



**Big Era One
Humans in the Universe**



**Landscape Teaching Unit 1.2
Human Ancestors in Africa and Beyond
7,000,000 - 200,000 Years Ago**

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Why this unit?

This unit 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, though none of these traits actually appeared in Big Era One, as far as we know.

Unit objectives

Upon completing this unit, 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 unit 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.

Author

The principal author of this teaching unit is Dr. Anne Chapman. She served for many years as history teacher and academic dean of Western Reserve Academy in Hudson, Ohio. She has been a history education consultant to the College Board, the Educational Testing Service, and the National Center for History in the Schools.

The 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. This species is introduced in more detail in the Panorama Teaching Unit for Big Era Two. *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 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 found in England

Dover Museum
Photo by R. Dunn

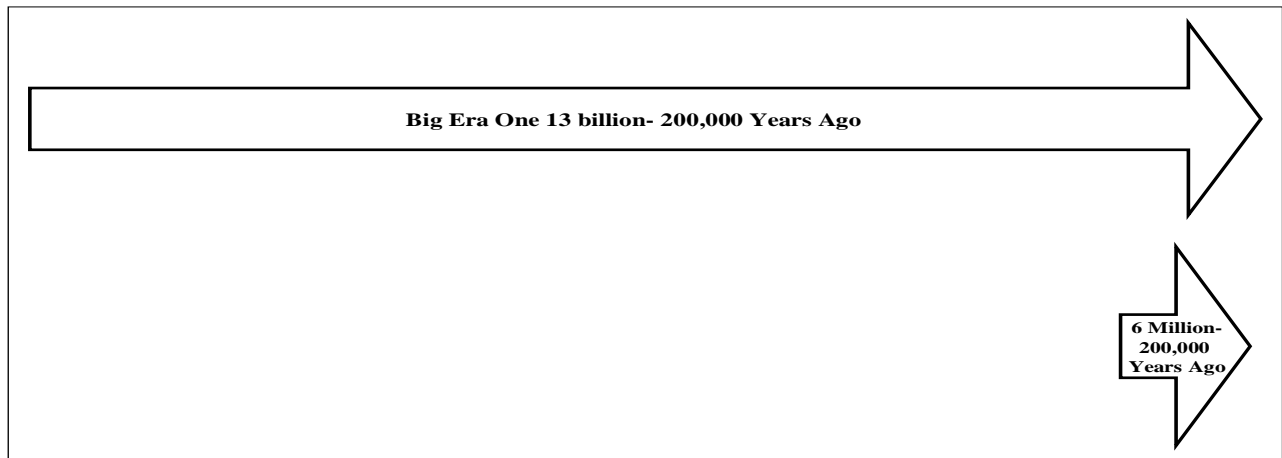
Our knowledge of human ancestors in Big Era One depends on:

- 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 teaching unit 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.

This unit in the Big Era time line



Lesson

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. 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. (This activity may serve as assessment.)
2. 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: (This activity could also serve as assessment.)
 - 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.

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: Rate the reliability of each of your inferences on a scale of 1 to 10, with 10 being the most reliable. Explain why you gave the ratings you did.

Lesson

Student Handout 1–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 5 of the 13 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 (1-4 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 27,000 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. *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 1220-1600cc.)
- Estimated height of males about 5.9, 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 6-foot wooden spears have been found along with stone tools and bones with cut-marks, mostly from horses. This material dates to about 500,000 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 800,000 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 40,000 to 60,000 years ago.

