WORLD HISTORY
THE BIG ERAS
OVERVIEW
BIG ERA ONE
BIG ERA TWO

EARLY HISTORY

Human Beings around the World

General Editor

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v1.0

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The units in this book are drawn from the Landscape Teaching Units of World History for Us All, a web-based model curriculum for world history (http://worldhistoryforusall.sdsu.edu). The website is continuously evolving with new content being added. If a topic is not included here, please visit the website to see if it is currently available.

A Companion to World History for Us All
A Model Curriculum for World History
http://worldhistoryforusall.sdsu.edu

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Publisher's Note

BACKGROUND

The Big Era lessons emphasize the relationships between particular subject matter and larger patterns of historical meaning and significance. This inclusive, context-focused approach is primarily concerned with forging connections on a global scale, thereby encouraging students to construct the globally integrated chronological framework essential to achieving deeper historical understanding. The lessons may be used flexibly, depending on interest, school curriculum requirements, and instructional time available.

This volume brings together the overview, "History, Geography, and Time," and the Landscape Teaching Units of Big Eras One and Two in World History for Us All, a web-based model curriculum for world history available online at http://worldhistoryforusall.sdsu.edu. The nine Big Eras constitute the periodization plan and the basic organizational structure of the World History for Us All curriculum. Many teachers have requested a printed version of the Big Era units, or lessons, to help guide them and their students in exploring historical developments, continuities, and turning points on a larger scale than textbooks or content standards lists offer.

GENERAL APPROACH

Chapters begin by explaining the educational value of their particular historical moment, identifying the topic's relevance and positioning it within the context of the global landscape. Outlining salient information in a written description and visually situating the era on a time line, the chapter's introductory section foreshadows the content and underlying themes of the chapter, preparing students to draw informed connections among historical events.

The Three Essential Questions and Key Themes encourage students to engage in critical, higher-order thinking as they solidify their comprehension of major world trends. (See below for further description.) Additional introductory material enumerates the chapter's learning objectives, estimates the time commitment required, and lists the materials necessary to complete the lessons.

The lessons offer a varied selection of activities, readings, primary source documents, discussion questions, assessments, and extension activities. The teacher's guides, containing instructions for lesson preparation, procedure, and background information, are followed by each lesson's reproducible student handouts. Charts, graphs, and maps referenced in the lesson are also provided.

Correlations to National History Standards are listed to enhance convenience for teachers designing their curricula to align with these content recommendations. All the lessons in this volume support learning and practice of critical-thinking skills. By teaching these lessons, instructors will help students develop the skills charted in both the Common Core State Standards Initiative and the *College, Career, and Civic Life (C3) Framework for Social Studies State Standards*. Extensive correlations for this volume to Common Core State Standards are found on the web-based product page at http://www.socialstudies.com/c/product.html?record@TF45334. The resource sections recommend books, articles, and digital content selected as means to further explore the chapter's historical concepts and expand the scope of understanding for both educators and students.

This book and the World History for Us All model curriculum use the secular designations BCE (Before the Common Era) and CE (Common Era) in place of BC and AD. This usage follows the format of the National Standards for History and the Advanced Placement World History course. It in no way alters the conventional Gregorian calendar. We also use BP (Before Present) for historical periods approximately prior to 10,000 BP.

GEOGRAPHICAL TERMS

Afroeurasia

Afroeurasia is the landmass made up of Africa and Eurasia combined. Afroeurasia was formed during the last forty million years by the collision of the tectonic plates containing Eurasia and those containing Africa and Arabia. This geographical expression serves as a helpful tool in discussing large-scale historical developments that cut across the traditionally defined continental divisions of Africa, Asia, and Europe. Even though Africa is separated from both Europe and Asia by the Mediterranean and Red seas (except at the Isthmus of Sinai where modern Egypt meets Israel), these bodies of water have historically been channels of human intercommunication, not barriers to it. Therefore, we may think of both the Mediterranean and the Red Sea as "lakes" inside Afroeurasia.

America, the Americas

The Americas are made up of the continents of North America and South America, including neighboring islands, notably the islands of the Caribbean Sea. Until the twentieth century, most geography books classified North and South America together as a single continent, labeling them the "New World" ("new" to Europeans beginning in the late fifteenth century CE) as opposed to the "Old World," that is, Afroeurasia. In the twentieth century, school children in the United States and most other countries (though not in some Latin American states) were taught to see the "Western Hemisphere" as comprising two distinct continents, joined only by the narrow Isthmus of Panama. However, humans in North and South America have never been entirely disconnected from one another. As far as we know, humans first migrated from North to South America 14,000 years ago, or longer, by advancing along either the Isthmus or its coastal waters. Also, it is not hard to perceive the Gulf of Mexico and the Caribbean Sea as two "internal seas" of a single American landmass, much the way we may think of the Mediterranean and Red seas as "inside" Afroeurasia. The Caribbean and the Gulf of Mexico are bounded on three sides by land and on the west by a long string of closely clustered islands.

Australasia

The continent of Australia, plus New Guinea, New Zealand, Tasmania, and other neighboring islands make up Australasia. During the last Ice Age, when sea levels were lower, Australia, New Guinea, and Tasmania comprised a single landmass known as Sahul. Human settlement of Australasia began as many as 60,000 years ago, although Polynesian mariners did not reach New Zealand until about 1000 CE.

Eurasia

Eurasia is the landmass made up of Asia and Europe. Today, this term is widely used in history and geography education. The idea that Europe and Asia are separate continents goes back many centuries, but scholars who accept the definition of a continent as "a large landmass surrounded, or nearly surrounded, by water" know that the definition applies to neither Europe nor Asia because these two landmasses are conjoined. Moreover, the Ural Mountains, designated by eighteenth century European geographers as the proper boundary between the European and Asian continents, have never been a serious obstacle to the flow of migrants, armies, trade goods, or ideas. In this book, Europe is defined as a subcontinent of Eurasia (or Afroeurasia), analogous to South Asia or the Indochinese peninsula.

Great Arid Zone

A climatic map of Afroeurasia shows that a good part of the landmass is a belt of dry or semi-dry country that extends all the way from the Atlantic coast of Africa in a generally northeasterly direction to the northern interior of China. This enormous tract comprises a chain of interconnected deserts, mountains, and semi-arid steppes. A steppe may be defined as flat or rolling grassland, equivalent to what Americans call "prairie" and Argentineans call "pampas." The main climatic characteristic of the Great Arid Zone is low annual rainfall, which may range from an average of less than 5 inches in the driest of deserts to 20 inches or so in better watered steppes. For several millennia the Great Arid Zone has been home to pastoral nomadic peoples. Where water has been available from rivers, springs, or wells, it has also been home to farming societies and even large cities.

Indo-Mediterranea

The region of lands and seas extending from the Atlantic coasts of Europe and North Africa to North India is known as Indo-Mediterranea. This expression includes the Mediterranean basin as a whole and extends eastward across Southwest Asia to northern India as far as the Bay of Bengal. In the long term of human history from at least the third millennium BCE to modern times, this region has been characterized by a proliferation of clusters of dense population (notably in river valleys) and by intense commercial and cultural interchange.

Inner Eurasia

The huge interior landmass of Eurasia, whose dominant features are flat, semi-arid regions of steppe and forest, is known as Inner Eurasia. David Christian defines Inner Eurasia as the territories ruled by the Soviet Union before its collapse, together with Mongolia and parts of western China. Poland and Hungary to the west and Manchuria (northeastern China) to the east may be thought of as Inner Eurasia's borderlands. The northern margins are boreal forest and Arctic tundra. The southern boundaries are the Himalayas and other mountain chains.

Oceania

The basin of the Pacific Ocean and its approximately 25,000 islands make up Oceania. Human settlement of this enormous region, sometimes called the Island Pacific, began in western islands near New Guinea about 1600 BCE. Polynesian mariners reached both Hawaii to the northeast and Easter Island to the far southeast around 500 CE. The majority of the islands lie in the tropical belt south of the Equator. The first peoples of Oceania spoke mostly Polynesian languages. Some geographers include both the large island of New Guinea and the continent of Australia as part of Oceania.

Southwest Asia

Southwest Asia is the designation of the region extending from the eastern coast of the Mediterranean Sea to Afghanistan. It includes Turkey and the Arabian Peninsula, but not Egypt or any other part of Africa. This region is often referred to as the Middle East, but this book uses the term "Middle East" only in the context of history since the start of the twentieth century. (For earlier periods, "Middle East" causes confusion because it is used sometimes as a synonym for Southwest Asia, sometimes to encompass Southwest Asia plus Egypt, and sometimes to embrace the entire region from Afghanistan to Morocco.)

THREE ESSENTIAL QUESTIONS

The Three Essential Questions introduce overarching thematic questions that stand at the crux of historical understanding. These questions provide three distinct lenses through which to examine the constantly evolving relationships that shape human civilization: the relationships between humans and the environment, humans and other humans, and humans and ideas. The study of these relationships—which have proven to be enduring aspects of the human experience—and their corresponding questions function as guides for organizing classroom activities and discussion. Prompted by the Three Essential Questions, students identify how the content of each chapter relates to these themes and utilize this information to predict future patterns of activity and thought.

Humans and the Environment

These questions require students to consider how humans have lived, how they have treated the earth, and how their power over the earth has grown, while relating each chapter's content to the underlying question, "How has the changing relationship between human beings and the physical and natural environment affected human life from early times to the present?"

Humans and Other Humans

These questions explore the relationships among humans themselves and how those relationships have evolved, while relating each chapter's content to the underlying question, "Why have relationships among humans become so complex since early times?"

Humans and Ideas

These questions push students to examine how ideas influence historical development and how events shape ideas, while relating each chapter's content to the underlying question, "How have human views of the world, nature, and the cosmos changed?"

KEY THEMES

The lessons in this volume address a number of historical themes. A theme is defined here as a topic that addresses a particular sphere of human activity over time. Themes are concerned with broad aspects of change of enduring importance in the human experience. Historical learning usually works best when students begin their investigations in world history with distant eras and move forward, connecting patterns of cause and effect over time. Nevertheless, attention to thematic issues offers ways to connect the study of particular periods and regions of the world to enduring aspects of the human condition. This encourages students to think more coherently, systematically, and comparatively about the past. Teachers may wish to emphasize one or more of the key themes suggested here in connection with any of the chapters and lessons in this book.

Key Theme 1: Patterns of Population

Key Theme 2: Economic Networks and Exchange

Key Theme 3: Uses and Abuses of Power

Key Theme 4: Haves and Have-Nots

Key Theme 5: Expressing Identity

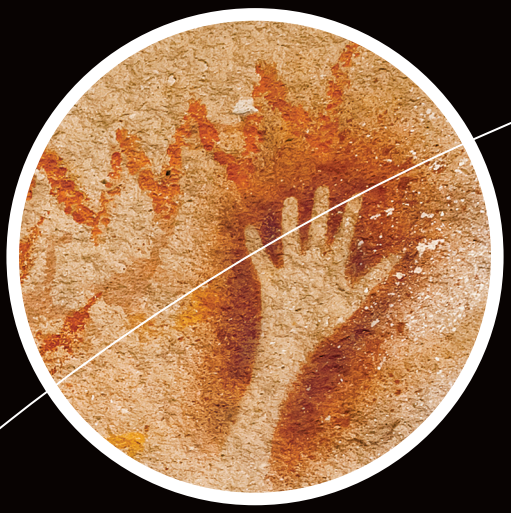
Key Theme 6: Science, Technology, and the Environment

Key Theme 7: Spiritual Life and Moral Codes

For in-depth discussion of these themes and for investigative questions that link them to the Three Essential Questions, go to World History for Us All (http://worldhistoryforusall.sdsu.edu, Questions and Themes, The Seven Key Themes).

BIG ERA OVERVIEW

History, Geography, and Time



By Ian Kelly

Getting Our Bearings

Maps of Time, Space, and History

WHY STUDY MAPS?

There is a story about five blind men and an elephant. Each of the men feels different parts of the elephant and so each comes away with a different, and incomplete, view of what an elephant must be like. If we think of the "elephant" as being the story of humans, the analogy has to change just a little in order for it to come out right. Instead of five blind men, a student is the examiner equipped with different tools of investigation. First, the student has a magnifying glass, which allows for a very close examination of the animal's skin cell structure, hair follicles, or tooth wear. Next, the student moves back a little, using just the eyes and seeing that the elephant is more than just the components of skin, hair, or teeth. The elephant is actually composed of all of these elements to create a large animal. The student's next tool is a very tall ladder. From that perspective the student can see for miles around, even entire herds of elephants, as well as gazelles, lions, grasslands, rivers, and maybe human beings.

Maps are a daily part of our lives, giving us tools (of a manageable size) to see where we are in relation to other things. These tools, though, are drawn to different scales depending on the level of precision we are dealing with. A city street map is a perfect tool to get to that new Cantonese restaurant in town that people are talking about. But it is useless for seeing where the Cantonese food style originated. We need a map of far larger scale to do that. In this chapter, students are introduced to the idea of scale and how it can be shifted to give a general impression or to give a very detailed understanding of a slice of time or space. It is particularly important for students to understand that one perspective is not "better" than another. Each perspective simply provides a different level of detail, and each is more suited to a particular topic. Take, for example, a late eighteenth-century European document that explains a court decision. Using a high-powered magnifying glass from our world history toolbox allows us to examine closely subjects such as the literary style of the document itself, or perhaps (with a less powerful glass) the author of the document and the proceedings that resulted in the writing of the document. Laying aside the magnifying glasses, it is possible to see the society whose laws are being applied and thus some of the cultural values of that society. In a panoramic view of the document, we may see the Enlightenment, as well as the very early stages of industrialization and increasing commerce, all of which would have a profound impact on concepts of law and society.

In working with the interactions of space and time, it is important for students to understand that the scales of both are independent of each other. That is, one can use a very small scale

of space, such as a single small valley in an African country, and use a very large scale of time, such as two millennia, to investigate the history of that valley. In doing so, one has the opportunity to view environmental shifts, perhaps the arrival of humans, the establishment of villages or towns, the disappearance of villages or towns—whatever may have occurred there over that period of time. At the same time, it is possible to consider the universal implications of the single nanosecond that occurred after the "Big Bang."

This chapter will introduce three different levels of historical scale in time—long distance, middle distance, and near distance. The first level encompasses large scale developments in world history, while the second two gradually zoom in to diminish the field of vision and arrive at a relatively restricted focus in time.

This curriculum describes three reasons for learning world history: to know who we are, to be prepared to live in the world, and to attain cultural literacy on a world scale. In order to help students understand themselves simultaneously as individuals, as sons or daughters, as citizens, and as humans, it is important to develop the skills of shifting perspectives on the past and present. With these skills, students will see the connections between themselves and ever-expanding groups, times, and places and so will be better suited to see where humanity has been and where it is headed.

OBJECTIVES

Upon completing this chapter, students will be able to

1. Describe three basic perspectives in relation to time, space, and history
2. Select and apply an appropriate perspective when given a specific historical topic
3. Understand and apply concepts of scale and proportion
4. Demonstrate mapping skills

TIME AND MATERIALS

This chapter is divided into four lessons. Lessons 1 and 4 should take about 45 minutes of class time. Lessons 2 and 3 may take longer. The lessons can be expanded or abbreviated according to need by shortening or deleting activities, repeating activities (as described in the lessons), or engaging students in a dialogue about the topic.
The lessons described below require the following materials:

- Photocopies of student handouts
- One-quarter inch graph paper

It is recommended that teachers obtain a directional compass and post signs of "North," "East," "South," and "West" on the classroom walls. Cards are provided in this chapter for timelines, though teachers may wish to create their own. A 20-foot (6-meter) length of clothesline is used in Lesson 2. A 20-foot section of wall space may be substituted for the clothesline. Some teachers

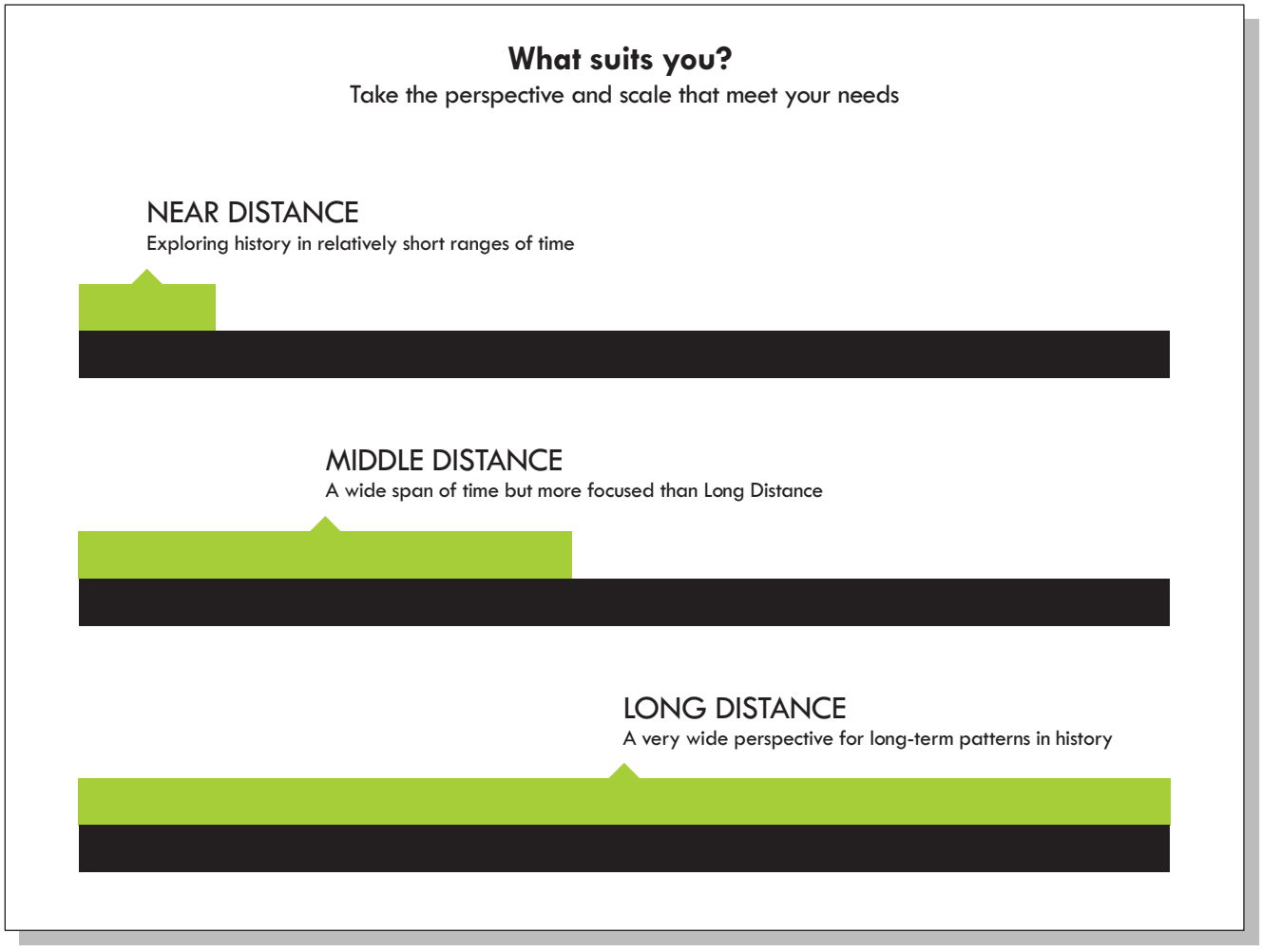
may find it visually useful to have three lengths of clothesline or wall space so that the timelines can be directly compared during discussions.

HISTORICAL CONTEXT

In this chapter we are not dealing with a specific historical issue but with concepts of history. We can view history from "real-time" speed down to the glacial pace of eons and eras. We can also view spatial scales from the cosmos down to a small sheep field. The Standards in Historical Thinking lay out five major categories for historical understanding. In order for students to become adept at each of these skills, they need to be able to adopt different frames of reference, different historical scales.

BIG ERA TIME LINE

In this chapter, we illustrate the elastic nature of scales, which allows us to conceptualize any expanse of time that is relevant to the question being studied. In other words, in a given amount of classroom time we can explore millions of years, an era, a decade, or a one-day event. Which perspective you take depends on your purpose or focus.



THREE ESSENTIAL QUESTIONS

Humans and the Environment

If one examines climatic changes in a region, which perspective will be most useful—large-scale (long distance), medium-scale (middle distance), or narrow-scale (near distance). Which perspective would be least useful? How might a map of space help us to understand our environment?

Humans and Other Humans

What might a map of time from the long distance perspective teach us about human interaction? What about the near distance perspective? Does a map of space tell us anything about how humans communicate with each other or share information?

Humans and Ideas

Is it possible to tell anything about ideas from maps of time and space? What clues might show us the use of ideas?

INSTRUCTIONAL RESOURCES

Brown, Cynthia Stokes. *Big History: From the Big Bang to the Present*. New York: New Press, 2007.

Christian, David. *Maps of Time: An Introduction to Big History.* Berkeley: University of California Press, 2004. An example of historical work on a very grand scale.

Christian, David, Cynthia Stokes Brown, and Craig Benjamin. *Big History: Between Nothing and Everything.* New York: McGraw-Hill, 2014.

Crosby, Alfred W. *Ecological Imperialism: The Biological Expansion of Europe, 900–1900.* Cambridge: Cambridge University Press, 1986. This work provides a fine example of smooth transitions between large and small scales.

Dunn, Ross E. *The New World History: A Teacher's Companion*. Boston: Bedford St. Martin's, 2000. Several essays in this edited collection on conceptualizing and teaching world history address problems of historical scale.

Ginzburg, Carlo. *The Cheese and the Worms: The Cosmos of a Sixteenth-Century Miller.* London: Routledge & Kegan Paul, 1980. An example of historical work on a highly focused scale, often referred to as "microhistory."

McNeill, J. R., and William H. McNeill. *The Human Web: A Bird's-Eye View of World History.* New York: Norton, 2003. A long-distance view of the human past from the dawn of tool-making to the present.

Spier, Fred. *The Structure of Big History: From the Big Bang until Today.* Amsterdam: Amsterdam University Press, 1996.

Wills, John E., Jr. *1688: A Global History.* New York: Norton, 2001. A book that embraces the entire world but focuses on just one year.

LESSON 1

Cartography and Chronography

Maps and Time Lines

Preparation

Since this lesson is expository, teachers can expect to approach this as a "lecture" lesson, though good opportunities for visual, aural, and kinetic learning will present themselves. Copies of student handouts will be needed, as well as quarter-inch (5-millimeter) graph paper. Be aware, especially with younger students (younger than eleven or twelve), that their understanding of time and sequencing is not always fully developed. Therefore, special attention to this issue may be needed.

Introduction

The term "cartography" was not used until 1859, although "chronography" has been around for nearly five hundred years. Even so, humans have been describing relationships in time and space for thousands of years. Maps are important to us because they tell us where we are, where other things and people are (or were), and what our relationship to those other things and people is. In order to understand these tools, students need to have a basic understanding of how they are constructed.

Sources: R. Burton, "Central Africa," *Journal of the Geographic Society* 24 (1859): 28.

E. Hall, *Chronicle* (*The Union of the Two Noble and Illustre Famelies of Lancestre and Yorke*), 1548.

Activity: Introduction to Cartography and Chronography

1. Fundamentals
    a. What do maps do for us? Why do we have them?
    b. Do all maps show the same thing?
    c. Cartography: the art of making maps
    d. Chronography: the art of arranging historical events
    e. Both cartography and chronography help to document relationships of time and space.

2. Elements of Maps
    a. Discuss the key elements of all maps
    b. Title: Why a title? Isn't it obvious what the map shows?
    c. Legend: What information does this provide?

d. Scale: What information does this provide? Why is it important?

e. Compass: Why is orientation important?

f. Points of reference (often latitude and longitude, or hash-marks on a time line to show increments of time)

g. Student Handout 1.1.1 allows students to work independently on map comprehension.

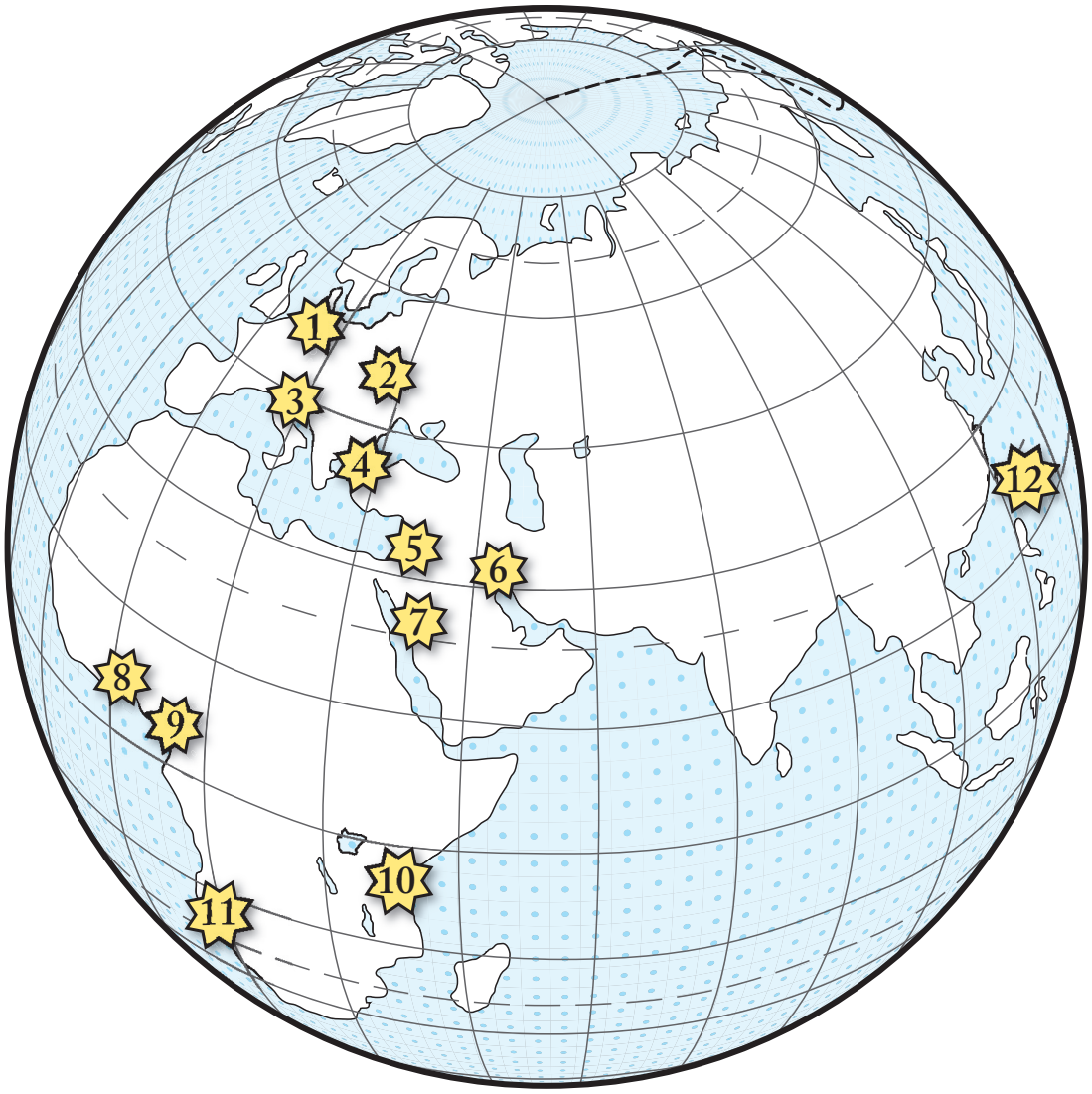
h. Chronography: Working individually, have students prepare three chronographs, each ten inches long. One should reflect their personal activities on the previous day, a second documenting their entire lives, and a third showing city/national/world events in the previous century. Discuss the differences between the three in terms of scale, precision, and detail.

Assessment

This lesson provides several points of assessment. Informally, student progress can be gauged according to their participation in the classroom discussions. More formally, Student Handout 1.1.1 and their maps can be submitted for assessment or a simple quiz can be used.

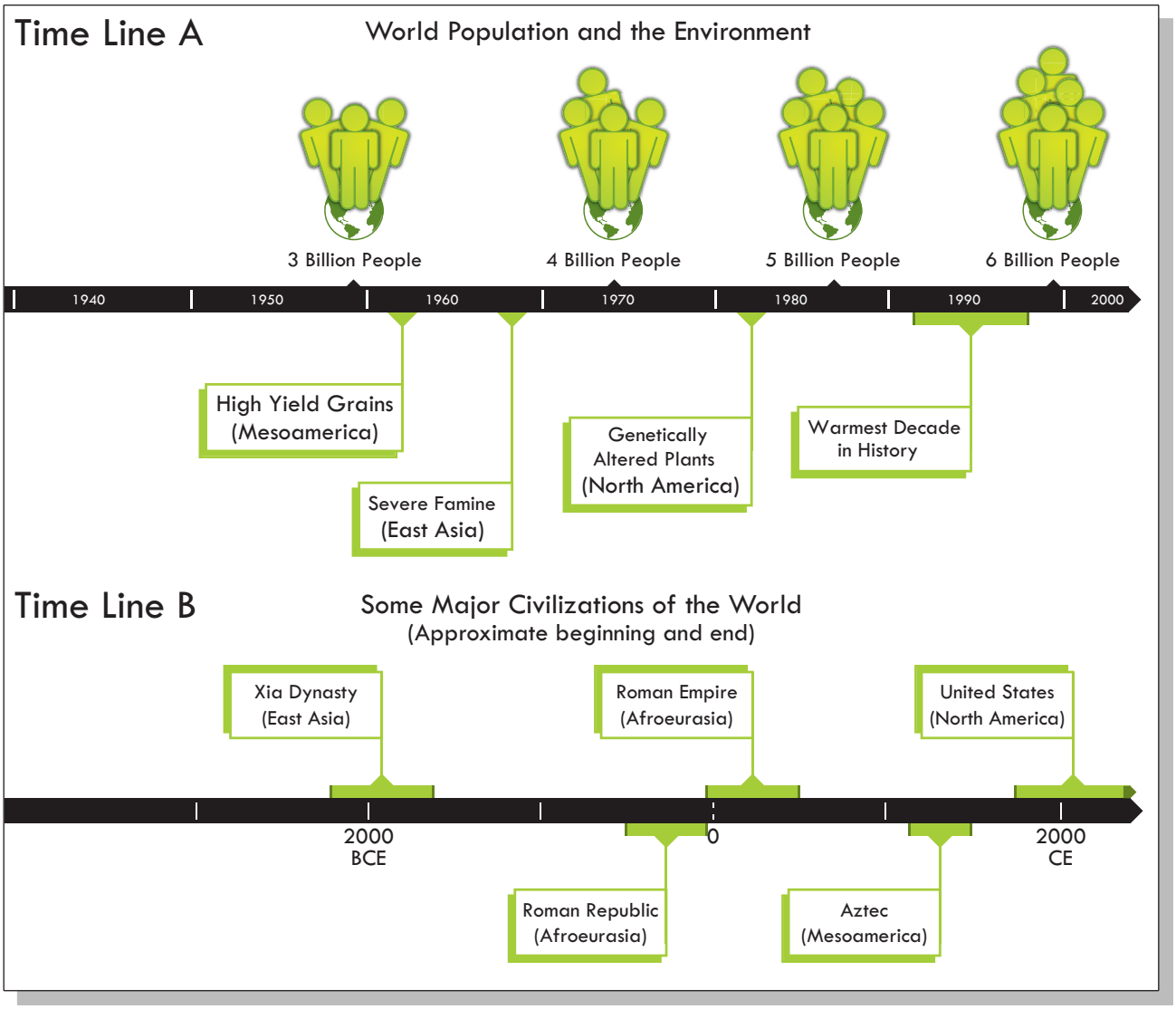
Cartography and Chronography

1. From your discussion in the classroom, what are the five elements of a map?
2. The map shows certain developments in World War I. Identify the five elements of a map by circling and labeling each one.
3. Are all of the elements shown? If one is missing, which one is it?
4. Why might the cartographer have left it out?
5. It seems like it would be a lot easier to read maps if they all used the same legend, scale, and orientation. Why do cartographers have to include the basic elements for every single map?



