World Geography
Coursebook

Oak Meadow

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Introduction

Geography is not just about learning the names of cities, rivers, and mountain ranges. The study of geography involves understanding the natural forces that shape our planet and the interactions between people and their environment. It's about how human activity can modify the surface of the Earth itself and inform the region's culture and inhabitants over time. This course is also about acquiring information from disparate sources, like maps, statistics, news reports, and literary accounts, and integrating it into a comprehensive understanding. The projects and assignments in this course will exercise your imagination, creativity, analytical mind, and critical faculties.

Overall Course Objectives

- Understand and use terminology of physical and human geography.
- Exhibit different types of writing for different purposes.
- Locate and evaluate sources for relevance and reliability.
- Interpret data presented in different forms.
- Compile data and display it in a variety of graphic forms.
- Become familiar with current issues related to different geographical regions.
- Initiate and engage in interest-led learning projects.

This course gives you many opportunities to explore areas of interest through self-designed projects. As you learn about the topics in each lesson, follow ideas and events that spark your curiosity, and take the time to find out more. The best way to get the most out of this course is to make it personally meaningful—as an independent learner, you have the freedom and flexibility to do that!

A Note About the Workload

Please note that there are a wide variety of assignments included in this course to give you many options for engaging with the material. **Students are not expected to complete every single assignment.** You can ask your supervising teacher or parent for help determining which assignments to focus on each week, based on your interests, strengths, and areas needing development. You might also prefer to complete some of the written assignments orally with your teacher or parent. Keep an eye on the

workload as you progress through the course, and make adjustments so that you have time for meaningful learning experiences rather than rushing to try to get everything done. If you are enrolled in Oak Meadow School, please consult with your teacher when making adjustments to the workload.

Course Materials

This coursebook contains all the instructions and assignments for a full-year course. This course is designed to be textbook-independent. This means that the course is driven by questions and inquiry that challenge you to become a researcher and a critical thinker. You can use *any* textbook (one or more) or other research materials to learn about the lesson topics. Throughout the course, you are encouraged to use a wide variety of sources such as nonfiction books, websites, films, textbooks, journals, novels, artwork, news archives, etc. You are welcome to purchase a textbook to use as your primary reading material, or use any combination of materials, but there isn't one specific textbook attached to this course. In fact, you should consider augmenting any textbook you use with additional print and online resources to help make your understanding of geography more complex and vital.

In each lesson, you'll find a range of topics to research. You aren't expected to gain a comprehensive body of knowledge on each topic—save that for the topics you are excited about. For most topics, you will read just enough to get a general idea of it. Interspersed with the content-rich lessons that have a lot of research and reading, you'll find lessons that give you the opportunity to process what you have been learning through creating projects of your own design. The goal of these lessons is to reflect on what you have learned, and to spend time on a project of personal relevance to you. The choice is totally up to you, but you'll get more out of this course if you try your hand at a variety of types of projects (research projects, essays, creative projects, experiments, etc.) and dive into topics with which you are not yet familiar.

This course makes good use of technology and the vast resources found online (see "Evaluating Internet Sources" below). If you don't have internet service at home, you are encouraged to do the online activities at your local library. If you are unable to use the internet, please talk to your teacher about alternative assignments. Of course, you'll also find valuable resources in print at your local library and librarians often have a wealth of knowledge to share.

How the Course Is Set Up

In this course, there are 36 lessons divided equally into two semesters. Each lesson begins with a short introduction, which often includes background information as well as ideas for you to ponder and discuss with your parents and friends. By discussing issues, expressing your opinion, and listening to the opinions of others, you will come to a clearer and more in-depth understanding of the topics in each lesson.

Lessons are divided into sections to guide your studies and enhance your understanding of the material.

An **Assignment Checklist** is found at the beginning of each lesson so you can see at a glance what you'll be doing, and check off assignments as you complete each one. Assignments are fully explained in the lesson.

Learning Objectives outline the main goals of the lesson and give you an idea of what to expect.

Reading sections outline the topics you will research and study using a variety of sources; consider the list of reading topics to be a starting point for your learning.

Comprehension and Critical Thinking Questions are designed to help you solidify key concepts and knowledge, think deeply about the material, and apply your knowledge and your reasoning skills.

Mapping the World is a year-long project in which you will be drawing a world map, adding new sections as you learn about each region.

Semester Reading Project reminders are included periodically to help you make steady progress on reading and analyzing one book per semester (see below for details and book selections).

Central Questions prompt you to think about deeper connections, issues, and concepts. Take your time pondering the Central Questions before responding to them. Discussing these questions with others will help clarify your own ideas and opinions.

Activities provide a wide range of ideas for exploring the topics you are studying. All activities are optional and you are encouraged to do any that interest you.

Share Your Work sections at the end of each lesson provide reminders and information for students who are submitting work to their teacher.

The **appendix** contains important material that you will be expected to read and incorporate into your work throughout the year. Take some time to familiarize yourself with the resources in the appendix. You will find information about writing techniques and composition formats, how to avoid accidental plagiarism, and details on citing sources and images.

It is assumed that you will be working with an adult who assesses and supports your learning whether you are enrolled in Oak Meadow or are using this course independently. This teacher—who may be a parent, tutor, or Oak Meadow teacher—is the one to whom you should turn if you have questions about your assignments or how to get the most out of this course.

If you are an enrolled student in Oak Meadow's distance learning program, be sure to look closely at the Google course doc your Oak Meadow teacher sends to you as your teacher may have modified your course and your lesson requirements.

Tips for Using a Textbook-Independent Course

1. Look over the reading topics for each lesson. Identify ones that are the highest priority and focus on them first. Some topics may have been addressed in previous work, so a quick conversation or review will suffice. Sometimes a simple definition of a concept is enough and other times a concept will need to be understood in more detail. By reviewing the lesson objectives and assignments, you can determine which topics need to be examined in greater depth.
2. Begin with the Oak Meadow Curriculum Links for your course. This is a good place to start your research, and it may have enough information that you don't need to go any further. By clicking and scanning each article, you can determine how useful each might be, depending on your learning style.
3. Begin an online search by typing the topic into the search bar. Before clicking on the first search result, scan the top eight or ten results, paying attention to how relevant they seem for your purposes. Take a look at the origin (website) of each source before clicking on it. Begin with reputable names, such as National Geographic, NASA, or well-known institutions, news sources, or magazines. For instance, after typing "Global positioning system" into the search bar, the top results may include gps.gov, spaceplace.nasa.gov, oceanservice.noaa.gov, and nationalgeographic.org. All of these are credible sources worth investigating.
4. If the topic is completely unfamiliar, it can be useful to begin by reading the Wikipedia entry, if one is available. This gives a general overview that will help you absorb the more complex articles found in the search results. Often, you can find related links in the entry or works cited.
5. Search for the topic on YouTube as well. Seeing visual representations of the material can help cement the key concepts and make the information more memorable. Start with videos that are short. If you are interested in the topic, you can find longer videos if you want to learn more. When choosing a video from the search results, consider the origin (who posted it), how old it is, and how many views it has. For instance, a YouTube search for "Global positioning system" may come up with multiple videos with hundreds of thousands of views that are under five minutes. Videos can be a great way to give you an overview of the topic in a short period of time.
6. If you need extra support, the preliminary research can be done by an adult who can look for one or two articles that present the information in a clear way without too much jargon. Diagrams and other visuals can be particularly useful. Also, find one or two videos that seem relevant and engaging. An adult can usually do a quick review of the material without reading or watching every piece. This lets them develop a list of two to four recommended resources for the weekly reading in about ten minutes.
7. As you advance through the course, you can learn to take on the tasks of identifying relevant sources. This can be done together with an adult at first until you gain confidence and skill.

Evaluating Internet Sources

You'll have plenty of opportunities to do online research, and you are encouraged to find videos, images, and articles about any of the topics you find interesting. The best way to learn is to follow your interests in any given subject. Be aware, however, that many online resources have no basis in fact and even commonly used resources like Wikipedia are full of errors and half-truths. When doing research online, be sure to examine who is writing what you are reading. Consider their intent and inherent bias. Materials produced by colleges and universities and written by well-known scholars are your best bet for finding meaningful, relevant information to help you with your course.

When you do online research, avoid drawing conclusions before you've checked the information for reliability. Often, you can tell when a website contains bias or is opinion-based. Some sites look very convincing, but contain information that is not supported by scientific evidence or experimentation. When you are uncertain of a source's reliability, consider the following criteria before you decide to use the information in your research:

- The authors make their case based on adequate evidence.
- The authors interpret the data cautiously.
- The authors acknowledge and deal with opposing views or arguments.
- The authors give a list of current sources that support their claims.

Some characteristics of unreliable websites require practice to identify. One trick is to look at the sources that are linked in the article you want to verify. These links can give you some idea of reliability. If your source is linked to a number of questionable sites, it's probably not a good source. Characteristics of unreliable websites:

- The authors make extraordinary claims with little supporting evidence.
- The authors relate evidence based on personal experience instead of referring to controlled studies.
- The author appeals to emotion rather than logic.
- The authors misrepresent or ignore opposing views.
- The arguments are biased to support a political or economic agenda.
- The site is linked to sites that support a particular political or economic agenda.

You will find a resource page for this course on the Oak Meadow website (www.oakmeadow.com/curriculum-links/). This page will include a variety of online sources that you might find useful in this course. These links are meant to help you in your research, not take the place of it—consider them a starting point.

