

Humans and Other Primates

BEFORE YOU READ

After you read this section, you should be able to answer these questions:

- What are two features of primates?
- How have hominids changed through time?

National Science Education Standards

LS 1a, 3d, 5a, 5b, 5c

How Are Humans Similar to Apes?

Humans, apes, and monkeys share many common features. In addition, scientists have found many fossils of organisms with features of both humans and apes. Therefore, scientists agree that humans, apes, and monkeys share a common ancestor. The species of humans, apes, and monkeys that are alive today all evolved from a single, earlier species. This species probably lived more than 45 million years ago.

Humans, monkeys, apes, and lemurs are all part of a group of mammals called **primates**. There are two features that primates share. First, a primate's eyes are located at the front of its head. Both eyes look in the same direction. This gives the primate *binocular*, or three-dimensional, vision.

A second feature primates share is flexible fingers. Almost all primates have *opposable thumbs*. This means that the thumb can move to touch each finger. It is not fixed in place like the toes of a dog or cat. Opposable thumbs help primates grip objects firmly.



◀ A primate's eyes both point in the same direction. This gives the primate three-dimensional vision.

▶ Primates have flexible fingers. Almost all primates, including humans and these orangutans, have opposable thumbs. Most primates also have opposable big toes, although humans do not.



Summarize As you read this section, make a timeline that shows how hominids have changed over time.

STANDARDS CHECK

LS 5a Millions of species of animals, plants, and microorganisms are alive today. Although different species might look dissimilar, the unity among organisms becomes apparent from an analysis of internal structures, the similarity of their chemical processes, and the evidence of common ancestry.

Word Help: structure
a whole that is built or put together from parts

Word Help: process
a set of steps, events, or changes

Word Help: evidence
information showing whether an idea or belief is true or valid

1. Identify What are two features that humans share with apes and monkeys?

SECTION 3 Humans and Other Primates *continued*

THE FIRST PRIMATES

The ancestors of primates probably lived at the same time as the dinosaurs. They probably lived in trees and ate insects. They were small and looked similar to mice. The first primates evolved during the early Cenozoic era. About 45 million years ago, primates with larger brains evolved. These primates were the first to share features with monkeys, apes, and humans. ✓

READING CHECK

2. Identify When did the first primates evolve?

READING CHECK

3. Identify What organism do scientists think is the closest living relative of humans?

APES AND CHIMPANZEES

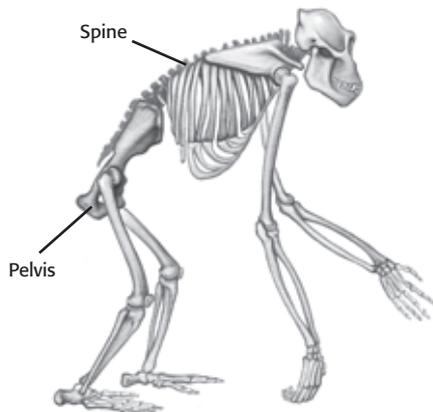
The chimpanzee is a kind of ape. Scientists think that the chimpanzee is the closest living relative of humans. This does not mean that humans evolved from chimpanzees. It means that humans and chimpanzees share a more recent common ancestor than humans and other apes. Between 30 million and 6 million years ago, ancestors of humans, chimpanzees, and other apes began to evolve different features. ✓

HOMINIDS

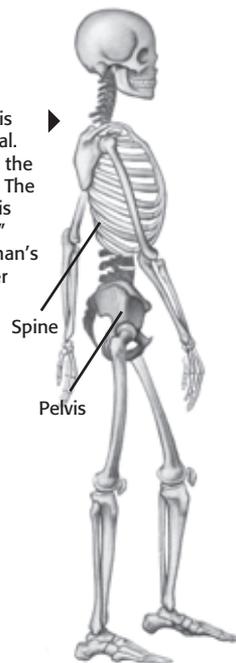
Humans are part of a group of primates called hominids. The **hominid** family includes only humans and their human-like ancestors. Humans are the only species of hominids that are still living.