Regions where Significant Fighting Took Place in World War I

1 Western European Front
2 Eastern European Front
3 Italian Front
4 Balkan Front
5 Palestine/Syria
6 Iraq
7 Arabia
8 German Togoland
9 German Cameroons
10 German East Africa
11 German Southwest Africa
12 German Pacific Islands



Review the time lines given above and answer the questions.

1. Each of the time lines above has hash-marks (vertical lines) one-inch apart. How much time is represented between the marks in Time Line A? In Time Line B?

2. About how long did the Xia Dynasty last? The Roman Republic?

3. Estimate the year that the world population reached five million. Take a look at the segment of time related to the United States. It begins on the time line around 1776, the year the Thirteen Colonies declared their independence from Britain. The segment does not indicate an end date; instead, it forms an arrow that points off the time line. What might that represent?

LESSON 2

Maps of Space

Preparation

This lesson lends itself nicely to students being up and moving in the classroom or around campus, as well as working on their artistic or drawing skills. The first half of this lesson will require quarter-inch graph paper. If teachers have open space available (such as a playground or field), they should consider having another adult to help with the outdoor version of "What Do You See." For option 2, the indoor version, the class will need a large photo mosaic poster. There is computer software to help generate these, or perhaps they can be purchased.

Introduction

Understanding spatial and chronological relationships is crucial to understanding historical developments. Polynesia and the Mediterranean region, for example, developed in very different ways from the Amazon basin or Inner Eurasia because of their differing geographical settings. In this lesson, students will explore how to shift scales based on the subject at hand. It is vital for students to understand that each perspective is a tool. There is no value judgment about one being "better" than another. They simply give different information.

Activity: Perspectives on Space

1. What Do You See? The Outdoor Version

    a. Take the class outside to a ball field, playground, or any open space that gives you at least 100 yards of clear view. Each student should have Student Handout 1.2.1, a pen/pencil, and something hard to use as a portable desk (notebook, text book, etc.).

    b. Have the other adult go to the far end of the field. This person is the "subject" of your study. Focusing on the subject, give the students a few minutes to complete the first section of Student Handout 1.2.1.

    c. Have the subject move closer to the students, perhaps halfway between them and the position they had taken above. Again focusing on the subject, give the students a few moments to complete the second section of Student Handout 1.2.1.

    d. Have the subject move to stand among the students. Again focusing on the subject, give the students a few moments to complete the third section of Student Handout 1.2.1.

    e. Return to the classroom. Discuss the questions raised in the final section of Student Handout 1.2.1 (Note: depending on time or other considerations, this section can be alternatively used as an assessment.)

2. What Do You See? The Indoor Version (Option 1)
    a. Display Teacher Tool 1.2.1.
    b. Ask students to describe what they see and to draw any conclusions they can from what they see.
    c. Remove Teacher Tool 1.2.1 and display Teacher Tool 1.2.2. Repeat step B above.
    d. Remove Teacher Tool 1.2.2 and display Teacher Tool 1.2.3. Repeat step B above.
    e. Discuss the differences and similarities between each of the three perspectives, eliciting views on the positive aspects of each, as well as the negative side. (It is worth mentioning that even Teacher Tool 1.2.3 is incomplete; there were other things that the photographer could see but that did not fall within the camera's frame.)
3. What Do You See? The Indoor Version (Option 2)
    a. Obtain a large photo mosaic poster and post it at the front of the room.
    b. Talk with students about what they see from their seats and what the poster represents.
    c. Invite a student (or several students) to come closer to the poster, perhaps six to ten feet from the poster. Is the image that they saw at their seats still as sharp and clear? What has changed?
    d. Invite one or more students to come right up to the poster, so that their nose is almost touching it. Now what do they see? Can they still see the image they saw at their desk? Why not? What do they see now that they did not see before?
    e. Talk with the students about how the long view and the close-up both give different, but still cohesive, understandings of the images. Discuss how the individual tiles relate to the larger image (in terms of color, theme, etc.).
4. Personalizing Maps of Space
    a. Cartography—Divide the class into three groups. Assign one group to create a map of the classroom, one to create a map of the school, and one to create a map of the town/city. (Note: the latter two groups will have to do a bit of research and estimating for their map-making.) Discuss the differences between the three maps in terms of scale, precision, and detail.
    b. Alternatively, use Student Handout 1.2.2 to be completed as an out-of-class assignment. Students will benefit from comparing their work with that of others to help understand what maps of space say about themselves. For example, what do students devote their own "personal space" to? Books? Games? Electronics? Clothes? Stuffed animals?

Assessment

Two forms of assessment are available in this lesson. Informally, students' engagement in the post-activity discussion will give an idea of how well the student has engaged in the concept. On a formal basis, teachers may wish to assign the final section of Student Handout 1.2.1 as well as Student Handout 1.2.2 for homework to be assessed.

Maps of Space

In this exercise, you will be asked to describe a subject from three different perspectives. Answer the questions below based on what you see.

Section One—Long Distance

1. From what you can see right now, describe the subject in detail.
2. Focusing on the subject, what other things can you see (for example: plants, the sky, cars, etc.)?
3. What do you see most of, the subject or his/her surroundings?

Section Two—Middle Distance

1. From what you can see right now, describe the subject in detail.
2. Focusing on the subject, what other things can you see (for example: plants, the sky, cars, etc.)?
3. What do you see most of, the subject or his/her surroundings?

Section Three—Near Distance

1. From what you can see right now, describe the subject in detail.
2. Focusing on the subject, what other things can you see (for example: plants, the sky, cars, etc.)?
3. What do you see most of, the subject or his/her surroundings?

Section Four—What's the Difference?

1. Comparing the long distance view and the middle distance view, was there a difference in what you could see of the subject? If so, what was the difference?
2. Comparing the long distance view and the near distance view, was there a difference in what you could see of the subject? If so, what was the difference?

Shift things a little. Suppose now that instead of studying a person on the field, you're studying a place, a part of the world.

1. Which perspective would give you the most information about how people built houses in that place?
2. Which perspective would give you the most information about how people got goods that could not be produced in that place?
3. Which perspective would give you the most information about how people interacted with others in the area?
4. How about you? Everyone is a little different. Some people really enjoy getting into the fine details, while others like the "big picture." Still others strike a balance between detail and general information. Which of the perspectives do you like the most? What is it that you enjoy about that perspective?

Creating Maps of Space

Maps are not just pictures. They also help us to understand more about the people and places shown. In this exercise, you will create maps, then discuss them in class.

Part I: Near-Distance Maps

Using your graph paper, draw a map of the room where you sleep. Include as much detail as you can to show furniture, electronics, windows, doors—everything! Remember to include the five basic elements of a map. If you do not have a tape measure to find out exact lengths, improvise. Use paces, hand-spans, or whatever you like. Just be sure to report what you used. Be prepared to discuss connections between how much space you devote to one type of item and how much you enjoy that item.

Part II: Middle-Distance Maps

Using your graph paper, sketch out a map of either a city you have visited or a city you would really like to visit. You can use a map or website to sketch from, but do not trace a map. You do not have to make a perfect map, just one that comes from *your hand*. Again, remember to include the basic elements of a map. Be prepared to discuss what this kind of map tells you about how humans have changed their environment.

Part III: Long-Distance Maps

Choose a part of the world (an area of at least continent-size) that you would like to visit, or have been to, other than where you live. Find samples of two maps that show different aspects of your selected area: one that shows the geographic or natural resource features and another that shows information such as population or political boundaries. Sketch a single map which incorporates the information from your two examples. Be prepared to discuss how you drew your map (for example, combining different scales, legends, etc) and what conclusions you might see from the combination. For example, do you see a correlation between population and geographical features? Between geographical features and political boundaries? Other connections?

Space in Near Distance

About This Photo

Taken in the twilight of a winter afternoon, this photo shows Union Terrace Park in central Aberdeen, Scotland. To the left is the railway that links Scotland's third largest city with the rural northeast. In the background are the offices and shops of Union Street, the city's main street and primary retail area. The steps in the right foreground lead up the hillside to the city library and Her Majesty's Theatre.

Questions for Consideration:

1. What estimates can we make about the town from this photo?

2. What about its environmental setting?

3. Do you see any indications that Aberdeen is the major seaport for North Sea oil?

4. Can we make any guesses about what the people of Aberdeen value?

Space in Middle Distance

Physical and political map of western China

Questions for Consideration:

1. What information does this map give that is different from the previous photo?

2. What estimates can we make of how environment has shaped this part of the world?

3. Find Chongqing. Given its position in relation to other towns and to the environment, what estimates can we make about its importance or regional influence?

Space in Long Distance

Physical and partial political map of Eurasia, with elements of Africa and Oceania. From this perspective, it is easy to understand the Mediterranean, Red, Black, and Caspian seas as lakes within Afroeurasia.

Questions for Consideration:

1. What features does this map show that the other two do not?
2. What does this map tell you about the people living in this region?
3. What route(s) could people use to get around?
4. How much of an influence would the ocean/seas have on history? Why?

LESSON 3

Maps of Time

Preparation

As with the previous lesson, this one allows for different modes of learning. In addition to copies of the handouts, you will need:

- Three 20-foot (6-meter) lengths of clothesline. You can get away with one, but you will have a better tool for comparison with three.
- Large cards (see Teacher Tools 1.3.1–1.3.3).

Introduction

Although history cannot be broken down into a simple series of dates, it is important to be able to appreciate the correlation between time, people, ideas, and the environment. In some cases historians are concerned with a span of weeks, as in the case of the man Menocchio in Carlo Ginzburg's book, *The Cheese and the Worms* (Baltimore: Johns Hopkins UP, 1991). In other cases historians consider a span of decades, as in the case of studies of historical trends during the "long nineteenth century" (1789–1914). Or, they may study very long periods of history such as ninety thousand years or more when humans populated parts of the world outside of Africa. As with maps of space, each of these spans of time tells us different parts of history's tale. Which perspective a student adopts depends on the level of detail or large patterns that are being investigated.

Activity: Walking through Time

1. Before starting this activity, identify a locally well-known city or landmark that is about 1000 miles (1600 km) from your school. Distribute the cards from Teacher Tool 1.3.1.
2. Stretch the clothesline across the classroom. Two volunteers might hold it up (though it would be better to secure it to a wall). One student represents the present, the other represents some time in the past.
3. Remind students of how a scale was used in map-making so that a fraction of an inch was used to represent far greater distances. Ask the students to imagine that each inch (25 mm) represents 200 years in time.
4. The modern myth of creation indicates that, using this scale, the "Big Bang" occurred in the city or landmark identified in "I" above. Have the students affix the cards at appropriate intervals on the clothesline.
5. Repeat this process using the cards from Teacher Tools 1.3.2 and 1.3.3.
6. Discuss these questions: What did students learn from seeing timelines laid out in this manner? What are the benefits of each scale? The drawbacks?

Time in Long Distance

The cards below are designed to correspond to a time scale of 1 inch (25 mm) as equivalent to 200 years. Print the cards on heavy paper, then attach a string or yarn to each card so that it can be tied to the clothesline at the appropriate place. Blank cards are provided to include events that might be of immediate interest to your students.

Language used for communication Perhaps 48,000 years ago	**Long distance trade Asia (the Silk Road) Mesoamerican empires About 1,800 years ago**
Development of agriculture Southwest Asia About 9,000 years ago	**Printing with ceramic type Eastern Asia About 1,000 years ago**
Large cities and societies appear Southwest Asia About 6,000 years ago	**The Crusades Europe & Southwest Asia About 700 years ago**
Empires: East Asia (Xia) Mesoamerica (Olmec) About 3,000 years ago	**European exploration & expansion Printing with metal type (Europe & Korea) About 600 years ago**
Empires: Rome About 2,500 years ago	**The Protestant Reformation Europe About 500 years ago**
Development of genetically engineered foods 1980s	**First nuclear power station North America December 1951**
The Enlightenment Europe & North America About 300 years ago	**Communications Revolution Industrial Revolution About 200 years ago**

First use of petroleum for energy **North America** **1859**	**World population tops 6 billion** **2000**
Global war **Europe & Southwest Asia** **1914–1918**	**Global war** **Afroeurasia & Oceania** **1937–1946**

Time in Middle Distance

The cards below are designed to correspond to a time scale of 1 inch (25 mm) as equivalent to one year. This means that the 20-foot (6-m) clothesline will cover a span of 240 years. Print the cards on heavy paper, then attach a string or yarn so that the card can be tied to the clothesline.

Massive world population rise begins About 1750	**Slavery outlawed in Europe Early 1800s**
Industrial Revolution starts About 1750	**Steam train invented George Stephenson 1814**
World Wars between Britain and France end 1763	**Famine Northern Europe 1843–1850**
Watt's steam engine 1769	**Slavery outlawed North America 1863**
European wars of the French Revolution and Napoleon 1790s–1815	**Suez Canal opens Egypt 1869**
Famine East Asia 1960s	**Trans-Siberian railway Eurasia Construction begins 1891**
Iranian Revolution Southwest Asia 1979	**Air travel possible The Wright Brothers 1903**

Personal computers North America Early 1980s	**Assassination of Archduke Ferdinand June 1914**
Tiananmen Square demonstration East Asia April–June 1989	**Television invented John Logie Baird 1925**
South Africa ends Apartheid 1991	**The Cold War begins 1946**

Time in Near Distance

The cards below are designed to correspond to a time scale of 10 inches (254 mm) being equivalent to one hour; the 20-foot (6-m) clothesline essentially represents a single day. The following cards are based on the diary of a Scottish immigrant during his transatlantic voyage in 1853. You may choose to use the blank cards to have the students describe their own day.

Awoke to hear little Katie crying **6:30 a.m.**	**Dinner in the cabin** **(Fish with fried potatoes)** **1:00 p.m.**
Breakfast with the Captain **(oatmeal with cream & salt, coffee)** **9:00 a.m.**	**Talked to Mr. MacDonald** **3:00 p.m.**
Walked on deck. **Still becalmed** **10:30 a.m.**	**Tea in the cabin** **(Tea with stale toast)** **4:00 p.m.**
Dr. Johnstone in to see Katie. **Passengers in steerage are also ill** **12:00 p.m.**	**Supper with friends** **(Dried beef, potatoes, claret)** **8:00 p.m.**
Talked with gentlemen **9:00 p.m.–12:00 a.m.**	

LESSON 4

Maps of History

Preparation

This lesson offers primarily a review of the previous two, and introduces the concepts of using maps of time and space together to see historical developments. Photocopies of Student Handout 1.4.1 will be needed if it is used. Having visual aids from the previous lessons and/or the student handouts for reference may be useful.

Introduction

The Oxford English Dictionary describes history as "a relation of incidents." In this lesson, we will be examining the relationship between time and space, again relying on a flexible use of scale, and how these help us to understand the people, environment, and information around us. This lesson points out how the scale of time being applied is independent of the scale of space.

Activities

1. Review of maps of space
    a. Review the elements of a map.
    b. Discuss benefits of each view of space, and contrast each to the others.
2. Review of maps of time
    a. Review the elements of a map.
    b. Discuss benefits of each view of space, and contrast each to the others.
3. The relationship of the two
    a. Student Handout 1.4.1 is aimed at helping students see connections of time and space.
    b. Is it necessary to use the same perspective in time as in space? For example, if one uses a close-up view of space, must one use a close-up view of time?
    c. What are some of the circumstances in which we would want to use the same perspective for both space and time? When would we want to use different perspectives?
    d. Is there a value decision associated with the perspectives?
4. How does this relate to "history?"
    a. Why is being able to shift scale important?
    b. Why not use just one scale?

Assessment

Since this lesson is primarily a review and analysis of the previous lessons, it is presumed that sufficient assessment has been completed at this point. Formalized testing may be desired.

Below are listed collections of documents that are available for study. Read through the descriptions and decide whether the collection will give you a relatively large-scale (long distance), medium-scale (middle distance), or narrow-scale (near distance) understanding of time and space.

Document Collection One

Archive Record 1: Diary of A.G. MacKellar, January 1844–June 1845, outlining his travel from Inverness, Scotland, to Louisville, Kentucky (USA).

Archive Record 2: Letter of Witold Brejnak, 12 March 1898, to his parents in Krakow, Poland, describing life in Spain.

Archive Record 3: Employment records of the Union-Pacific Railway, recording the names, nationality, age, and length of employment for those working on the Transcontinental Railway (1863).

Archive Record 4: Ship manifest, 5 August 1804, names and personal data on persons that sailed from Nice, France, and eventually landed at Buenos Aires, Argentina.

Questions

1. What perspective does this collection provide in time?

2. What perspective does this collection provide in space?

Document Collection Two

Archive Record 1: Statement of account, January 1954–December 1954, detailing farm expenses (groceries, heating, stock feed, etc).

Archive Record 2: Trust Deed, recorded July 1953, detailing exact farm property boundaries.

Archive Record 3: Letter from an unknown farm laborer to his mother dated 11 November 1954, describing other laborers and daily routines on the farm.

Questions

1. What perspective does this collection provide in time?

2. What perspective does this collection provide in space?

Document Collection Three

Archive Record 1: Biologists' field records, study completed in 2006, describing the number and variety of plants and animals along the Negro River (a tributary of the Amazon) in Columbia.

Archive Record 2: Audiotape interviews with native elders describing life and the setting of their village along the Negro River. The stories relate to approximately 1910.

Archive Record 3: Biologist's report on findings related to a tree that fell during a violent storm along the Negro River. The study of the tree's rings demonstrates growth spurts, fires, drought, and indicates that the tree was approximately 400 years old.

Archive Record 4: Archaeologists' reports and findings of a settlement on the Negro River. Artifacts, fire pits, waste dumps, and so on suggest the environmental setting dating back approximately 1,500 years.

Questions

1. What perspective does this collection provide in time?

2. What perspective does this collection provide in space?

CHAPTER 2

By Susan Douglass

Introduction to Big Geography

WHY STUDY BIG GEOGRAPHY?

Before launching into any course on world history, students need to explore the terrain on which human history took place. Students are exposed to exciting concepts about the earth's formation and dynamic processes in science classes, but they seldom have the opportunity to link this information to history. Geography studies, on the other hand, often focus on the state of the contemporary world. This chapter introduces the concept of Big Geography, an innovative way of looking at the divisions and connections of the world as a dynamic stage for human activity over thousands of years. This chapter challenges many conventional or traditional notions about geography in order to prepare students and teachers to look at larger scales of time and place. In the three lessons in this chapter, students will review much of what they know, fulfilling numerous objectives from the National Geography Standards in the process of developing historical thinking skills as they relate to geography. A prominent learning objective in this chapter addresses the concept of "region" in geography. Students will consider how people have conceived of and created regional divisions and how the definitions of region have changed over time in response to new evidence and new ways of viewing human and biological space.

OBJECTIVES

Upon completing this chapter, students will be able to:

1. Differentiate among various flat world map projections in terms of their relative distortion of land shape and area
2. Identify the earth's continents and describe alternative ways of naming them
3. Evaluate geographers' opinions concerning the boundaries of continents and their relationships to each other and to bodies of water
4. Compare views of earth from different vantage points and identify several large regions as stages of world history

5. Define continental drift and explain in general terms how global land masses came to be distributed as they are today
6. Analyze the relationship between vegetation zones, population distribution, and paths of interaction in historical time
7. Evaluate topographical features of earth in terms of their impact on the mobility of flora, fauna, and human beings

TIME AND MATERIALS

These lessons take 3–5 class periods to complete.
Materials:

- Student handouts
- Globes and atlases
- Thin tracing paper
- .05-cm graph paper
- Calculators
- Wall map (physical earth) (optional)
- Computer with Internet access (optional)

HISTORICAL CONTEXT

The chapter introduces world history from the beginning of geologic time, and it encompasses the whole of human history. Its lessons deal with the natural and human divisions of the globe, and people's changing perceptions of those divisions based on scientific and historical evidence. The chapter builds upon students' prior knowledge of earth and life science, and challenges them to link that knowledge to an overall view of human history. It presents a conceptual geographic framework for considering the earliest human settlements and migrations, as well as current population distribution and communication across the globe. It also presents geographic, historical, and scientific evidence challenging conventional views of the division of land masses into continents. It encourages students to think about how land masses and waterways are interconnected, and how this has affected human, plant, and animal life over time. Finally, as an introductory chapter, the lessons provide a review of map skills and identification of major geographic features.

THREE ESSENTIAL QUESTIONS

Humans and the Environment

How have physical or natural features of the earth affected people's capability of communicating over long distances? What physical or natural features might prevent or hinder transport?

Humans and Other Humans

How might concepts and perceptions of geographic space affect the perceptions and attitudes of the people of one country toward the people of another?

Humans and Ideas

If a continent is defined as a large land mass surrounded, or almost surrounded by water, how do you imagine that Europe, which is not surrounded by water, came to be categorized as a continent? Who might have decided that there are seven continents and that Europe is one of them? Was a different definition used to identify Europe as a continent? Should Europe be recategorized as a subcontinent, parallel, say, to South Asia? Teachers and students may wish to refer to Martin W. Lewis and Kären E. Wigen, *The Myth of Continents* (Berkeley: University of California Press, 1997).

CORRELATIONS TO NATIONAL GEOGRAPHY STANDARDS

Geography for Life

The World in Spatial Terms. 1. How to use maps and other geographic representations, tools, and technologies to acquire, process, and report information from a spatial perspective. 3. How to analyze the spatial organization of people, places, and environments on earth's surface. Places and Regions. 4. The physical and human characteristics of places. 5. That people create regions to interpret earth's complexity. 6. How culture and experience influence people's perceptions of places and regions. Physical Systems. 7. The physical processes that shape the patterns of earth's surface. 8. The characteristics and spatial distribution of ecosystems on earth's surface. Human Systems. 9. The characteristics, distribution, and migration of human populations on earth's surface. Environment and Society. 15. How physical systems affect human systems. 16. The changes that occur in the meaning, use, distribution, and importance of resources. The Uses of Geography. 17. How to apply geography to interpret the past.

INSTRUCTIONAL RESOURCES

Black, Jeremy. *Maps and History: Constructing Images of the Past.* New Haven, CT: Yale University Press, 1997.

———, ed. *DK World History Atlas.* 2nd ed. New York: Dorling Kindersley, 2005.

Dunn, Ross E. "Big Geography and World History." *Social Studies Review* 49, 1 (Spring/Summer 2010): 14–18.

Farndon, John. *DK Concise Dictionary of the Earth.* New York: Dorling Kindersley, 1994.

Lewis, Martin W., and Kären E. Wigen. *The Myth of Continents: A Critique of Metageography.* Berkeley: University of California Press, 1997.

Monmonier, Mark. *How to Lie with Maps.* Chicago: University of Chicago Press, 1991.

———. *Rhumb Lines and Map Wars: A Social History of the Mercator Projection*. Chicago: University of Chicago Press, 2004.

Raat, W. Dirk. "Innovative Ways to Look at New World Historical Geography." *The History Teacher* 37, 3 (May 2004): 281–306.

Smithsonian, National Museum of Natural History. The Dynamic Earth. http://www.mnh.si.edu/earth/main_frames.html.

Snyder, John P. *Flattening the Earth: Two Thousand Years of Map Projections.* Chicago: University of Chicago Press, 1997.

LESSON 1

Seeing the World

A Lesson in Three Parts

Part 1: Calculating distortions on world map projections
Part 2: Setting the scene of history: continental drift and geologic time
Part 3: Viewing earth from different vantage points: theaters of human history

Materials

- Student Handouts 2.1.1–2.1.3
- Graph paper (.05-cm spacing on thin paper)
- Calculators
- Freestanding globe
- Google Earth

Part 1: Calculating Distortions on World Map Projections

1. Divide the class into at least three groups. Assigning each group to study one of the three different world map projections on Handout 2.1.1 (Mercator, Peters, or Robinson projects), have them find the relative area of the continents (as conventionally defined) by superimposing 1-cm graph paper on each map.
2. Estimate the number of square centimeters of water versus land area and use a calculator to compute the approximate percentage on each projection.
3. Using the centimeter grid, have students work in groups to estimate the number of square centimeters of the land masses listed on the table in Handout 2.1.1 and place the figure in the appropriate boxes. Use a calculator to compute the area and percentages of the total global surface area and enter into the appropriate boxes.
4. Using the data on Handout 2.1.1, find out the total surface area of the globe in square kilometers. Find out the actual area of each continent in square kilometers and enter into the appropriate boxes. Using a calculator, find out the total percentage of earth's surface covered by each continent's area. Enter the results in the appropriate box. Use these figures to compare the map projections.
5. Displaying the chart in Handout 2.1.1, ask each group for its results from studying the chart. Compare the relative area of each land mass on the various projections. Which land masses are most distorted relative to their actual area? Which are least distorted on the various map projections?

Discussion

1. How might use of the Mercator projection in schools have affected generations of students in terms of their perception of the relative size and importance of different land masses?
2. Even assuming that people realize that the sizes of Greenland and Antarctica are out of proportion on the Mercator projection, how are people likely to perceive the relative sizes of Asia and Africa? Are people likely to perceive that a relative size distortion exists? Why or why not?
3. Equal area projections are quite commonly used now. How might that fact affect the geographical perceptions of the current generation of students and readers of print and electronic media?

Part 2: Setting the Scene for History—Continental Drift and Geologic Time

1. View online animations that illustrate the theory of plate tectonics and show continental drift over millions of years. Have students briefly review or research the theory of continental drift. Students may be asked to summarize their research results in verbal or graphic form.
2. The geology portal at the University of California, Berkeley's Museum of Paleontology site has animations in varying file sizes. See http://www.ucmp.berkeley.edu/geology/tectonics.html. The site also features links to detailed information about geologic periods. See http://www.ucmp.berkeley.edu/exhibit/geology.html.

Discussion

1. Discuss with the class or evaluate any written research summaries in terms of the following points:
    - The time frame of continental drift in millions of years (clarify the stage of the continents' configuration during which human beings were present, for example).
    - The implications of plate tectonics for the likely future of the earth
    - Present-day effects of plate tectonic movements on earth's life forms (destruction by earthquakes, volcanoes, tsunamis; fertile soils created by eruptions, ecological alteration of affected areas).

Part 3: Viewing Earth from Different Vantage Points—Theaters of Human History

1. Working individually or in groups with globes, have students follow the instructions on Student Handout 2.1.2 to investigate views of hemispheres centered on different coordinates.

2. Student Handout 2.1.3 shows three large-scale spatial "theaters" of human history between 10,000 BCE and 1500 CE. These three theaters are Afroeurasia, the Americas, and Australasia. This handout provides overlap with Student Handout 2.1.2, giving students notes and a reference sheet for their world history notebooks that can be consulted in their study of later chapters involving these theaters.