How to Read Research Materials

It can be challenging to absorb research materials, particularly if they are written for adults instead of teens. Here are some tips:

- Pay attention to the key concepts, section headings, and main ideas in any article or text you are reading. It is helpful to look over the entire piece to get an idea of what it covers before you begin reading it.
- The most important words to focus on are the ones you don't understand. Take the time to look up words you don't know so you can comprehend what you are reading.
- Pay special attention to the images! This cannot be emphasized enough. The diagrams, maps, charts, and illustrations are sometimes easier to understand than the text. They often provide information in a way that your brain can make sense of more readily and will help you better understand what is written.
- Learn how to take good notes. Find a method of note-taking that works for you, and use it to keep track of key ideas while you read.
- Use your notes! Taking notes is helpful for storing information in your long-term memory, and referring to them when completing your assignments helps jog your memory, letting you make more meaningful connections between topics.

Project Tips

Throughout this course, you will have the opportunity to develop many projects of your own design, based on your interests and questions that are important to you. Here are some tips that will help you with designing and creating meaningful projects.

- **Choose a topic that engages your curiosity.** Choose a topic that you want to know more about, or consider tackling a topic or question that puzzles you. If you're having trouble finding a topic, talk to your teacher.
- **Start early!** Starting early also gives you time to revise your design as you learn more, change the focus, and prepare a presentation that means something to you.
- **Set small goals for yourself within the project.** For example, if you have one week in which to do a project, you may want to assign yourself daily goals. Small goals are easier to accomplish than one big project, and will help you track your progress.
- **Don't believe everything you read, hear, or watch.** Question the reliability of all of your sources, especially the news media outlets. Government agencies, professional associations, museums, or known scientific journals are generally reliable sources. It is important to confirm information by using a variety of sources.

- **Keep track of your notes.** Writing notes in your own words helps you retain information more easily. It is important to know which source your information comes from. Include citation information with your notes so you can go back to confirm data or gather more information as necessary.

Keep in mind that your project will be shared with others. Give some thought to the final form it will take, and try out different forms with each project. The goal is to convey your information or message in a way that others will understand or benefit from. Be clear about what information is factual and what is your opinion. Show how the evidence you gathered supports your conclusions. If you are using graphs or tables, make sure they are easy to read. When relevant, give details about how and where you got your information. Even if you are presenting your findings in a creative manner, you should be able to explain the facts behind your work.

Semester Reading Project

In addition to your assignments and projects in each lesson, you will read one additional book each semester. A list of book choices appears below. If you would like to read another relevant book not listed, discuss it with your teacher.

As you're reading your chosen book throughout the semester, use your critical and analytical faculties to assess the book, and your responses to it. Pay attention to passages in the book that intrigue you, frustrate you, or remind you of related subjects you may want to investigate more thoroughly. Jot down notes as you read—these will help you when you write your final project for each book (see lesson 2 for more details). You have the entire semester to read your book.

Work on your ability to synthesize the information you are reading, compare or combine it with information in other books, and to express the book's ideas in your own words with clarity and purpose. Novels, for example, though fictional, often contain valuable insights about life during a particular time period or in a particular place. Geography has connections to a wide range of other subjects, including science, history, and the arts, and learning about any of these can illuminate your understanding of geography.

Reading Project Selections: Nonfiction

An Inconvenient Truth: The Crisis of Global Warming by Al Gore

> Climate change, global warming, and our own responsibility in responding to it are brought into focus with vivid images and graphics. This book is a clarion call to action.

The Coming Plague: Newly Emerging Diseases in a World Out of Balance by Laurie Garrett

> As humanity expands and moves into new areas of the globe, technologies that enable our way of life also provide opportunities for diseases to flourish. This book examines the intersection between globalization, ecology, and disease.

How to Lie with Maps by Mark Monmonier

This clever and revealing book shows how people manipulate maps to sell their version of the truth, and gives readers the tools to evaluate maps with a healthy skepticism.

Krakatoa: The Day the World Exploded: August 27, 1883 by Simon Winchester

Connecting history and geology, this book describes the devastating volcanic eruption that claimed nearly 40,000 lives. Eyewitness accounts give a picture of humanity's exceptional ability to recover from disasters and rebuild.

A Crack in the Edge of the World: America and the Great California Earthquake of 1906 by Simon Winchester

Plate tectonics were responsible for the disaster in San Francisco, but the fire that was ignited by the earthquake raged for three days and burned much of the great city to the ground. This book explores how profoundly geological phenomena can affect human culture.

Before the Dawn: Recovering the Lost History of Our Ancestors by Nicholas Wade

Using DNA analysis, geneticists can trace the movements of a small band of human ancestors from East Africa about 50,000 years ago. This book explores genetic evidence regarding the origins of humanity, race, language, social behaviors, and cultural practices, and looks at how an evolutionary event is recorded in DNA.

Guns, Germs, and Steel: The Fates of Human Societies by Jared Diamond

A comprehensive look at how geography and environmental influences shape human society, this book, which won the Pulitzer Prize, traces a clear path of human development in each region of the world.

The World Until Yesterday: What Can We Learn from Traditional Societies? by Jared Diamond

Based on the author's experiences over 50 years in New Guinea and neighboring islands, this book details the traditional culture that, until recently, had little or no influence from industrial Western societies.

Collapse: How Societies Choose to Fail or Succeed by Jared Diamond

Why have so many ancient empires collapsed, leaving only elaborate and mysterious ruins? This book uses recent archaeological and paleoclimatic studies to explore the role of environmental factors in societal collapses.

Mountains Beyond Mountains: The Quest of Dr. Paul Farmer, a Man Who Could Cure the World by Tracy Kidder

This biographical book details the life of Dr. Farmer as he works to cure infectious diseases and improve the health and lives of people in Haiti, Peru, Cuba, and Russia.

Child of the Dark: The Diary of Carolina Maria de Jesus by Carolina Maria de Jesus

This journal chronicles life for the poor in Brazil's *favelas* (slums). A hard look at what the poor have to do to survive, this true account drew attention to social problems for the poor around the world.

Goodbye to a River: A Narrative by John Graves

Before a series of dams along the Brazos River in Texas are built, the author undertakes a final canoe journey to experience the natural beauty before it is forever changed.

Cadillac Desert: The American West and Its Disappearing Water by Marc Reisner

Water has defined the American West, from its earliest inhabitants to modern-day politics and business. This hard-hitting book exposes widespread corruption and ecological damage in the never-ending battle for water rights.

Diamond: A Journey to the Heart of an Obsession by Matthew Hart

Diamonds have captivated the passion and imagination since they were first discovered. This book explores how this gem has wielded its influence on environmental, social, political, and economic levels.

An American Plague: The True and Terrifying Story of the Yellow Fever Epidemic of 1793 by Jim Murphy

With a powerful narrative, the author traces the disease and its aftermath in Philadelphia, which was, at that time, the capital of the new nation.

The Endless Steppe: Growing Up in Siberia by Esther Hautzig

A true-life account of a family exiled to Siberia and learning how to eke a living out of the harsh land of the Siberian steppe.

Stuffed and Starved: The Hidden Battle for the World Food System by Raj Patel

A complex investigation of global food systems and why people are starving in some countries while other countries have such an abundance of food that it is wasted by the ton and elsewhere farmers are paid not to produce food. This book offers a glimpse at how to create a balanced, sustainable food system.

The Log from the Sea of Cortez by John Steinbeck

This book recounts the experiences of Steinbeck and a biologist friend as they explore the Gulf of California. A lively blend of science, philosophy, and adventure.

The Horse, the Wheel, and Language: How Bronze-Age Riders from the Eurasian Steppes Shaped the Modern World by David W. Anthony

How did so many modern languages spring from the same source? Combining archaeology, history, cultural migrations, and technological innovations, the author traces the spread of Indo-European languages from ancient history to today.

Banana: The Fate of the Fruit That Changed the World by Dan Koeppel

From jungle to high-tech labs, this entertaining and surprisingly revealing examination of a common fruit shows how human and physical geography interact and influence each other.

The Boy Who Harnessed the Wind by William Kamkwamba and Bryan Mealer

A true story of what happened when the author's small village in Malawi lost their crops to a severe drought. Kamkwamba's account of how he built a wind generator from scrap metal is an inspiring memoir.

The Snow Leopard by Peter Matthiessen

The moving account of a physical and spiritual journey into the remote mountains of Nepal, the author and a field biologist seek the rare snow leopard.

Desert Solitaire by Edward Abbey

As a park ranger and conservationist, the author offers a unique collection of poetic accounts of life in the desert.

Reading Project Selections: Fiction

Cry, the Beloved Country by Alan Paton

This dramatic, moving novel tells the story of a Zulu pastor in South Africa and his son, living through the social injustices of apartheid. Considered a classic work showing how courage and dignity shine through during humanity's most challenging times.

The Years of Rice and Salt by Kim Stanley Robinson

The Black Death killed 30 percent of the population of Europe during the fourteenth century. In this science fiction epic, the author asks: What if it had killed 99 percent instead? This story presents a 700-year "alternate history" of what the world might have looked like without European colonization.

The Poisonwood Bible by Barbara Kingsolver

The setting of the Belgian Congo provides a rich backdrop for this novel about a family who moves from the United States to Africa to work as missionaries in a place where the natural world strongly influences the lives of the native people and the newcomers alike.

