in the other boxes on the table.

Name _____ Date _____

Performance Task Activity: World Lakes



Name _____

Date _____

World Lakes Performance Task Notes Table

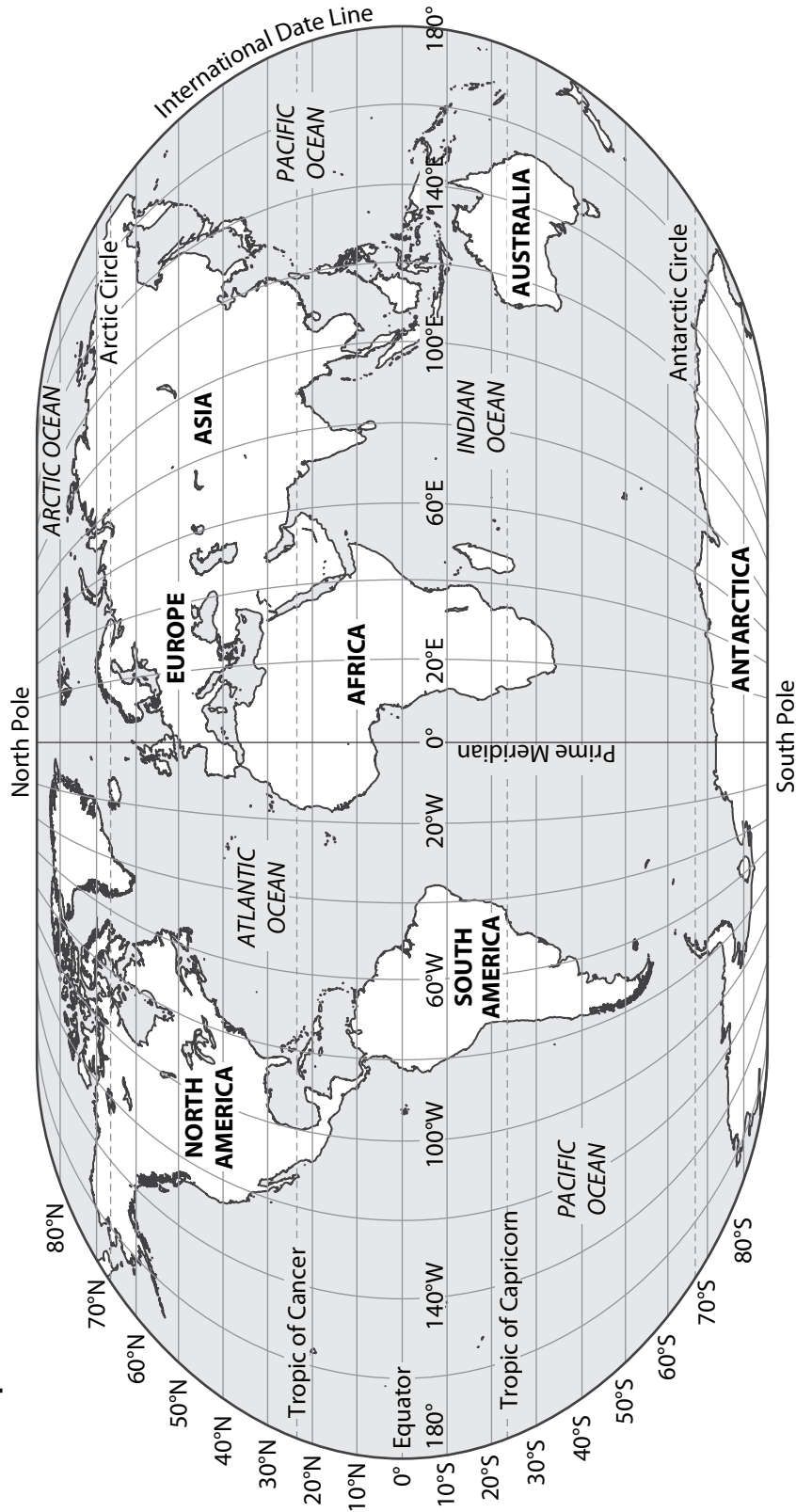
Use the table below to help organize your thoughts as you refer to *World Lakes*. You do not need to complete the entire table to complete the Performance Activity Map, but you should try to have at least the location and one other column completed for each lake.