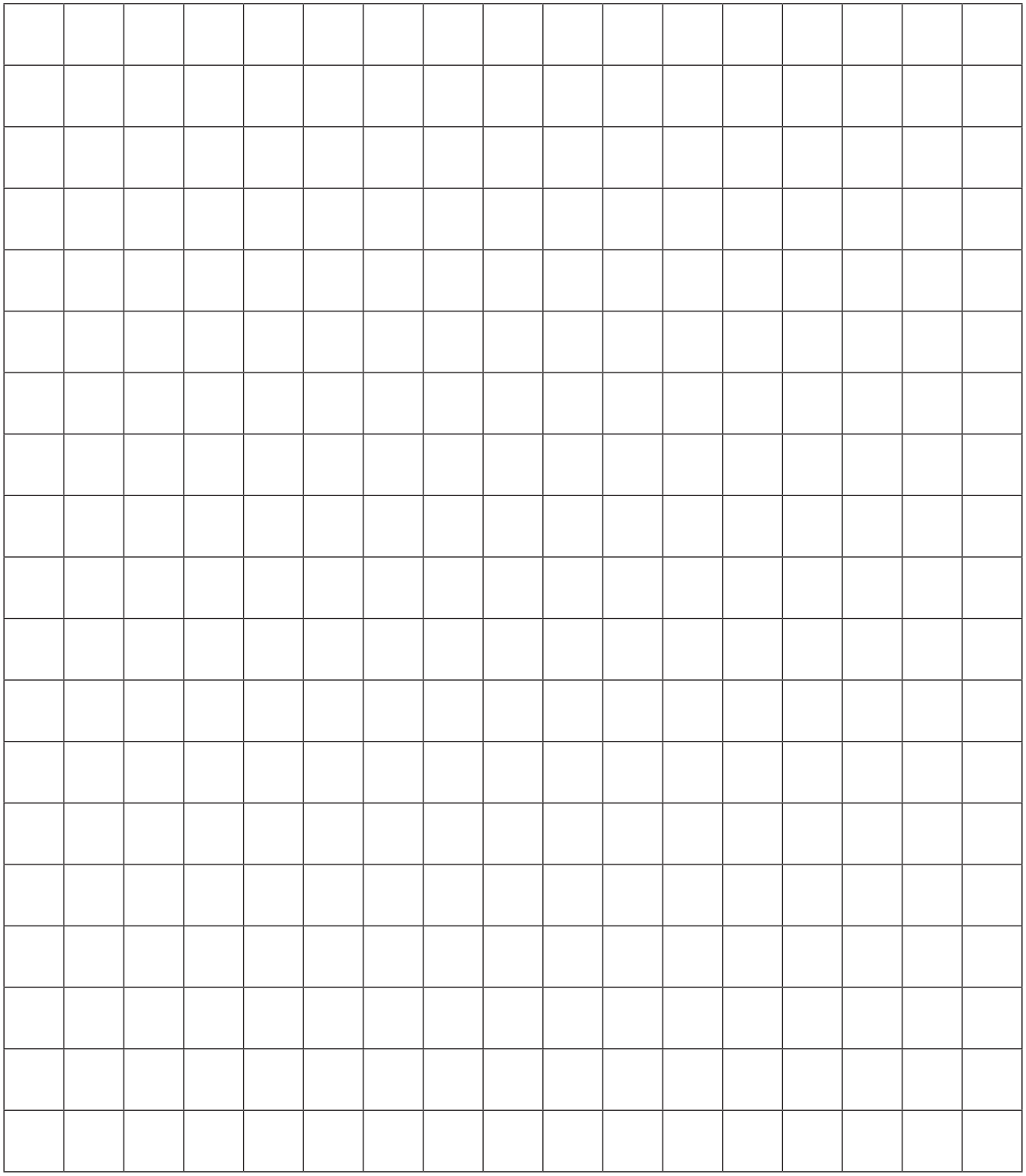
Calculating Distortion on World Map Projections

Continent or country name	Mercator Projection (area in sq cm)	% of total map area	Robinson Projection (area in sq cm)	% of total map area	Peters Projection (area in sq cm)	% of total map area	Actual sq km	Actual % of world's surface
South America								
Greenland								
Africa								
Asia								
North America								
South America								
Australia								

Object Measured	Surface Area in Square Miles (Square Km)	Percent of Total Land Area of Earth	Percent of Total Surface Area of Earth
Earth	197,000,000 sq. mi. (509,600,000 sq. km)	—	100%
Total Water Area	361,800,000 sq. km.	—	70%
Total Land Area	57,309,000 sq. mi. (148,429,000 sq. km.)	100%	30%
Asia (plus the Middle East)	17,212,000 sq. mi. (44,579,000 sq. km.)	30.0%	8.7%
Africa	11,608,000 sq. mi. (30,065,000 sq. km.)	20.3%	5.9%
North America	9,365,000 sq. mi. (24,256,000 sq. km.)	16.3%	4.8%
South America	6,880,000 sq. mi. (17,819,000 sq. km.)	12.0%	3.5%
Antarctica	5,100,000 sq. mi. (13,209,000 sq. km.)	8.9%	2.6%
Europe	3,837,000 sq. mi. (9,938,000 sq. km.)	6.7%	2.0%
Australia (plus Oceania)	2,968,000 sq. mi. (7,687,000 sq. km.)	5.2%	1.5%

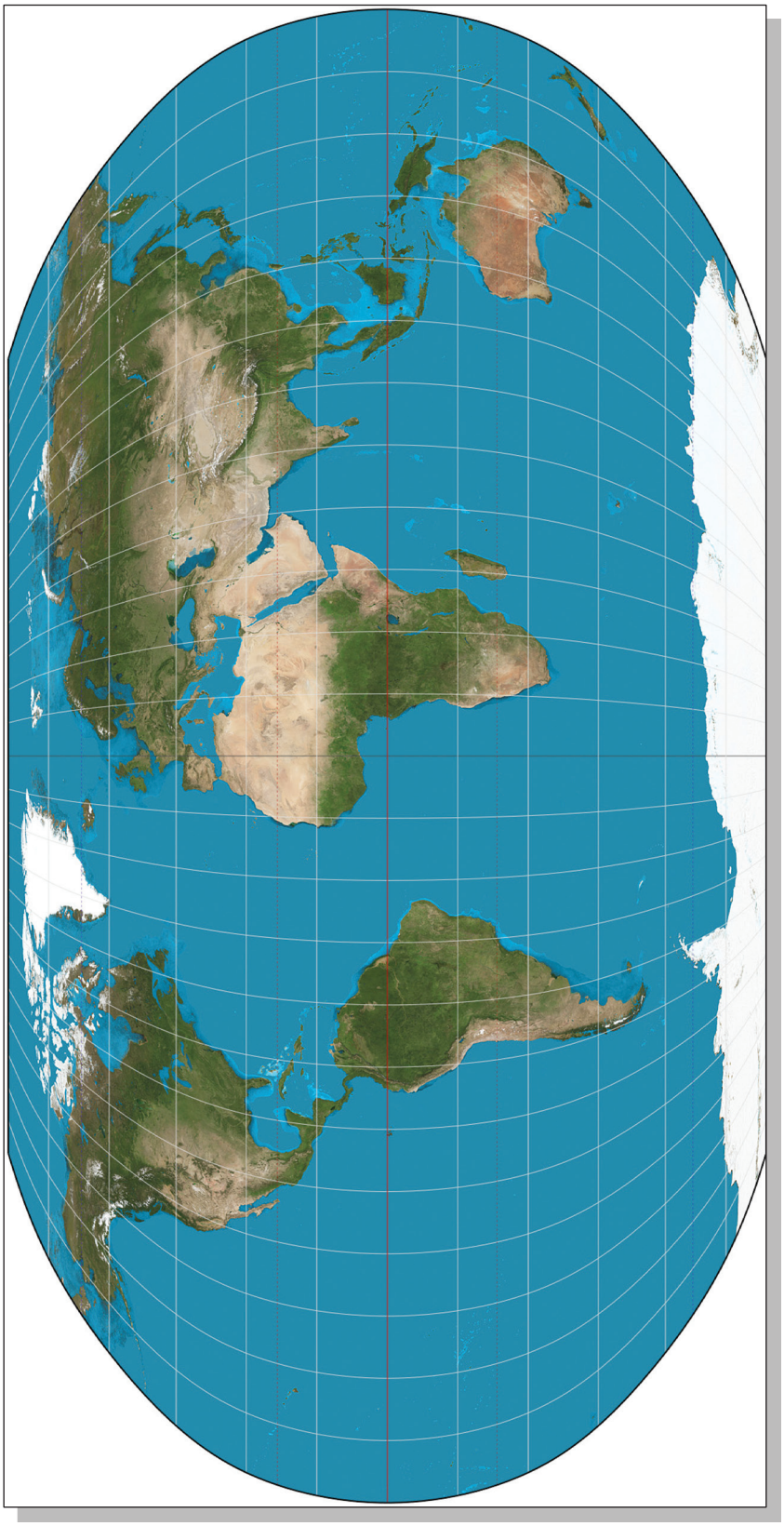
Sources: http://www.britannica.com/ebi/article-199816 ; http://www.enchantedlearning.com /geography/continents/Land.shtml; http://hypertextbook.com/facts/2001/DanielChen.shtml.

One-Centimeter Grid for Calculating Distortion on World Map Projections



Mercator Projection

Robinson Projection



Gall–Peters Projection

Viewing Earth from Different Vantage Points

Your usual view of the world is a wall map centered on the equator and the prime meridian, or a globe fixed to a frame at the North and South Poles. If you were riding in a satellite orbiting Earth you would see very different views. Also, if you were standing anywhere on Earth's surface you might think of your position as the center of the Earth. To enable you to look at the surface of earth from different perspectives, use a freestanding globe that is not attached to a frame. You may also use Google Earth to turn the globe in different directions.

1. Turn the globe until you can view it with the center at the North Pole. What land masses can you see? Which are not visible at all? How are these land masses and bodies of water connected and separated? Is this part of the world inhabited by many people?

2. Turn the globe so that the South Pole is in the center. Answer the same questions as you did for the North Pole.

3. Turn the globe so that you can view a hemisphere centered on the Pacific Ocean. What land masses can you see? What is this region often called?

4. Turn the globe to center it on 60°E, 15°N. Which continents are visible? Which bodies of water are visible? Why do you think this view of the globe has been called "The Old World"? Why might historians call this huge region a major theater of human history?

5. Turn the globe to place the Americas at the center, with the North and South Poles visible at the edge and the Prime Meridian and International Date Lines at the eastern and western edges. What other land masses can be seen? How far toward the poles do North and South America extend? Why do you think this view of the globe has been called "The New World"? Why might historians consider this another theater of human history?

6. Would historians be likely to think of a view of earth centered on 0° and 180° as a theater of human history? Why or why not?

7. Turn the globe to place Australia at the center, so that the view is centered on the Tropic of Capricorn and 120° E longitude. What other land masses are visible? Why might this large region, which is also mostly water, be considered a theater of human history?

Theaters of Human History

For the period from about 10,000 BCE to 1500 CE, historians can identify three primal spaces within which humans interacted. Identify and label the major land masses and bodies of water in these theaters of human history. Write a paragraph or discuss in groups why they are considered distinct regions for that period. Use the spaces next to the globes to take notes. What happened after 1500 CE to change the boundaries of these theaters, and how did they change?

LESSON 2

How Many Continents Are There?

A Lesson in Four Parts

Part 1: What Is a Continent?
Part 2: Pull the Plug
Part 3: Crack the Eggshell
Part 4: Debate the Conclusions

Materials

- Student Handouts 2.2.1–2.2.3
- Tracing paper
- Computer with Internet access (optional)

Part 1: What Is a Continent?

1. Have students review and prepare to critique the conventional designation of seven continents by completing Student Handout 2.2.1. This activity familiarizes students with the unique case of the Europe-Asia boundary, as well as the concept that the process of naming geographic features has its own historical context. For example, the Prime Meridian of longitude is located where it is because of decisions made by British leaders, not because it "naturally" belongs there.

Part 2: Pull the Plug

1. This and the next exercise continue students' interaction with different types of maps and different ways of viewing Earth. They work with the implications of seeing Earth in different ways for thinking about human-made divisions of the world. Student Handout 2.2.2 shows the seafloor relief and the continental shelves. After passing out the map handout, ask the class what they are seeing in this view of Earth. Tell them if they could pull a giant plug and let all the water out of the seas, lakes, and rivers, this is how Earth's surface would appear.
2. Explain or solicit prior knowledge that the seafloor contains mountains as high as any on Earth, and trenches several miles deep. Ask or explain about (1) the mid-ocean ridges that provide evidence of seafloor spreading, (2) molten rock that emerges along seams and that push the plates apart, and (3) deep trenches such as those along the Pacific Rim where edges of the plates have been pushed downward into the mantle. These phenomena are fundamental aspects of plate tectonics.

3. Assign students in groups or individually to investigate the seafloor map and respond to the questions on Student Handout 2.2.2. The first question refers to the darker and lighter shades of blue representing variations in the depth of the water. The shallow (light blue) areas around the continents represent the continental shelves that students are asked to define.

4. Provide tracing paper to allow students to draw a rough map using the continental shelves as continent boundaries. As they investigate and as the class debriefs at the conclusion of the activity, draw attention to the island chains in Southeast Asia and features such as the Caribbean Sea and the Mediterranean, which no longer seem separate from the continents near them. Note which coastlines on Earth have a very wide or very narrow continental shelf. Discuss how this view supports the idea of a continent of Afroeurasia, since the three conventional regions of Africa, Asia, and Europe no longer appear separate. Also ask students to consider the idea that North and South America constitute a single land mass. Some atlases also show the seafloor at the North Pole, which shows that North America and Asia are intimately joined.

Part 3: Crack the Eggshell

1. Distribute Student Handout 2.2.3. Ask students what the earth is like at its core. Is the earth a solid sphere of rock, and what is under the surface on which we stand? (The web sites attached to the Student Handouts 2.2.2 and 2.2.3 maps provide this information if the discussion goes in that direction.) Explain to students that the earth's crust is quite thin compared with the mantle and the core, and that it is made up, scientists now believe, of gradually shifting plates in dynamic movement.

2. Have students complete the investigation of the map and complete the activities in pairs or groups.

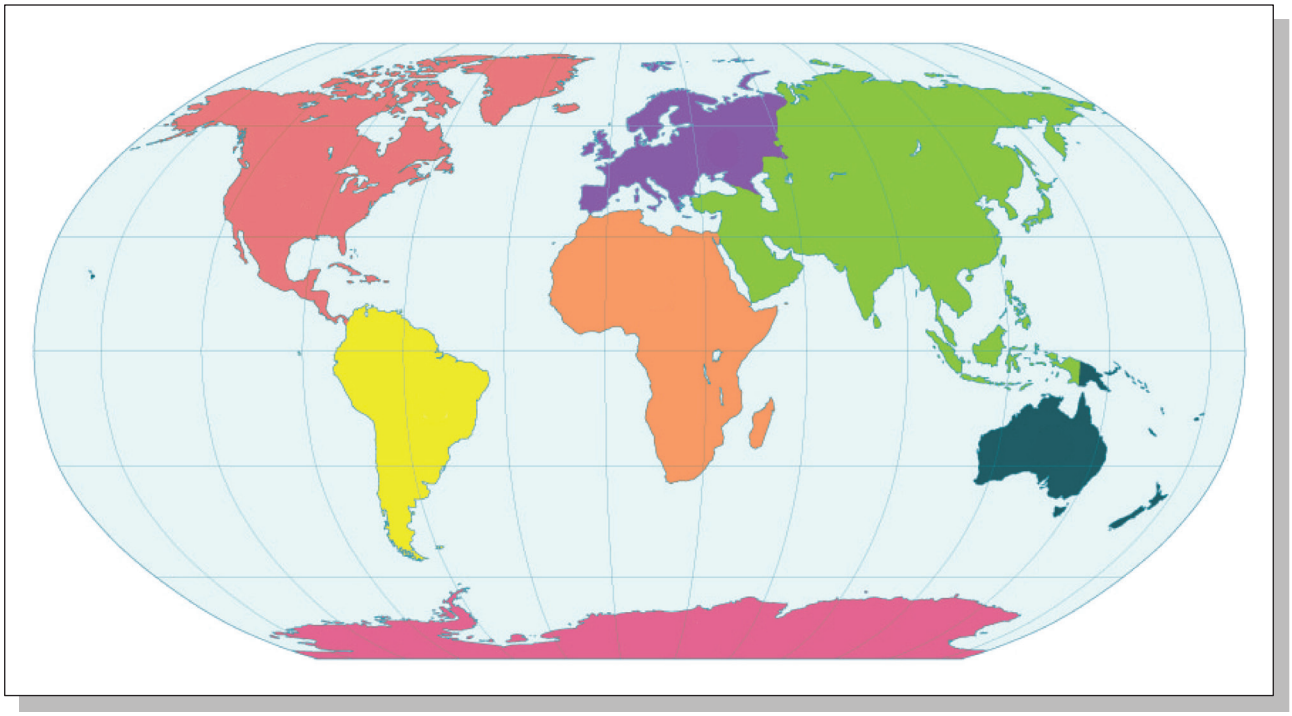
3. In discussing students' findings, take advantage of the opportunity to correlate the points of collision between plates and earth's major mountain chains. Note particularly the long chain reaching from Alaska to the tip of South America, as well as the one from the North African coast and the northern rim of the Mediterranean in Europe extending eastward across Central Asia to China. These chains correspond closely to major subduction zones. ("Subduction" refers to the action or process of the edge of one crustal plate descending below the edge of another.) Another chain on the western rim of the Pacific (called the "ring of fire" because of incessant volcanic activity) traces a line of island chains from the Bering Strait to New Zealand.

4. Note the name of the tectonic plate on which Asia and Europe are located, as well as the Arabian plate that bridges between Africa and the Eurasian plates. Call attention to the direction of plate movement indicated by the arrows.

Part 4: Debate the Conclusions

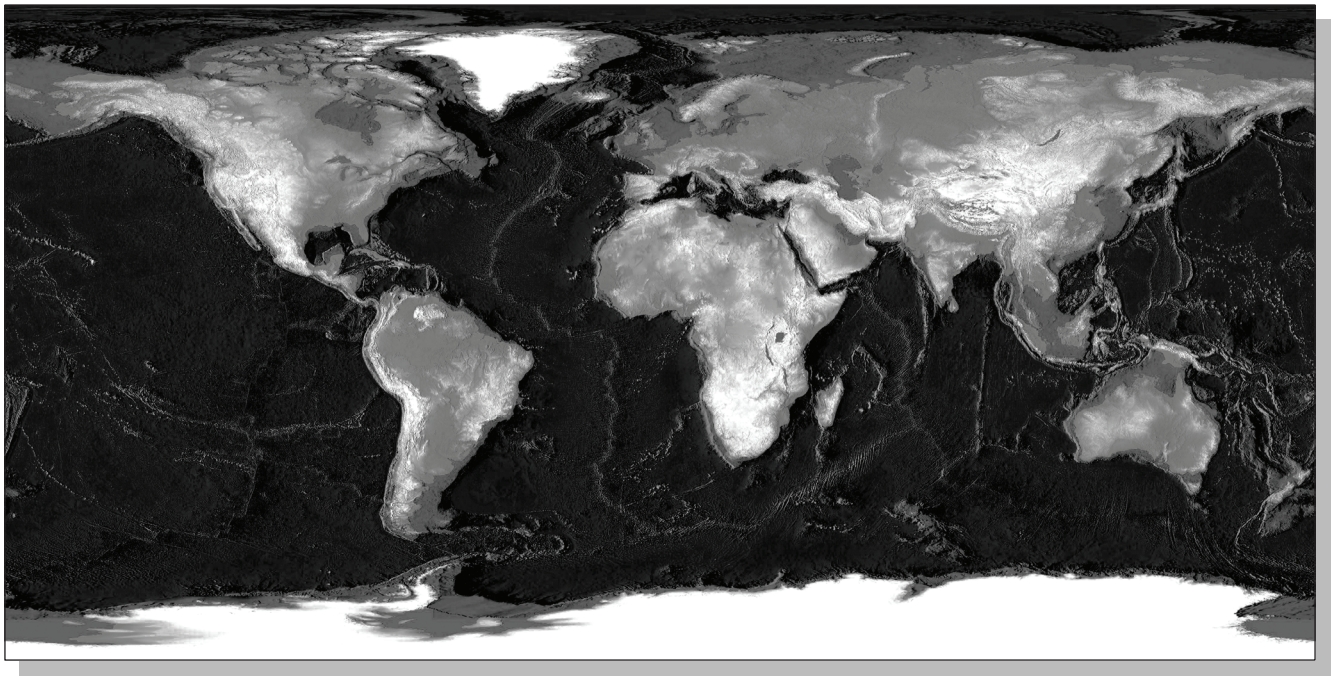
1. Assign students to write a paragraph describing how their opinions of the number of continents might have changed by looking at the topography of the ocean floor and the tectonic divisions of earth's crust.
2. For maps of the seafloor topography combined with designations of continental plates, see recent editions of the *National Geographic Atlas of the World*.
3. After collecting the students' views, invite them to stage a classroom debate in which students are grouped in teams with similar opinions. Ask them to argue for traditional or alternate designations of the continents, and the number of continents they believe there are.
4. After these extensive investigations of a wide range of geographic topics, students should be encouraged to assess and organize what they have learned about the earth and geography by writing in their journals or other learning record.

What Is a Continent?



1. Identify the continents as shown on this map and label them.
2. Locate the Equator on the map and label it. What is the significance of the Equator line?
3. Locate the Prime Meridian on the map.
4. What does the Prime Meridian represent, and why does it run through Greenwich, England?
5. In what year was this line established and named, and by whom?
6. What is meant by "Greenwich Mean Time?"
7. Why was this placement considered logical? Could the Prime Meridian be located anywhere else on earth?
8. Look up the dictionary or glossary definition of a continent and write a brief version here.
9. Describe the defining boundaries around each continent. Which ones cut through land masses?
10. Which land borders between continents are the shortest?
11. Where is the longest land border between any two continents?
12. What boundaries divide Africa from Asia?
13. In an atlas, find out what topographical features mark the boundary between Europe and Asia. List these features:
14. Why do you think that geographers are willing to unite Asia and Europe as a single continent under the name "Eurasia"?

Pull the Plug



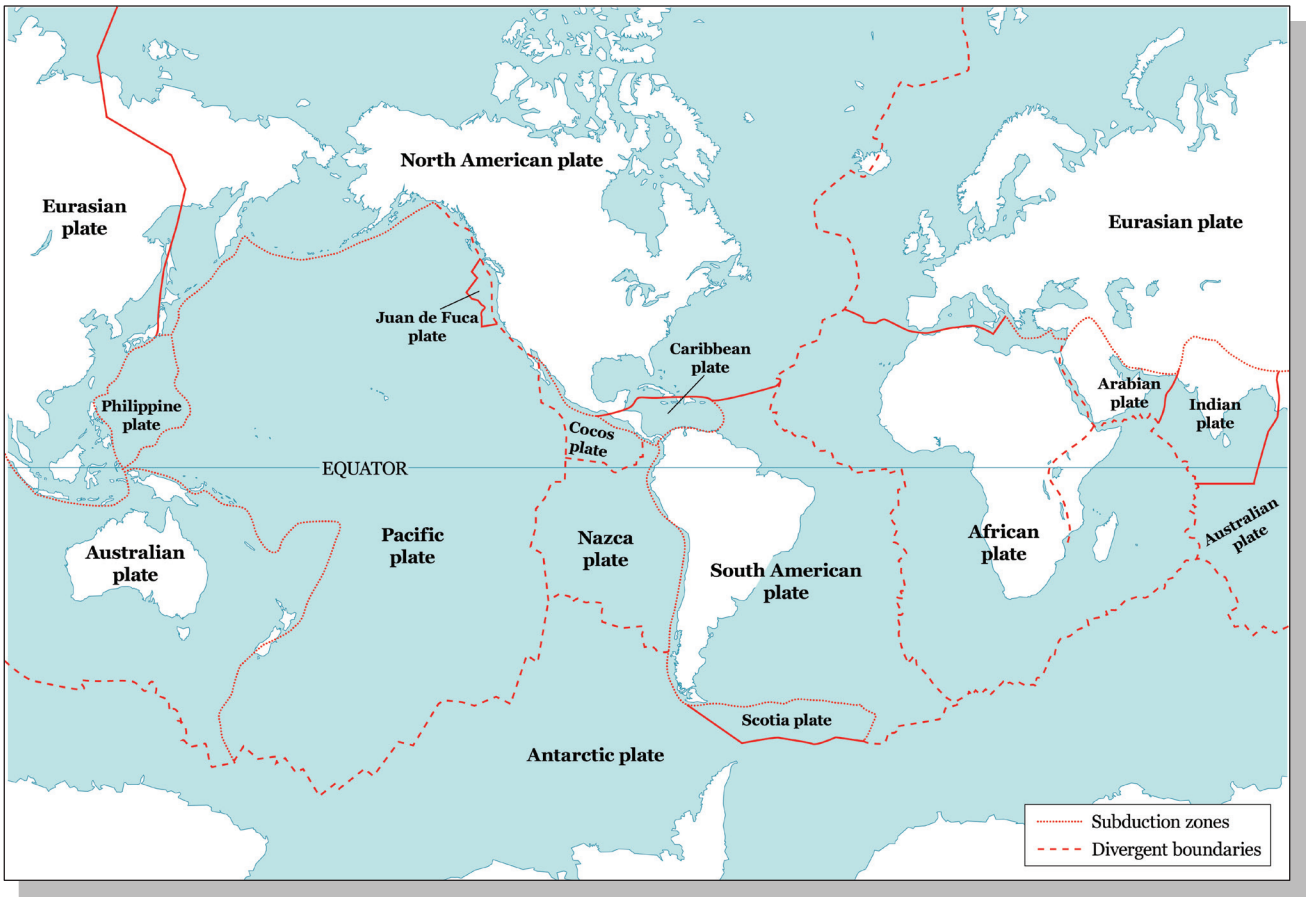
1. Pretend the earth is a bathtub, and you just pulled the plug. When the seas have all been drained out, view the map of earth's topography, above.

2. Look at the differing scales of gray on the map and describe what they represent. Find a definition for the areas represented by the lightest shade.

3. As you know, over the long run of Earth's history, the level of the seas has not always been the same. During the Ice Ages, when water was locked up in huge polar ice caps, sea level was so much lower that a land bridge existed between Asia and North America. Use this map to form a new view of the continents we know from maps showing all the water in place.

4. Make a sketch or use tracing paper to draw a new map of Earth's continents in which the edge of the continental shelf is the continental border. Answer the questions below.
    a. According to this way of looking at the world, how many continents are there?
    b. Where else on Earth might land bridges have existed during the Ice Ages? Verify that land bridges existed in the regions chosen.
    c. How does the appearance of the Caribbean Sea change in this view?
    d. What is the relationship between Asia and Australia, and what lands lie between them?
    e. What is the relationship between Asia and North America?
    f. Could you argue that the Mediterranean is an inland sea within a huge landmass? Why or why not?
    g. Does this map support the idea of a continent called Afroeurasia?

Crack the Eggshell



1. Using the map key, locate and explain what the two different types of lines represent. (Hint: use a dictionary or encyclopedia.)

2. Complete the following activities to provide another view of the continents and their boundaries.
   a. The theory of plate tectonics explains the occurrence of earthquakes and volcanoes, as well as the phenomenon of continental drift. Explain the basic principles of plate tectonics.
   b. Locate major earthquake zones in each of the following regions: Pacific Ocean, Indian Ocean, Mediterranean Sea, North America, and South America. Recall or research recent earthquakes along any of these lines. (Find dates and place names and associate them with the lines on the map.)
   c. Make a list of the plates that make up Earth's crust and write the name of the continents and subcontinents that ride on each.
   d. What is the relationship between subduction zones and Earth's major mountain chain and island chains off the east and southeast coasts of Asia?
   e. Cut on the red lines to make a puzzle. How many puzzle pieces do you have? Mix up the pieces and, working with a partner, try to reassemble them. Glue your result to a piece of paper.

LESSON 3

The Personality of Earth's Surface

A Lesson in Three Parts

Part 1: In the Zones—Plants, Animals, and People
Part 2: Moving on the Continental axes
Part 3: Inside and Outside: Afroeurasian Waterways

Materials

- Student Handouts 2.3.1–2.3.4
- Computer with Internet access (optional)
- Classroom atlases
- Wall map of the physical Earth (optional)

Part 1: In the Zones—Plants, Animals and People

1. Introduce the three types of maps placed in Student Handout 2.3.1. Have students work in pairs or small groups. It may be helpful to discuss how climate and vegetation maps correlate and get students started by filling in one line of the chart as an example.
2. When students have finished, discuss the difficulties they found in making the correlations on climate and vegetation. Ask them to give examples of plants and animals that live in each zone, and how humans use both as resources in those places.

Part 2: Moving on the Continental Axes

1. Having set up students with the necessary information base to understand Jared Diamond's concept of latitudinal and longitudinal axes of continents and diffusion. It should not be difficult to use the diagrams to bring the ideas to discussion. Have them view the map and carefully read the quotation on Student Handout 2.3.2 from Jared Diamond's *Guns, Germs, and Steel* to approach understanding of the concept.
2. It may be practical to respond to the questions on Student Handout 2.3.2 as a whole class activity. Have students refer to the climate and vegetation maps and chart, and use the physical wall map in the classroom or atlas. Encourage students to support their answers with evidence. Try to draw out what they may have learned in science and geography classes in earlier years of school. Some of the questions will be raised and considered rather than answered. Students should be encouraged to note these questions for reference later in the course.

3. Ask students for their prior knowledge of latitudinal movements across Africa and the Americas in history. These questions may, of course, be raised now but only answered in the course of the coming year of world history study. Therefore, this lesson becomes a question or theme to carry through the year. Examples may include the spread of indigenous American groups before 1500 CE or sub-Saharan migrations in Africa. For modern examples, invasive species brought by colonizers and shipping companies, global food trade as a carrier of microorganisms such as West Nile virus, Avian flu, or AIDS.

Part 3: Inside and Outside—Afroeurasian Waterways

1. Student Handout 2.3.3 is a review and identification opportunity, but it is also intended to illustrate how complex the coast of Europe (or western Eurasia) is, with its many bays, seas, and peninsulas. Using classroom atlases, have students identify and label the bodies of water. Because of space considerations, a numbered key may be easier than labeling.

2. When students have completed labeling, discuss the effects of these interior waterways on communication, maritime migration, warfare, trade, and fishing. Discuss how the bodies of water within the dotted oval on the map are external routes to larger bodies of land and water, as well as interior seas. Ask students to recall from prior knowledge how these bodies of water have connected people together and linked Europe to other parts of Afroeurasia. Ask in what ways the Red Sea and the Persian Gulf are part of the system of interior waterways.

3. Student Handout 2.3.4 carries this theme farther, demonstrating how the coastal waterways linked all of Afroeurasia's western and southern warm-water seas. Using the imaginary voyage, have students identify the waterways, locate them on the map, and connect them together. Some students will trace the route across northern Eurasia, so it may be necessary to help these students consider the climate factor and other possible obstacles. (Compare the northern trans-Eurasian route to the Northwest Passage across the northern regions of North America). The "eleven seas" to be identified from northwest to east are: Baltic Sea, North Sea, northeastern coastal Atlantic, Mediterranean Sea, Red Sea, Persian Gulf, Arabian Sea, Bay of Bengal, South China Sea, East China Sea, and the Sea of Japan. (The Red Sea and the Persian Gulf are parallel alternative routes.)

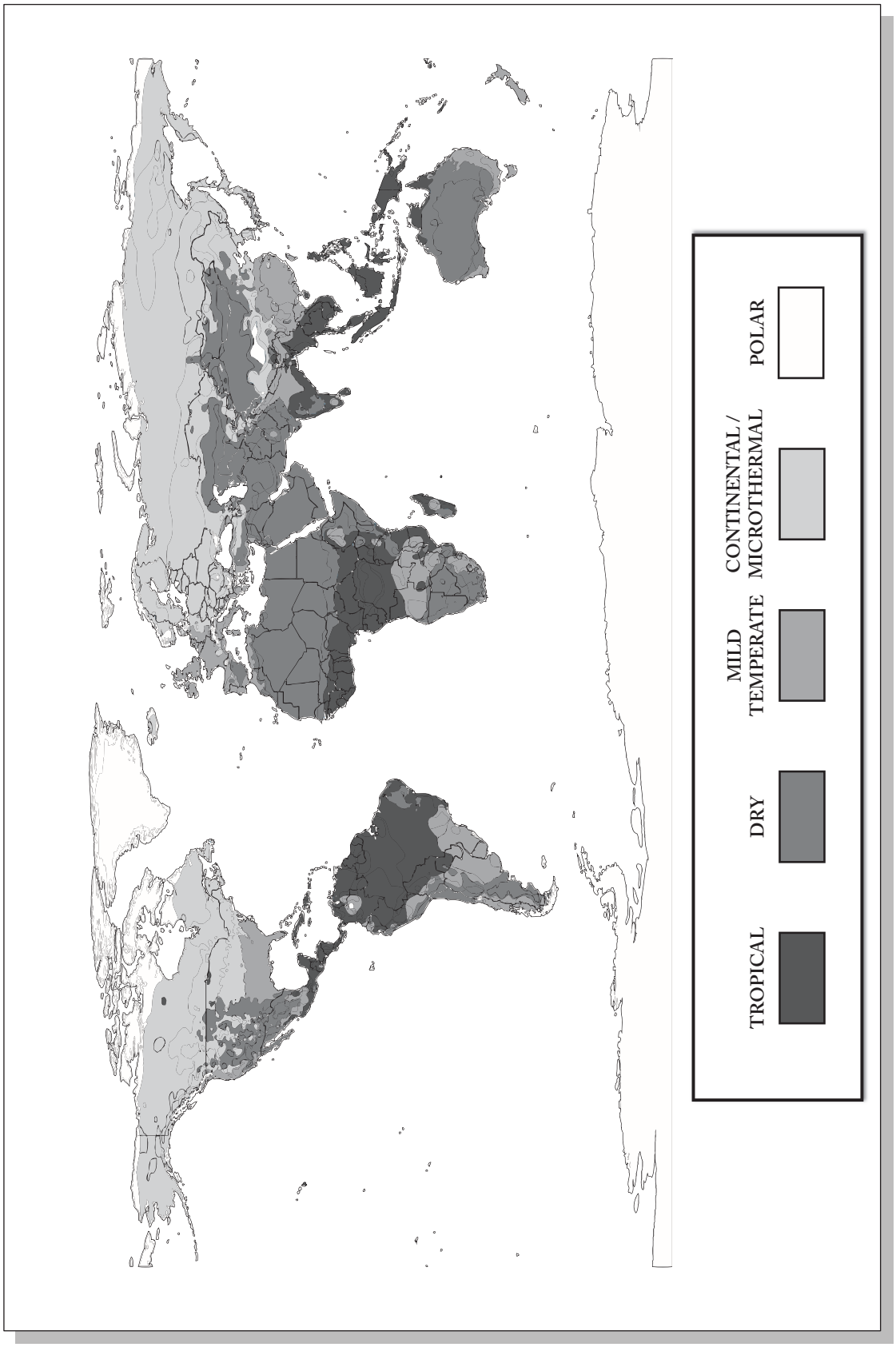
4. Using online resources, locate maps of global shipping. Use a world history textbook map showing medieval trade routes of the Indian Ocean, Mediterranean Sea, the Atlantic coastal region, and the overland routes, including the Silk Roads. Compare the use of the waterways on Student Handout 2.3.4

5. Have students locate the major rivers on each continent using Handout 2.3.5 and a classroom atlas or wall map. Identify the watersheds of these rivers and the direction of flow. Assign individuals or volunteers to do mini-research projects on the navigability of these rivers.