Things Fall Apart by Chinua Achebe

This illuminating tale from African author Achebe portrays life in Nigeria before and after colonial rule. Complex characters and cultural conflict create an authentic story with great depth and relevance.

A Thousand Splendid Suns by Khaled Hosseini

Afghan-born Hosseini tells the story of two women living in Afghanistan under the Taliban rule. Mirroring the harsh realities of the country, their brutal lives draw them together in unexpected friendship and love.

The Alchemist by Paulo Coelho

When a young shepherd goes on a quest in search of hidden treasure, his travels take him from Spain to Egypt, gathering along the way inner knowledge more valuable than the riches he seeks.

Treasure Island by Robert Louis Stevenson

A classic novel that combines geography and a detailed sense of place with an exciting search for pirate treasure. Memorable characters and lively action create a story for the ages.

The Winter King by Bernard Cornwell

A King Arthur tale that takes the reader from Wales to Scotland to Britain. Geography and history are woven together as the landscape shapes the characters and their actions.

The Call of the Wild by Jack London

Based on the author's experiences and fascination with the Klondike, this classic adventure story follows a dog who is pushed into the harsh environment and brutal greed of the Klondike Gold Rush.

Key Twenty-First Century Skills and Competencies

As culture and technology have modernized and globalized, key essential skills have emerged. Rather than the emphasis on memorization and single-view answers, citizens today are encouraged to think broadly and flexibly. This applies to educational, political, and social realms. In this course, you will be engaging skills such as the following:

- Identify main ideas and supporting details.
- Use contextual clues to make inferences.
- Analyze cause and effect.
- Compare and contrast to identify similarities and differences.
- Summarize data.
- Draw conclusions.
- Make predictions.
- Analyze media content (images, political cartoons, ads, etc.).
- Analyze primary and secondary sources.
- Consider divergent viewpoints.
- Identify bias and differentiate between fact and opinion.
- Organize data in a variety of ways.
- Read maps, charts, graphs, and tables.
- Pose informed questions.

- Avoid plagiarism.
- Evaluate the validity of a source.
- Identify patterns and trends.
- Synthesize information from a variety of sources.
- Organize ideas in a logical way.
- Support ideas with evidence.
- Give an effective presentation.
- Participate in a discussion.
- State an opinion and defend it with supporting evidence.
- Write an essay.
- Take into account cultural influences.

This list can help guide your studies as you strive to develop the skills necessary in today's world.

For Students Enrolled in Oak Meadow School

If you are enrolled in Oak Meadow School, you will receive a Google course doc from your teacher that may modify the course in order to allow more customized engagement. Please make sure to examine this course doc closely so that you understand what is expected of you in terms of course content and individual assignments. After submitting work, continue working on your next lesson while you are waiting for your teacher to send lesson comments. You will receive a first-semester evaluation and grade mid-year, and a final evaluation and grade at the end of the course. These grades will be recorded on your Oak Meadow high school transcript.

Please place your responses in the Google Drive course doc provided by your teacher. Your teacher will give you feedback on your work in this shared Google doc, so the more work that can be put there, the better. Activities and projects that are completed by hand can often be photographed or scanned and linked to your course doc (detailed instructions on how to do this are provided in the appendix). This is the preferred method since all your work stays in one place, as do your teacher's comments.

You are expected to meet your work with integrity and engagement. Your work should be original and give an authentic sense of your thoughts and opinions, rather than what you think the teacher reviewing your work wants to hear. When you conduct your research, you are required to cite your sources accurately. Plagiarism, whether accidental or intentional, is a serious matter. Please see the appendix for guidelines on recognizing and avoiding plagiarism. It is your responsibility to make sure you understand these academic expectations and abide by them.

Please remember to stay in touch with your Oak Meadow teacher and share your comments, ideas, questions, and challenges. Your teacher is eager to help you.

Enjoy this exploration into the geography of the world!

UNIT I: Earth, Our Home Planet

(Image credit: Max Pixel)

Lesson

1

Geography Skills

Learning Objectives

- Learn about tools and terms of geography.
- Compare and analyze different map projections.
- Make inferences based on a special purpose map.
- Explain how world maps can reflect the political and cultural bias.

Geography is a multifaceted discipline that combines elements of science, statistics, history, and the humanities. For your first lesson, you'll familiarize yourself with the tools and strategies of geographic study, so that you can effectively assess the information presented throughout the rest of the course.

A representation of what Anaximander's map may have looked like (Image credit: digitalmapsoftheancientworld.com)

ASSIGNMENT CHECKLIST

- ☐ Learn about tools and terms of geography.
- ☐ Answer comprehension and critical thinking questions.
- ☐ Begin drawing a world map.
- ☐ Answer the Central Question.
- ☐ Choose an optional activity:
  - Activity A: Roadtrip!
  - Activity B: U.S. Census
  - Activity C: Landscape Model
  - Activity D: Mapmaking
  - Activity E: Visitor from Another Galaxy

The most important tool to the geographer, of course, is the map. It is believed that the first map to represent the known world was made by the Greek philosopher Anaximander in the sixth century BCE. Anaximander was more than a philosopher—he also wrote and speculated on the subjects that we now know as biology and astronomy. Sadly, his map itself no longer exists, but it was described by another Greek philosopher, Herodotus, in his writings. Shaped like a circle, the map showed the known land areas grouped around the Mediterranean Sea at the center and surrounded by ocean.

Maps are useful for navigating the imagination as well as the physical world. Anthony Trollope, Thomas Hardy, Sinclair Lewis, and Robert Louis Stevenson all drew maps to help readers picture characters in their literary landscapes. Fantasy authors such as Ursula K. LeGuin and J. R. R. Tolkien also created maps of imaginary places to bring life to the fictitious worlds that their characters inhabit.

In addition to learning how to interpret maps and other graphical information sources such as charts and tables, you'll acquire a geographic vocabulary. The terms that geographers use to describe the Earth come from many different languages. For example, the term *tsunami* is a Japanese word meaning "harbor wave." *Mesa* is Spanish for "table." *Fjord* is a Norwegian word meaning "long, narrow bay."

Modern geographic study has its origins in the work of early nineteenth-century scientists, such as Germany's Alexander von Humboldt, often called the "father of modern geography." Humboldt and other pioneers began to describe, classify, measure, and compare geographic features and to study the interrelationship of humans and the environment. Since then, geographers have extended the frontiers of geographic knowledge by collecting vast amounts of data, analyzing the information, and recording their results in charts, graphs, maps, and text. Scientific instruments, such as satellites and computers, gather and organize data that is used by geographers, planners, and governments. Computers have revolutionized the process of mapmaking, providing much greater precision, and making rapid changes possible.

In this course, we will explore the five main themes in geography:

1. Location on the Earth's surface
2. Place (physical and human characteristics of a place)
3. Human/environment interactions (shaping the landscape)
4. Movement of humans
5. Regions (how they form and change)

When geographers study the Earth in spatial terms, they focus on where places are located. Location can be expressed as absolute location or relative location. Geographers also group places into regions with similar physical or human characteristics. They study the Earth's physical systems, such as the effects of natural phenomena and ecosystems. Geographers also look at human systems, including how and where people create settlements, form societies, build permanent features, and migrate. Human-environment interaction focuses on the relationship between people and their physical environment.

Reading

Learn about the following tools and terms of geography. If you choose to use a textbook as a resource, any high school geography textbook can be used. However, consider a textbook only as a starting point, and do further research. In addition to reading articles, news items, and other texts, look for videos, podcasts, radio programs, and visual media such as graphs, diagrams, charts, and other ways of looking at data. The more different types of information you find, the more likely you are to fully grasp the information and apply it in the assignments.

- Latitude, longitude, and location
- Planar, cylindrical, and conic map projections
- Geographic information system (GIS)
- Global positioning system (GPS)
- Map symbols and scales
- Physical maps, political maps, and special purpose maps
- Line, bar, and circle (pie) graphs

You can use the assignments and activities in each lesson to help you focus your research efforts and identify helpful sources of information. You will need to understand the reading topics in order to complete the assignments in this course. Check the Oak Meadow web page for relevant curriculum resource links (www.oakmeadow.com/curriculum-links/). Get in the habit of checking this page frequently.

You will be doing a great deal of research and reading in this course. In order to help you manage the amount of reading successfully and retain information effectively, use these reading strategies:

Pay attention to the main ideas in whatever text you are reading (textbook, primary sources, websites, news articles, etc.). Take notes as needed and after each section, ask yourself if you understand and can explain what you just read. If not, review the reading section until you understand the material.

Study all the maps, photos, graphs, diagrams, illustrations, and other graphics you might run across, and read all the captions. This will greatly expand your understanding of the material.

Give yourself a quiet place to study when you are reading, and stop frequently to check your comprehension. Take breaks so you don't get overloaded.

Ask for help if you need it to locate or understand the resource material. Whether you are enrolled in Oak Meadow School or working on the course independently, reach out for help. Find people who can support your learning.

Comprehension and Critical Thinking Questions

Use the information you gathered in your reading and research to complete the following assignments. Use accurate terminology and apply the concepts you have learned as you formulate your responses.