Name	Location (Continent)	Salt Water or Fresh Water?	Resources It Provides	Unique Characteristics
A. Lake Tanganyika				
B. Lake Victoria			transportation routes	
C. Lake Chad				
D. Lake Titicaca				
E. Lake Maracaibo	South America			
F. Lake Superior				

G. Lake Michigan				
H. Lake Huron				
I. Lake Erie				
J. Lake Ontario				<ul style="list-style-type: none"> • Welland Canal • Niagara Falls • access to St. Lawrence Seaway
K. Lake Baikal				
L. Caspian Sea	Between Europe and Asia (Eurasia)			
M. Aral Sea				

Name _____
Date _____

World Map



Name _____

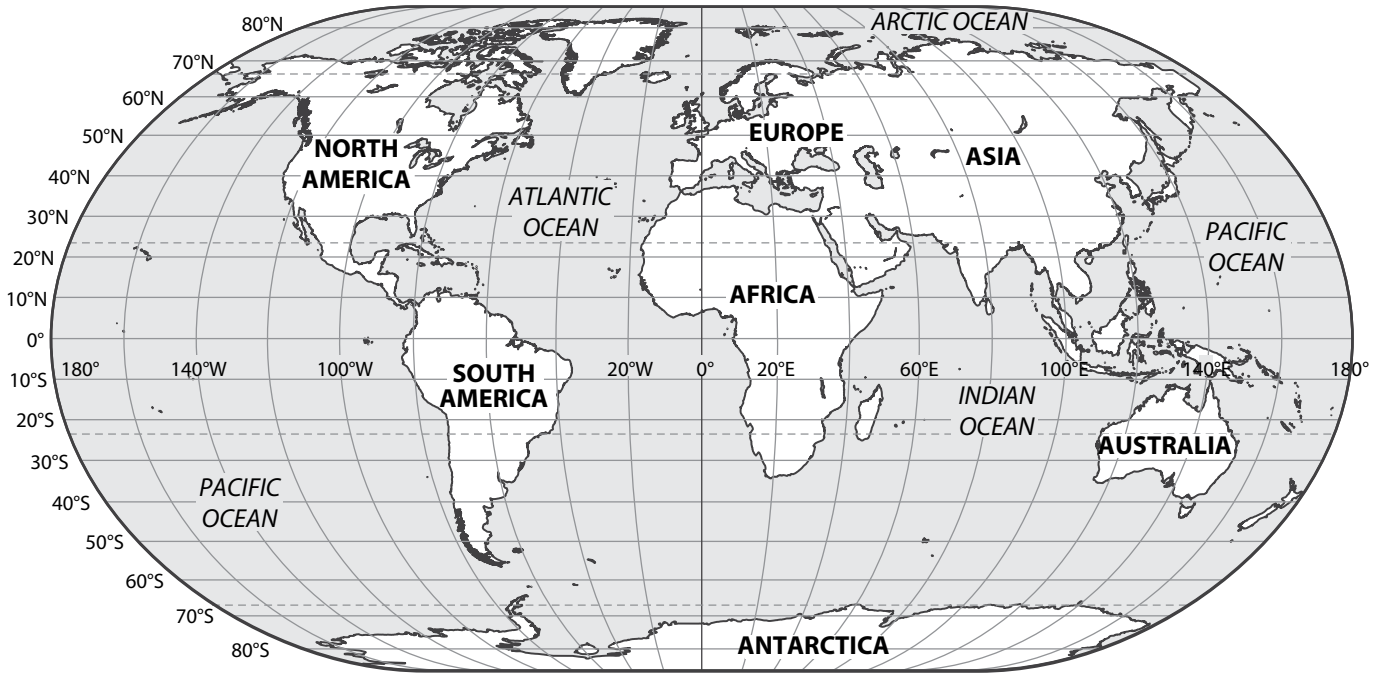
Date _____

Activity Page 1.2

Use with Chapter 1

Imaginary Lines

Study the map. Then complete the items below.