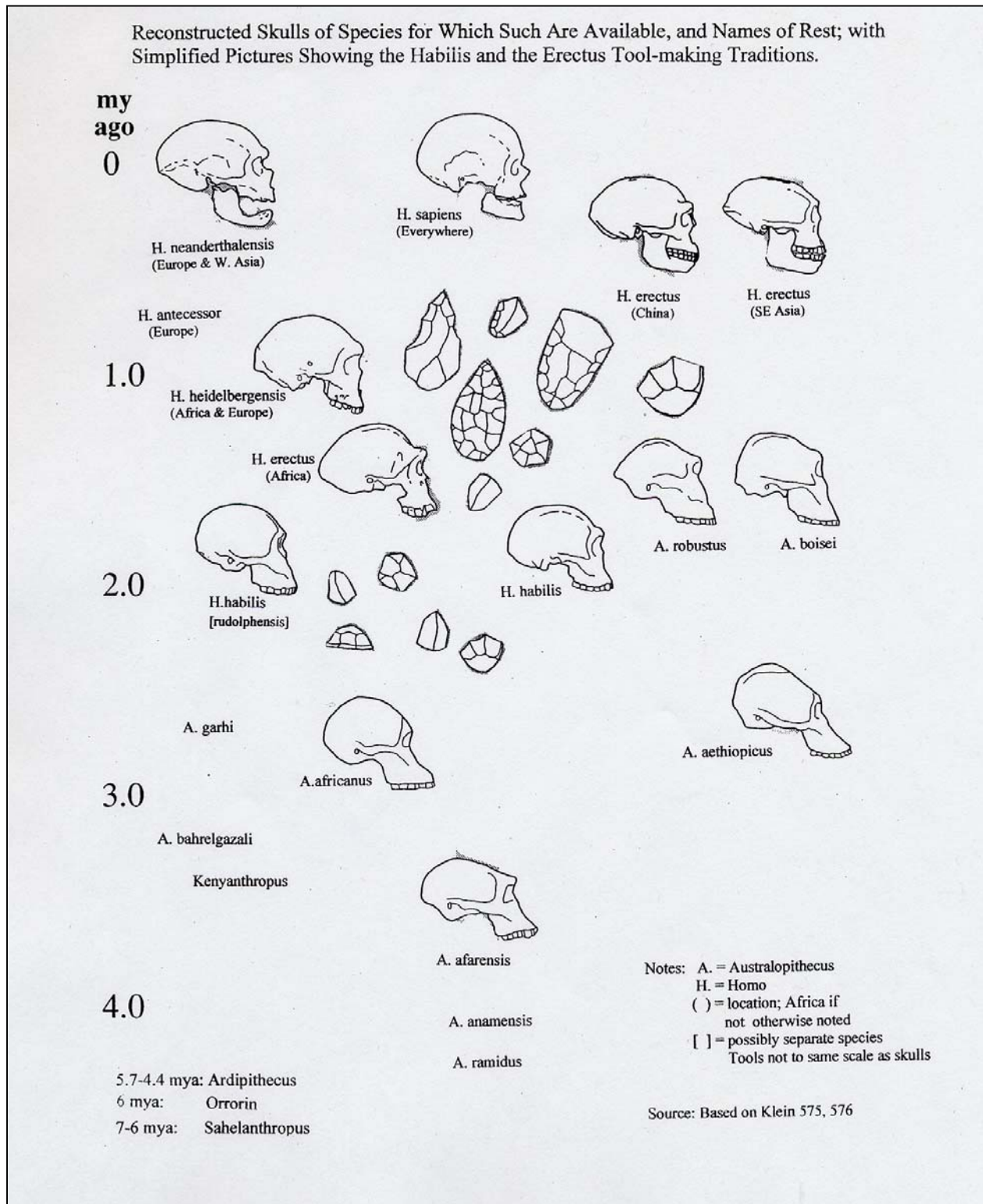


Sparsely wooded savanna in Southern Africa

Photo by R. Dunn




Lesson

Student Handout 2—Family Pictures



Based on illustration in Richard G. Klein, *The Human Career: Human Biological and Cultural Origins*, 2nd Ed. (Chicago: University of Chicago Press, 1999), 575-576.

This unit and the Three Essential Questions

 <p>HUMANS & the ENVIRONMENT</p>	<p>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?</p>
 <p>HUMANS & other HUMANS</p>	<p>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?</p>
 <p>HUMANS & IDEAS</p>	<p>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?</p>

This unit and the Seven Key Themes

This unit emphasizes:

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

This unit and the Standards in Historical Thinking

Historical Thinking Standard 1: Chronological Thinking

The student is able to (C) establish temporal order in constructing historical narratives of their own: working forward from some beginning through its development, to some end or outcome; working backward from some issue, problem, or event to explain its origins and its development over time.

Historical Thinking Standard 2: Historical Comprehension

The student is able to (C) identify central question(s) the historical narrative addresses and the purpose, perspective, or point of view from which it has been constructed.