1. Draw or describe the global grid and explain how a specific location can be pinpointed on Earth. Give a specific example in degrees, minutes, and seconds of latitude and longitude. Use where you live or the location of a major city or landmark.
2. Explain the difference between the Winkel Tripel Projection, Robinson Projection, Mercator Projection, and Goode's Interrupted Equal-Area Projection. What do you think is the most helpful projection and why? Are some better for certain purposes? Feel free to include other projections when answering this question.
3. Find examples of special-purpose maps in the library or on the internet. Special-purpose subjects include bicycle routes, the path of killer bees, ocean currents, energy use, and pizza delivery routes. Even the treasure map that opens Robert Louis Stevenson's classic adventure story, *Treasure Island*, is a special-purpose map. Explain what the map shows and what information you might infer from the map.
4. Explore a dictionary of geographic terms, such as the one found online at www.physicalgeography.net/glossary.html. Find three terms specific to geography that are new to you and give a brief definition.

Mapping the World

During this course, you will be creating a world map, drawing by hand each region as you study it. Drawing this map will help you gain a clear understanding of how different regions compare and relate to one another in terms of location, land mass, and natural features. You might prefer to use a drawing tool on the computer. Drawing the map freehand—either on paper or digitally—will allow you to carefully study the political borders and natural features. Simply printing a map or outline and coloring it in will not give you the same experience and depth of understanding.

You will be working on this map for the whole year. It will be a physical and political map, showing both the natural landforms and political (national) boundaries. Your map will not be judged on your artistic abilities, so don't worry about how well you draw. Mapmaking is a skill that requires precision and attention to detail—artistic ability is just a bonus! Your work will be assessed based on your care and effort, not your drawing skills.

If you add to your map as you study each region, the project will not be overwhelming or too time consuming. You'll need a large piece of paper (or several taped together) and colored pencils or markers. It's probably a good idea to first trace in borders and shapes of land masses in pencil so that you can make sure the scale is reasonably accurate before you color it in or make the lines darker.

Read all the instructions below before you begin to draw.

1. Start your map by choosing which projection to use as your model. When you have decided, you might want to print a copy to use for reference.
2. Taking into account the size of your paper, lightly draw lines for the seven continents: North America and South America (with Central America connecting them), Europe, Asia, Africa, Australia, and Antarctica. Take your time to make sure that you have an accurate, consistent scale. Once you are happy with your representation, you can darken the lines (or you might want to leave them light for now, and darken them as you add countries to each continent).
3. Label the oceans.

Once you've finished, find a safe place to keep your map. It may work best to pin it to the wall. That will keep it out of the way, and you'll have it to refer to as you move through this course, adding detail with each lesson.

Central Question

The Central Questions in this course are designed to help you zero in on the underlying themes of what you are studying. Take your time pondering these questions and discussing them with others before forming your response. Feel free to include examples, graphics, current events, and any other information to help you get your point across effectively.

How do world maps reflect the political and cultural bias? Is there a way to create an accurate world map that is free of bias?

Activities

Throughout the course, you will find a variety of optional activities. Please read all the activities first before selecting one that interests you. These activities will help deepen your understanding of the material in this course. None of these optional activities are required but all offer an opportunity to expand your knowledge and experience.

- Activity A: Roadtrip!
- Activity B: U.S. Census
- Activity C: Landscape Model
- Activity D: Mapmaking
- Activity E: Visitor from Another Galaxy

Activity A: Roadtrip!

Use an atlas or other resources to plan a cross-country trip through the United States. Choose a definite starting point and destination, and plot your route between the two points. Calculate the approximate distance of the journey, how long you estimate the journey will take, and list the points of interest you'll visit along the way. Draw up an itinerary that shows how long it will take to travel between points of interest, and where you will spend the night along the way.

Activity B: U.S. Census

Research the most recent U.S. Census. How is the population distributed throughout the United States? Where are particular ethnic groups concentrated? Which states have lost population since 2000, and which states have gained population? How do the census results affect the U.S. House of Representatives? Report your answers to these questions in the form of bar graphs. For instance, you might make a bar graph comparing the number of congressional representatives from different states.

Activity C: Landscape Model

Use clay to mold a model landscape with specific geographic features. If you wish, paint the model after the clay dries to make it more realistic.

Activity D: Mapmaking

Make a map. You can choose to make a map of your room, house, neighborhood, town, or make up a completely fictional map all your own. Your map should include not only names of places and appropriate boundaries, but also a compass rose and a map key.

Activity E: Visitor from Another Galaxy

How would you describe the Earth to a visitor from another galaxy? Brainstorm the facts and impressions about planet Earth that you might want to communicate. Describe physical features, our location in space, and the inhabitants of the planet (including human systems). Create a poster displaying your ideas.

SHARE YOUR WORK

If you have any questions about the assignments in this lesson, please contact your teacher. Oak Meadow students should consult their teacher's welcome letter and Google course doc for information on which assignments to focus on, and when and how to submit your work.

Lesson

2

Human Geography

Learning Objectives

- Identify examples of the human-environment interaction.
- Use one specialized research method to gather local geographical information.
- Distinguish between fact and opinion in news articles.
- Determine positive and negative effects of cultural or spatial diffusion.

> *"As the world grows smaller and more interdependent daily, our country's future absolutely depends on our ability to see the connections between ourselves and our global neighbors."*
>
> **Gilbert M. Grosvenor, chairman of the National Geographic Society**

How does the physical geography of the Earth influence culture? Geographers aren't just concerned with the Earth, but with how people influence Earth systems and are affected by them. The following global issues are of special concern to geographers:

- climate patterns and the ability to predict weather
- issues of population growth and density
- the impact of human activity on the environment
- the impact of physical geography on human systems
- the location, distribution, development, and conservation of the planet's resources

ASSIGNMENT CHECKLIST

- ☐ Learn about the interrelatedness of humans and the environment.
- ☐ Answer comprehension and critical thinking questions.
- ☐ Answer the Central Question.
- ☐ Choose an optional activity:
  - Activity A: Family Origins
  - Activity B: Spatial Diffusion
  - Activity C: Politics and Geography
  - Activity D: World Trade

By investigating the relationships among human activities, the Earth's physical systems, and the environment, the study of geography can contribute to a better future for the world.

Geographers use research methods and tools to study places and human activity, including direct observation, mapping, interviewing, statistics, and technology. Geographers study the relationships among the physical and human features of the Earth by using other disciplines such as history, government, culture, and economics.

Human, or cultural, geography looks at all aspects of human activity in relation to the physical environment. It includes analyses of human-constructed geographic features, such as settlements and political entities, and lines of communication and transportation. Cultural geographers investigate how human population growth, distribution, migration, and density affect Earth's physical and human systems. They also research human cultural features, such as languages and social groupings, as well as economic activities. Industries, for example, rely on cultural geographic studies for data concerning the uses of raw materials, the recruitment of labor, and marketing of products. The building of transportation facilities, highways, and resorts also depends to some extent on the findings of cultural geography.

Global population is growing rapidly, placing more demands on food and water supplies. Population distribution varies greatly from place to place, often as a result of migration from villages to cities for better economic opportunities or from country to country due to wars, food shortages, or lack of jobs.

Language, religion, politics, and economic activities may define cultural groupings. Today cultural diffusion has increased rapidly due to globalization and the Information Revolution. While renewable resources can be used as needed, nonrenewable natural resources need to be conserved to meet future needs. Developed countries have manufacturing and service industries and high standards of living. Developing countries are shifting from agricultural to industrial economies. The uneven distribution of natural resources promotes world trade and can lead to drastic cultural changes as developing countries are forced to make decisions that threaten their traditional lifestyles and ecosystem sustainability. Economic activities have led to increased pollution of the air, land, and water, causing damage to ecosystems.

Issues of trade, environmental protection, and human migration transcend national boundaries, making various parts of the world interdependent. One of the geographer's greatest challenges is to explore how the planet's limited resources might best be managed and distributed.

Reading

Use a variety of sources to research the following topics. If you find a topic that is of special interest to you, feel free to explore it in detail. This information will be needed to complete the assignments below.

- Specialized geographical research methods (direct observation, mapping, interviewing, statistics, and technology)

- Positive and negative population growth
- Patterns of population density and migration
- Natural resource management in developing countries
- Cultural diffusion
- Spatial diffusions (of language, disease, habits, etc.)

In addition to reading text sources, you can view videos, listen to podcasts and radio programs, and search out graphs, diagrams, charts, and other data sources that support your understanding of these topics. Remember to check the Oak Meadow web page for curriculum resource links.

Check out the website *radio.garden* to listen to radio in the places you are studying to get a sense of the culture. Experiment with the navigation tools as you spin the globe and tune into radio stations around the world.

Comprehension and Critical Thinking Questions

Use the information you gathered in your reading and research to complete the following assignments, using accurate terminology, and applying relevant data in your answers.

1. Why might geographers be interested in learning about the history of an area? Explain how humans can affect geography and how geography can affect humans. Choose a specific area of the globe and provide several concrete examples.
2. Select one of the specialized research methods used by geographers: direct observation, mapping, interviewing, statistics, and technology. Gather geographic information about your neighborhood, using only your chosen research method. Report your findings. How does each research method contribute to an overall understanding of the geography of the neighborhood? By which method do you think you would obtain information most easily? What was your greatest challenge using your chosen method?
3. Research and read three articles in print or digital media regarding the issue of global population. Choose the article you find the most convincing, authoritative, and believable, and analyze it using the following criteria:
    a. Write an outline for the article (using a two-column note-taking system or other graphic organizer) that shows the main ideas and supporting evidence.
    b. Identify whether each piece of supporting evidence is fact or opinion.
    c. Excerpt specific passages and explain how you determined whether it was fact or opinion.
    d. Note which pieces of evidence reference primary sources and which use secondary sources. Give at least one example of each.

e. Finally, write a brief explanation about why you found this article most convincing of the three you read. List specific ways in which this article differed from the other two in terms of credibility.

f. Include a citation for each of the three articles. (See the appendix for how to cite sources.)