1. The numbers that go across the center of the map from left to right indicate lines of _____.
2. The numbers on the side of the map indicate lines of _____.
3. On the map, label the following:

equator	Arctic Circle	Tropic of Capricorn
North Pole	Antarctic Circle	prime meridian
South Pole	Tropic of Cancer	international date line

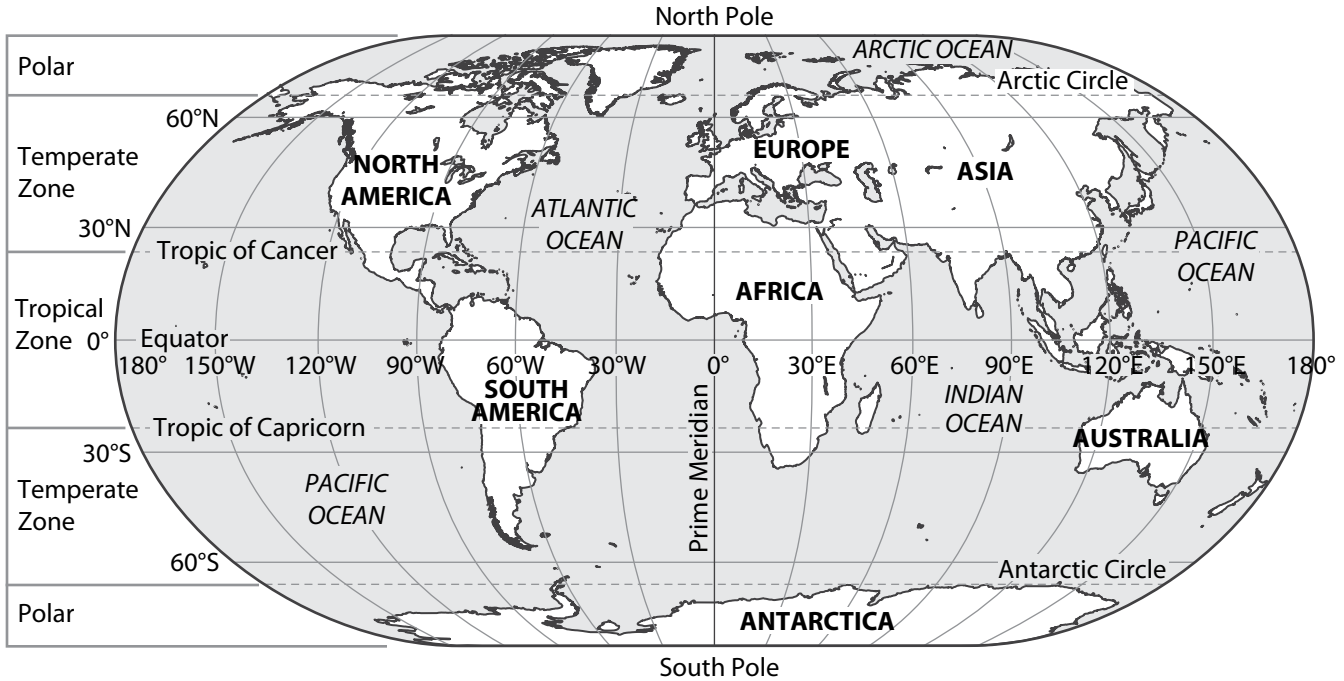
Name _____

Date _____

Activity Page 1.3

Use with Chapter 1

Latitude as Climate Indicator



1. Color the area between the Tropic of Cancer and the Tropic of Capricorn red. This area is known as the _____ zone.
2. Color the area north of the Arctic Circle blue. This area is known as the _____ zone.
3. Color the area south of the Antarctic circle blue. This area is known as the _____ zone.
4. Find the areas between the tropics and the polar (arctic and antarctic) climates. Color these climate areas yellow. These areas are known as the _____ zones.