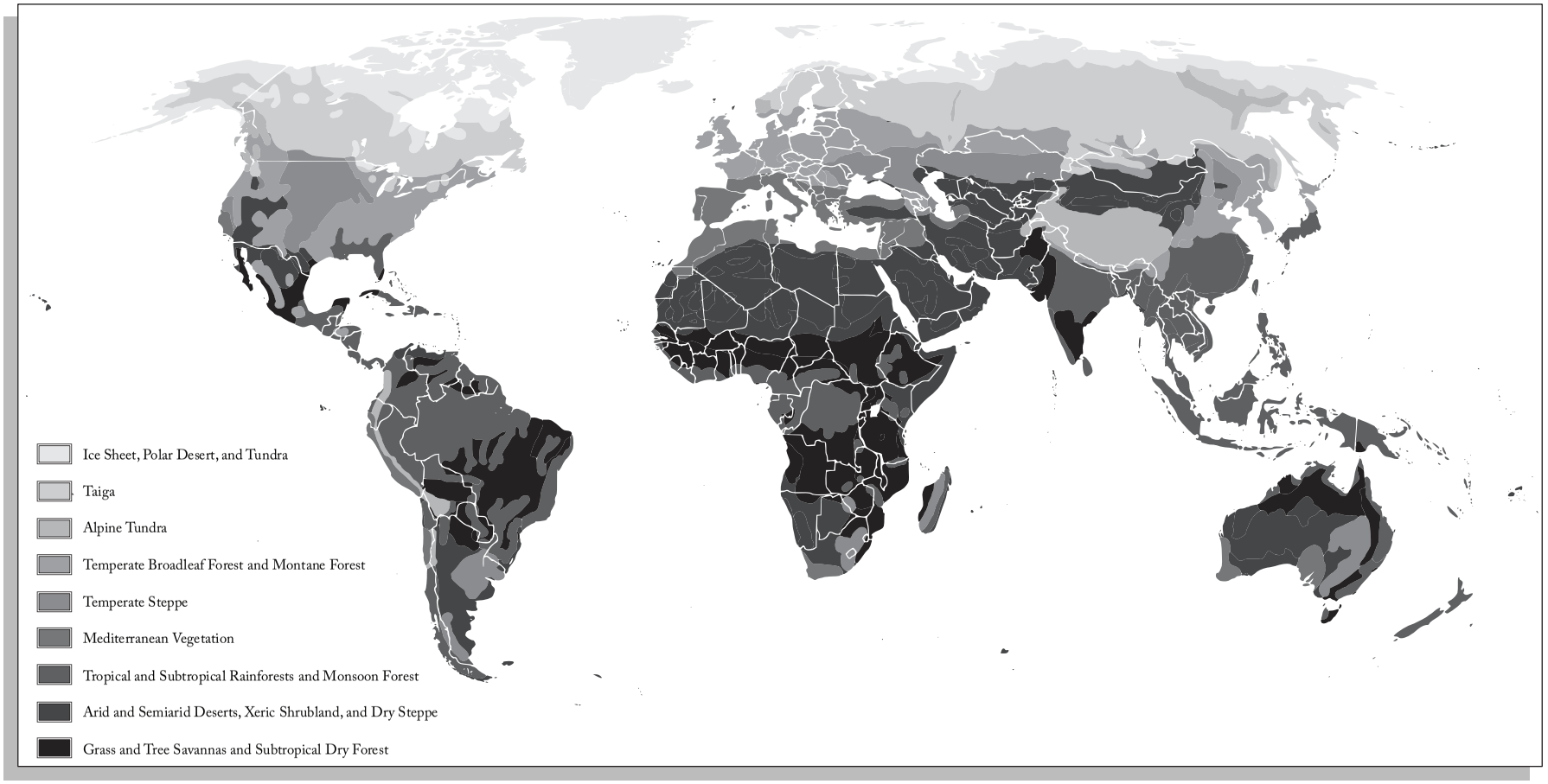
6. Identify and locate the cities students associated with the rivers and assess their importance today and in the past, soliciting students' prior knowledge. Note any correlation with rivers that flow through dry climate regions and deserts as exceptions to the population density trends in the last lesson. Identify these major rivers and the cities associated with them, historically and today.
7. Refer to these rivers and instruct students to keep the worksheets and maps from this lesson handy for future reference in their world history course.

Climate, Plants, and People

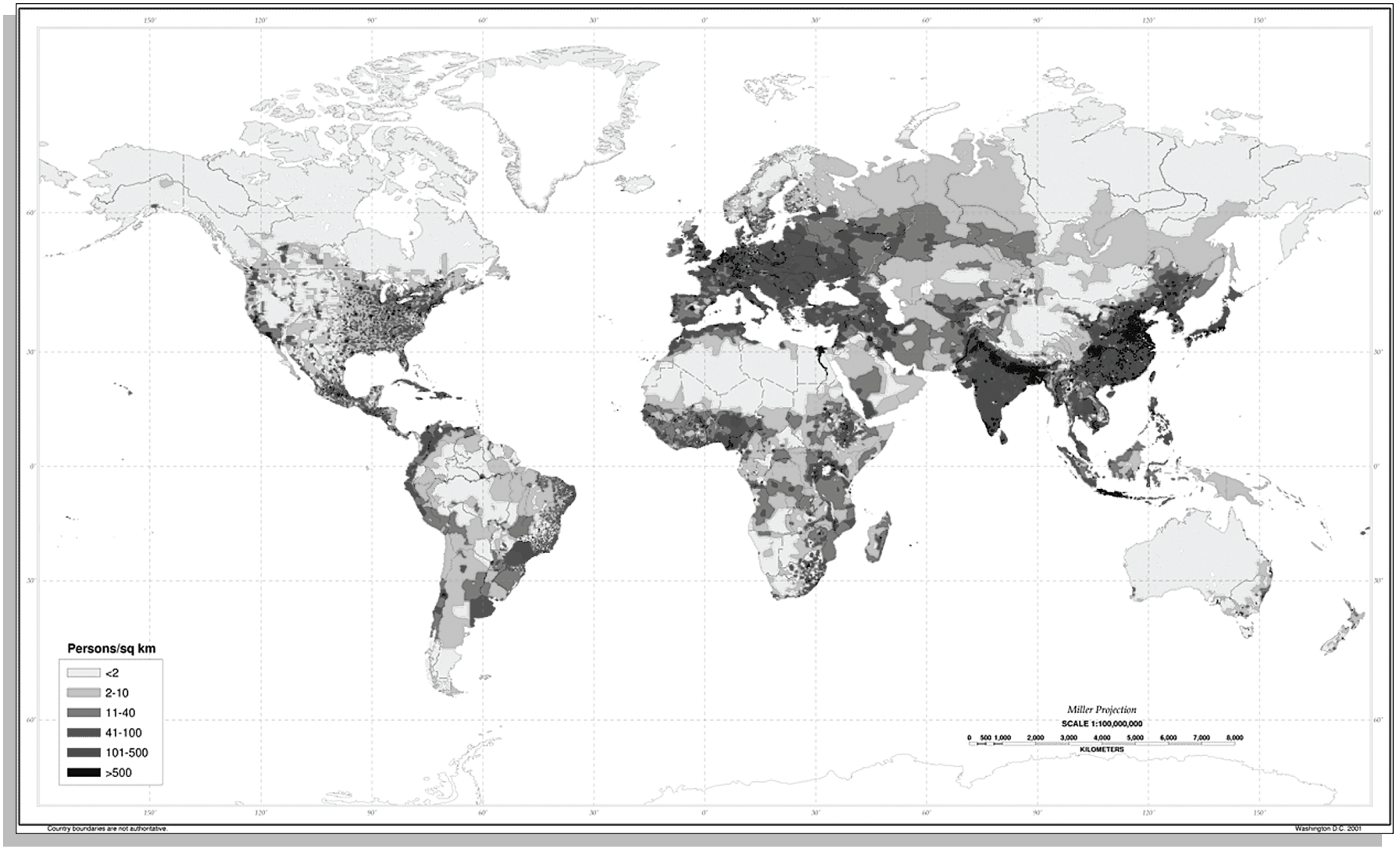
World Map of Koppen-Geiger Climate Classification



Vegetative Biomes (Ecosystems) of the World



Historical Population Density—1994



1. Match the corresponding climate classifications to the biome classifications. (Some will overlap.)

Climate Classification	Vegetative Biome (Ecosystem)

2. Which vegetation zones correlate to the highest population density?

3. Which vegetation zones correlate to the lowest population density?

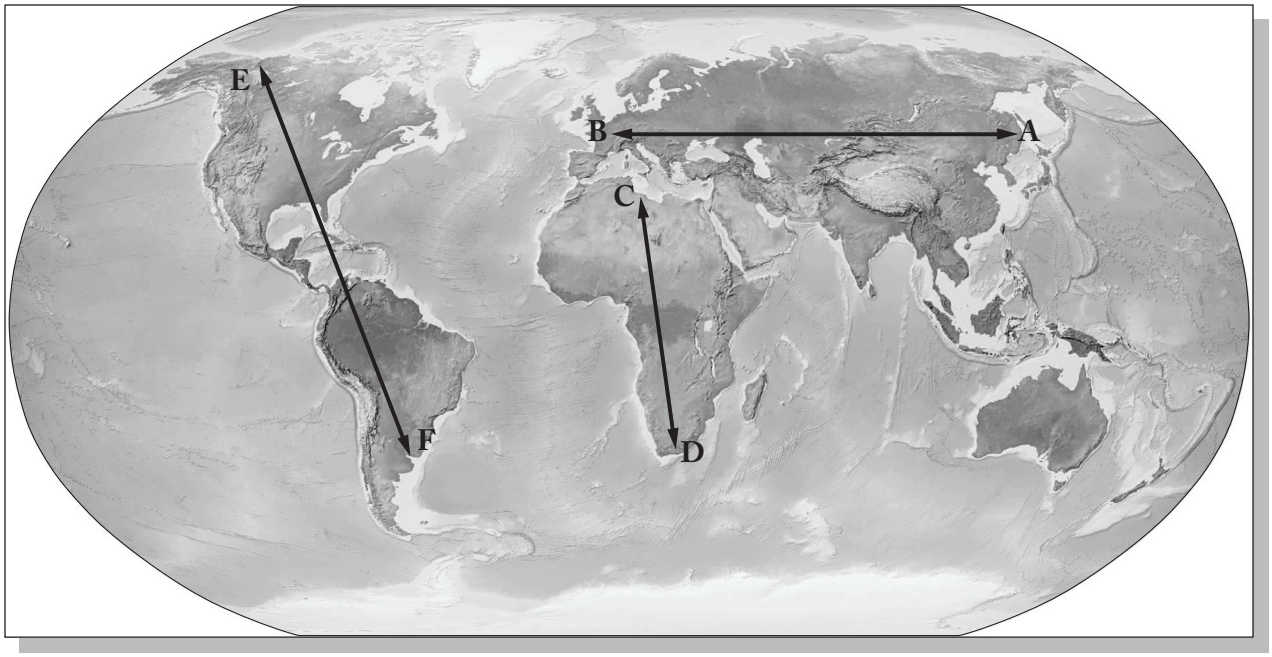
4. Can you locate any areas that show high human population density in areas of low vegetation and dry or cold climate? List them.

5. Why do you think these areas form an exception to the global trend?

6. How have humans overcome the climate conditions to live closely packed in such regions?

7. Which of these areas have major rivers?

Moving on the Continental Axes



The following quotations are taken from Jared Diamond's book *Guns, Germs, and Steel: The Fates of Human Societies* (New York: W.W. Norton, 1999), pages 176–189. These quotations summarize his ideas about the relationship of the geographic axes of the continents (as conventionally defined) to differences in human technological development. For more information, read Diamond's book, Chapter 10, "Spacious Skies and Tilted Axes."

> On the map of the world, compare the shapes and orientations of the continents. You'll be struck by an obvious difference. The Americas span a much greater distance north-south (9,000 miles) than east-west: only 3,000 miles at the widest. . . . That is, the major axis of the Americas is north-south. The same is also true . . . for Africa. In contrast, the major axis of Eurasia is east-west. What effect, if any, did those differences in the orientation of the continents' axis have on human history?
>
> Axis orientations affected the rate of the spread of crops and livestock, and possibly also of writing, wheels, and other inventions. That basic feature of geography thereby contributed heavily to the very different experiences of Native Americans, Africans and Eurasians in the last 500 years.
>
> Just as some regions proved much more suitable than others for the origins of food production, the ease of its spread also varied greatly around the world. . . . At the one extreme was its rapid spread along east-west axes: from Southwest Asia both west to Europe and east to the Indus Valley; . . . and from the Philippines east to Polynesia. . . . At the opposite extreme was its slow spread along north-south axes: . . . from Mexico northward to the U.S. Southwest . . . [to] the eastern United States . . . from Peru north to Ecuador.
>
> Why was the spread of crops from the Fertile Crescent so rapid? . . . Localities distributed east and west of each other at the same latitude share exactly the same day length and seasonal variations. To a lesser degree, they also tend to share similar diseases,

> regimes of temperature and rainfall, and habitats or biomes (types of vegetation) . . . the germination, growth, and disease resistance of plants are adapted to precisely those features of climate. Seasonal changes of day length, temperature, and rainfall constitute signals that stimulate seeds to germinate, seedlings to grow, and mature plants to develop flowers, seeds and fruit. . . . Animals too are adapted to latitude-related features of climate.
>
> Thus, Eurasia's east-west axis allowed Fertile Crescent crops quickly to launch agriculture over the band of temperate latitudes from Ireland to the Indus Valley. . . . Contrast the ease of east-west diffusion in Eurasia with the difficulty of diffusion along Africa's north-south axis. . . . Similarly, the spread southward of Fertile Crescent domestic animals throughout Africa was slowed by climate and disease.
>
> Contrast also the ease of diffusion in Eurasia with its difficulties along the America's north-south axis. The distance between Mesoamerica and South America . . . is only 1,200 miles, approximately the same distance in Eurasia separating the Balkans from Mesopotamia. . . . But other crops and domestic animals failed to spread between Mesoamerica and South America. The cool highlands of Mexico would have provided ideal conditions for raising llamas, guinea pigs, and potatoes, all domesticated in the cool highlands of the South American Andes. Yet the northward spread of those Andean specialties was stopped completely by the hot intervening lowlands of Central America.
>
> Latitude . . . is a major determinant of climate, growing conditions, and ease of spread of food production. However, latitude is of course not the only determinant, and it is not always true that adjacent places at the same latitude have the same climate . . . Topographic and ecological barriers . . . were locally important obstacles to diffusion.

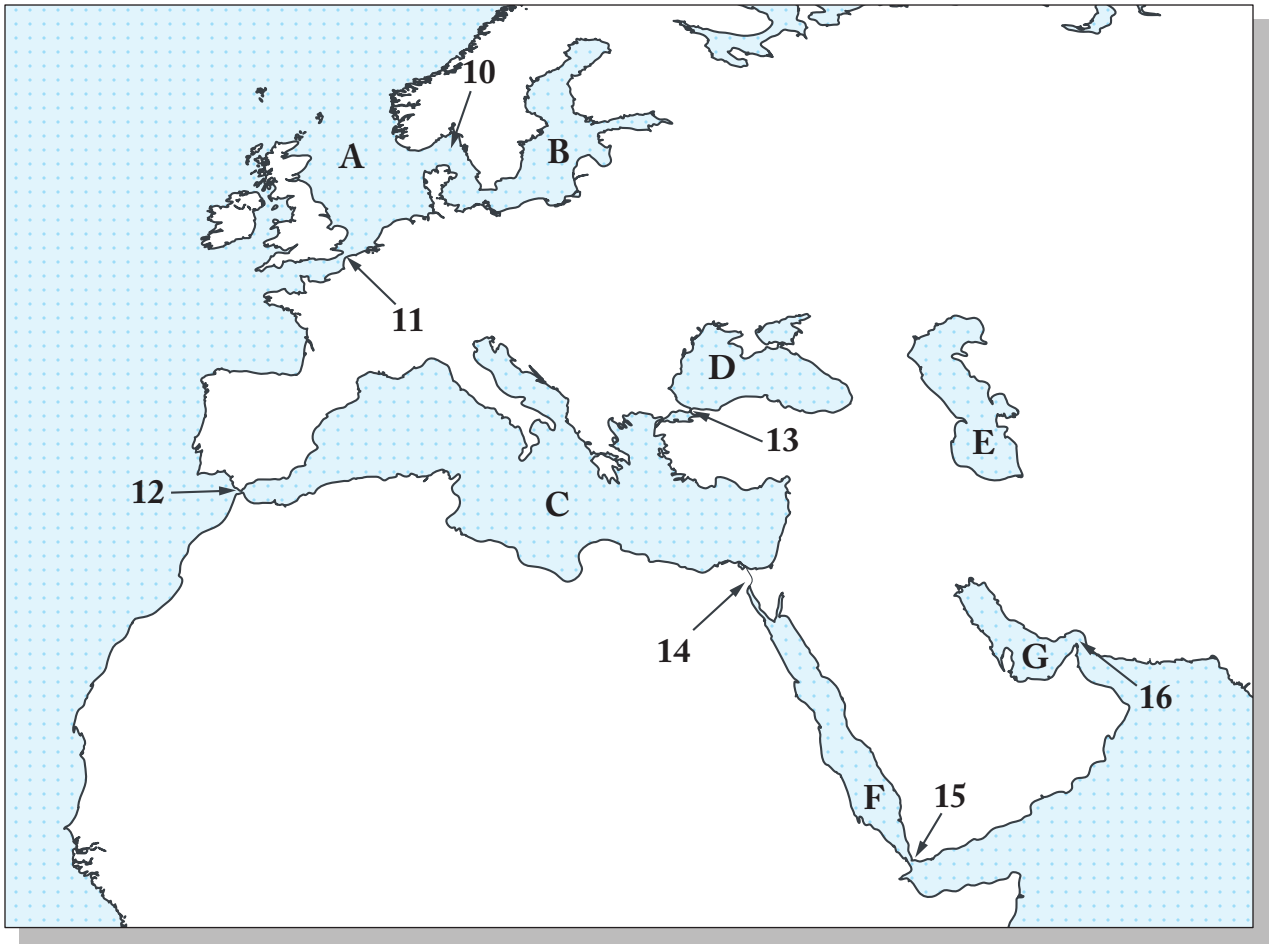
Study Questions

1. Compare the map of Earth's major climate zones (tropical, temperate, arctic) with the world biomes map and with the map showing axes of the inhabited continents above. How many biological and climate zones would a person, plant, or animal have to cross going from point A to B on the map? From C to D? From E to F?
2. Why might it be easier for plants, animals, and people to migrate within the same or similar biomes and climate zones than to cross between very different zones? Which of the three life forms is most adaptable? What if we include microorganisms?
3. Give examples of plant, microorganism, animal, and human migrations you have learned about that involved long distances. Was the crossing of the Alaska/Eurasia land bridge that historians believe helped populate the Americas with people from Eurasia an east-west migration or a north-south migration? What about diseases and insects?

Assessment

Using evidence from these maps, write a paragraph explaining the quotations from Jared Diamond's *Guns, Germs, and Steel.* Use supporting evidence from your study of various types of maps.

Inside and Outside: Afroeurasian Waterways



1. Identify the seas marked A–G on the map above. Which waterways connect with others?

2. Which bodies of water are landlocked?

3. Use a classroom atlas or wall map to identify and label the numbered straits and channels that link these waterways.

4. Which man-made waterway links the Red Sea and the Mediterranean today? When was it built?

The Eleven Seas of Afroeurasia

The nineteenth century was a time when many artists and poets were fascinated by maritime journeys and exotic places. Many of these references appeared in lighthearted poems for children that became classics. The lines below are from *The Owl and the Pussycat* by British poet Edward Lear (1812–1888). Imagine a fantastic voyage like this one as you learn about the geography of Afroeurasia.

The Owl and the Pussycat went to sea
In a beautiful pea-green boat:
They took some honey, and plenty of money
Wrapped up in a five-pound note . . .
They sailed away, for a year and a day,
To the land where the bong-tree grows . . .

They dined on mince and slices of quince,
Which they ate with a runcible spoon;
And hand in hand on the edge of the sand . . .
They danced by the light of the moon.

1. Can you trace a journey by sea undertaken by this famous poetic pair, which starts at the northernmost point of the Baltic Sea and ends in the Sea of Japan?
2. What two routes are possible? Which route might be blocked either all or most of the year? By what?
3. Which route has the smallest obstacle to passage? Is that passage open today? How might it have been crossed before 1869 CE when an artificial waterway was completed? What was this waterway called?
4. Which journey would the Owl and the Pussycat have been most likely to survive? Mark the route with a line.
5. Using an atlas, list the eleven seas and gulfs in Afroeurasia that the Owl and the Pussycat would pass through. Using the map on the next page, label those bodies of water on the map key, then place the corresponding number on the appropriate spot on the map.

Map Key Afroeurasia's Eleven Seas
1
2
3
4
5
6
7
8
9
10
11

Earth's Rivers: Highways into the Continents

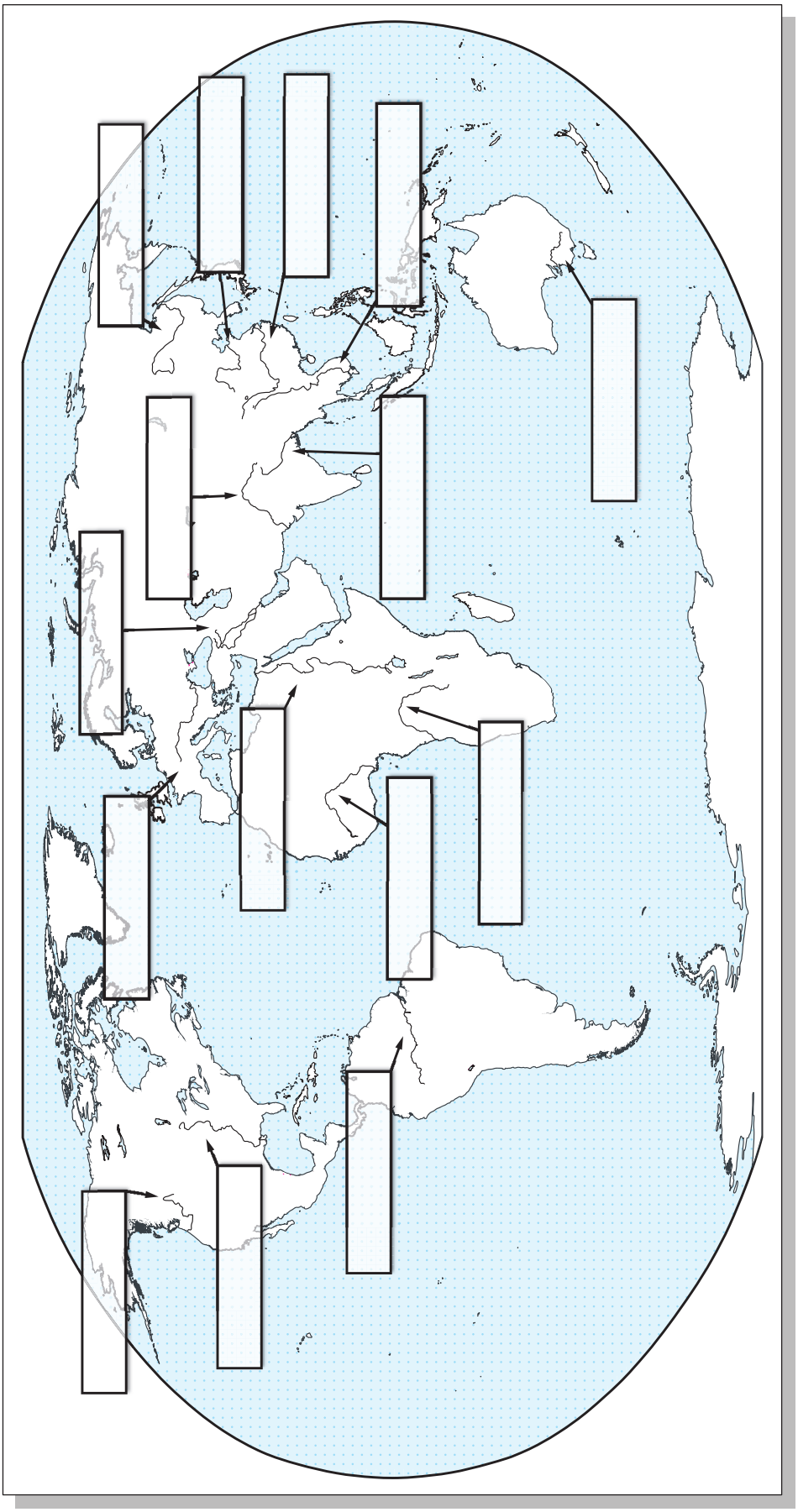
1. Identify each of the major rivers shown on the map and write its name in the correct box.

2. What is a watershed? Name three rivers that have watersheds draining large parts of each continent.

3. What makes a river navigable? What prevents a river from being navigable?

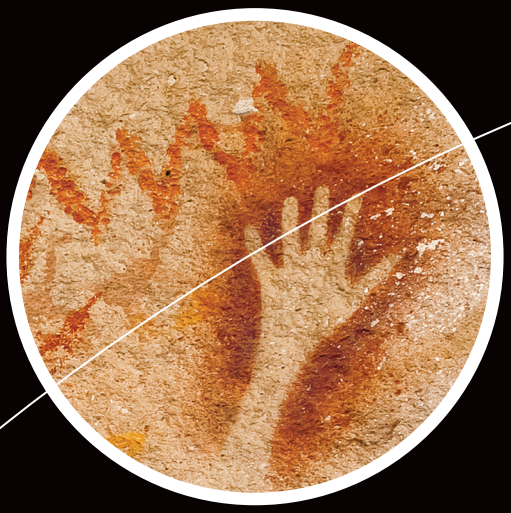
4. Name one major city on each of the rivers you labeled on the map.

River	City	River	City



BIG ERA ONE

The Horizon of Human History
13,000,000,000–200,000 years ago



Introduction

Humans are part of a universe that is older and larger than we can begin to imagine. How did this universe come into being? What led to our earth's existence? How and when did our ancestors evolve? What is our place in the universe?

This Big Era sets the stage for human history. It is about the very beginnings of our environment, of the world we live in, its landscapes, its plants and animals. It is also about the evolutionary steps that led to the existence of our species, Homo sapiens. Understanding this era is vital if we are to grasp how human history fits into the larger history of our earth and the universe as a whole. Our ideas about the universe, the earth, and our own existence as a species affect how we think about ourselves and our history; they help us understand our place in the larger universe of which we are a part. This fascinating quest to discover the very roots of humanity has tantalized us for millennia. Since the earliest times, creation myths—stories attempting to explain the origins of our world—have existed in all human societies.

CHAPTER 3

By Andrew Pass

Creation Myths

WHY STUDY CREATION MYTHS?

We all have a need to understand beginnings. People from different ethno-racial backgrounds and religions have rooted themselves in particular understandings of beginnings. One cannot understand the history of the world without understanding different ways in which individuals and groups have perceived the origins of the world. This chapter engages students in a consideration of why an understanding of beginnings is so important to people. In it students will investigate, compare, and contrast different creation myths. Students will consider some of the modern scientific processes and procedures used to judge the validity of different creation myths, including the theory of evolution. Finally, based on their consideration of myths and scientific theories, students will examine what it means to "know" something and the role of theories in understanding the world around them. The content considered in this chapter serves as a foundation for the entire world history course that follows.

OBJECTIVES

Upon completing this chapter, students will be able to:

1. Explain why people possess an intrinsic need to understand the origins of both themselves and the world
2. Compare and contrast features of different creation myths, and analyze how these myths have satisfied the needs of people with different backgrounds to understand the origins of the world
3. Describe the order in which different components of the universe came into existence, according to the Big Bang Theory

4. Analyze the idea that people often understand the world through theories rather than absolute knowledge and that theories are based on the best knowledge available to people at a particular time

TIME AND MATERIALS

- 3 class periods (40 minutes each)
- Markers and/or crayons
- Unlined paper

THE HISTORICAL CONTEXT

Modern science theorizes that the universe appeared quite suddenly about 13 billion years ago. Since humans did not emerge on the scene for another 12,999,750,000 years, there is no first hand account of the world's origins. These origins remain a mystery. This time period, however, set the stage for human existence. Within these nearly 13 billion years the Earth developed, as we know it today, into a planet on which the human race could develop and grow. Modern scientists have extensively investigated the processes that enabled the development of our planet. For our purposes, the actual processes that formed our Earth are not as important as the ways in which these processes have been perceived by humans.

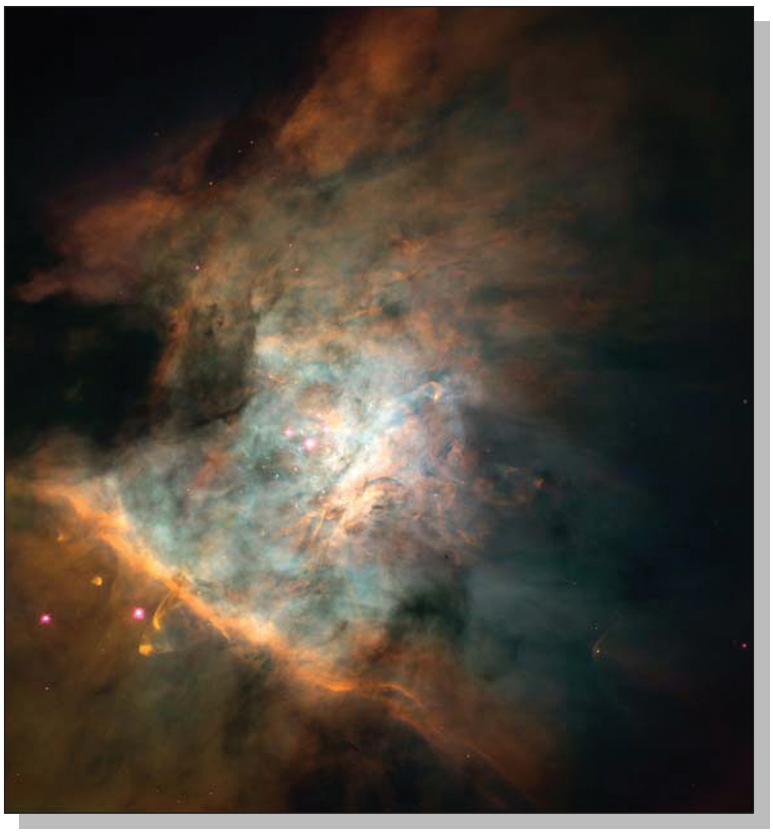
Though people may never "know" with absolute certainty how our world came to be, they will never stop contemplating this question. Beginnings are fundamentally important, and a desire to understand beginnings is fundamentally human. People not only want to know about the beginnings of the world. They also want to know about their own beginnings, that is, their infancy and early childhood. Indeed, historians maintain that it is important to know where we started in order to understand how we have arrived at our present circumstances. Though people cannot know how the world began, this has not stopped them from developing explanations of it.