Semester Reading Project

Choose one book to read for this semester, either from the list provided in the Introduction or a book on another topic related to geography. (Enrolled students: Contact your teacher for more suggestions.) When you complete the book, you will give a brief summary and then reflect on it through the mirror/window/door lens.

Mirror: How does this book reflect the progress of humanity and the current state of the world? How does it relate to your own experience?

Window: How does this book show things from a new perspective? What unique view does it offer? What new ideas did you pick up?

Door: What opportunities does this book point the reader toward? In what ways does it suggest next steps or ways to use the information effectively for the benefit of Earth and humanity?

Acquire your chosen book and begin reading. This assignment is due at the end of the first semester.

Central Question

How does cultural and/or spatial diffusion affect global population? Can an idea or innovation have a positive effect in one area and a negative effect in another? Can it have both positive and negative effects in one culture at the same time? Choose a specific example and region to support your thoughts.

Your response should include at least one relevant graphic, or can be presented entirely in visual form. Make sure the graphics, images, charts, and other visuals clearly express your ideas on the topic. Often a combination of text and graphics are the most effective way to get your ideas across.

Activities

The following activities are optional. Feel free to choose any activity that interests you.

- Activity A: Family Origins
- Activity B: Spatial Diffusion
- Activity C: Politics and Geography
- Activity D: World Trade

Activity A: Family Origins

Interview family members or a family friend to find out where they or their ancestors came from. Using a large outline map of the world, place colored dot stickers on your family's places of origin. To accompany your map, write a brief essay about how you think these cultural origins have influenced your family's lifestyle, traditions, or experiences.

Activity B: Spatial Diffusion

Draw a map that shows the spatial diffusion of a language, belief, commodity, or disease (such as the bubonic plague). Then, write a description of the phenomenon's effects on regions of contact.

Activity C: Politics and Geography

Research the current foreign policy positions of selected nations, such as the United States, Japan, Israel, and the United Kingdom, regarding the government of a country in the Middle East. What geographic factors might shape the positions taken by these countries on this issue?

Activity D: World Trade

Look at issues of world trade as interpersonal relationships played out on a global scale, with a similar need to pay attention to issues of communication and respect. Then, write a short play about a trade negotiation between two countries in the form of a two-person conversation.

SHARE YOUR WORK

When submitting work to your teacher, make sure everything is clearly labeled and organized. Link any scanned photos, illustrations, etc. to your course doc (if you are using one) or send copies to your teacher as an email attachment. If you are unsure about how to submit any of your projects or assignments, please contact your teacher.

Let your teacher know what book you have chosen for this semester's reading project.

UNIT II: North and Central America

NASA satellite image of Central America and part of Mexico (Image credit: NASA World Wind Globe)

Lesson

6

Landforms of the United States and Canada

Learning Objectives

- Explain the formation of natural landforms.
- Identify how physical geography, climate, and ecosystems influence the daily lives of a region's inhabitants.

The United States and Canada share the largest part of the North American continent, which also includes Mexico, Central America, and the Caribbean Islands. The United States is the world's fourth largest country, and Canada is the second largest after Russia. Canada extends southward from the North Pole to the U.S. border. From east to west, Canada extends over six time zones. The United States and Canada share a 5,523 mile (8,893 km) undefended border (including Alaska) and similar topography. The physical geography, the natural resources, and the climate and vegetation of this large and spacious region are tremendously diverse.

Canadian Rocky Mountains (Image credit: publicdomainpictures.net)

ASSIGNMENT CHECKLIST

- ☐ Learn about the geography of the United States and Canada.
- ☐ Answer comprehension and critical thinking questions.
- ☐ Draw natural features of the U.S. and Canada and add map key to your world map.
- ☐ Answer the Central Question.
- ☐ Choose an optional activity:
  - Activity A: Travel Brochure
  - Activity B: When the Levee Breaks
  - Activity C: Klondike Gold Rush
  - Activity D: Hawaiian Islands

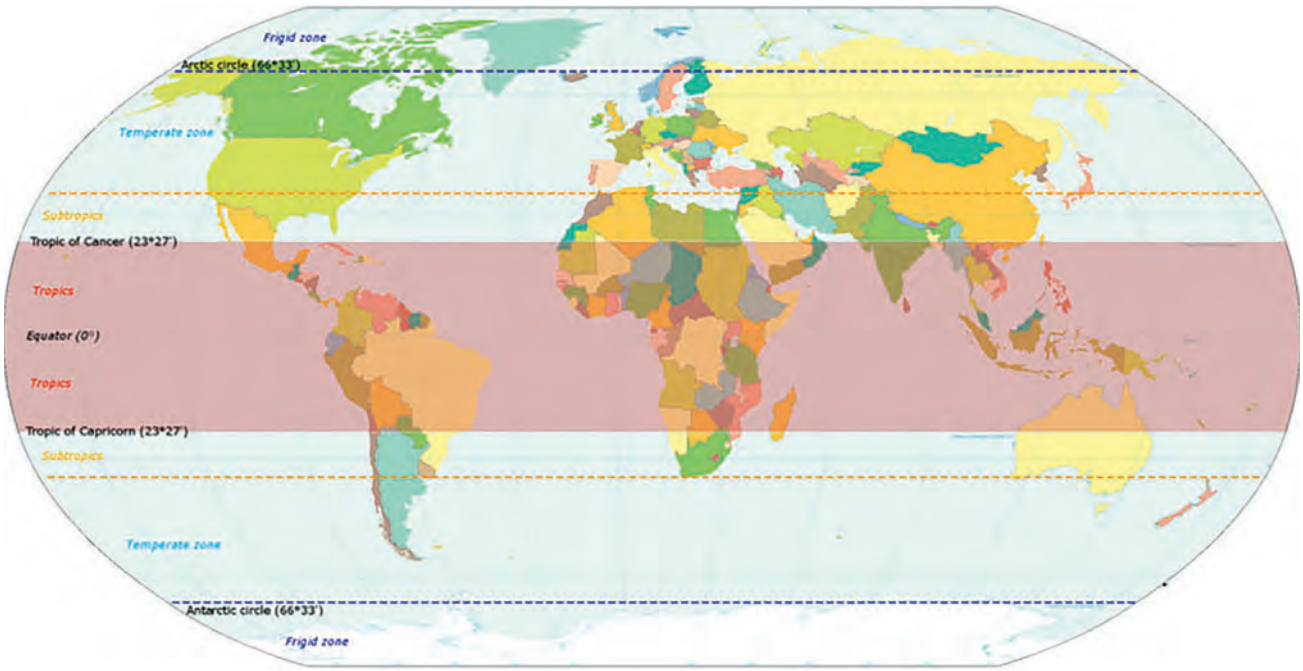
The Central Plains extend some 400 miles across the central part of the region. The Canadian Shield anchors the continent in the northeast, and the Appalachian Mountains, the oldest mountains in North America, run from Quebec to central Alabama.

Geographic forces helped shape two major mountain ranges in the west—the Pacific Range and the Rocky Mountains. Dry basins and plateaus are located between these ranges. The Continental Divide of the Americas is a high ridge running in a north/south direction, separating the continents' river systems and causing them to flow either into the Pacific Ocean or the Atlantic Ocean (or the Gulf of Mexico).

Lakes and rivers provide the United States and Canada with an abundant supply of water for industrial, agricultural, and recreational uses. Glaciers carved out basins north of the central plains of the United States that later became the Great Lakes. The St. Lawrence Seaway links the interior region of the Great Lakes with the Atlantic Ocean.

The continent provides a variety of natural resources: oil and natural gas reserves, minerals, and timber. Fisheries are located on both the Pacific and Atlantic coasts. Only about 5 percent of Canada's land is arable; the United States has about 16 percent arable land.

The climatic conditions in Canada and the United States vary tremendously depending on latitude, elevation, ocean currents, rainfall, and location. The islands of Hawaii have a tropical climate and the Florida Keys enjoy a subtropical climate, whereas large parts of the northern region of Alaska and Canada consist of subarctic and tundra climate zones. Although many people think of Canada's climate as completely subarctic, much of the country is temperate. Canada's southernmost point, Pelee Island, at the tip of the peninsula of southern Ontario, is located south of 11 U.S. states.



(Image credit: Genetics4good, Wikimedia Commons)

The coastal climates vary from Mediterranean along the southern California coast to a marine west coast climate from northern California to southern Alaska. Humid subtropical wetlands and swamps dominates the Southeast, while the humid continental climate with deciduous and mixed forestland extends from the northeastern United States into southeastern Canada.

Reading

Conduct research using a variety of sources to become familiar with the following landforms and geographical features, paying particular attention to how each was formed and how it influences the region's plants, animals, and humans:

- Continental Divide
- Great Lakes
- Rocky Mountains and Pacific Range
- Hudson Bay
- Gulf of Alaska
- Bering Sea and Bering Strait
- Hawaiian Islands
- Mojave Desert
- Everglades
- Yukon Territory

Take note of informational graphics, and look for patterns or trends as you explore the material in this lesson. Use the concepts, terms, and information you have learned in your assignments and projects. Use the Oak Meadow web page for curriculum resource links as a starting point for your research.