Name _____

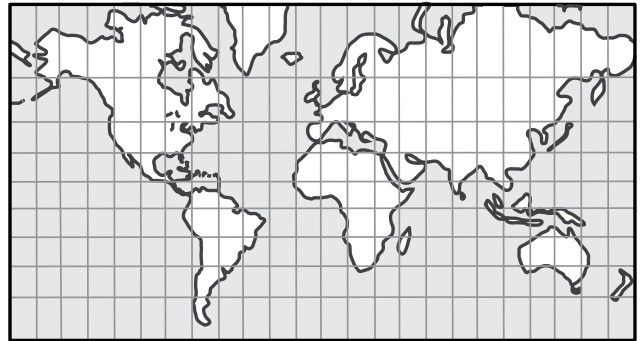
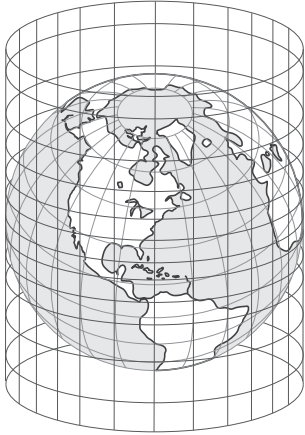
Date _____

Activity Page 1.4

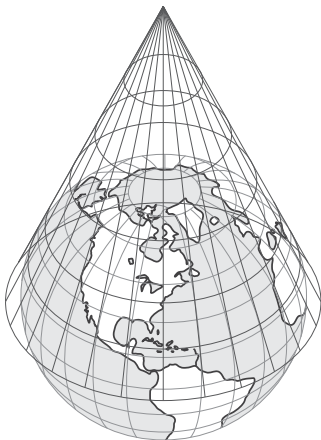
Use with Chapter 1

Three Different Map Projections

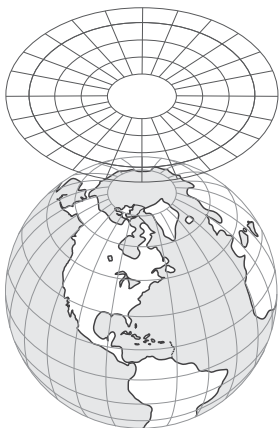
Mercator Projection



Conic Projection



Plane Projection



Name _____ Date _____

Cool Facts About World Lakes

Use this chart after reading each chapter to record notes about each lake.

Lake	Location	Longitude/Latitude	Salt or Fresh Water	Characteristics
Aral				
Baikal				
Caspian				
Chad				
Erie				
Huron				
Maracaibo				
Michigan				
Ontario				
Superior				
Tanganyika	Africa	7° S 31° E	Fresh	
Titicaca				
Victoria				

Activity Page 4.1

Use with Chapter 4

World Lakes Domain Vocabulary

For each word, write the letter of its definition.

_____	Terms	Definitions
_____	1. canal	a) to change the path of a river
_____	2. cargo ship	b) a body of water surrounded by land
_____	3. derrick	c) a part of an ocean extending into land
_____	4. divert	d) something from nature that is useful to humans
_____	5. evaporate	e) an area set aside by the government where animals are protected from hunters
_____	6. game reserve	f) a large boat used to carry goods
_____	7. gulf	g) a stream that flows out of a larger body of water
_____	8. industry	h) a narrow body of water that connects two larger bodies of water
_____	9. lake	i) a business that manufactures a product or provides a service
_____	10. lock	j) a framework tower that supports a drill over an oil well
_____	11. mineral	k) a naturally occurring oil found in certain rock layers under Earth's surface used to make plastics and fuels, such as gasoline
_____	12. natural resource	l) a part of a canal that has gates for lowering and raising the water level
_____	13. outlet	m) a naturally occurring substance found in Earth's crust
_____	14. petroleum	n) to change a liquid to a vapor or gas