Throughout the very brief history of human existence, people have developed creation myths in an attempt to understand the world's beginnings. Though individual myths have similarities and differences with one another, all creation myths seek to explain how the world started. Individuals and communities often accept myths as valid explanations of something that has occurred. They accept creation myths because they believe that the myth contains a valid explanation for the ways in which the world came into being. While some myths lose their credibility over time, others continue to maintain adherents who accept them as valid. For example, the historian David Christian calls the theory of evolution the creation myth of the present time. The tenets of this myth, or scientific model, demand that thoughtful individuals apply certain "scientifically acceptable" processes and procedures to an investigation of the world's beginnings. In calling the theory of evolution a modern-day creation myth, Christian does not mean that the theory of evolution is fallacious. Rather, he argues that evolution is the theory that modern people commonly accept as explaining how the world as we know it today was formed.

Modern historians consider the ways in which people representing different societies have perceived the origins of the world. They recognize that throughout their existence human beings have developed myths to explain their origins. While these myths may not accurately explain the world's origins, they do reveal significant information about the ways of life of the people, societies, and civilizations that conceived these myths.

Creation myths typically place individuals, specifically their authors, at the center of creation. Simply put, the central motif of these myths often posits that the universe's creation specifically led to a time and place in which the authors and more generally the societies in which they lived came to exist. These myths typically do not consider the idea that most of the history of the universe has unfolded without any human beings existing in it.

Many world history courses taught in American high schools begin more than twelve billion years after this course begins. Rather than starting with the origins of the universe, these courses typically begin with the paleolithic era, the period of history in which people survived as hunter/gatherers. As such, most history courses lend credence to the perception that people fill *the central role* in the universe. This course, on the other hand, begins with the origins of the universe, since this represents the beginning of time, as we know it. This starting point supports the idea that one cannot truly understand the human role in the universe without understanding the short period of time in which humans have inhabited the earth and the tiny amount of space that the earth occupies in the realm of the universe.



Center of the Orion Nebula

THREE ESSENTIAL QUESTIONS

Humans and the Environment

Formulate a fundamental question about origins or processes in the natural or physical environment, and construct a non-scientific myth to answer that question. Explain your myth. (For example, develop a myth to explain why earthquakes occur or why certain kinds of trees have leaves in the summer but lose them in the winter.) What factors might make your myth convincing or believable?

Humans and Other Humans

Discuss why creation stories are usually concerned with relationships between humans and supernatural beings. What attitudes and actions may characterize those relationships? (For example, what sort of relationship develops between God on the one hand and Adam and Eve on the other in Chapter 2 of the Book of Genesis in the Bible?

Humans and Ideas

Construct a poster, graphic illustration, or brief PowerPoint presentation that explains Darwin's theory of natural selection. Try to communicate this idea with few words or none at all.

KEY THEMES

This chapter emphasizes the following historical themes:

Key Theme 5: Expressing Identity

Key Theme 6: Science, Technology, and the Environment

Key Theme 7: Spiritual Life and Moral Codes

INSTRUCTIONAL RESOURCES

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LESSON 1

Creation Myths

1. In groups of two or more, asks students to use available dictionaries to define the words "myth," "fable," and "scientific." After students have completed defining these terms, reconvene the class. Lead a discussion in which students consider the meanings of these three words. Help students understand that while both fables and myths teach important ideas, fables are typically accepted as fallacies. Myths, on the other hand, are typically accepted as factual depictions of something by some group of people at some point in time, even though people outside that group may regard them as fables. For example, even though some people consider the first two chapters of Genesis as a fable, others accept it as a scientific account of origins. Urge students to consider the difference between a myth and something that is scientific. In order to help students understand the difference between "myth" and "scientific," explain that while "scientific" requires observations through the senses, myths are ideas that people accept primarily because of belief rather than hard evidence. Ask students what they think the term "scientific story" means. Stories that are based on empirical observations might be called "scientific stories." As a challenge, ask students if they think that scientific knowledge can ever become myth.

2. Ask students to form groups of two or three and read the worksheet titled "A Creation Myth from the Yoruba People of West Africa." In their groups, students should answer the questions that follow the summary of this traditional creation myth. After students have answered these questions, reconvene the class. Tell students that approximately twenty-eight million Yoruba-speaking people live in Nigeria in West Africa. Today most Yoruba people are Christian and Muslim, but this myth stems from their ancient history. Invite students to share their answers aloud.

3. Now ask students to return to their groups and read the worksheet entitled "A Babylonian Creation Myth." Students should answer the questions that follow this excerpt. Then, reconvene the class, and invite students to share their answers. Ask students if they think the traditional Babylonian myth accurately describes creation processes. Students will likely agree that these myths do not contain accurate depictions. Ask students why they think that people might have accepted these stories as accurate depictions of the world's creation at one point in time. Encourage them to support their opinions. During this discussion, point out that while the Yoruba creation myth explains the way in which the entire Earth became populated, the Babylonian creation myth limits its explanation to Babylonia.

4. Now ask students to return to their groups and read the worksheet titled "A Story of Creation as Depicted in Genesis." Students should answer the questions that follow this excerpt. Reconvene the class, and invite students to share their answers.

Ask students if they can prove that the ideas in this text are true. Ask if they can prove that the ideas in this text are false. Urge students to support their opinions.

5. Pose the following statement to students. "Only simple-minded people would develop a myth about creation." It would be best to write the statement on the board. Tell students who agree with this statement to go to one side of the room. Students who disagree with the statement should go to the other side of the room. Once students have gone to their chosen side of the room, inform them that the class is going to hold a debate. Ask each group to develop an argument, sharing their perspective. After students have developed these arguments, reconvene the class. Invite each group to present their argument to the class. Once both groups have presented their arguments, encourage students to challenge one another by asking probing questions. During this debate, students will hopefully examine the idea that ancient people developed creation myths using the knowledge that they possessed at the time. Both the time and place in which they lived constrained their knowledge. If students do not raise these ideas on their own, lead them to these ideas by facilitating the debate. (Note: If either group is too large to develop one argument, ask the group to break into two groups. Each group should then develop its own argument. If no students go to one side of the room, challenge a few of your students with good critical-thinking skills to develop an argument for that side of the room, even if they do not agree with it.)

6. Ask students if they think that the authors of these creation myths necessarily believed in their historical truth. Encourage students to consider the fact that the authors might have intended these myths to be interpreted symbolically. Ask students to contemplate the reasons that creation myths typically attributed the beginning of the world to one or more gods. Ancient people realized that they could not have created the world. Therefore, they decided that a power superior to themselves must have created it. At the same time, people saw themselves as the center of creation, perhaps because they knew the world from their own perspective. They formed a theory based upon their own knowledge and reasoning skills. In other words, these authors might have recognized that they could not know how the universe came to exist. However, they desperately wanted to explain it. Therefore, they developed these myths.

7. Urge students to reflect on the lessons that might be learned from these myths, even if the myths lack historical accuracy. Point out that just as poetry often uses symbolic language, so do creation myths. For example, the last line of the Babylonian creation myth in Student Handout 3.1.2 states, "Marduk established Babylon as his own residence." Ask students if they think that ancient Babylonians truly believed that Marduk was one of their neighbors. Encourage them to consider what this sentence might mean, if it does not mean that Marduk actually lived in Babylon. Students should recognize that the authors believed in the central position that people held in the universe. Ask students why they think that myth writers might have written ideas that they did not intend to be construed literally. Help them understand that these

writers might have used the language that they were most familiar with to explain very difficult ideas. For example, even if the authors did not believe that gods had human form, they did not know how to describe the gods without attributing human form to them. Consequently, they attributed human form to the gods in a symbolic manner. Students should understand that some people actually accepted the historical accuracy of creation myths. These people did not recognize symbolic messages of creation myths; they thought that the ideas contained in the myths should be accepted literally.

8. Now, ask students if they can think of any questions that they would ask the authors of any of these creation myths if they could speak to them. (For example: "Do you *really believe* this stuff?") Perhaps one or more students will ask about the origins of the gods discussed in these different myths. If no students raise this question, raise it for them. While these creation myths explain how the world came into being, they do not explain how gods came into being. Help students understand that people who accept religious myths might believe that one or multiple gods have always existed; therefore, they do not have to consider the origins of gods. However, non-religious people sometimes raise this origins question as problematic and perhaps believe that no good answer exists.

Planet Earth

A Creation Myth from the Yoruba People of West Africa

Before creation, Earth was a huge mass of water. Olodumare, the Supreme Deity and Sky God, summoned Obatala, his vice-deity, to his presence. He commanded him to begin creation, by creating "land mass." With a vine attached to a piece of dry soil, Obatala descended on the watery mass and began his job. He dropped the vine and soil on the surface of the water and with the assistance of a hen and a pigeon, anchored the vine and scattered the soil about. When a portion of the surface had been covered with the soil, Obatala eagerly reported to Olodumare the successful completion of the work of creating Earth.

Olodumare then commanded Obatala to return to the land mass, a place called Ife, to create human beings. Obatala started making human beings out of clay, but he made a mess of his work. Olodumare dismissed him and sent another being named Oduduwa to finish the job correctly. Oduduwa did well. He created the first community of humans at Ife and became their leader. Later he sent several of his own sons to found kingdoms in other parts of the region. And that's how the world became populated.

Source*:* Richard M. Dorson, ed., *African Folklore* (Garden City, NY: Anchor, 1972), 322–323.

Summary and Questions

1. Summarize the above myth in your own words.

2. What can we learn about the way that ancient Yoruba people thought about creation from this myth?

3. Why do you think ancient Yoruba people thought in this way?

A Babylonian Creation Myth (Enuma Elish)

Before the universe was created, the gods engaged in a civil war. One group of gods, called Anunnaki, was determined to beat the other gods. They chose Marduk, a very young god, to serve as their leader. After arming himself, Marduk set out to challenge the monster-goddess Tiamat. After he killed her, Marduk cut Tiamat in half. He used her top half to form the sky and her bottom half to form the Earth. After Tiamat's death, those who sided with her were enslaved and forced to work for the Anunnaki gods. However, after some time passed, Marduk also destroyed Tiamat's husband, Kingu. From Kingu's blood, Marduk created mankind. Marduk established Babylon as his own residence.

Summary and Questions:

1. Summarize the above myth in your own words.
2. What can we learn about the ways in which ancient Babylonians thought about gods from this creation myth?
3. What can we learn about the ways in which ancient Babylonians thought about themselves from this creation myth?
4. Why do you think that ancient Babylonians thought in these ways?
5. Do you think those who told these stories regarded some parts of them as symbolic and others as literally true? Which parts do you think they thought of as symbolic?

Genesis, Chapter 1

[**1**] In the beginning God created the heaven and the earth.

[**2**] And the earth was without form, and void; and darkness was upon the face of the deep. And the Spirit of God moved upon the face of the waters.

[**3**] And God said, Let there be light: and there was light.

[**4**] And God saw the light, that it was good: and God divided the light from the darkness.

[**5**] And God called the light Day, and the darkness he called Night. And the evening and the morning were the first day.

[**6**] And God said, Let there be a firmament in the midst of the waters, and let it divide the waters from the waters.

[**7**] And God made the firmament, and divided the waters which were under the firmament from the waters which were above the firmament: and it was so.

[**8**] And God called the firmament Heaven. And the evening and the morning were the second day.

[**9**] And God said, Let the waters under the heaven be gathered together unto one place, and let the dry land appear: and it was so.

[**10**] And God called the dry land Earth; and the gathering together of the waters called the Seas: and God saw that it was good.

[**11**] And God said, Let the earth bring forth grass, the herb yielding seed, and the fruit tree yielding fruit after his kind, whose seed is in itself, upon the earth: and it was so.

[**12**] And the earth brought forth grass, and herb yielding seed after his kind, and the tree yielding fruit, whose seed was in itself, after his kind: and God saw that it was good.

[**13**] And the evening and the morning were the third day.

[**14**] And God said, Let there be lights in the firmament of the heaven to divide the day from the night; and let them be for signs, and for seasons, and for days, and years:

[**15**] And let them be for lights in the firmament of the heaven to give light upon the earth: and it was so.

[**16**] And God made two great lights; the greater light to rule the day, and the lesser light to rule the night: he made the stars also.

[**17**] And God set them in the firmament of the heaven to give light upon the earth,

[**18**] And to rule over the day and over the night, and to divide the light from the darkness: and God saw that it was good.

[**19**] And the evening and the morning were the fourth day.

[**20**] And God said, Let the waters bring forth abundantly the moving creature that hath life, and fowl that may fly above the earth in the open firmament of heaven.

[**21**] And God created great whales, and every living creature that moveth, which the waters brought forth abundantly, after their kind, and every winged fowl after his kind: and God saw that it was good.

[**22**] And God blessed them, saying, Be fruitful, and multiply, and fill the waters in the seas, and let fowl multiply in the earth.

[**23**] And the evening and the morning were the fifth day.

[**24**] And God said, Let the earth bring forth the living creature after his kind, cattle, and creeping thing, and beast of the earth after his kind: and it was so.

[**25**] And God made the beast of the earth after his kind, and cattle after their kind, and every thing that creepeth upon the earth after his kind: and God saw that it was good.

[**26**] And God said, Let us make man in our image, after our likeness: and let them have dominion over the fish of the sea, and over the fowl of the air, and over the cattle, and over all the earth, and over every creeping thing that creepeth upon the earth.

[**27**] So God created man in his own image, in the image of God created he him; male and female created he them.

[**28**] And God blessed them, and God said unto them, Be fruitful, and multiply, and replenish the earth, and subdue it: and have dominion over the fish of the sea, and over the fowl of the air, and over every living thing that moveth upon the earth.

[**29**] And God said, Behold, I have given you every herb bearing seed, which is upon the face of all the earth, and every tree, in the which is the fruit of a tree yielding seed; to you it shall be for meat.

[**30**] And to every beast of the earth, and to every fowl of the air, and to every thing that creepeth upon the earth, wherein there is life, I have given every green herb for meat: and it was so.

[**31**] And God saw every thing that he had made, and, behold, it was very good. And the evening and the morning were the sixth day.

Source: *Bible, King James Version*. Humanities Text Initiative, University of Michigan. http://www.hti.umich.edu/cgi/k/kjv/kjv-idx?type=DIV1&byte=1477.

Questions:

1. How does this chapter of the Bible describe God's role in creation?

2. How does this chapter of the Bible describe people's role in the world?

3. Make a list of five details that this chapter of the Bible explains about creation.

LESSON 2

A Modern Perspective on the Origins of the World?

1. Ask students to write down three sentences about the beginning of their lives. After students have written these sentences, invite them to share their work with two or three other students. Then reconvene the class and ask students if the information that they wrote is important to them. Encourage them to support their opinions.

2. Now instruct students to read Student Handout 3.2.1. Ask students to use the information presented in this essay to construct a graphic representation of the process that transpired as the universe formed and life appeared on earth. Invite students to share their graphic representations with one another.

3. Dividing students into groups of three or four, ask them to respond to the following question: "Do you think that people should try to understand what happened at the beginning of the universe? Why or why not?" After students have discussed this question in their groups, reconvene the class. Ask a representative from each group to report to the entire class on the group's discussion. Facilitate a class discussion in which students consider why it might be important to consider the beginnings of the universe in a world history class.

4. Ask students to review the worksheet titled "The Chronology of the Universe Compressed into Thirteen Years" and to write down three things that they learn from this chart. After students have written their lists, ask them to share them with one other student. After students have shared their lists, reconvene the class. Ask students to explain the most important idea that they learned from this chart.

5. Although the Big Bang Theory draws on the most advanced scientific knowledge available to explain the origins of the Universe, students should recognize that that knowledge does not stand still. Indeed, as new knowledge becomes available, theories built on old knowledge become outdated. In order to help students recognize the inherent instability in scientific knowledge, ask them to imagine what would happen if tomorrow they read a newspaper article explaining that the stars and planets of the universe have always existed but that a nuclear reaction took place 13 billion years ago (what scientists call the Big Bang Theory) that created the illusion of a new beginning.

    a. Ask students whether or not they would accept this information in place of what they already know about the origins of the world. Encourage students to support their opinions thoughtfully. Lead a discussion in which students consider that our present understanding of the origins of the world might change as new knowledge becomes available.

b. Students should recognize that even though theories change as people develop new knowledge, previously identified findings are not always discarded with the advancement of knowledge. Instead scientists sometimes refine these findings to fit with new knowledge. For example, even in the hypothetical scenario presented here, something did occur 13 billion years ago, a nuclear reaction that created an illusion of the beginning of the universe. The hypothetical new knowledge successfully identifies the illusion as an illusion. This illusion had previously been unknown. Just as the ancient Babylonian myth studied in Lesson 1 seems primitive to us today, future people might see our scientific understandings of the origins of the universe as primitive. Emphasize that despite this fact, we continue to contemplate the origins of the universe because as human beings we have a fundamental need to try to understand from whence we came.

Extension Activity

1. Present the following scenario to students:

    a. In recent years, educators have argued over whether or not schools should teach the Big Bang Theory or the Theory of Intelligent Design, which contends that a supernatural being, such as God, intelligently planned the creation of the earth and organic life on it. Some argue that both the Big Bang Theory and the Theory of Intelligent Design should be taught.

    b. Based upon everything that you have learned in this chapter, take a position on this debate. Write a five-point essay explaining your position. Be sure to relate your argument to the ideas discussed in this chapter.

The Formations of the Universe

The Universe

Modern science suggests that the universe was created about 13 billion years ago. What existed before that moment? At present, we have no way of answering that question. Many astronomers would say that the query is meaningless because neither time nor space existed before the creation of the universe. There was nothing. Even so, there must have been at least the *possibility of* something because in this Nothingness a sort of explosion occurred.

Within a split second of that explosion, something did exist. The early universe was tiny and fantastically hot, a searing cloud of energy and matter much hotter than the interior of the sun. For a trillionth of a second the universe expanded faster than the speed of light, until it was bigger than an entire galaxy. Then the rate of expansion began to slow, although expansion continues to the present day.

As the universe expanded, it cooled down. After about 300,000 years, it was cool enough so that protons and electrons could combine to form atoms of hydrogen and helium. These are the simplest atoms of all. After about 1 billion years, huge clouds of hydrogen and helium began to collapse in on themselves. As they did so, their centers got hotter and hotter. When they were hot enough, hydrogen atoms began to fuse together violently like vast hydrogen bombs. In this way, the first stars lit up. Hundreds of billions of stars appeared, gathered in hundreds of billions of clusters that we call "galaxies." In the stars, new elements were created, so that as stars lived and died, they created new and more complex types of matter.

Our Galaxy

Our attention now turns to one tiny part of the universe. Our sun and the planets that circle around it were created about 4.5 billion years ago. So they are about one third of the age of the universe. They were created about two thirds of the way from the center of a galaxy we call the "Milky Way." Look up at the heavens on a clear night, and the Milky Way looks like a pale creamy pathway through the stars.

Our sun is a star, and like all other stars, it was formed from the collapse of a huge cloud of gas and dust particles. Most of this material went to make up the sun, but wisps of matter orbited around it at various distances. Over time, the matter in each orbit was drawn together by gravity or by violent collisions into lumps of matter that eventually formed the planets. This is how our earth was formed. At first, it was extremely hot. The heavy metals within it melted and sank to the center of the earth. Lighter materials rose to the surface, and gases bubbled up to form the earliest atmosphere.

The Earth

The early earth was a violent place, bombarded by asteroids and bubbling with heat from its interior. If you visited it, you would have seen landscapes full of volcanoes. But you would not have been able to breathe because its atmosphere contained no oxygen. Slowly, the number of asteroid impacts diminished, the surface cooled, and about 4 billion years ago, water vapor in the atmosphere condensed to form the first oceans.

Eventually, the earth's surface hardened and congealed, forming a number of thin plates that floated on the hot, molten material beneath. These plates slowly moved around the surface, and where they collided, they formed huge mountain chains. Where they moved apart, they created huge tears in the earth's surface (you can see one of these tears today in Africa's Rift Valley). Some of these huge valleys eventually filled up to form new oceans. This process, known to geologists as "plate tectonics," means that the surface of the earth has changed continuously. As it changed, so did the landscapes and weather patterns at the surface of the earth.

Early Life Forms

Life evolved in this ever-changing environment. The first living organisms probably evolved deep within the seas. Around volcanic vents deep beneath the surface, complex chemicals engaged in ever-changing reactions powered by the heat from volcanoes. These reactions led to the formation of complex chemicals that eventually created the first living organisms. Did life evolve only on our earth? At present, we don't know for sure, but it seems likely that life has evolved many times, wherever planets appeared that are similar to our earth.

The earliest living organisms consisted of single cells, as most living organisms do, even today. The earliest organisms probably fed off the chemicals leaking from deep-sea volcanoes. Their fossil remains can be identified today, and the oldest can be dated to about 3.5 billion years ago. Like all living organisms, these early single-celled creatures were subject to the laws of evolution. Minor changes in individuals were passed on from generation to generation, and those individuals that flourished best in particular environments multiplied most successfully and left the most descendants. In this way, generation by generation species gradually changed and diversified, and the number and variety of different species increased.

By as early as 3.5 billion years ago, some single-celled organisms began to derive energy directly from sunlight by using the chemical reaction known as photosynthesis. Since then, the sun's energy has been the main "battery" driving life on earth. Photosynthesizing organisms breathed in carbon dioxide and breathed out oxygen. So, as they multiplied, the amount of oxygen in the atmosphere increased. Living organisms were already shaping the earth's atmosphere. Eventually, more complicated cells appeared that could "breathe" oxygen. These are known as "eukaryotic" cells. From about 600 million years ago, organisms appeared that were made up of many individual eukaryotic cells. These were the first "multi-celled" organisms. Large, multi-celled organisms eventually colonized the land.

The Chronology of the Universe Compressed into 13 Years

If the universe had begun 13 years ago, then, at this moment . . .

The Earth would have existed for about . . . 5 years

Large organisms with many cells would have existed for about . . . 7 months

The asteroids that killed off dinosaurs would have landed . . . 3 weeks ago

Hominids would have existed for . . . 3 days

Our own species, Homo sapiens would have existed for . . . 53 minutes

Agricultural societies would have existed for . . . 5 minutes

The entire recorded history of civilization would have existed for . . . 3 minutes

Modern industrial societies would have existed for . . . 6 seconds

The Internet, as we know it, would have existed less than . . . 1 second

Source: David Christian, "World History in Context," *Journal of World History* 14 (Dec. 2003): 437–458.

LESSON 3

Knowledge, Myths, and You

1. Dividing students into groups of three, ask them to complete the assignment on Student Handout 3.3.1 titled "Do You Believe." Reconvene the class and invite students to share their opinions. Lead a discussion in which students consider what types of information they would look for to determine whether or not they believe that a space ship from another planet had landed on Earth. During this discussion, encourage students to support their statements with high-quality thinking.

2. Ask students to explain how the data that they said would either encourage them or discourage them in believing that a space ship from another planet had landed on Earth would compare to data that would either encourage or discourage them from believing in a creation myth or the Big Bang Theory. Students should recognize that as modern individuals we seek empirical evidence to support or discourage beliefs. Whereas we cannot always observe everything ourselves, we also rely on the empirical observations of others, whom we trust. Tell students that when historians analyze events from the past, they must consider what types of evidence they will accept and what types of evidence they will not count as valid.

3. Prompt students to offer suggestions as to the meaning of the word "theory." Through discussion, lead students to the idea that a theory is an explanation of why something occurs in the way that it does occur, based on all of the available evidence. In groups of two or three, ask students to complete Student Handout 3.3.2 titled "My Theories." This worksheet asks students to identify four theories that are important in their lives. After students have completed this work, reconvene the class. Invite students to share a few answers. Help them understand that theories shape the ways that people think about their lives. For example, one cannot truly "know" that somebody else loves them. This is a theory. One cannot truly know that somebody else is trustworthy. This is also a theory. Just as individuals have theories, so do governments. The United States government, for example, is based on the theory that democracy is the most effective means of governance. Remind students that like the Big Bang Theory, the creation myths discussed earlier in this chapter were theories as to how the world came to exist.

4. Suggest that not all theories are equal. The best theories are supported theories. Unlike individuals who tend to develop theories for their own personal lives, scientists try and develop theories that explain the world and phenomena in the world. Ask students what types of information scientists might use to support their theories. Encourage them to offer some suggestions. Then ask students to complete Student Handout 3.3.3, entitled "Supporting Theories," working in groups of two or three. After the groups have completed this work, reconvene the class and invite students to share their answers.

5. Remind students that in the creation myths they examined in the first two lessons of this chapter, Earth and human beings were seen as the most important elements of the universe. Encourage them to ponder why this is so. Elicit from students why people would develop theories that give humans the central role. Help students understand that because people tend to see the world from a personal perspective, it may be natural for them to place themselves at the center of their theories. In order to help students think about this type of mind set, ask students if they have ever viewed a situation from a personal perspective that caused them to misunderstand that situation. Ask them what the consequences were of viewing the situation from a strong personal perspective.

Extension Activity

1. Present the following scenario to students:

    a. In recent years, educators have argued over whether or not schools should teach the Big Bang Theory or the Theory of Intelligent Design, which contends that a supernatural being, such as God, intelligently planned the creation of the earth and organic life on it. Some argue that both the Big Bang Theory and the Theory of Intelligent Design should be taught.

    b. Based upon everything that you have learned in this chapter, take a position on this debate. Write a five point essay explaining your position. Be sure to relate your argument to the ideas discussed in this chapter.

Do You Believe?

Imagine that one of your classmates told you that a space ship from another planet had landed on Earth yesterday. Write down seven points of evidence that you would look for to determine whether or not you believed your classmate. Explain how each point would either prompt you to believe or not believe your classmate.

My Theories?

As you know, it is very difficult to know for certain that some things are true. Since people often do not know if things are true, they develop theories and simply assume that their theories are correct. This exercise asks you to identify three theories that are significant in your life. Please list each of these theories below.

Example: I will do well in school if I try my best.

Supporting Theories

As you know, the highest quality theories are supported with the best evidence. When social scientists develop theories they use evidence from various discipline areas such as the sciences. In school, you study math, science, English/language arts, and social studies. Explain how learning each of these subject areas will provide you with insight for considering the validity of pre-existing theories and developing new theories.

- Math

- Science

- English/Language Arts

- Social Studies

CHAPTER 4

By Anne Chapman

Human Ancestors in Africa and Beyond

WHY STUDY HUMAN ANCESTORS?

This chapter sets the stage for the beginnings of the human story. It is during the period from about 7,000,000 to 200,000 years ago that Homo sapiens, that is, the anatomically modern human species, emerged in Africa among multiple evolutionary lines of primates. It is during this period that humans acquired distinctive features, notably large brains relative to body mass, relatively small teeth and chewing muscles, and the ability to walk upright, make tools, and adapt to contrasting environments. The biological underpinnings of other human characteristics also evolved, especially the capacity for complex problem solving, symbolic thought, and language, although none of these traits actually appeared in Big Era One, as far as we know.

OBJECTIVES

Upon completing this chapter, students will be able to:

1. Construct a chronology showing significant developments in the evolution of hominid species and assess the significance of these developments
2. Compare ways in which the main ancestral groups related to Homo sapiens were similar to and different from one another; also, compare humankind to its closest relatives among existing primates

3. Describe evidence from which scientists have gained knowledge about hominids, their evolution, and their ways of life; also, recognize the tentativeness and changing character of this knowledge

TIME AND MATERIALS

The lesson in this chapter can be taught in one to three 45-minute class periods. Time taken will depend on attention to introductory activities and discussion questions, assignment of homework, and use of assessments. No special materials are needed other than copies of the student handouts.

HISTORICAL CONTEXT

What were our ancestors like? How did they live? How do we know about them, and how reliable is our information? New finds and methods of investigation have recently given us more answers about human ancestry. However, the fossil evidence is still patchy. What conclusions can be drawn based on the evidence we have? Scholars agree on the main outlines of hominid evolution, but many questions remain open and controversial.

As of 2003, scientists have identified some eighteen upright-walking (bipedal) hominid species from fossil remains, many of these species discovered in the last dozen or so years. They reinforce the hypothesis that human evolution did not take place in a straight line, with the earliest ape-like creatures being gradually replaced over time by increasingly human-like species. Instead, several species with different mixtures of ape-like and human-like characteristics emerged over time, and several coexisted for hundreds of thousands of years.

Fossil species with some human-like but mainly ape-like characteristics are generally classified under one category, the genus Australopithecus. Those species with more human-like characteristics are classified as the genus Homo. It is among the Homo group that scientists look for evidence of the direct ancestors of our own species.

The process of a hominid species becoming fully human took a long time. Modern Homo sapiens only emerged at the very end of Big Era One, about 200,000 years ago. Studies of the DNA of living humans and apes suggest that what became the human evolutionary line divided from that of gorillas about 8 million years ago and from chimpanzees 5–7 million years ago. Scientists have dated the earliest hominid fossil so far discovered to between 6 and 7 million years ago. All hominid fossils, both Australopithecus and Homo, dated from then to about 1.5 million years ago have been found in Africa. Fossils of Homo erectus, the first species known to have migrated out of Africa, have been dated to not long after 1.5 million years ago as far from Africa as the Caucasus Mountains, northern China, and the island of Java in Indonesia. Fossils probably belonging to several species intermediate in anatomy between Homo erectus and modern Homo sapiens have been found in both Africa and Europe and dated to between 700,000 and 400,000 years ago. Europe and Western Asia seem to have been the area that the Neanderthal species (Homo neanderthalensis), probably a descendant of Homo erectus, first colonized. Fossils from about 200,000 years ago are widespread in those areas. Homo

erectus survived in Java, and Neanderthals survived in Europe until as recently as 27,000 years ago. Then, they became extinct, leaving Homo sapiens, the species "like us," as the only hominid species living on earth.

The process of human evolution was also complicated. Although the structure of the face became shorter at a fairly steady rate throughout the long period of evolution from ape to modern human, other characteristics changed less smoothly. Some species developed increasingly large and robust jaws and teeth. Ridges above the eyes and on top of the skull appeared and disappeared. Some early species had more human-like skulls than some more recent ones. Bipedalism and tool-making appeared in some populations without any significant increase in brain-size. Some upright walkers kept features of hands and toes suggesting that they continued to spend considerable time in trees. The evidence we now have points to at least eight species with different mixes of ape-like and human-like characteristics developing in Africa in the relatively "short" period from 2.5 to 1.5 million years ago. All of these species except Homo erectus seem to have become extinct by about 1 million years ago.