Comprehension and Critical Thinking Questions

The following assignments can be completed using written explanations, diagrams, or both. Make sure diagrams are clearly labeled, and have titles that indicate what they show.

1. Explain how moisture reaches the Great Plains.
2. Explain how weather patterns and landforms have created the Mojave Desert.
3. Name at least three landforms or geographical features shared by the United States and Canada.
4. Describe the climate and vegetation of the Arctic regions.
5. Explain how the Great Lakes were formed.

Mapping the World

In this lesson, you will be adding detail to the United States and Canada on your world map. Read all the instructions first before you begin drawing. Refer to the lines of latitude and longitude, as well as your map model, to help you create an accurate representation.

1. Begin by carefully drawing the borders between the United States and Canada, including the line dividing Alaska and the west coast of Canada. Take your time, drawing it lightly at first, and making any corrections necessary to get it reasonably accurate.
2. Add the Great Lakes, labeling each one.
3. Draw and label the major bays and islands in northern Canada and along its Atlantic and Pacific coasts. You don't have to try to include every single thing—just choose the major landforms and water features.
4. Add the major mountain ranges and rivers. Label them. You can decide how you'd like to indicate mountain ranges. Look at a variety of maps to get ideas. Use your discretion when deciding what mountain ranges and rivers to add—this is your map and you can make it as detailed or simple as you like.
5. Finally, add a map key in one corner of your map. In this key, draw the symbols you are using and label them. For instance, you might have a symbol like this Δ to show mountains, and blue lines to show rivers.

Semester Reading Project

Have you begun reading the book you chose for the semester reading project? If you have, you may want to keep a reading journal so you can jot down ideas of interest to you. Your final project will be more successful and easily created if you have notes to guide you (see lesson 2 for details on this project).

Central Question

How do the physical geography, climate, and ecosystems of the United States and Canada help define the daily lives of the people who live there?

Answer this question in the format of a travel article or brochure that highlights five different areas of the United States and Canada. Include sketches, maps, photos, and personal anecdotes (blogs are a good source for this) to enrich the narrative.

Activities

Use these optional activities to help deepen your understanding of the lesson material.

- Activity A: Travel Brochure
- Activity B: When the Levee Breaks
- Activity C: Klondike Gold Rush
- Activity D: Hawaiian Islands

Activity A: Travel Brochure

If you live in the United States or Canada, describe the climate and location where you live. (If you live elsewhere, choose a place in the United States or Canada to write about.) Name some geographical features that distinguish your region, such as rivers and other bodies of water, mountains, plains, and deserts. If you were writing a brochure for your local Chamber of Commerce, what aspects of climate and physical features would you emphasize? Why do you think other people might choose your region as a place to live?

Activity B: When the Levee Breaks

Levees, which are embankments built along waterways to prevent flooding, allow people to use the natural floodplain. When it rains, the level of the river contained by the levee rises, and the river flows faster. As the river's pressure increases, levees may break or overflow. Research what happens when a levee bursts. Why is flood damage from a broken levee more severe than damage from a river overflowing its natural banks?

Activity C: Klondike Gold Rush

Read "The Cremation of Sam McGee" (1907), a humorous poem by Robert Service that is set during the Klondike Gold Rush. Write an essay analyzing the role of geography in the poem, or use Service's style as inspiration for your own poem about this region.

Activity D: Hawaiian Islands

Do some research and create a graphical report on the formation of the Hawaiian Islands. Be creative and illustrate the processes by which these islands came to exist, and the origins of their landforms and features. How are these processes continuing today? To help explain the process, you may choose to develop an animated presentation.

SHARE YOUR WORK

When you have completed this lesson, share your work with your teacher. If you are unsure about how to submit a project, let your teacher know.

Lesson 17/18

Semester Project and Lab

Learning Objectives

- Explore an aspect of world geography.
- Complete an experiential laboratory activity.
- Reflect on the learning process and perform a self-assessment.

ASSIGNMENT CHECKLIST

- ☐ Explore any topic of interest.
- ☐ Perform one of the lab activities.
  - Lab Choice A: Practicing Sewer Science
  - Lab Choice B: A Sporting Chance of Success
  - Lab Choice C: Inca Engineering
- ☐ Complete a learning reflection and self-assessment.

Student-Designed Project

For your final self-designed project in the first semester, you are encouraged to try something different. Choose a topic related to what you have studied so far that you'd like to learn more about. Rather than focusing on producing a project to share, this time you will simply write about your experience. If you do end up creating something you'd like to share, please do! However, this project is really a chance for you to spend time with a topic that you are interested in or curious about. You might spend time researching and reading, watching a movie or video, creating or viewing art or maps, experimenting with models, observing natural phenomena, or any other method that lets you learn more about what you are interested in.

No matter what you do, write down your thoughts and ideas about the process in journal form. Jot down a few notes about what you did and what you learned. Journal writing doesn't require the use of complete sentences or organized paragraphs. Just capture your experience somehow.

Midterm Lab Project

You are now halfway through the World Geography course, and will wrap up the first semester with a hands-on laboratory activity. For your project, choose one of the activities listed below. You need only choose one of these labs to complete. On the Oak Meadow web page for curriculum resource links, you'll find articles that can help your understanding of the lab topics.

Read the overviews for each of the three labs before making your choice. Read all of the lab instructions for your chosen lab and assemble everything you need before you begin. (If it is hard to find materials for a particular lab, you may want to choose a different one.)

Complete instructions for each lab are found at the end of this lesson.

Lab Choice A: Practicing Sewer Science

Clean water is one of the Earth's most important resources. People cannot live without clean water. Many everyday human activities create wastewater, or water that is unfit for human consumption and use. Wastewater must pass through a sewage treatment system before reentering the community water supply. Many communities are looking for more efficient ways to directly recycle water from laundry, sinks, and tubs, which is called *gray water*, in order to keep it out of the wastewater treatment plants. This lab explores methods of water treatment to help you better understand the process.

Lab Choice B: A Sporting Chance of Success

Professional sports leagues are big business. High player salaries and huge stadiums are among the major expenses for the franchise owners. The income that each team's management receives comes from ticket sales, television and radio revenue, and sales of team merchandise. Hundreds of jobs are created in the team's home city when fans pay for tickets, food, hotel rooms, transportation, parking, and other services. In addition to the money and prestige that professional sports bring to a city, the events also provide entertainment and a source of local pride. All of these factors make choosing a team's location critical. In this activity, you will use population figures to analyze the locations of major sports franchises.

Lab Choice C: Inca Engineering

The Inca were master builders. Using tools of the hardest stone, the Inca carved blocks of another type of stone so precisely that they fit together perfectly without mortar. Inca structures have survived harsh weather and even earthquakes for more than 500 years. Some Inca buildings consisted of massive stones weighing up to 100 metric tons. After shaping the huge stones, Inca workers moved them miles up mountain slopes. They used mud, gravel, or other materials beneath the stone to help it slide along the ground. These materials reduce the friction between the stone and the ground, making it easier to move the heavy stone blocks. Inca engineers did not have machinery or animals to help them. It took the efforts of hundreds of laborers using ropes to haul the massive stones up steep inclines.

Semester Reading Project

Your semester reading project is due. (See lesson 2 or 15 for details).

Learning Reflection and Self-Assessment

Complete the following learning reflection and self-assessment for your work in the first semester of this course. Consider each question carefully. Take the time to reflect on the experience before answering.

Answer the following questions using a scale of 1 to 10, with 1 representing the lowest or worst and 10 representing the highest or best.

On a scale of 1 to 10, how would you rate the quality of your work on assignments and projects in this semester? Explain why you would give yourself this rating, and how you might improve the quality of your work in the second semester.

On a scale of 1 to 10, how would you rate the amount of research you did for each lesson topic in this semester? Explain your rating, and how you might improve your research efforts in the second semester.

On a scale of 1 to 10, how would you rate yourself for effort in your work overall this semester? Explain your rating.

Thinking back on the semester, what stands out as your favorite part of the course so far? What did you like about it?

What did you learn in this course that surprised you?

What have you learned about yourself, and your strengths and challenges as a student?

If you could change or add something to the course, what would it be? Why?

Considering the quality and depth of your learning experience, and your overall effort, what grade would you give yourself in this course? Explain your reasoning.

SHARE YOUR WORK

When you have completed this lesson, submit the following to your teacher:

- Journal/thoughts on your self-designed project
- Lab report and data table
- Reflection and self-assessment
- Semester reading project
- Work from lesson 17/18
- Any other outstanding lessons or assignments

Notify your teacher when the work is ready for review.

Name _____

LAB

A

Practicing Sewer Science

Most water treatment facilities use a two-stage or three-stage process. First, wastewater passes through filters that remove large objects and solid waste. Oil and grease are skimmed from the remaining liquid, called *effluent sewage*, and chlorine is added to kill disease-causing microorganisms. In the second stage, the effluent is aerated, or exposed to oxygen in a tank, where beneficial microorganisms consume the remaining organic material. Additional chlorine is added to the water before returning it to the community water supply.