Name _____

Date _____

Activity Page 4.1: Continued

Use with Chapter 4

	Terms	Definitions
_____	15. plateau	o) a channel dug by people, used by boats or for irrigation
_____	16. resource	p) a long, deep, narrow valley in East Africa
_____	17. rift valley	q) a large area of high, flat ground
_____	18. source	r) a starting point or beginning of a river's water
_____	19. strait	s) a path for traveling from one place to another
_____	20. transportation route	t) something that people can use

Answer Key: World Lakes

Unit Assessment

1. c 2. c 3. b 4. b 5. a 6. b 7. c 8. a 9. c 10. c 11. c 12. a 13. b 14. d
15. d 16. e 17. c 18. h 19. g 20. i 21. b 22. a 23. j 24. d 25. f

Activity Pages

Imaginary Lines (AP 1.2) (page 61)

1. longitude
2. latitude
3. equator: 0° latitude; North Pole: 90° N latitude; South Pole: 90° S latitude; Arctic Circle: 66.5° N latitude; Antarctic Circle: 66.5° S latitude; Tropic of Cancer: 23.5° N latitude; Tropic of Capricorn; 23.5° S latitude; prime meridian: 0° longitude; international date line: 180° longitude

Latitude as Climate Indicator (AP1.3) (page 62)

1. tropical
2. polar
3. polar
4. temperate

Cool Facts About World Lakes (AP 1.5) (page 64)

Lake	Location	Longitude/Latitude	Salt or Fresh Water	Characteristics
Aral	Asia	45° N 143° E	Salt	Will vary (is shrinking)
Baikal	Asia	52° N 115° E	Fresh	Will vary (very clear and very deep)
Caspian	Eurasia	45° N 133° E	Salt	Will vary (saltwater lake)
Chad	Africa	12° N 10° E	Fresh	Will vary (borders Nigeria and Chad, is shrinking)

Lake	Location	Longitude/Latitude	Salt or Fresh Water	Characteristics
Erie	North America	42° N 81° W	Fresh	Will vary (borders Ohio, Pennsylvania, and New York)
Huron	North America	45° N 83° W	Fresh	Will vary (gives Michigan its mitten shape)
Maracaibo	South America	9° N 72° W	Some salt and some fresh	Will vary (a gulf, rather than a lake)
Michigan	North America	45° N 87° W	Fresh	Will vary (the only Great Lake entirely inside the United States)
Ontario	North America	43° N 78° W	Fresh	Will vary (flows into the St. Lawrence Seaway)
Superior	North America	47° N 88° W	Fresh	Will vary (deepest of the five Great Lakes)
Tanganyika	Africa	7° S 31° E	Fresh	Will vary (second-largest lake in Africa)
Titicaca	South America	16° S 70° W	Fresh	Will vary (located in the Andes mountains)
Victoria	South America	1° S 33° E	Fresh	Will vary (Africa's largest lake and largest tropical lake)

World Lakes Domain Vocabulary (AP 4.1)
(page 65–66)

1. o 2. f 3. j 4. a 5. n 6. e 7. c 8. i 9. b 10. l 11. m 12. d
13. g 14. k 15. q 16. t 17. p 18. r 19. h 20. s



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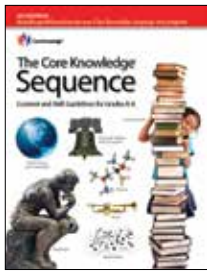
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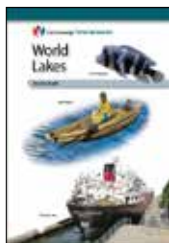
World Lakes

Core Knowledge Sequence History and Geography 5



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