One striking characteristic of evolution towards full humanity has been the gradual enlargement of the brain as the table of comparative brain volume shows:

Australopithecines	400–550 cc
Homo erectus	850–1,200 cc
Homo sapiens	1,220–1,600 cc
Modern chimpanzees	300–400 cc

The change, however, has not all been one way. The range of brain size was larger among Neanderthals than in our own species.

Bipedalism emerged very early, probably by 6 and certainly by 4 million years ago. It did so among populations that continued to be adapted for tree climbing and that had brains barely larger than those of chimpanzees. Ape-like walkers are known to have lived across eastern and southern Africa at a very early date. The earliest lived in mostly forested areas.

Scientists have linked changes in climate, and therefore in environment, to several evolutionary changes on the road from ape to human. One has been walking as a response to the gradual thinning of forests, which forced tree-adapted apes to spend increasing time on the ground getting from one clump of trees to another. New evidence, however, suggests that the first upright walkers lived in forested environments. This means that the earlier hypothesis has to be reconsidered. Less controversially, adaptation to warm and cool climates has been linked to changes in body mass, colder climates favoring bulky, heat-storing bodies rather than tall, thin ones. The question of just how much environmental change played in human evolution is still under debate.

We have little direct evidence for the way hominids lived in Big Era One. Analysis of teeth and bones show that early species were mostly vegetarians, with fruit making up much of their diet. Some species developed jaws and teeth strong enough to eat nuts, seeds, and fibrous tubers. Evidence for meat in the diet comes from tool marks on animal bones. Early hominids probably

did little or no hunting. Rather, they scavenged for the meat of dead animals. Homo erectus, however, was a hunter and also knew how to control fire.

The earliest evidence we have for tool-making is dated to about 2.3 million years ago. It consists of stones crudely chipped to give a sharp edge. Hominid bones dating to about that time have been found in association with crude stone tools. The species that fashioned these implements has been labeled Homo habilis, or "handy person." Scientists have not, however, been able to link many early tool finds with fossil remains, so we cannot necessarily identify all the species that may have had this ability. The style and method of producing early tools, many of them apparently choppers and scrapers, remained almost unchanged for about 1 million years. This consistency implies that hominid species had enough capacity for collective learning to keep a tradition of simple manufacturing going for a very long time.

Homo erectus fossils having larger brain cavities than earlier species are first known from about 1.8 million years ago. At first, this species appears to have made tools very much like those that Homo habilis made. But at about 1.4 million years ago, a new style of tool appears in the archaeological record. It is a symmetrical, teardrop-shaped hand-axe with at least two cutting edges. From then on, Homo erectus is known to have chipped these axes in large numbers. Use of these tools, known as Acheulean tools, have been found widely in Africa and Eurasia, and they remained consistent in style for more than a million years. We have no way of knowing whether hominids before Homo sapiens made tools of wood, fiber, bamboo, reeds, skins, or other perishable materials because objects of organic material would have disintegrated long ago.

Acheulean hand-axes

Our knowledge of human ancestors in Big Era One depends on:

- Archaeological evidence of hominid, animal, and plant remains, as well as early tools.
- Climatic and geological evidence that helps us hypothesize about the environmental conditions under which hominid and early human species lived.

- The theoretical tools of archaeology, anthropology, biology, and other disciplines that help make sense of the material evidence. Through these disciplines, scientists arrange evidence in chronological sequences and, when possible, date the evidence within a relatively narrow range of error.
- Establishing from skeletal remains some of the physical and mental potentials and limits, as well as the life experiences, of hominids.
- Analyzing physical evidence of bones and tools to make inferences about diet and behavior.
- Making analogies based on comparisons with the information we have about apes living today. This comparative approach must be used cautiously. Inferences based on such evidence may range from the fairly accurate to the almost entirely speculative. For example, there are great differences in the behaviors of living species of great apes. Therefore, we cannot assume general similarity between any one of those species and any hominid species that existed in Big Era One.
- Finally, we must remember that our knowledge of human evolution is constantly changing and that generalizations made and dates cited in this chapter are subject to revision without notice. Think only of how our knowledge of DNA has revolutionized the study of evolution and forced us to rethink or abandon many hypotheses that were current just a decade ago.

THREE ESSENTIAL QUESTIONS

Humans and the Environment

Through both biological and cultural changes, humans have adapted to a wide range of climates. What adaptations would our Homo erectus ancestors have had to make, both genetically and in the way they ate, dressed, or made shelter, to inhabit both African tropical grasslands and northern China. What cultural adaptations would you have to make if you moved from Minnesota to southern Florida? What might happen if you refused to make those adaptations?

Humans and Other Humans

Homo erectus was the earliest species we know of to migrate from Africa to Eurasia and to inhabit a wide range of natural environments. But we know almost nothing about how those migrations took place. What sort of social cooperation, if any, do you think Homo erectus travelers would have had to undertake to move successfully from one local area to another, or even over a long distance?

Humans and Ideas

We have no evidence that any of our human ancestors had language. How could any of these hominid species have invented tools, adapted to new environments, or planned hunting expeditions without language?

KEY THEMES

This chapter addresses the following historical theme:

Key Theme 7: Science, Technology, and the Environment.

CORRELATIONS TO NATIONAL HISTORY STANDARDS

National Standards for History
Era One: The Beginnings of Human Society, 1A: The student understands early hominid development in Africa.

INSTRUCTIONAL RESOURCES

"African Origins of Hominids." *Calliope* 10 (September 1999). An issue of this lively children's magazine devoted to the study of human origins.

Cavalli-Sforza, L. L. *Genes, Peoples, and Languages.* Translated by Mark Seielstad. New York: North Point Press, 2000.

Dawkins, Richard. *The Greatest Show on Earth: The Evidence for Evolution.* New York: Free Press, 2009.

"The Dawn of Humans." *National Geographic* 189 (March 1996): 96–117, 191 (May 1997): 84–109, 194 (August 1998): 90–99, 197 (May 2000): 76–83.

Lewin, Roger. *Human Evolution: An Illustrated Introduction.* 5th ed. Hoboken, NJ: Wiley-Blackwell, 2004. This text is somewhat technical but has many useful and enlightening illustrations.

Ristvet, Lauren. *In the Beginning: World History from Human Evolution to the First States.* Boston: McGraw-Hill, 2007.

Stanford, Craig. *Significant Others: The Ape-Human Continuum and the Quest for Human Nature.* New York: Basic Books, 2001. This is a reconsideration of what it means to be human in light of field observations of chimpanzees. Solid, interesting information. It is a reader-friendly, non-technical text.

Stringer, Chris, and Peter Andrews. *The Complete World of Human Evolution.* 2nd ed. London: Thames & Hudson, 2012.

Tattersall, Ian. *Masters of the Planet: The Search for Our Human Origins.* New York: Palgrave Macmillan, 2012.

Tattersall, Ian, and Jeffrey H. Schwartz. *Extinct Humans.* Boulder, CO: Westview Press, 2000. Striking color photographs show fossil skulls and skeletal remains in the fragmentary and damaged state in which they have been found. This is a useful corrective to the usual cleaned-up reconstructions.

LESSON 1

Will the First Humans Please Stand Up?

Introductory Activities

Ask students to brainstorm and discuss:

1. What are the 3–4 most important questions you would want to have answered about humanity's primate ancestors? Why do you think these are the most important questions?
2. Ask half the students to list what are the most important similarities, the other half the most important differences, between living humans and living apes. Then ask: Why do you consider the differences to be the most important ones? Would you expect the same kinds of similarities and differences to have existed between extinct ape-like and extinct human-like primates? Why or why not?
3. If you had to pick a single characteristic that millions of years ago distinguished an ape from the first creature that could be called a hominid, what would it be? Why did you pick this characteristic?

Discussion Questions

Note: These questions are all based on information provided in the student handouts. Consider sharing with students those questions and activities that you are going to ask them to work with, before they start going through the student handouts. This often helps students to consider the handouts more attentively and productively.

1. What would you say were the three most important similarities, and the three most important differences, between chimpanzees and australopithecines? Between australopithecines and Homo erectus? Explain the reasons for your answers, including an explanation of how you decided what was "important." (This discussion lends itself well to small group work.)
2. Some scholars have suggested that Homo habilis was not distinctively human enough to be classified as "Homo" and should be re-classified as "Australopithecus habilis." Based on the evidence you have, would you agree with making this change? Why or why not?
3. Which, if any, of the questions about human ancestors that you had considered most important in the introductory part of this lesson have remained unanswered? Do you still consider them to be the most important? Why or why not? Given the information you now have, do you think it would be possible for your unanswered questions to be answered? If not, why not? If so, what evidence might answer them? How reliable might the answers be? What, if any, important new questions do you have now?

4. Based on the evidence you have, what would be the most promising hypothesis you could make about possible reasons for the changes in hominids towards increasing resemblance to anatomically modern humans? Why would this hypothesis be the most promising? (This activity can also be used as small group work.)

Activities

1. This activity may serve as assessment. You have been asked by a textbook publisher to act as their consultant on a chapter to be called "Human Ancestors in Africa and Beyond." Your job is to come up with a time line that shows all the information you think students need to know about this topic. Base your time line on the information in this lesson. The publisher also needs from you the reasons why you have chosen the information you have shown as being important.

2. This activity may serve as assessment. You are the leader of a scientific expedition looking for early human ancestors in Africa. You hit it lucky, digging up a number of fossilized bones with at least some human-like features, as well as various other kinds of objects. All were found between layers of ashes, the top one dated to about 1.5 million years ago, the bottom one to about 2.5 million years ago. Describe the fossils and other objects you have found from which you could infer:

    - What the early human ancestor you have found was like
    - What opportunities and problems its environment posed for it
    - What its way of life and behavior were like
    - Where your find fits into the evolutionary line from ape to human, whether you should class it as an Australopithecus or a Homo and if Homo, then what species

3. Outline your inferences and classification, and explain what features of your finds are allowing you to make these choices. On which of the following subjects could you make the most numerous inferences? The most reliable ones?

    - Human ancestors and the environment
    - Particular human ancestors in relation to other human ancestors
    - Human ancestors and their ways of thought and behavior

Extension Activity

1. Rate the reliability of each of your inferences on a scale of one to ten, with ten being the most reliable. Explain why you gave the ratings you did.

It's All in the Family: Who Were Our Ancestors?

Chimpanzees

The two living species in this genus are our closest relatives. We share 95–98 percent of our genes with them. (We also share 80 percent of our genes with a laboratory mouse.) Our ancestor at the point where ape and human lines of descent divided must have been very similar to living chimpanzees, though we have no fossil proof of this.

Time Frame

5–9 million years ago to the present

Range

Equatorial African rain forest, open woodland, mixed riverside forest, and savanna

Physical Characteristics

- Estimated brain capacity 300–400 cubic centimeters (cc).
- Face sticks out far forward, heavy jaw, large canine teeth with gaps next to them.
- Arms longer than legs.
- Opposable big toes, long fingers, short thumbs.
- Walks on soles of feet and knuckles of hands; can stand and walk upright briefly.
- Average adult male height about 4 feet, female about 3 feet. Individuals varied.

Diet

About 75 percent of their diet consists of ripe fruit. They also eat nuts, seeds, blossoms, leaves, and insects. Some groups hunt bush pig, antelope, and monkeys, but meat is only about 2 percent of diet. Some groups do not hunt.

Technology

The only apes known to use tools are one of the two species of chimpanzee. Different traditions of tool use exist among different chimpanzee groups, even those living in the same kind of environment. In areas where termites, ants, nuts, and stones are all plentiful, some groups carefully dig into termite holes with sticks or vines they have stripped of leaves. They wiggle their tool delicately to fool the insects into fastening onto it, then carefully pull it out to get a good mouthful. They do not, however, do this to get ants; nor do they use stones as tools. Other groups use sticks to "fish" for ants but not termites.

Still other chimps use specially chosen stones and carry them some distance in order to crack nuts. But these animals do not go after ants or termites with sticks. Adult chimps teach these tool-using skills to their young, who take several years to fully master the skill. But no chimpanzee in the wild has been known deliberately to shape stones into tools.

Earliest Hominids

Remains belonging to a very early ancestral group have been found in Chad, Ethiopia, and Kenya in recent years. Together, they date to about 5–7 million years ago. Each of the specimens had different mixes of ape-like and hominid-like characteristics, though more of the former. We do not know whether or not they walked upright.

Australopithecines

Remains of some half-dozen species. These species emerged at various times and survived on Earth for varying lengths of time. Several were contemporaries for considerable periods.

Time Frame
Remains of all known species are dated to between 1 and 4.2 million years ago.

Range
Varied by species, but some known from all over Africa below the southern edge of the Sahara. Preferred environments have included tropical river and lake shores with permanently wooded fringes and some grassy areas. Some later species lived in drier, sparsely wooded savannas and uplands. Evidence for their environment comes from seeds, fossil woods, and animal bones.

Physical Characteristics

- Estimated brain capacity 375–500 cc.
- Estimated height of males about 4 feet, females about 3 feet; individuals varied.
- Face and jaw stuck out significantly, to varying degrees; very heavy and robust in some.
- Teeth of all were larger than humans' but lacked extra large ape-like canines, though one early species had ape-like gap next to their enlarged canines. Two late species had extremely large and massive back teeth, unlike either apes or humans.
- Tooth enamel smoothly worn, in pattern characteristic of fruit eaters.
- Hip, leg, and foot bones show all walked upright (confirmed for one by footprints dated to about 3.7 million years ago). However, features such as arms long relative to legs and length of fingers show that some adaptation to tree-climbing continued, whether for shelter, sleep, or feeding. The earliest species had the most human-like leg and arm joints. Another, from about 2.5 million years ago, was also human-like in its skeletal bones but very primitive in skull, jaws, and teeth.

Diet
Fruit was the main part of the diet. This is inferred from the size and shape of teeth, from the type of wear on them, and from the amounts of various elements in bones. The species with extra heavy back teeth ate harder, more fibrous vegetables, nuts, and tubers, in addition to fruit. One early and one late species were less exclusively vegetarian than the rest. For these two, the possibility of some limited meat eating is an open question. Competitors for food in

most environments were, among other species, monkeys and baboons (for fruits and nuts), pigs (for tubers), and rodents (for seeds and nuts).

Technology
Two of the species have been suggested as makers of stone tools dated to a time when they co-existed with Homo habilis. Fossils of one dated to about 2.5 million years ago have been found together with antelope bones that show cut marks of the kind made by stone tools. No tools, however have so far been found with any australopithecine remains.

Homo habilis

Remains may belong to two different species.

Time Frame
Remains of all known specimens dated to 1.4 to 2.3 million years ago.

Range
Range and environments are much the same as those of the Australopithecines.

Physical Characteristics

- Estimated brain capacity about 510–750 cc.
- Some individuals had relatively large skulls and Australopithecus-like teeth; others had small Australopithecus-sized skulls and human-like teeth.
- Inside shape of some skulls suggests left/right differentiation of brain, which may be a pre-condition for language development. Other anatomical features rule out language ability itself.
- Estimated height: males from about 3 to 5, females barely over 4 feet; individuals varied.
- Foot less completely evolved for walking than that of some earlier Australopithecus species. In spite of that, and most specimens' more ape-like proportions of arm and leg length, all walked upright.

Diet
Fruit was still a staple part of diet as shown by tooth wear. But there is reliable evidence for some opportunistic meat eating. Habilis fossils have been found associated with stone tools and with bones of prey animals such as antelopes. On some of these bones microscopic analysis has shown cut marks, definitely made by chipped blades of the type found with Homo habilis remains. In five of the thirteen bones where carnivore teeth marks and cut marks overlapped, the cut marks were on top, suggesting that the hominids consumed scavenged meat that animals had earlier killed. Adding scavenged meat to the diet was not accompanied by any evolutionary changes such as the size or power of teeth or fingernails.

Technology

The earliest Homo habilis fossils and the earliest stone tools have been dated to approximately the same time-period. However, evidence of both tools and Homo habilis fossils in the same place is scant. At one site where this occurs, use-wear on the stone tools shows that they were used in butchering meat and in cutting or shaping wood and soft vegetation. Raw material for tools has in some cases been fetched from as far as seven miles away. The tools are typically small (one to four inches). They are of several types, including choppers and scrapers, but not shaped to consistent patterns. This stone tool-making tradition survived until after the extinction of Homo habilis.

Homo erectus

Time Frame

Known remains dated to between 1.9 million and twenty-seven thousand years ago.

Range

First known species to move into extreme southern and northern Africa. Certainly by about 1.2 million years ago and perhaps earlier species moved into Asia. Soon Homo erectus ranged from the Caucasus to Indonesia and northern China. It was also the first hominid or human species to become at home in environments as varied as tropical, temperate, hot and dry, cool and dry, and seasonally downright cold.

Physical characteristics

- Estimated brain capacity about 850–1200 cc. (Modern Homo sapiens is 1220–1600 cc.)
- Estimated height of males about 5.9 feet, females 5.2 feet; individuals varied.
- Face somewhat stuck out; some had ridges above eyebrows and on top of the skull. First species with protruding rather than flat nose.
- Tooth enamel heavily pitted and scratched, unlike other hominid species.
- Reduced arm length and narrower hips that increased efficiency of leg-muscles suggest an exclusively ground-dwelling rather than partly tree-dwelling way of life.
- Narrower hips imply less room for guts, in turn suggesting need for higher quality food.
- Some anatomical features are considered to rule out human-like speech, making pronouncing of vowels and clear articulation difficult or impossible. No anatomical evidence exists for or against capacity for abstract or symbolic thought. Note, though, that experimenters have recently taught chimpanzees to use symbols, though in extremely limited ways.

Diet

Circumstantial evidence, including tooth wear, suggests Homo erectus was omnivorous, with meat playing a much larger part in the diet than in that of australopithecines or Homo habilis. There is no conclusive evidence either for or against Homo erectus having been a hunter. The first explicit evidence of hominids hunting comes from Germany, where three six-foot wooden spears have been found along with stone tools and bones with cut-marks, mostly from horses. This material dates to about five hundred thousand years ago. The species responsible is not known.

Technology

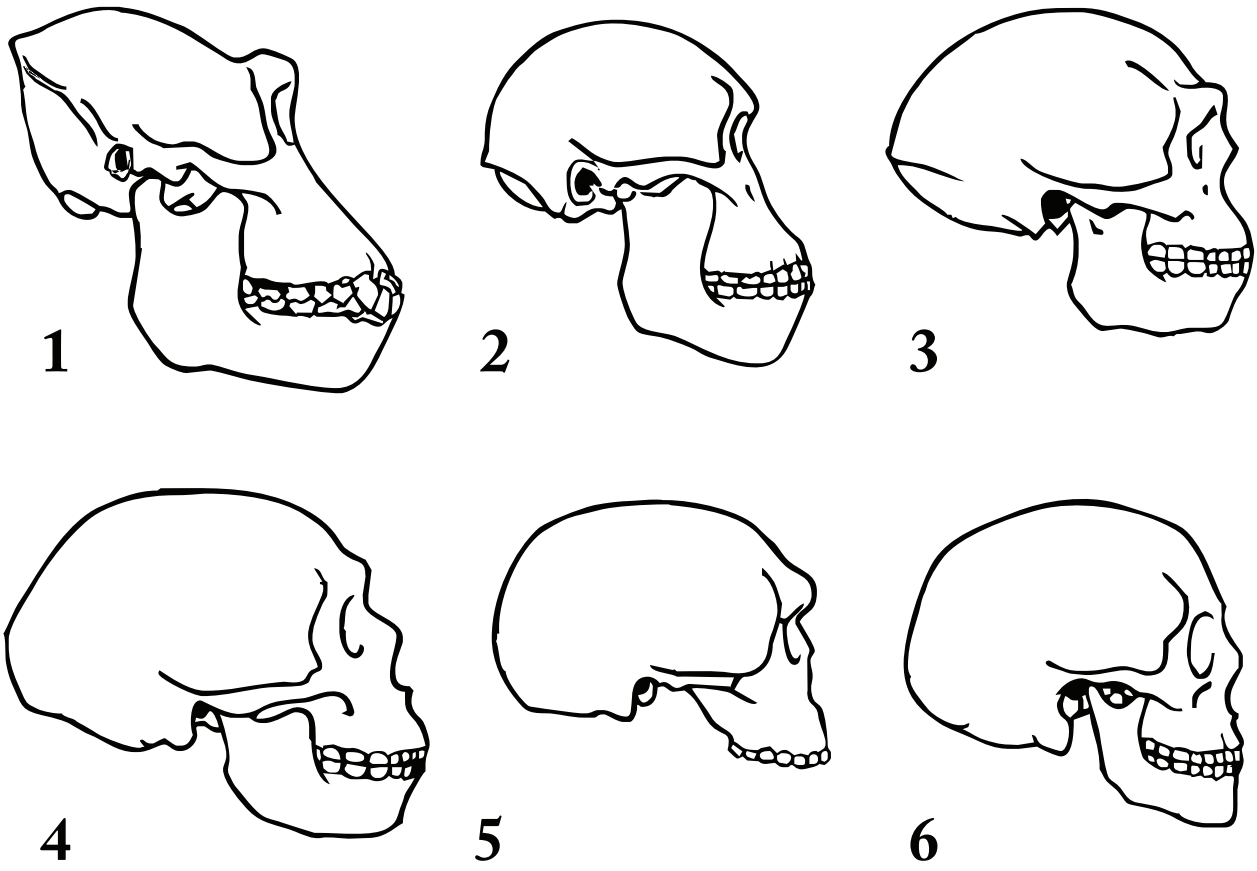
For nearly half a million years, Homo erectus went on using the same kinds tools as had Homo habilis. About 1.5 million years ago, however, a new kind of stone tool, the teardrop-shaped hand axe, appeared at Homo erectus sites. This new type, called Acheulean by scientists, was larger than earlier ones and deliberately shaped to a standard form. It was symmetrical in three dimensions. It was produced in enormous numbers. Some specimens are several times larger than the typical 6-inch-or-so, fit-in-the-palm models. Bone hammers were used on some to produce a finer edge. The earlier types of stone tools also continued to be made long after the Acheulean type made its appearance.

Hand axes continued unchanged in shape and style, except for increasingly fine craftsmanship, for about a million years. It appears that Homo erectus highly valued these tools because they were carried away from butchery sites to be used again. Modern experiments prove that they worked well in butchering animals as large as elephants. These tools have not been found at sites in Indonesia and China, perhaps because Homo erectus migrated to those areas before the more sophisticated hand axes were invented in Africa.

Tools associated with Homo erectus dated to about eight hundred thousand years ago have been found on the island of Flores, which was never connected to the Indonesian mainland in the era when that species existed. This suggests that Homo erectus was able to cross open water. The next sea crossing known was not taken until Homo sapiens peopled Australia only forty thousand to sixty thousand years ago.

African savanna scene

Family Pictures

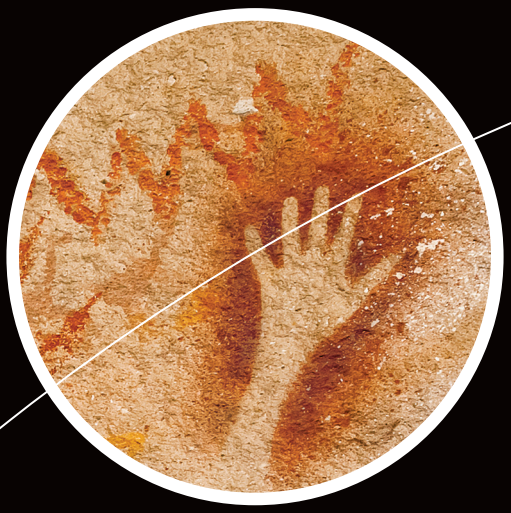


Skulls of members of the genus *Homo*, as well as one gorilla for comparison:

1. Gorilla
2. Australopithecine
3. *Homo erectus*
4. Neanderthal
5. the Steinheim skull (an example of either *Homo sapiens* or *Homo heidelbergensis*)
6. Modern human (*Homo sapiens*)

BIG ERA TWO

Human Beings Almost Everywhere
200,000–10,000 years ago



Introduction

This is the first era in which our own species, Homo sapiens, is known to have existed. This makes it the first era of human history. Scholars argue vigorously about when Homo sapiens first appeared. An increasing number of archaeologists and paleontologists put this date at around 200,000 BP (Before Present) in eastern Africa. One reason supporting this approximate date is that, today, the genetic differences between humans are very small, far too small for those differences to have accumulated over a period much longer than 200,000 years. Also, fossilized remains of humans from around 200,000 BP suggest that they were almost identical to the anatomies of people living today. There are also hints that those folk were beginning to behave very differently from earlier hominins.

Big Era Two extends to about 10,000 BP when, in some parts of the world, humans began for the first time to take up farming. Scholars conventionally mark that date as the approximate transition from the Paleolithic (Old Stone Age) to the Neolithic (New Stone Age). This is the time when humans in some places started using an array of more sophisticated stone tools, many of which facilitated early agricultural production. We can therefore think of Big Era Two as the era of human history that preceded farming and agriculture.

This era before farming was by far the longest in human history—encompassing about 95 percent of the time that our species has existed on earth—but it is also the era about which we know the least. In discussing it, we will have to explore many different types of evidence available to try to understand it.

Most historical scholarship is based on written evidence. However, writing did not exist during Big Era Two, so we cannot tell a traditional historical story about this period. For example, we do not know the names of a single society or individual from that era.

Nevertheless, scholars have done a great deal of research in archaeology. Therefore, we can say a surprising amount about how humans lived and how they related to the natural environment. We can even make some reasonable guesses about how they thought about the world around them. Archaeologists are extremely skillful at examining material objects that have survived from this era in order to help us understand how people lived. Scholars can learn a surprising amount by examining the bones of both humans and the animals they hunted.

Archaeologists also analyze the remains of human tools or foods. They can often date these remains quite accurately. They can therefore study how technologies changed over time and how humans slowly spread into new areas. They also use what they know about climatic change to make inferences about changes in human life. Finally, study of modern communities that use technologies similar to those known in Big Era Two can give us some helpful hints about the way people lived, the organization of their communities, and the sort of perceptions they may have had about their world.

In recent years, scientists have discovered a major new source for reconstructing early human history, especially the dating and patterns of migratory movements. This tool is the analysis of deoxyribonucleic acid (DNA), the material inside the nucleus of a cell that carries genetic information for reproduction of cells. Scientists can determine the DNA profile of any individual by drawing a blood sample or taking a swab of cells from inside a subject's mouth. As DNA is passed down from one generation of humans to the next, small alterations, or mutations occur. This happens at a regular rate, which means that over time, the genetic differences between individuals sharing a common ancestor statistically increase. The longer two human populations have no contact with one another, the greater the genetic differences between them will be. Using complicated biochemical procedures, scientists can measure the rate of change in genetic material and thus estimate how many thousands of years separated two human groups from one another. From this data, scholars may propose hypotheses about early migratory directions and dating.

To understand how people might have thought before 10,000 BP, we have to resort mostly to indirect forms of evidence. If people buried their dead, it is tempting to think that they had an idea of an afterlife and were, in some sense, religious. Art, however, probably provides the most powerful evidence of how humans perceived their world. Most archaeologists believe that the existence of art is one of the first signs that humans had a wider, more complex ability to communicate. When we find early evidence of art, we are probably in the presence of people who were capable of using language.

Language may in fact be the defining characteristic of our species. Apart from the evidence of bones, how can we tell that early Homo sapiens really were fully human? In fact, what is it that distinguishes humans from animals? Historians, philosophers, and archaeologists have debated this basic question for a long time, and they have not reached a universally accepted answer. One trait that appears on most lists of what makes us human is the ability to communicate with one another through language.

Many animals can use gestures to communicate with each other, but only humans can communicate information with precision and detail. Only humans can talk about things that are not present (a new pathway through a forest), things that probably do not exist (dragons, leprechauns, or sky gods), things that are abstract (one o'clock in the afternoon or the beauty of a ripe pear). Because of this ability, humans can communicate to one another the results of what they learn throughout their lifetime. With this ability, knowledge could accumulate within communities as each individual and each generation contributed to the common store of knowledge. This transformed the relationship of humans to their environment and to each other.

CHAPTER 5

By Felicia Eppley and Ellen Leader Pike

Human Beings around the World

WHY STUDY HUMANS AROUND THE WORLD?

Between 100,000 and 10,000 years ago, humans migrated to new environments within Africa. Even more importantly, some humans also moved out of Africa into Eurasia, Australia, and eventually the Americas. These migrations took humans into new environments. This required new survival skills and lifeways. This globe-encircling movement of humans has no parallel in the histories of other species. It demonstrated that there was something unique about our species, an adaptability and a level of technological genius that no other species could match. This exceptional creativity is what makes human history so different from that of other species.

Of course, some other animals have managed to move to radically new environments. But they have done so only after undergoing significant biological changes. An example is the hairy mammoth. It is closely related to the African elephant, an animal adapted to tropical environments. But the mammoth could survive in the tundra lands of ice-age Siberia because it had changed genetically. Specifically, it acquired a hairy covering that kept it warm. In contrast, humans remained the same biologically but developed new technologies and ways of doing things. For example, humans adapted to the cold of ice-age Siberia by learning to hunt animals such as mammoths, to warm themselves with fire, and to clothe themselves in tailored animal skins. While animals adapt by changing genetically, our distant human ancestors adapted much more quickly by changing their behaviors.

What enabled humans to alter their behaviors so radically? What makes our species so different? In this chapter, students will hypothesize about the factors that have made our species so creative? They will consider a theory called collective learning, which has been developed by Professor David Christian. This theory might help explain humans' adaptability. Students will also investigate the particular skills and technologies early humans used to adapt to new environments. They will do this using the concept of biomes.

OBJECTIVES

Upon completing this chapter, students will be able to:

1. Define collective learning
2. Explain the theory presented in this chapter of why humans were able to move out of their original habitat while chimpanzees were not
3. Explain the distinction between the terms "biome" and "ecosystem"
4. Describe features of the biomes presented here, and locate them on a map
5. Explain what factors may have led early humans to migrate to new biomes

TIME AND MATERIALS

This chapter includes two lessons. The first explores the idea of "collective learning," the feature that has made our species so unique and that lies at the foundation of our history. The second explores the skills humans used to adapt to different environments. Each lesson takes approximately 45 minutes to complete.

Materials: Student Essay ("Collective Learning—Pass It On"), Migrations Map and student handouts, paper, and pencils. Atlases and other maps with climate and topographical information are helpful.

HISTORICAL CONTEXT

Between 100,000 and 10,000 years ago, humans migrated to all the habitable regions of Africa, and some even left Africa. They and their descendants eventually migrated to most other parts of the world.

Archaeological evidence demonstrates that by about 100,000 years ago some humans had migrated out of Africa to Southwest Asia. From then, people moved farther and farther from their African homeland. Somewhere between 60,000 and 40,000 years ago they crossed from Southeast Asia to Sahul, the ice-age continent made up of present day New Guinea and Australia. About 40,000 years ago they migrated to ice-age Russia and the Ukraine. In addition, evidence suggests that beginning 13,000 years ago and probably earlier, people migrated from Asia to the Americas, either by crossing the frozen Bering land bridge from Siberia to Alaska or by paddling boats around the northern rim of the Pacific Ocean. Within just a couple

of thousand years, these travelers managed to populate all of North and South America from northern Canada to Tierra del Fuego at the tip of South America.