Historical Thinking Standard 3: Historical Analysis and Interpretation

The student is able to (H) hold interpretations of history as tentative, subject to change as new information is uncovered, new voices heard, and new interpretations broached.

Historical Thinking Standard 4: Historical Research Capabilities

The student is able to (C) interrogate historical data by uncovering the social, political, and economic context in which it was created; testing the data source for its credibility, authority, authenticity, internal consistency and completeness; and detecting and evaluating bias, distortion, and propaganda by omission, suppression, or invention of facts.

Resources

Instructional resources for teachers

Christian, David. *Maps of Time: An Introduction to Big History*. University of California Press, 2004. A sweeping synthesis of history beginning with the Big Bang. Part III titled “Early Human History: Many Worlds” is especially useful as an accompaniment to this teaching unit.

Kingdon, Jonathan. *Lowly Origin; Where, When and Why our Ancestors First Stood Up*. Princeton: Princeton University Press, 2003. Although scholarly, this book is user-friendly and accessible to readers without specialized background knowledge. It emphasizes distinction between theory and evidence.

Klein, Richard G. *The Human Career: Human Biological and Cultural Origins*. Second Edition. 1999. A great reference work, with an exhaustive and often technical text. The many comparative illustrations of reconstructed skulls and skeletons give good insight into the similarities and differences between fossil ape and hominid species.

Lewin, Roger. *Human Evolution: An Illustrated Introduction*. Fourth edition. Malden, MA: Blackwell Science Inc., 1999. This text is somewhat technical but has many useful and enlightening illustrations.

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.

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. Easy to read text, but its mixing of the history of discovery and past theories with descriptions can be irritating.

Instructional resources for students

“African Origins of Hominids,” *Calliope* 10 (Sept. 1999). An issue of this lively children’s magazine devoted to the study of human origins.

Brooks, Alison S. and Rick Potts. New Research In Early Human Origins 7 to 1 Million Years Ago. *AnthroNotes* 24 (Spring 2003). Available at www.nmnh.si.edu/departments/anthro.html. Concise, clear, and user-friendly 8-page account of our current state of knowledge.

“The Dawn of Humans,” *National Geographic* 189 (March 1996): 96-117, 191 (May 1997): 84-109, 194 (Aug. 1998): 90-99, 197 (May 2000): 76-83. This series explores recent developments in the search for human origins.

John Noble Wilford, “Another Branch of Early Human Ancestors Is Reported by Scientists,” *New York Times* (5 March 2004), A14. An early report of an important discovery in Ethiopia.

Correlations to National and State Standards

National Standards for History

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

California: History-Social Science Content Standards

Grade Six, 6.1 Students describe what is known through archaeological studies of the early physical and cultural development of humankind from the Paleolithic era to the agricultural revolution.

New York: Social Studies Resource Guide with Core Curriculum

Unit One: Ancient World – Civilizations and Religions (4000 BC – 500 AD), A. Early people, 4. Migration of early human populations.

Virginia History and Social Studies Standards of Learning

World History and Geography to 1500 AD. Era I: Human Origins and Early Civilizations Prehistory to 1000B.C. WHI.2 The student will demonstrate knowledge of early development of humankind from the Paleolithic Era to the agricultural revolution by a) explaining the impact of geographic environment on hunter-gatherer societies; d) explaining how archeological discoveries are changing present-day knowledge of early peoples.

Conceptual links to other teaching units

Study of this teaching unit sets the scene for Big Era Two, Human Beings Almost Everywhere 200,000 – 10,000 Years Ago. Big Era Two focuses on the long history (though not as long as

Big Era One!) of Homo sapiens—people “like us”—up to the development of farming. Current evidence shows that even though our hominid ancestor Homo erectus migrated from Africa to parts of Eurasia, Homo sapiens fully evolved in eastern and southern Africa, then moved out from there, eventually replacing all Homo erectus bands in both Africa and Eurasia. The next Landscape Teaching Unit (2.1) is concerned with the early history of Homo sapiens in Africa, continuing the exploration of what makes Homo sapiens so unlike any other species on earth, including the hominid ancestors from whom we are descended.