In this lab, you will be asked to write down detailed observations. Use clear, specific language in your descriptions, reporting only what you see. For instance, when describing an observation, you might write "In the first five seconds, the particles were swirling in a uniform mass. Within 10 seconds, they began to slowly drift straight down. Some of the lighter particles floated on top while heavier pieces sank to the bottom." Be as detailed as you can and use precise terminology and measurements whenever possible.

Objectives

- Observe different properties of pollutants.
- Observe how sediment (sludge) forms.
- Experiment with separating sludge from wastewater.

Materials

3 cups dirt

1 cup clean sand

1 cup clean pebbles or aquarium gravel

2 to 5 rocks, each about 1 inch (2.6 cm) in diameter

1 gallon tap water

1 cup salad oil

cooking baster

eyedropper

World Geography—Lab A: Practicing Sewer Science

4 clear plastic cups

small aquarium, goldfish bowl, or large transparent glass bowl

bucket

writing materials

Procedure

1. Read all the instructions before you begin.
2. Use a permanent marker to number the clear plastic cups 1–4.
3. Mix the dirt and water in a bucket. Use your hands or a stick to stir the mixture until it is well mixed. As soon as you stop stirring, the dirt will settle back to the bottom of the bucket, but that's okay.
4. Using the baster, fill cup #1 with the dirt-water mixture. Observe what immediately happens to the mixture. Use the chart below to record your observations (you can create your own chart if you need more room to write).
5. Add the sand, pebbles, and rocks to the bucket, and mix them with the dirty water.
6. Use cup #2 to scoop a cupful of this mixture. Observe what immediately happens, and record your observations.
7. Pour the salad oil into the bucket. Stir the mixture a few times.
8. Insert the baster several inches below the surface of the bucket's contents, and fill the baster. Transfer this material to cup #3. Record your immediate observations.
9. Fill the baster from the surface of the bucket's contents. Place this material in cup #4. Record your immediate observations.
10. Without mixing the bucket's contents, carefully pour the remainder into the aquarium. Notice what happens to each material, and record the properties of each.
11. Repeat your observations after one hour, five hours, one day, and one week and record any changes you see. If there are no changes, record that as well.

Name _____

World Geography—Lab A: Practicing Sewer Science

Observed	Cup #1	Cup #2	Cup #3	Cup #4	Aquarium
Immediately					
After 1 hour					
After 5 hours					
After 1 day					
After 1 week					

Lab Report and Conclusions

Complete this section after your final observation.

1. Using your observation notes, compare how the five samples differ from one another at each stage of settling.
2. How could you remove the oil from the samples in cups #3 and #4? Use your imagination! You don't have to actually do it, but you can experiment with different ways of removing the oil if you'd like.

3. How would it be possible to remove the sludge from the bottom of the aquarium without disturbing the liquid on top? Again, you can experiment with this or you can just use your imagination to come up with ideas that might work.
4. Based on your observations, what happens to the water in streams and rivers over time, particularly those that run through or near human populations? Explain your answer using correct terminology.
5. Why would the natural settling process be inadequate for meeting the water treatment needs of a large community?

When you submit your lab report and conclusions, include your data table and observations.

Name _____

LAB

B

A Sporting Chance of Success

In this activity, you will use population figures to analyze the locations of major sports franchises.

Objectives

- Locate major U.S. cities on a map.
- Determine the population base needed to support a professional sports team.
- Determine the best location for an expansion team.

Materials

outline map of the United States

markers in 3 colors

world atlas (optional)

Procedure

1. Read all the instructions before you begin.
2. Research the locations of existing professional football, basketball, and baseball teams in the United States. You can find this information in a world almanac, sports almanac, or on the internet. There are 32 NFL football teams, 30 major league baseball teams, and 30 teams in NBA basketball (two of which are in Canada—you can choose whether or not to include them). Some of these teams are based in the same city so you will have fewer than 100 cities listed, but it will still be a very long list.
3. Make a list of the sources you use to gather your data. Cite each course in MLA format (see the appendix for information on how to cite sources).
4. Create a chart like the following to record information on each city with a major league team. You can put a check mark for each type of team or write in the team name.

City	Population	Football	Baseball	Basketball

5. Locate and label each city on your U.S. map. Cities can be indicated with a dot and the name written next to it.
6. Using a different colored marker for each sport, place a mark on the map to show the locations of the sports teams. (You may need to consult the atlas to determine the locations of the cities.)
7. Draw a key for your map indicating what sport each color represents.

Lab Report and Conclusions

When you have completed your research and map, answer the following questions.

1. Based on your data, what appears to be the smallest population needed to support a professional sports franchise?
2. What can you infer about why there are so few teams located in the Rocky Mountain and Great Plains states?
3. What factors other than population might affect the success of a team in a city with a small population?
4. Taking into account population and the location of current teams, what cities would you select for the location of a new football team? A new baseball team? A new basketball team? Explain your reasoning.

When you submit your map, include your data table and a list of the sources you used in this lab activity.

Name _____

LAB

C

Inca Engineering

This lab explores engineering techniques for moving heavy objects without machinery. You will be setting up an experiment to test how well three different materials reduce friction. You will need a partner to help you.

Objectives

- Experiment with different materials to reduce friction and make moving heavy objects easier.
- Predict which materials are most effective in reducing friction.

Materials

1 board, 2" × 8" × 4'

1 chair

1 concrete block

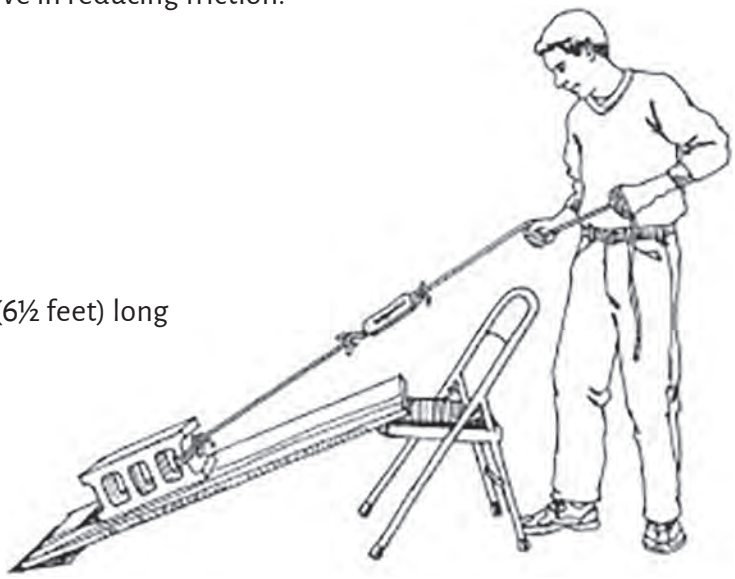
2 pieces of strong twine, each 2 meters (6½ feet) long

spring scale

several handfuls of pea gravel

several handfuls of fine sand

4 dowels, 1" diameter x 4' long



Procedure

1. Read all the instructions before you begin.
2. Put one end of the 2" × 8" board on the seat of the chair and the other end on the ground to create a ramp (inclined plane). This simulates the incline created when building pyramid-shaped monuments like those the Inca built as well as the incline of the steep terrain that faced builders in the Andes.
3. Place the concrete block on the bottom end of the ramp. Tie one end of a piece of twine to the block as shown in the illustration. Tie the other end to the hook on one end of the spring scale.

4. Tie the second piece of twine to the other end of the spring scale. This will be where you pull. The spring scale will measure the amount of force needed to move the block up the incline.
5. Pull the concrete block up the incline and note the scale measurement. Record this measurement in the table below.

	Predicted force	Actual force
Bare board	n/a	
Pea gravel		
Sand		
Dowels		

6. Based on your first measurement, record your predictions of how much force it will take to move the block up the ramp using the pea gravel, sand, and dowels to reduce the friction.
7. Pour a small amount of pea gravel on the ramp just above the concrete block. Then, slowly and steadily pull the block over the gravel up the ramp, using the string attached to the spring scale. Continue to spread gravel in front of the block as it is pulled up the ramp (your partner can help). Observe the force that is necessary to move the block up the ramp. Note the measurement on the spring scale and write down the actual force used.
8. Remove the gravel from the plank, and repeat the experiment using the sand. Record your results.
9. Remove the sand, and repeat the experiment using the dowels. Lay the dowels horizontally across the board in the path of the block so that the block rolls over them. Have your partner keep moving the dowels from the back to the front of the concrete block as it is pulled up the ramp. Record the reading from the spring scale.

Lab Report and Conclusions

Once you have performed the experiments and recorded your results, clean up your materials, and then answer the following questions.

1. Which material made it easiest to pull the block? Which material made it hardest? How did your predictions compare to the actual measurements? Were you surprised by the results? If so, why?
2. Assume that you are an Inca engineer. Based on your experiment, what recommendations would you make to builders who need to move large blocks of stone? How might you modify conditions to make it even easier to move heavy stone blocks?

World Geography—Lab C: Inca Engineering

3. What factors besides the materials used to reduce friction would be important for the builders to consider?
4. What other natural materials might you try to reduce friction even further? Explain your reasoning.

When you submit your lab report and conclusions, include your data table.

Lesson

23

Geography and Cultures of South Asia

Learning Objectives

- Create an informational graphic related to population.
- Summarize a current events issue and formulate an opinion.
- Interpret data about educational opportunities and draw conclusions.