Though these migrations occurred long before there were any written records, they show for the first time the unique ability of our species to adapt to new environments. Humans were learning how to live in extreme types of climate. Their capacity for collective learning allowed humans to acquire and accumulate the new skills that were needed to adapt to environments throughout the world. Among the most significant developments in history is the story of how humans have interacted over time with the community of plants and animals in different environments. We will explore this aspect of early human history by exploring how humans adapted to different "biomes".

THREE ESSENTIAL QUESTIONS

Humans and the Environment

Why were human beings able to adapt to many different biomes when most animal species could not?

Humans and Other Humans

How important was social cooperation in human adaptation to a wide range of biomes?

Humans and Ideas

Homo erectus, an early hominid species, adapted to fairly cool climates in Asia even though we have no evidence that this species had language. Could humans have adapted successfully to any biome if they had not had language?

KEY THEMES

This chapter addresses the following key themes:

Key Theme 1: Patterns of Population

Key Theme 6: Science, Technology, and the Environment.

CORRELATIONS TO NATIONAL HISTORY STANDARDS

National Standards for World History

Era One: The Beginnings of Human Society, 1B: The student understands how human communities populated the major regions of the world and adapted to a variety of environments.

INSTRUCTIONAL RESOURCES

Cavalli-Sforza, Luigi Luca, and Francesco Cavalli-Sforza. *The Great Human Diasporas: The History of Diversity and Evolution.* Reading, MA: Addison-Wesley, 1995. Fascinating discussion of the relationship between the genetic and the linguistic trees of human dispersion around the world.

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Jones, Stephen, Robert D. Martin, and David R. Pilbeam, eds. *The Cambridge Encyclopedia of Human Evolution*. Cambridge, UK: Cambridge University Press, 1994.

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LESSON 1

Collective Learning: Pass It On

Procedure

1. Have students look at Map 1 (The Spread of Modern Humans), and Map 3 (Current Chimpanzee Habitat). Both of these maps are located in Lesson 2. Then ask students to read Student Handout 5.1.1 titled "Collective Learning: Pass it On." When students have finished reading, ask them to put away the essay and try to write definitions of "symbolic language" and "collective learning." Have students compare their answers and discuss the results.

2. Organize students into groups. No one may write or talk once the exercise begins. Choose one person from each group and see how long it takes this person to explain to his/her group that:

    a. Tomorrow is a free day and they don't have to come to school.

    b. The teacher is going to drop everyone's lowest test grade for the next report card period.

    c. Discuss how the chosen student communicated these two ideas using gestures but not words. Why is it difficult to explain these ideas without symbolic language involving words? Are gestures and facial expressions part of symbolic language?

3. As a class or in groups, consider one or all of the following:

    a. Pretend that there has been some disaster which killed every human on earth except you and your family (or other group) and disintegrated all books and computers. Fortunately, it didn't kill any animals or leave any harmful aftereffects like radiation or giant roaches. Using pencil and paper, make an inventory of the knowledge and skills possessed by the members of your family (or group). How could you best use them? How many of the things that you use every day would you be able to maintain (water, lights, machinery)? How would your life change?

    b. Pretend that the disaster left the members of your town, say one thousand people, still alive. Would that change the picture? Pretend that the disaster left your town and its library. How does that change things?

4. As a class or in groups, consider a world if humans could not speak or write with words.

    a. What difference would it make in their lives? What kinds of things could they do and what kinds of things would they be unable to do? Could they have built cars? TVs? Would they be likely to gather with others in a place of worship? What kinds of things would they be able to teach their children?

Collective Learning: Pass It On

The chimpanzee is our nearest relative and capable of doing many things that we view as proper to humans. They learn, they use tools, and they communicate. Yet, when comparing Map 1 (The Spread of Modern Humans) to Map 3 (Current Chimpanzee Habitat), it is clear that humans have been able to leave their African homeland while chimps have not. Humans have been able to acquire entirely new skills so that they can adapt to environments very different from those in which they first evolved. Why is it that humans have been able to do this—to make the world their habitat and even move into outer space, while chimps are stuck at home?

In his book *Maps of Time: An Introduction to Big History,* world historian David Christian theorizes that the key to human adaptability is the ability to pass on knowledge through the use of symbolic language—language that uses words to symbolize abstract ideas. It is true that chimps are able to pass on knowledge to their offspring; but, because they don't have symbolic language, they can only do so by demonstration. A chimp, for example, may poke a stick in a termite mound to show its offspring how to get to the termites. Chimps can teach only what can be shown. They cannot describe things that are not present. They are also stuck in the present. They can't discuss the past or imagine the future. Humans, on the other hand, because of symbolic language, can pass on knowledge about what happened yesterday ("A lion ate the canoe.") They can imagine the future ("Tomorrow it will be your turn to wash the camel."). And they can describe things that are out of sight ("There is quicksand in the river at the edge of the yellow cliffs.").

Symbolic language allows humans to describe things precisely and in great detail. As a result, humans can pass on huge amounts of information from generation to generation. That means that the human species' store of information about hunting, making tools and weapons, gathering food, using plants for healing, organizing themselves, and a thousand other topics, grew and increased in complexity as humans passed it from one generation to another. The human species was developing the equivalent of a giant, communal brain. Christian refers to this ability to learn and transfer the knowledge learned—the ability to build this giant brain, as "collective learning."

Because they share knowledge, humans have access to the ideas of other humans, both living and dead. This gives them a huge advantage over chimps and other animals. Christian theorizes that it is collective learning that allowed humans to leave their native biome and to populate, eventually, even inhospitable corners of the earth. If he is right, it is collective learning that explains why the history of humans is so different from that of all other animals.

Collective learning enabled humans to adapt to new environments by allowing them to share ideas about how to cope with their surroundings. Over time, this enabled them to adapt to more and more varied environments. Animals can adapt to new biomes only by changing genetically. Elephants moved into Siberia, but they had to evolve into a new breed, the woolly mammoth. Humans, on the other hand, did not need genetic alteration to move to frigid climates. Humans made the move relatively quickly by adopting warm clothing of skins and furs, building houses of skins or sod, and eating musk ox steak!

Humans exhibited their capacity for collective learning before they left Africa. They began by moving out of their original habitat and into new environments within Africa. They developed

new tools and used new materials. For example, some living near sea shores learned how to fish and to consume shellfish. Individual groups developed their own distinctive lifeways, passed on from generation to generation, and displayed distinctive styles in the making of their tools. Exchange systems were created, sometimes between groups a hundred miles apart. Each of these innovations (new ideas) was built on an accumulating backlog of knowledge, a store of collective learning.

So, how did we humans do it? How did we learn collectively? We did it through symbolic language. Unlike grunts or chirps, symbolic language (mainly the use of words) is capable of transferring information of every kind. Not only can words refer to things but to ideas and even other words. New words can be invented as needed. The system is efficient and flexible. It is the system that we humans still use today as we continue to enlarge our collective brain and adapt to increasingly complex environments, even including the environment of the moon!

LESSON 2

Meeting New Challenges

Early Humans on the Move

Increasingly sophisticated systems of dating, going beyond carbon-14 to such techniques as thermoluminescence, potassium argon, and electron spin dating, are giving archaeologists increasingly accurate ways to examine fossil sites. In spite of this increase in technological proficiency, professionals in fields like paleo-ethnobotany, paleo-climatology, paleo-anthropology, and other fields debate the significance and dates of their finds and frequently disagree. For example, the date of human arrival in the Americas is hotly contested and ranges from 30,000–12,000 BCE. Therefore, dates are often presented as ranges in order to take into consideration various researchers' explanations.

A key term for this lesson is biome. A biome is a major ecological community that corresponds to a climate zone and is characterized by plant and animal species that have adapted to that particular environment. Biomes are composed of many ecosystems. Whereas biomes are limited to a particular climate, ecosystems tend to be limited by geographical features, such as mountains, rivers, or surrounding seas. A biome may be composed of many ecosystems. Within biomes, plants have similar growth forms and animals tend to have similar feeding habits. Biologically, all living things are closely adapted to their biomes. A change in any part of the environment, such as an increase or decrease in the population of a particular plant or animal, has a ripple effect of change on other parts of the environment.

World biomes are determined by climate. In general we can group them according to their latitudes. For example, low-latitude biomes include tropical rainforest, savanna, and desert. Mid-latitude biomes include steppe, chaparral, grasslands, and deciduous forest. High-latitude biomes include taiga, tundra, and alpine forest. In addition, biomes include several types of aquatic environment.

Humans are exceptional. Like all living things they adapt biologically to their biomes. In addition, collective learning allows humans to adapt culturally. Unlike other large animals, humans have moved into many different environments. This process is the focus of this lesson.

Procedure

1. Display "Map 1: Spread of Modern Humans" (see below).
    a. Ask students to examine the map and to note the movement and dates of humans out of Africa and across the globe.
    b. Ask students to hypothesize about the challenges of geography and climate that early humans confronted as they moved out of Africa.

2. Arrange students into groups.

    a. Assign each group a biome and give them the appropriate handout (see handouts below).

    b. Tell students that they must imagine that they have been dropped into their assigned biome with nothing but the tool kit described in their handout. They will not have food, clothing, or shelter. Their job is to:

        i. Figure out how they will provide themselves with food, clothing, shelter, and if necessary, a type of transportation.

        ii. Keep track of the skills they have to develop to deal with this new environment.

    Note: Teachers should remind students that in some regions either built up or excavated dirt was the only option for housing, while in mountainous regions caves were useful. As for food, eggs of birds and larvae of insects were plentiful in some regions. While some biomes of this period were populated with many species of megafauna, only eight kinds of land mammals weighing more than a ton are left on earth—the giraffe, two species of elephants, four species of rhinos, and the hippo. Students should consider how hard it would be to kill one of these animals with only a spear.

3. Reorganize students into groups with one student from each biome. Ask each student to present the details and challenges of her/his biome and the adaptations humans likely made. All students in each group should have some idea about the ways in which humans survived within each biome.

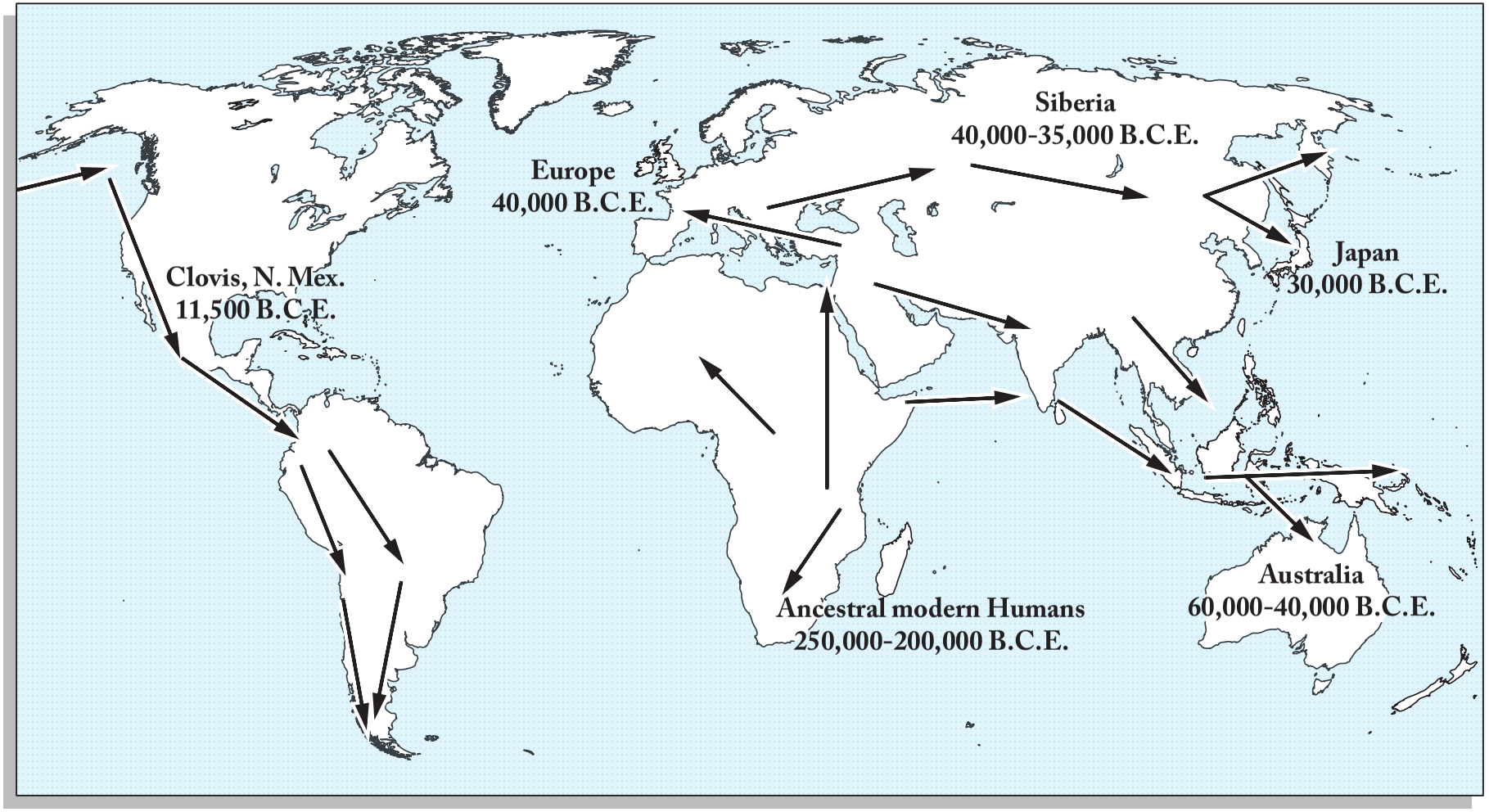
4. Show Map 2, which shows five different biomes. Ask students to reconsider their original hypothesis on the problems faced by migrating humans. What adjustments have they made in their initial hypotheses?

5. Show Map 3: Current Chimpanzee Habitat. Ask students to hypothesize why humans have expanded their habitat to include the entire world and why chimpanzees are limited to an ever-shrinking habitat in West Africa.

6. Ask students to consider ways in which humans continue to adapt to their environments. Students should ponder not only new ways of dealing with their environments (e.g., air travel, thinsulate insulation) but also take into account new types of environments they may encounter (e.g., high altitudes, outer space, ocean depths).

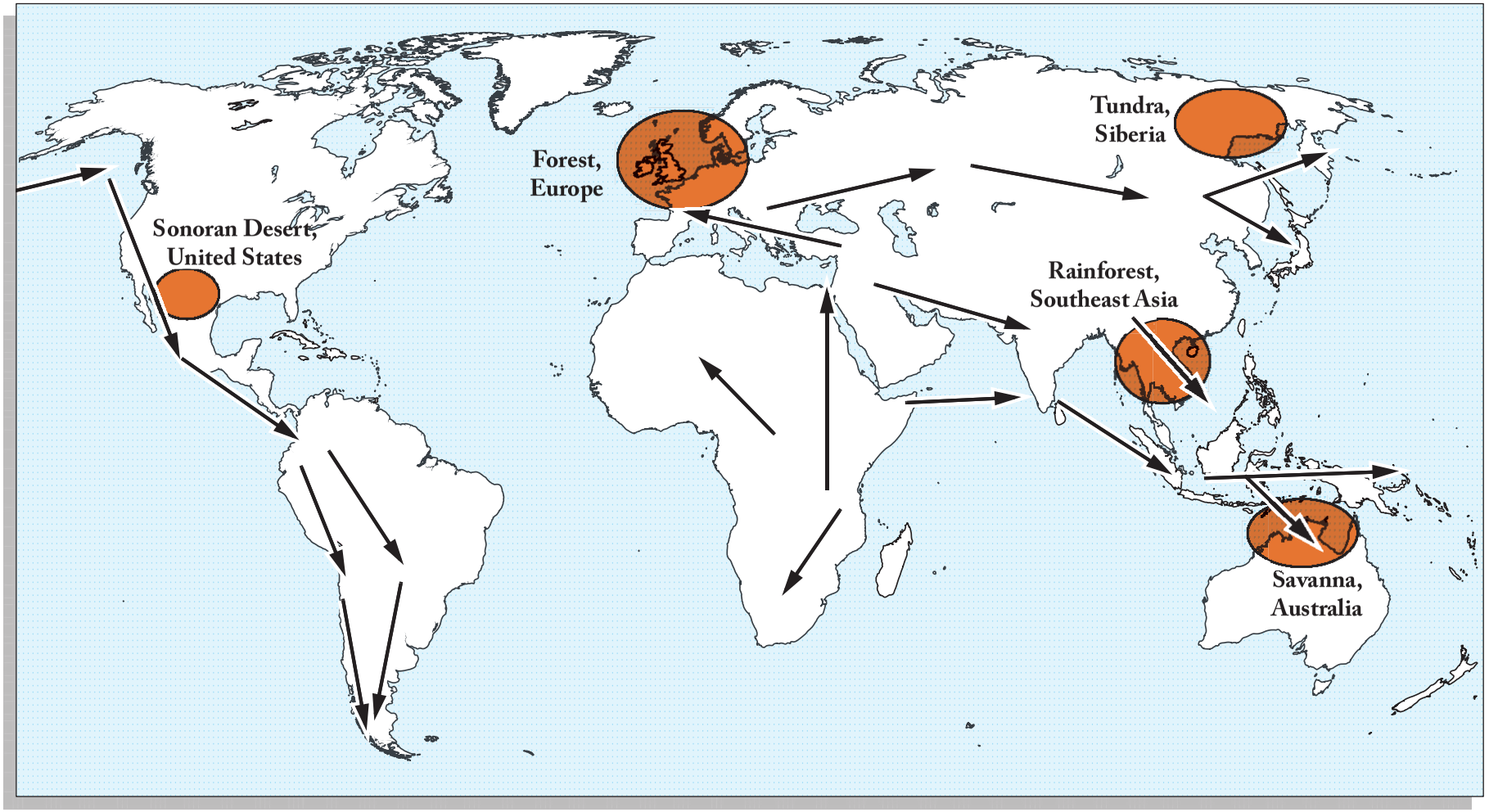
7. Assessment: Have students think of themselves as paleo-climatologists who are about to present papers at an International Paleo-Climatology Conference in Stockholm, Sweden. Students should write abstracts (summaries of a longer text, usually of an academic article) of the papers they will present for the Conference Bulletin. Each student should select one of the biomes that has been studied in this lesson. Then they should describe it, and explain how humans likely adapted to it and what technological skills they might have had to perfect in order to survive in it.

Map 1



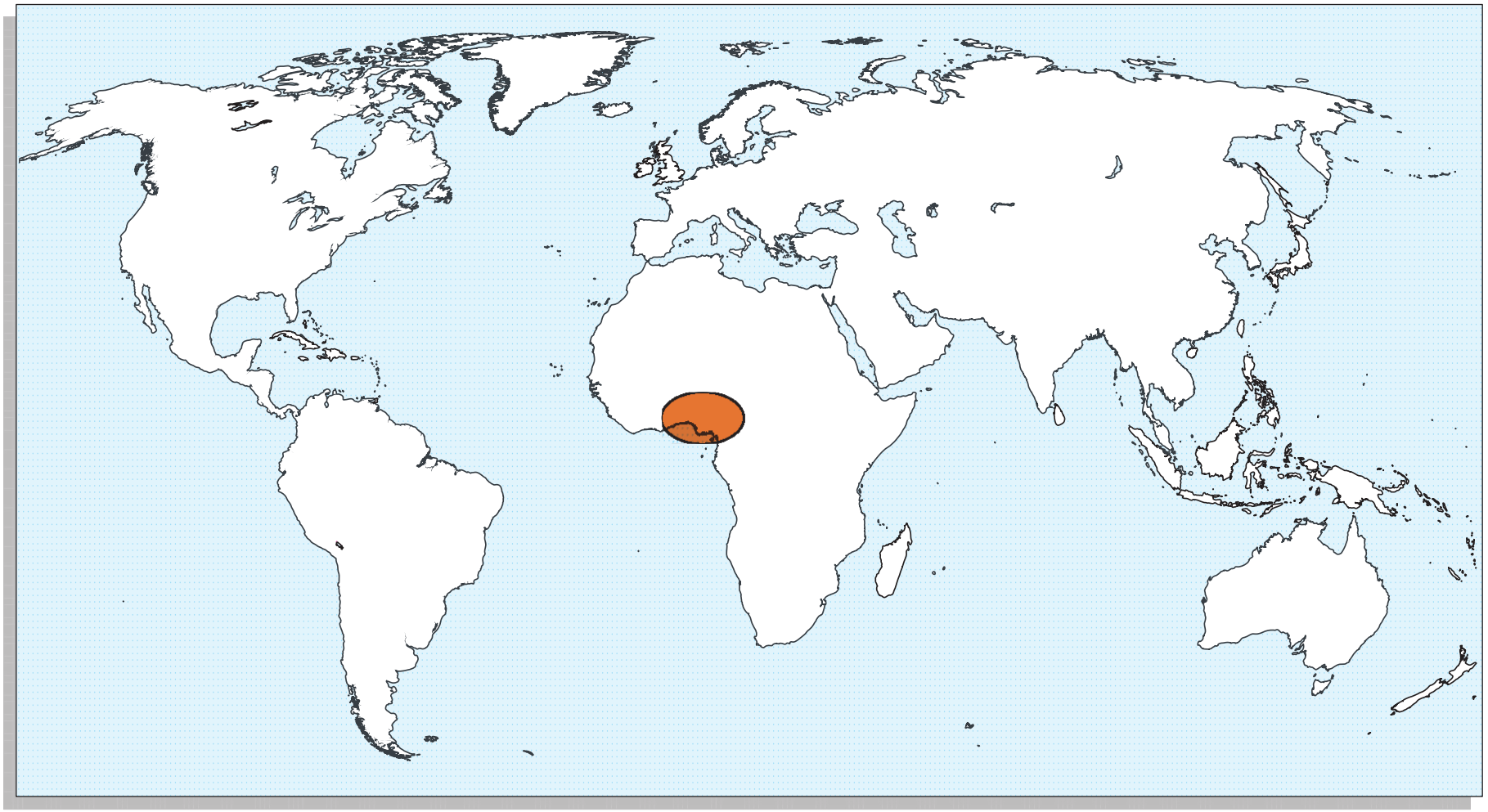
Spread of Modern Humans

Map 2



Selected Biomes on Migration Routes of Early Humans

Map 3



Current Chimpanzee Habitat

Characteristics of Specific Biomes

Tropical Rainforest: Southeast Asia

Features

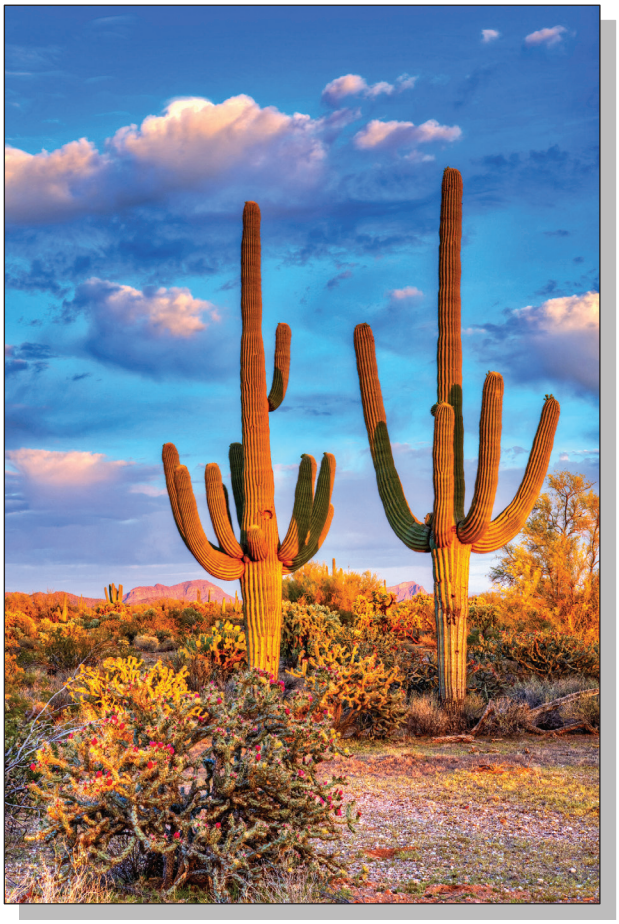
- Densely forested, broad canopy with little light penetration to floor of forest
- Broadleaf evergreen trees, generally shallow- rooted
- Orchids, ferns, palms, mosses
- Hot and humid, little seasonal change
- Daily period of heavy rainfall
- Great variety of birds
- Reptiles—crocodiles, snakes, lizards
- Rats, bats, wild pigs, dogs
- Fish and shellfish in nearby waters
- Tree kangaroos
- Insects

Tool Kit

- Flint [knives, scrapers, weapons]
- Stone [grinders and pounders]
- Bone [awls, needles, shovels, fuel, shelters, ornaments]
- Wood [digging sticks, supports for shelters, fuel]
- Composite tools [stone-tipped spears, spear throwers, harpoons]
- Fire

Characteristics of Specific Biomes

Desert: Southwest United States (Sonoran Desert in Arizona)



Features:

- Arizona Upland straddles the frost line where the upper slopes of mountains are forested with oak, juniper, and pinion pine.
- At lower altitudes: ironwood, mesquite, blue palo verde, acacia, and willow along streams
- Shrubs (bursage and creosote bush) give way to yuccas, agaves, saguaro (up to 12 feet high), prickly pear, cholla, and other cacti
- Rainfall: 15–23 inches per year
- Springs and seasonal streams
- Bighorn sheep, javelina, ring-tailed cats, snakes, lizards, salamanders, frogs, desert tortoise, rabbits, kangaroo rats, and other rodents
- Mexican eagles, owls, roadrunners, and other birds
- Insects
- 11,000 BCE: Camels, saber toothed tigers, mammoths, long-horned bisons, short-faced bears (taller than a Kodiak bear and able to kill almost anything, except a healthy mammoth), and panthers are all extinct.

Tool Kit

- Flint [knives, scrapers, and weapons]
- Stone [grinders and pounders]
- Bone [awls, needles, shovels, fuels, shelters, and ornaments]
- Wood [digging sticks, supports for shelters, and fuel]
- Composite tools—[stone-tipped spears, and spear throwers]
- Fire

Characteristics of Specific Biomes

Tundra: Asia (Siberia)

Features:

- Bare, rocky ground supports low-growing shrubs, mosses, heaths, and lichen
- No true soil
- Lower latitudes: birches
- Ground permanently frozen 10 inches to 3 feet deep
- Little precipitation: 6–10 inches a year
- Winter: cold and dark with high winds
- Summer: Top layer of permafrost melts. Land gets soggy and covered with marshes, lakes, bogs, and streams that attract migrating birds and insects [mosquitos]
- Big animals: caribou, reindeer, musk oxen, wolves, and Arctic foxes
- Small animals: snowshoe rabbit, Arctic hare, and lemmings

Tool Kit:

- Flint [knives, scrapers, and weapons]
- Stone [grinders and pounders]
- Bone [awls, needles, shovels, fuel, shelters, ornaments]
- Wood [digging sticks, supports for shelters, fuel]
- Composite tools—stone-tipped spears and spear throwers

Characteristics of Specific Biomes

Savanna: Australia (Northern Territory)

Features:

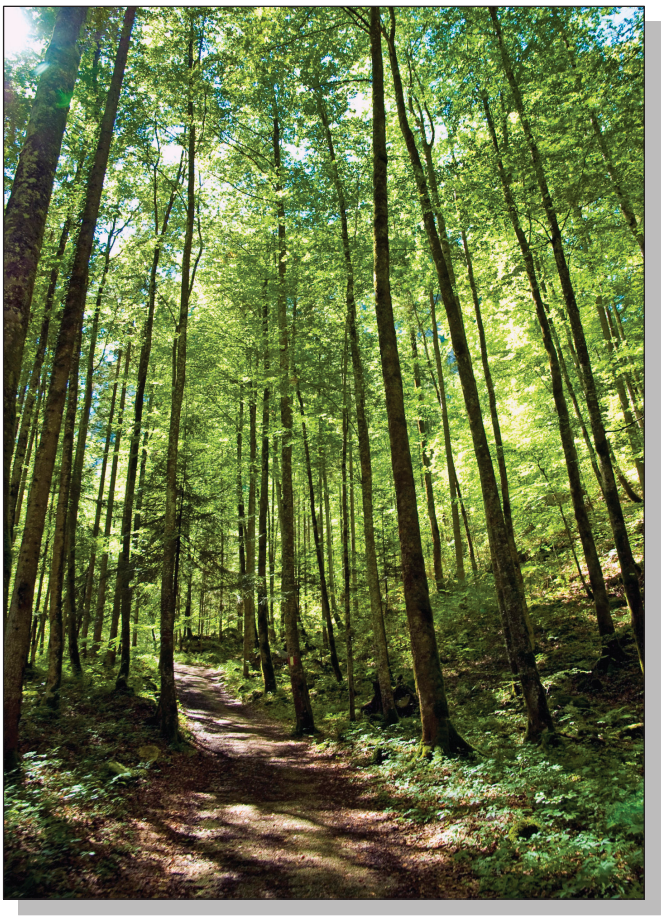
- Terrain tropical perennial grassland, grasses 3–6 feet tall
- Widely spaced, drought resistant trees, mostly eucalyptus
- Rainfall 40"–60" per year
- Distinct dry season—frequent fires (burnt shrubs return nutrients to the soil and force animals into the open to feed, which encourages regrowth)
- Kangaroos, wallabies, possums, and echidna
- 35,000 BCE: megamarsupials
- Varieties of lizards, snakes, and mice
- Insects—termites, beetles—and their larvae
- Cockatoos, cranes, emu, and grass owls
- Cycads: large palm-like plants whose kernels are very nutritious but highly toxic

Tool Kit:

- Flint [knives, scrapers, and weapons]
- Stone [grinders and pounders]
- Bone [awls, needles, shovels, fuel, shelters, and ornaments]
- Wood [digging sticks, supports for shelters, and fuel]
- Composite tools—stone-tipped spears, spear-throwers, and harpoons
- Fire

Characteristics of Specific Biomes

Forest: Europe



Features:

- Deciduous trees like ash, beech, and birch
- Patches of evergreens in northern regions
- Temperate climate: four seasons, warm summer, and cold winter. Ample rainfall fairly evenly distributed throughout the year
- Animals: bears, reindeer, deer, squirrels, and foxes
- Variety of birds: woodpeckers, warblers, tufted titmouse, and wood thrushes
- Snakes, lizards, and frogs
- Insects

Tool Kit:

- Flint [knives, scrapers, and weapons]
- Stone [grinders and pounders]
- Bone [awls, needles, shovels, fuel, shelters, ornaments]
- Wood [digging sticks, supports for shelters, fuel]
- Composite tools—stone-tipped spears, spear-throwers, and harpoons
- Fire

CHAPTER 6

By Anne Chapman

Language: What Difference Does It Make?

WHY STUDY LANGUAGE?

The core of this chapter is the question: What makes human language different from animal communication? The question is important because that difference has made possible much that characterizes humans, from abstract thought to collective learning and rapid cultural change. Simple exercises, discussion questions, and an illustrated handout help students to construct and refine a hypothesis about the question they are investigating, both promoting and demonstrating their understanding of the lessons in this chapter.

OBJECTIVES

Upon completing this chapter, students will be able to:

1. Explain the key differences between animal communication and human language
2. Relate the advantages of language to its short-range and long-range survival value
3. Construct a hypothesis based on evidence, and revise it in the light of new information

TIME AND MATERIALS

This chapter will take 45–75 minutes. Actual time will vary with circumstances. If time is limited, the chapter can be shortened by omitting the Introductory Activities.

HISTORICAL CONTEXT

We don't know when, or how, human language began. Scholars offer varying viewpoints that argue for the:

- Sudden appearance of language about 50,000 years ago, perhaps by genetic mutation
- Gradual development of language through various changes at different times in basic ape communication abilities, starting with the australopithecines 3,000,000 years ago or more
- Appearance of language as an ability exclusive to Homo sapiens and part of our genetic make-up, emerging at the same time as the species did between 250,000 and 100,000 years ago

We do know that the following are associated with the beginnings of spoken language:

- The right brain size and structure
- The right throat and mouth structure
- A group of people (society) sharing a common set of symbolic meanings, and whose young learn these symbols and their meanings by imitation and adult feedback

But we can only know whether the above requirements for language were present:

- From skeletal remains, which for some periods are scarce or often damaged or incomplete
- From remains, such as tools or art, which give clues to behavior; we may ask: Could people have done this without language?

Most importantly, we know that language was of decisive importance for humanity. Language allowed humans to:

- Build closer social bonds among wider groups
- Share knowledge and pass it on to new generations
- Spark ideas through discussion

All these factors involved collective learning, of which only humans are capable.

THREE ESSENTIAL QUESTIONS

Humans and the Environment

How might a band of Homo sapiens living 50,000 years ago have used language successfully to drive a herd of deer into a swamp so that they could kill some of the animals for food?

Humans and Other Humans

We do not know whether in the distant past all human beings spoke a single language, but as hunting and gathering bands migrated into different parts of the world languages diverged and multiplied. Why did thousands of different languages eventually emerge? Is a language invariably changing, or can it remain mostly fixed? What are some words you use in English, Spanish, or another language today that did not exist a year or two ago? Why in the past few centuries has the number of languages in the world decreased rather than increased?

Humans and Ideas

Language gave humans the ability to explain how a piece of technology worked without having to show how it worked. The key to success is that your listener shares with you the meaning of the words you use to make your explanation. Explain how one of the following tools works using words only. Do not name the tool or use any physical expressions or gestures: hoe, screwdriver, drill, or pulley. Why is this task hard or easy?

KEY THEMES

This chapter addresses the following historical theme:

Key Theme 5. Finding Identity

CORRELATIONS TO NATIONAL HISTORY STANDARDS

National Standards for World History

Era One: The Beginnings of Human Society, 1B: The student understands how human communities populated the major regions of the world and adapted to a variety of environments.

INSTRUCTIONAL RESOURCES

Boesch, C., and H. Boesch-Achermann. *The Chimpanzees of the Tai Forest.* New York: Oxford University Press, 2000.

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LESSON 1

What Makes Language Special?

Introductory Activities

1. Ask students to solve the problem outlined in the scenario below, working in small groups.
2. Tell them first that they have to do so without using language or pictures, and in only five minutes.
3. After about five minutes, ask them to stop and tell them they may now use language and pictures to solve the problem, again in about five minutes.
4. Scenario (same for first round without the use of language, and the second round with the use of language):
    a. You are one of the few adult members of a small band of pre-language hominids. Recently, the weather changed in your territory and the large mammals you have been mostly living off of have disappeared. As a result, you are all hungry. You have noticed a lot of rabbits running around. They could solve the hunger problem if you and the rest of the band could decide how to get enough rabbits to feed all of your group. You have five minutes to work out with your group a scenario for getting enough rabbits.

Discussion Questions

1. What difference did the use of language make in solving the rabbit problem above?
2. In what ways would developing language have survival-value for hominids? In what situations (students should identify 2–3) would language be of immediate, critical importance? In what situations (students should identify 2–3) would language be critical in the long range and not immediate importance?
3. How might a group of pre-language hominids develop language? How probable would you say each of your suggestions would be? Why? (Possible prompts might be: natural selection, mutation, trial and error, gradual refinement of an existing communication system, or a cultural invention.)
4. What are the differences between speaking language and drawing pictures? In what ways are these means of communication similar? Do pictures qualify as a "language?" Why or why not?
5. In what ways can people communicate that are considered visual (not spoken) and can be called "language"?

Activities

1. Ask students to brainstorm answers to the following questions, with the teacher recording their responses on the blackboard using grids such as those provided below:

    a. What pet animals can humans communicate with? Why can humans communicate with those animals and not other animals?

    b. What can humans say to their pets that they can understand?

    c. What kinds of things can pets communicate to humans that they can understand? Do pets try to communicate things to humans that they cannot understand?

    d. What kinds of things can pets communicate to other pets that they can understand? What can they not communicate to each other?

List of Pets	Reasons Why Pets Can Communicate with Humans
1.	
2.	
3.	

	Human to Pet	Pet to Human	Pet to Pet
Things They Can Communicate			
Things They Cannot Communicate			

2. Ask students to place each of the following items in the appropriate slot on the second grid above as things that can or cannot be communicated human to pet, pet to human, or pet to pet:

threat	disagreement	bragging
description	negation	indicating past, present or future
questioning	bargaining	explanation
command	gossip	indicating certainty or uncertainty
persuasion	seduction	cheating

3. Which of the list above (starting with threat and ending with cheating) can humans communicate to other humans without using language?

4. In which 3–4 situations on the list would the use of language (as opposed to gestures or wordless sounds) have the greatest survival value? Why?

5. Ask students to use the information below about the ways various animals communicate to answer the following questions:

    a. What conclusions would you draw based on the information given about the differences between animal communication and human language?

    b. Which form of communication has the greatest survival value? Explain your answer.

Marmoset monkey:	Danger! Danger! Danger!
Vervet Monkey:	Leopard! Leopard! Leopard!
Human-taught ape:	Leopard Nearby, Help!
Human:	Sssssh! There's a sleeping leopard on the tree to the left, about fifteen feet away. Brumby, you help me get some stones for the sling, and Spike, you watch the leopard and holler if he wakes up.

6. Extension or alternative activity: Ask students to discuss the following question: How could you tell that an attempt at communication by a newly-discovered species or an extraterrestrial creature was a "language"?

Before giving students the handout below, ask them to come up with a hypothesis (based on work done so far in this chapter) that states the key differences between animal communication and human language. Ask them to keep the theory in mind as they read the handout. Having read it, they will be asked for ways in which the reading confirmed, contradicted, or suggested the need for changing their assumption.

What Difference Does Language Make?

All humans have language. All human languages can precisely express very complicated and abstract ideas, and give information about what is past, future, or invented.

Human babies will learn whatever language the adults around them are using. Verbal communication can be in the form of any one of the roughly five thousand different languages now spoken in the world. Language can also be a communication of gestures, such as American Sign Language. Hearing, speaking, and seeing are not essential for learning and using oral communication. Helen Keller learned language through touch alone, and she was not the only one.

Human children who grow up in isolation without ever being exposed to language in any form do not have language. Those found young enough could learn language, but only by intensive training over years with the help of psychologists and language therapists. Language training failed with those who began it after they were about eight years old.

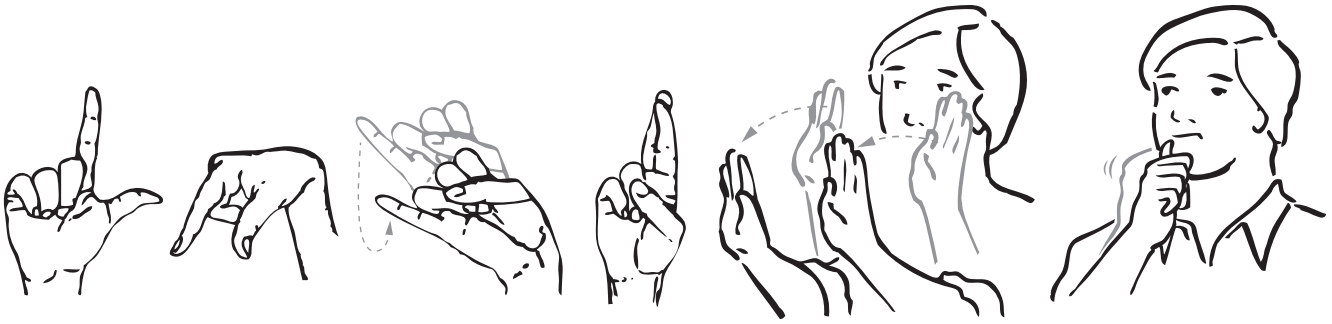
Apes who grow up isolated, never hearing or seeing one of their own kind, still grow up capable of making the calls and sounds typical of their species. But there are differences in the gestured signaling of chimpanzee bands living in separate regions in the wild. This suggests that at least some of their gestured communication signals may be learned rather than inherited.

Vervet monkeys in the wild have six different alarm calls, given when seeing a leopard, an eagle, a snake, a baboon, a human, or a smaller predator. Other vervets react to each call differently. For example, when a leopard call is heard, they run in among trees and perch themselves on a branch too heavy to bear a leopard's weight. For an eagle call, they look up and then hide among the bushes. Vervet babies make mistakes. For instance, they may give a leopard call for many different mammals (though never for eagles). As they get older, they learn accuracy.

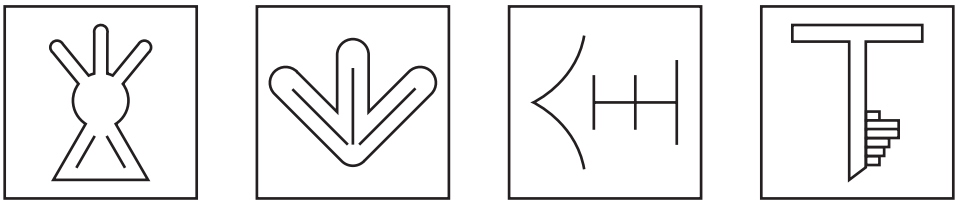
For a traveling chimpanzee troop, changes in travel directions or a rest period can be signaled by leaders drumming on tree trunks. Through gestures and sounds, chimpanzees can give different kinds of information to others of their kind.

Scientists have raised apes in human families, treating them like human babies and teaching them language. However, these apes did not learn how to articulate speech in a human language. Viki, an ape who was given seven years of intensive training, could say only "cup," "papa," and "mama." She could use these words correctly most of the time.

Other human-raised apes were taught American Sign Language, based on gestures. See the illustration below. After several years of training, Washoe, a chimpanzee and Koko a gorilla, had a reliable gesture-sign vocabulary of about 100 words. Very rarely, they used several words in sentence-like combinations, such as "you," "me," and "hide." These animals did not understand how to use the question mark, and they did not understand human voice communication.



Chimpanzees who are taught to communicate by using plastic shapes standing for words like "Sarah," or by a computer keyboard with arbitrary symbols standing for words (see illustrations) can learn a lot of language. Those who started learning at an early age did best. The most successful was Kanzi, a bonobo. He began to learn language almost at the time of his birth. By age seven, he had learned how to use over 200 words with consistent correctness. Kanzi used single words by far the most often, frequently combining them with gestures. Occasionally, he spontaneously used two or three-word combinations.



Tests suggest that Kanzi also understood about 150 words in English. He often used his keyboard to comment on things, tell about places where he wanted to go, and ask for what he wanted, along with answering questions. He seemed to have learned the grammatical rule that a verb came before a noun in combinations such as "hide peanut," "bite tomato," "tickle Kanzi," and followed the rule consistently. He and other human-taught apes were able to communicate with each other using the symbols they learned, but they did not do so spontaneously. Outside of experimental situations, they used body language with each other.

Humans also continue to use body language such as gestures, smiles, frowns, and hunching their shoulders. Parts of the brain that deal with these gestures are different from the parts that deal with making speech sounds and understanding of language symbols. Humans did not simply trade body language for word-based symbolic language. They use every means they can to communicate.

Watching a soap opera on TV with the sound turned off, we can tell a good deal about what is going on. However, if we had to choose, there is not much doubt which mode of communication we would prefer to keep.

Discussion Questions

1. In what ways did the reading confirm, contradict, or suggest the need for changing your hypothesis about the key differences between human language and animal communication?
2. What questions would you ask that would help you improve your hypothesis about the key differences between human language and animal communication?
3. What in the reading did you consider the most important information for the understanding of language? Why do you consider this information important?
4. What would an animal have to do for you to accept with no doubts that it had learned human language? In what ways could others argue that you are wrong, and how would you defend yourself against their arguments?

Extension Activity

1. Design an experiment where the results would convincingly demonstrate that an ape has learned human language (not necessarily vocal). How might others argue that your experiment was not convincing? How would you answer their criticisms?

Assessment

1. Explain in what ways human language differs from animal communication.
2. Define the characteristics of human language. Take into account the information you gained from this chapter on how language works, how it is acquired, what it can do, and what is needed for it to be present.

Glossary

Afroeurasia: The land masses of Africa and Eurasia, together with adjacent islands, as a single spatial entity. The concept of Afroeurasia is useful in the study of both historical and contemporary social phenomena whose full geographical contexts overlap in one way or another the conventionally defined continents of Africa, Asia, and Europe.

agrarian society: A society where agriculture, including both crop production and animal breeding, is the foundation of both subsistence and surplus wealth. To be distinguished from hunter-forager and pastoral nomadic societies.

agriculture: The intentional cultivation of domesticated plants and animals. Beginning about 12,000 years ago, the development of agriculture permitted unprecedented growth of human population and the emergence of towns, cities, and the centralized state. Scholars generally agree that agricultural economies developed in several parts of Afroeurasia and the Americas independently of one another.

Amerindian: A member of any of the native populations of the Americas; an American Indian or Native American.

animism: A doctrine that the vital principle of organic development is immaterial spirit.

archaeologist: A professional scholar in a branch of anthropology that documents similarities, differences and change among various human societies of the past. Archaeologists work with the material (physical) remains of societies. Their work provides the major source of information available on societies that did not have writing systems. Archaeologists also provide evidence that supplements written sources.

aristocracy: A privileged or ruling class, usually a small social minority. Often the hereditary nobility or major landowning class in a society. An "aristocrat" is a member of this upper class. Also "aristocratic," as in "aristocratic government." "Aristo" is from the Greek, meaning the "best."

Australopithecus/australopithecine: A group of hominid species ancestral to Homo sapiens. Australopithecines were bipedal but had brains about one third the size of modern Homo sapiens. These species appeared in Africa between four and three million years ago and died out about one million years ago. The best-known australopithecine remains are those of the creature named Lucy, who lived in what is today Ethiopia about 3.2 million years ago.

barter: The mutual transfer of goods or services not involving the exchange of money. Used as the common form of exchange before the invention of currency. The practice of bartering continues to one degree or another in all modern societies.

belief system: A combination of ideas, values, and practices that serve a society's cultural needs. Belief systems include all religions, as well as philosophical, ethical, and moral systems.

Big Bang theory: The cosmological theory that the universe began as an infinitesimally small, dense, and hot entity. About 13 billion years ago the universe began to expand and continues to expand today.

bipedalism: The physical ability, characteristic of the genus Homo, to walk upright on two legs, thus freeing the hands to hold and manipulate objects or tools. "Homo sapiens is a bipedal species."

caliph: In Arabic, khalifa. In Sunni Muslim teaching, the successor to the Prophet Muhammad as rightful leader of the Muslim community chosen by a concensus of that community. In the Umayyad (661–750) and Abbasid (751–1258) dynasties, the Caliphs were also the heads of state and transmitted their authority to their descendants.

cartographer: A person who designs or constructs maps or charts.

cash crops: Crops grown for sale on the market rather than exclusively for local consumption and subsistence.

civilization: See *complex society.*

clan: A form of social and political organization in which the fundamental principle of solidarity is kinship. Clans typically constitute two or more kinship groups within a tribe. Clan organization is common among pastoral nomadic and stateless societies.

collective learning: The view that the human species has a unique capacity to accumulate and share complex knowledge and to transmit this knowledge from one generation to the next.

complex society: A type of society characterized by all or most of the following features: dense population, agricultural economy, cities, complex social hierarchy, complex occupational specialization, centralized state, monumental building, a writing system, and a dominant belief system. To be distinquished generally from hunter-forager, pastoral nomadic, and small-scale agricultural societies. Civilization.

creation myths: A type of myth that explains how the universe, the earth, life, and humankind came into being. Most societies in history have had creation myths.

demography: The study of the size, growth, density, and other characteristics of human populations.

domestication: The process whereby humans changed the genetic makeup of plants and animals by influencing the way they reproduced, thereby making them more appealing in taste, size, and nutrition, as well as easier to grow, process, and cook. Humans could not invent new plant species, but they could select plants that possessed certain observable mutations, that is, characteristics that made them desirable. Farmers could tend these mutants in ways that ensured their survival. The domestication of animals through selective breeding followed a similar process.

ecological niche: The environment within which an organism is adapted to live.

endemic: Prevalent in or peculiar to a certain area, region, or people, as an infectious disease.

epidemic: An outbreak of contagious disease affecting a significant portion of the population of a locality. See also *pandemic*.

eukaryotic: A single-celled or multicellular organism whose cells contain at least one nucleus. Animals, plants, and fungi are all eukaryotes.

extensification: "An increase in the range of humans without any parallel increase in the average size or density of human communities, and consequently with little increase in the complexity of human societies. It involves the gradual movement of small groups into new lands, usually adjacent to and similar to those they have left" (David Christian, *Maps of Time: An Introduction to Big History* [Berkeley: University of California Press, 2004], 190). Processes of extensification were characteristic of the paleolithic era in world history. See also *intensification*.

farming: The process of growing and harvesting domesticated plants and animals for food, fiber, and other commodities. Farming is characteristic of agrarian societies.

Fertile Crescent: An arc of cultivable land characterized by wooded hillsides and alluvial valleys that runs northwestward along the Zagros Mountains of Iran, loops around the northern rim of the Syrian Desert, and extends southward parallel to the eastern shore of the Mediterranean. The Tigris-Euphrates and Jordan river valleys are also conventionally considered part of the Fertile Crescent. The earliest physical traces of farming settlements in the world are located in this region. The American scholar James Harvey Breasted invented the term in 1916.

Great Arid Zone: The belt of arid and semi-arid land that extends generally northeastward across Afroeurasia from the Sahara Desert in the west to Manchuria (northern China) in the east. The Great Arid Zone has been home to both pastoral nomadic communities and to farming societies where water from rivers, wells, and periodic rainfall is available. In addition to the Sahara, the large deserts of the Great Arid Zone include the Arabian Desert, the Great Indian Desert, the Takla Makan Desert, and the Gobi Desert.

Great Dying:

1. An extinction event that occurred about 250 million years ago and that wiped out many marine and land species.
2. The massive die-off of American Indian peoples that followed contact with humans from Afroeurasia beginning in the late fifteenth century. This mortality, which in some areas may have reduced populations by 90 percent, followed the introduction from Afroeurasia of infectious disease microorganism for which American Indians lacked immunities. Warfare, enslavement, and social disorder associated with European conquests in the Americas also contributed to high mortality. Only in the seventeenth century did indigenous populations began partly to recover.

Hajj: The Arabic term for the formal pilgrimage to the city of Mecca undertaken by Muslims as a religious duty. Islamic teaching enjoins Muslims to make the hajj at least once in their lifetime if they are physically and financially able.

hominids: This category in evolutionary biology includes all humans and their early ancestors within the primate family. Hominid species include the Australopithecines, *Homo habilis*, *Homo erectus*, Neanderthal, and *Homo sapiens*. Until recently, most scholars agreed that all hominid species other than *Homo sapiens* became extinct about 28,000 years ago. Anthropologists, however, have begun to study fossil evidence found in Indonesia that suggests the existence of a species (named *Homo floresiensis*) that may have lived as few as 13,000 years ago.

Homo erectus: A hominid species and likely ancestor of *Homo sapiens*. *Homo erectus* was characterized by a prognostic jaw as well as a large brow and receeding forehead. This species emerged between and 2.4–1.6 million years ago and may have become extinct about 30,000 years ago.

Homo sapiens: The scientific name for anatomically modern humans, a hominid species that emerged between 150,000 and 150,000 years ago, eventually displacing all other hominid species. The development of the frontal lobe of the brain was a key factor differentiating this species from other hominid species. The average human brain is larger than that of other hominids. The oldest fossils have been found in Africa. Fossil evidence and more recent DNA analysis indicates that *Homo sapiens* evolved in East Africa and subsequently displaced the Neanderthals and any other hominid types that shared the planet.

hunter-gatherers: Also hunter-foragers. Humans that rely on naturally occurring sources of food, obtained by scavenging, gathering, or hunting. Because hunter-gatherers require much more extensive land areas from which to secure food than do farmers or stock-raisers, their communities have necessarily been small. Hunter-gatherer communities were the exclusive form of human economic and social organization until the emergence of farming about 12,000 years ago. Today, hunter-gatherer groups account for only a tiny percent of the human population.

Inner Eurasia: The huge interior land mass of Eurasia, whose dominant features are flat, semi-arid regions of steppe and forest. Inner Eurasia generally corresponds to the territories ruled by the Soviet Union before its collapse, together with Mongolia and parts of western China. Poland and Hungary to the west and Manchuria (northeastern China) to the east may be thought of as Inner Eurasia's borderlands. The northern margins are boreal forest and Arctic tundra. To the south are the Black and Caspian seas and the Himalayas and other mountain ranges. A mountain-free corridor connects Inner Eurasia to Iran.

intensification: "New technologies and lifeways that enabled humans to extract more resources from a given land area" (David Christian, *Maps of Time: An Introduction to Big History* [Berkeley: University of California Press, 2004], 207). Intensification is associated with the emergence of agriculture about 12,000 years ago and with the subsequent unprecedented increase in the size and density of human populations in some regions.
See also *extensification*.

khan: The title of a Turkic or Mongol tribal leader; a common title of sovereigns in Inner Eurasia. The feminine form is khatun, a typically carried by wives and daughters of khans.

life expectancy: The probable life span, or the expected age at death, of an individual; a statistical determination of the probable life span of an individual or category of persons.

lineage: A form of social and political organization in which the fundamental principle of solidarity is kinship. A lineage is typically a local kinship group of several generations, both living and deceased individuals. Several lineages may constitute a clan.

logographic writing system: A system of writing in which signs, or characters represent meanings rather than the sounds of speech as in an alphabetic writing. In logographic systems a single character may represent an entire word or phrase. Chinese is the most widely used logograhic system today.

mammals: Any warm-blooded vertebrate of the class Mammalia that feeds its young with milk from the female and that has body hair, for example, dogs, apes, and human beings.

Mecca: A city in the western Arabian Peninsula and birthplace of Muhammad, the Prophet of Islam, in the seventh century CE. Although Mecca never became a large city, it is Islam's holiest center and the principal destination of Muslim pilgrims making the Hajj.

Mesoamerica: The part of North America that includes modern Mexico and the states of Central America. Mesoamerican civilizations included the Olmec, Oaxacan, Teotihuancan, Maya, Toltec, and Aztec. The combining word "meso," meaning "middle," is from the Greek.

mestizo: A person of mixed Spanish and Native American ancestry.

monotheism: The doctrine or belief that there is one God.

monsoon: A rainy season that endures for several months in a particular region. The term also typically refers to the seasonal winds that dominate the Indian Ocean basin. These winds blow generally from southwest to northeast in the summer months (April to October) and from the northeast to the southwest in the winter months (November to March). For thousands of years, knowledge of the monsoon wind cycle has allowed mariners to sail from one part of the Indian Ocean to another with fair speed and predictability.

nation: A community of people who believe they share a common culture, history, and future destiny. The members of the nation typically believe that they share rights, including the right to occupy a territory and to constitute a sovereign government to rule that territory.

nation-state: A sovereign state that generally coincides with, or aspires to coincide with, a single national community or nation. A state, on the other hand, may also be multinational, for example, an empire.

nationalism: The modern ideology based on the principle that an individual's loyalty and dedication to the national community or nation-state surpasses loyalty to any other group interest. The scholar Benedict Anderson characterized the national community as an "imagined community": its members do not for the most part know one another but nonetheless have common bonds of aspiration and loyalty.

natural philosophy: The study of nature and the physical universe. The intellectual discipline that prefigured modern science.

Neanderthals: An ancient hominid species (*Homo neandertalensis*) that lived during the late Pleistocene Age mainly in Europe, Southwest Asia, and North Africa. The species had more advanced tool-making ability than earlier species. Physically Neanderthals were characterized by thick bodies, a flat forehead, and a pronounced brow. The species had a brain case similar in size to humans, but the frontal area was less developed. There is no evidence that Neanderthals possessed language. *Homo sapiens* replaced Neanderthal populations throughout their habitat, leading to their extinction by about 28,000 years ago.

Neolithic Age: The period from about 12,000 to 6,000 years ago, when humans domesticated plants and animals and took up ways of life centered on agriculture. The invention of more sophisticated, versatile stone tools also characterized the period, thus neolithic, or "new stone" age.

pagoda: A typically multi-storied memorial structure built in connection with a temple or monastery, usually Buddhist.

Paleolithic Age: The era from approximately 2.5 million to 12,000 years ago when *Homo sapiens* and its hominid ancestors relied on a technology principally of tools and weapons fashioned principally of stone. Scholars commonly divide the paleolithic into three periods: lower (2.5 million–300,000 years ago), middle (300,000–40,000 years ago), and upper (40,000–12,000 years ago). In each of these periods humans or their ancestors produced increasingly varied and useful stone technologies.

paleontologist: An expert on animal life of the distant past, studied mainly from evidence of fossilized remains.

pandemic: An outbreak of contagious disease that is not confined to a single locality but spreads from one locality to the next, possibly over a great distance. The Black Death of the mid-fourteenth century was a pandemic that reached across Afroeurasia. The influenza pandemic of 1918 was worldwide. See also *epidemic*.

pastoral nomadism: An economy and way of life centered on the raising of domesticated animals such as cattle, horses, sheep, or camels. This economy is an adaption to arid or semi-arid land, such as the steppes of Inner Eurasia, where farming is either limited or impossible. Pastoral nomadic communities typically move their herds or flocks seasonally in search of pasture and water. Pastoral nomadic societies probably emerged in the third millennium BCE.

patriarchy: A society in which males are socially and politically dominant over women. All complex societies have been more or less patriarchal, though in the past two centuries women have in many parts of the world gained legal and civil rights that have helped to constrain patriarchal attitudes and behavior.

periodization: In the study of history, periodization is the dividing or categorizing of time into separate sections. Historians periodize the past for a number of reasons. "One is simply to identify and isolate chunks of time in order to study them one by one, since all periods cannot be studied simultaneously. A second is to distinguish one cluster of interrelated historical events from another in order to discover patterns of change. A third is to identify significant shifts in those patterns in terms of discontinuities or turning points, which serve as the start and end of periods. A four is to highlight trends or events that appear dominant or important during a particular span of time" (Ross E. Dunn, ed., *The New World History: A Teacher's Companion* [Boston: Bedford St. Martin's, 2000], 359).

plate tectonics: The science dealing with the forces or conditions within the earth that cause movements in the earth's crust, notably the study of when and how large plates, or sections of the earth's crust moved, separated, and came together to form large land masses, or continents; the study of continental drift; because large land masses have in geologic time been joined or separated (sometimes by wide oceans) over spans of millions of years, the history of continental drift is closely related to evolutionary biology.

Pre-Columbian America: The period of North and South American history before Christopher Columbus initiated sustained intercommunication between the Americas and Afroeurasia; history of the Western Hemisphere up to 1492; sometimes labeled the Pre-Contact Period.

primary and secondary sources: Primary sources are items of historical evidence, including both written documents (legal contracts, government papers, personal letters, bills of sale, biographies) and artifacts (material objects, works of art, elements of language) that were generated during or relatively close to the historical period being studied. Secondary sources are documents, mainly books, articles, and illustrations, based on primary sources and generated some time after the historical event which they describe or interpret.

primates: The order of mammals that are large-brained, live mostly in trees, and have the ability to see three-dimensionally. This order includes humans, all hominids, apes, chimpanzees, and monkeys.

secularism: Pertaining to worldly, as opposed to supernatural or religious, beliefs, values and behavior. Any movement that questions or rejects religious faith or the social influence of religious organizations and hierarchies. Secularization is any social process that strives to imbue society with secular values. In the Christian tradition, the term "secular" is also used to refer to members of the clergy who live "in the world," that is, who have not taken monastic vows or live in a monastery.

sedentary: The practice of residing in a specific locality, as opposed to a mobile way of life centered on hunting and gathering or on pastoral nomadism. Farming societies are necessarily sedentary.

shaman: An individual believed to have power to communicate with supernatural forces and through these interventions to heal, bring blessings, or foretell the future. Belief in the power of shamans, or shamanism, has been a mark of traditional religion among pastoral nomadic peoples of Inner Eurasia, though the term has been applied throughout the world to local healers, doctors, diviners, and others believed to have the ability to communicate with the world beyond.

Southwest Asia: The region of Afroeurasia extending from the eastern coast of the Mediterranean Sea to Afghanistan, including Turkey and the Arabian Peninsula. The common term for this region has conventionally been the Middle East or Near East. Many scholars, however, now regard these expressions as obsolete, except in the context of the history of the past century or so, because these terms evoke a specifically European perspective on the world, that is, that all of Afroeurasia may be thought of as constituting two primal zones, the West (Europe) and the East (all lands east of Europe).

state: A population and territory over which a central government holds authority.

steppe: Flat or rolling grassland characterized by semi-aridity. Equivalent to what Americans call "prairie" and Argentineans call "pampas."

sultan: A title designating rulership of a Muslim state, usually implying administrative and military authority as opposed to religious leadership. A sultanate is a state headed by a sultan.

syncretism: A blend or combination of different beliefs and practices, usually religious; the adoption of one group's religious or other cultural beliefs and practices by another group.

tribe: A form of social and political organization in which the fundamental principle of solidarity is kinship. The members of a tribe claim to be descended from a common ancestor. A tribe is typically the largest group in a region claiming shared descent. Tribal organization is common among pastoral nomadic and stateless societies. In tribal societies, individuals identify primarily with kinship groups rather than with a specific geographical territory.

Upper Paleolithic: The period from about 40,000 to 12,000 years ago when humans invented a range of new specialized tools, including fine, multi-purpose stone blades, that gave men and women increasing control over their local environments. Although recent evidence suggests that humans acquired symbolic language and the capacity for artistic expression in Africa between 75,000 and 90,000 years ago in Africa, the upper paleolithic witnessed numerous technical and social breakthroughs, including increases in the size of hunter-gatherer communities; larger, more permanent dwellings, the construction of boats, and production of jewelry, sculpted images, and cave paintings.

urbanization: The growth of urban areas, or cities; the movement of people from rural communities to cities.

world religion: A belief system that embraces people of diverse languages and cultural traditions and that has had significant influence on the course of human history. The major world religions are Buddhism, Christianity, Daoism, Hinduism, Islam, and Judaism. Confucianism is a major belief system, though some scholars reject classifying it as a religion because it addresses mainly moral and ethical issues rather than the spiritual or supernatural realm.

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