The subcontinent of South Asia is separated from the rest of Asia by mountains, and forms a distinct landmass that includes India, Pakistan, Bangladesh, Sri Lanka, Nepal, Bhutan, and the Maldives. South Asia contains some of the most varied landforms on Earth. In the north, the lofty Himalaya, Karakoram, and Hindu Kush ranges dominate the landscape. These mountain chains together create a formidable barrier between the region and the rest of Asia. In the past, invaders from the north could enter South Asia only through a few narrow passes. The mountain kingdoms of Nepal and Bhutan managed to remain isolated from the outside world well into the twentieth century.

From the "abode of snows," as the Himalaya are called in Nepal, South Asia's landmass spreads southward in the form of a subcontinent. Within this upside-down triangular area are plains watered by three great river systems: the Indus, the Ganges, and the Brahmaputra. These waterways are the key to life in the region, providing alluvial soil, drinking water, transportation, and hydroelectric power. There are also arid deserts, vast plateaus, rugged hills, and eroded mountains. In addition, South Asia includes islands, such as Sri Lanka and the Maldives, in the Indian Ocean. South Asia is touched by three bodies of water: the Arabian Sea, the Indian Ocean, and the Bay of Bengal.

ASSIGNMENT CHECKLIST

- ☐ Learn about the geography and cultures of South Asia.
- ☐ Answer comprehension and critical thinking questions.
- ☐ Add natural and political features of South Asia to your world map.
- ☐ Answer the Central Question.
- ☐ Choose an optional activity:
  - Activity A: Textiles of South Asia
  - Activity B: Outdoor Adventures
  - Activity C: The Mahabharata

Most of South Asia has tropical and subtropical climates with diverse vegetation, including rain forests and savannas. Little vegetation can survive in the higher altitudes of the highlands, while trees flourish in more temperate zones. In the northern part of the subcontinent, the fertile soil of the Ganges River supports some of the planet's most densely populated areas. Farther south, the relatively arid Deccan Plateau is home to fewer people, but well-watered coastal areas of southern India are densely populated. Dry climates are found along the lower Indus River and on the Deccan Plateau. The region's largely tropical location makes it dependent on seasonal winds called monsoons, which determine the three seasons of the region. These seasonal wind patterns bring drenching rains that relieve the intense heat and nourish crops. Areas outside the path of the monsoons receive little or no rainfall. South Asia is vulnerable, however, to weather-related disasters, such as drought, flooding, and typhoons.

Although the region has petroleum reserves, South Asia relies on other energy sources and imported oil. South Asia's rich natural resources—iron ore, gemstones, and industrial minerals—have for centuries attracted outside conquerors, traders, and colonists. Today, the region's seven countries are working to balance environmental preservation with economic development.

With a population of more than 1.3 billion, South Asia is home to more than one-fifth of the world's people. India is the second most populated country after China. South Asia's population density is almost seven times the global average, with the population concentrating in areas where the climate, vegetation, and physical features are favorable. Most people live in rural areas, where life has changed little over hundreds of years. In recent years, however, growing numbers of South Asians have been migrating to urban areas for better jobs and wages. The region's cities have turned into population centers where modern buildings contrast with slums and temporary shelters.

South Asia was home to one of the world's earliest cultural hearths, the Indus River valley civilization, in what is now Pakistan. During the centuries after Aryan invaders entered the subcontinent, a succession of Hindu and Buddhist kingdoms and empires developed in the region. Greek, Central Asian, and Islamic groups added to the cultural mix. The British became a major world power in the late eighteenth century, and through the early twentieth century ruled or controlled most of South Asia. Independence came to the region's peoples after World War II, following years of work by Mohandas Gandhi and others to bring about self-rule. Religious and cultural differences eventually led to the creation of three countries—India, Pakistan, and Bangladesh—from the area that was once British India. Control of Kashmir, a largely Muslim region in the subcontinent's northwest, has been disputed between India, Pakistan, and China since the late 1940s. The region continues to experience border conflicts and ethnic and religious tensions.

Hinduism, Buddhism, Jainism, and Sikhism have their origins in this region. Some of the earlier settlers established a complex social structure that grew into the caste system. Their culture and religion developed into Hinduism. In India, where the ancient Hindu caste system still influences daily life, people commonly identify themselves by *jati*, or occupational groups, each with its own rules and customs. Buddhism, which rejects this rigid social system, is the second major religion in the region. Other religions, such as Islam and Christianity, were brought to South Asia by migrants, missionaries, traders, and conquerors.

There are 19 major languages and hundreds of local dialects spoken in this region, most of which fall into the Indo-European language family. English is a common language, and Hindi is spoken by half of India's people as their primary language. Mumbai has developed the world's largest film industry. The literature, art, music, dance, and architecture of South Asia reflect the region's cultural diversity, and a variety of regional foods and other products have become known internationally. Tea, curries, spices, the practice of yoga, and textiles and patterns such as cashmere, calico, and paisley are just a few of South Asia's contributions to the world.

While high-technology and service industries have grown in recent years in the region, most South Asians still live a traditional lifestyle of subsistence farming. The stresses that large populations place on the environment are compounded in South Asia by the region's ethnic, religious, and political divisions and the wide gap between rich and poor. The challenge of feeding the region's enormous population has begun to be met through scientific breakthroughs such as the green revolution, which has raised food production and improved people's diets. Concerns remain, however, about pesticide runoff, genetically modified seeds, and the increased energy use demanded by advanced technology. Cash crops such as tea still take up a disproportionate share of the region's agricultural land.

Countries in South Asia practice sustainable management to manage their resources, including wildlife and forests, for their large populations. Access to clean water is a persistent problem throughout South Asia. Scientists are studying the region to find solutions to the problems of air pollution and devastation by storms. Changing global weather patterns bring special challenges to South Asia, where delayed or torrential monsoon rains can cost hundreds of thousands of lives and cause widespread devastation. Rising ocean levels caused by climate change threaten island countries such as the Maldives and low-lying countries such as Bangladesh.

Reading

Conduct research to learn more about South Asia. The following topics provide a good starting point for your study.

- Indus River valley
- Great Indian Desert
- Sherpa people of Nepal
- Ganges River delta
- Khyber Pass
- Hindu caste system
- Island nations of Sri Lanka and the Maldives
- Major exports and imports
- Cultural traditions and heritage
- Events leading to independence

Comprehension and Critical Thinking Questions

1. Create a bar graph to compare the populations of at least six of the largest cities in South Asia. Make sure to label both axes and title the graph. For each city, indicate what percentage of the nation's population the city holds.
2. How have Bhutan and the Maldives restricted tourism? Why? In what ways are the reasons similar and how are they different?
3. Summarize how India and Pakistan view their claims to Kashmir. Do you think the recently acquired nuclear weapon capabilities of India and Pakistan will impact their struggle for control over Kashmir? Give your opinion on the issue.
4. Using the data table below, answer the following questions:
   a. Which country has the highest percentage of its school-aged people in secondary education?
   b. Which country had the lowest percentages in 1980? In 1999?
   c. What conclusions can you draw from this data about how educational opportunities have changed over time in these countries?

Percent Enrolled in Secondary School in Selected South Asian Countries

	1980		1999	
	Males	Females	Males	Females
Bangladesh	26	9	25	13
India	39	20	59	39
Nepal	33	9	51	33
Pakistan	20	8	33	17
Sri Lanka	52	57	72	78

Source: Population Reference Bureau

Mapping the World

Continue to develop your world map. Rather than treating this as a drawing exercise, put some thought into how the natural features have affected the political boundaries, and how these political boundaries have changed over time.

1. Add the natural features of South Asia, including major mountain ranges, rivers, and deserts.
2. Draw the islands of Sri Lanka and the Maldives.
3. Label the Arabian Sea, Bay of Bengal, and the Indian Ocean.

4. Using your map model and lines of latitude and longitude, draw the political boundaries for each of the seven South Asian nations.
5. Locate and label the capital city for each country.

Central Question

Collect news articles and internet resources on several South Asian environmental challenges. Be sure to note the source of each article or resource. Then identify articles, resources, or statements that indicate bias, and discuss what bias is being shown in each. Remember to watch for particular agendas and interests.

Activities

The following optional activities offer ways to explore the material in more detail.

- Activity A: Textiles of South Asia
- Activity B: Outdoor Adventures
- Activity C: The Mahabharata

Activity A: Textiles of South Asia

Research the origins of one or more of the following South Asian textiles: calico cotton, madras plaids, cashmere, paisley and pashmina shawls, and Indian rugs. Create a photo essay. You may also want to research some of the typical patterns and printing methods used in the manufacture of South Asian textiles. Create your own patterned textiles based on South Asian designs using one of the following techniques: block printing, batik, silk painting, embroidery, or weaving.

Activity B: Outdoor Adventures

Assume the role of a writer for a travel magazine or outdoor sports journal. Compose a first- person account of one of the following South Asian journeys: trekking (hiking at levels where supplementary oxygen is not required) in the Himalaya; sailing and diving in the Maldives; collecting botanical specimens in the Sri Lankan rain forest; or visiting archaeological digs in the Indus Valley. Do some research for your writing, and use vivid language in your account.

Activity C: The Mahabharata

View director Peter Brooks's version of the Mahabharata (BBC Video, 1989). This ancient story cycle has been performed in almost every art form—dance, song, drama, puppetry, film, and television—a testament to its popularity with Indian audiences of all ages.

SHARE YOUR WORK

When you have completed this lesson, share your work with your teacher.

Appendix