The main feature that separates hominids from other primates is bipedalism. *Bipedalism* means “walking on two feet.” Humans are bipedal. Other primates are not bipedal. They mainly move around with all four limbs touching the ground.

The skeletons of humans and gorillas are similar. However, they are not exactly the same.



The pelvis of this human is vertical. It helps to hold the human upright. The human's spine is curved in an “S” shape. The human's arms are shorter than its legs.



▲ The pelvis of this gorilla tilts the gorilla's upper body forward. A gorilla's spine is curved in a “C” shape. The gorilla's arms are long and touch the ground as it moves.

TAKE A LOOK

4. Compare How is the shape of a human spine different from that of a gorilla?

SECTION 3 Humans and Other Primates *continued***How Have Hominids Changed Through Time?**

Scientists continue to find fossils of hominids. These fossils help scientists piece together the hominid family tree. As scientists find more fossils, they will better understand how modern humans evolved.

THE EARLIEST HOMINIDS

The earliest hominids had some humanlike features. Like all hominids, they could walk upright. They also had smaller teeth, flatter faces, and larger brains than earlier primates.

The oldest hominid fossils are more than 7 million years old. They have been found in Africa. Therefore, scientists think that hominids first evolved in Africa. ✓



These are footprints from an early hominid. They are about 3.6 million years old. Anthropologist Mary Leaky discovered these footprints in Tanzania, Africa.

Scientists have classified many early hominids as australopithecines. *Australopithecines* were apelike hominids. They had slightly larger brains than apes and may have used simple stone tools.

READING CHECK

5. Explain Why do scientists think that hominids first evolved in Africa?

TAKE A LOOK

6. Apply Concepts Did the hominid that made these prints walk on two feet or four? Explain your answer.

SECTION 3 Humans and Other Primates *continued*

A VARIETY OF EARLY HOMINIDS

Many australopithecines and other types of hominids lived at the same time, just as many species of apes live today. Some australopithecines had slender bodies. They had humanlike jaws and teeth but small, apelike skulls. They probably lived in forests and grasslands. Scientists think that some of these australopithecines were the ancestors of modern humans. ✓

READING CHECK

7. Identify What type of hominid do scientists think was the ancestor of modern humans?

Some early hominids had large bodies and massive teeth and jaws. They had fairly small brains. They probably lived in tropical forests. Scientists think that these large-bodied hominids were probably not the ancestors of modern humans.

THE GROUP *HOMO*

About 2.4 million years ago, a new group of hominids evolved. These hominids were similar to the slender australopithecines, but were more humanlike. They had larger and more complex brains, rounder skulls, and flatter faces. They were probably scavengers, eating many different kinds of food. They may have migrated or changed the way they lived to adapt to climate change. ✓

READING CHECK

8. Compare How were the hominids that evolved 2.4 million years ago different from earlier australopithecines?

These new hominids were members of the group *Homo*, which includes modern humans. Fossil evidence shows that several different species of *Homo* may have lived at the same time on several continents. One of these species was *Homo habilis*, which evolved about 2.4 million years ago. Another species, *Homo erectus*, evolved about 1.8 million years ago. Members of the *Homo erectus* species could grow as tall as modern humans.

TAKE A LOOK

9. Explain How do scientists infer what early hominids looked like?



This is an artist's idea of what *Homo erectus* looked like. Artists and scientists work together to produce models like this. They used information from bones to infer what *Homo erectus* may have looked like.

SECTION 3 Humans and Other Primates *continued***When Did Modern Humans Evolve?**

Until about 30,000 years ago, two types of hominids may have lived in the same areas at the same time. Both had large brains and made advanced tools, clothing, and art. Scientists think that one of these early hominids was the same species as modern humans.

NEANDERTHALS

One type of recent hominid is known as the *Neanderthal*. Neanderthals lived in Europe and western Asia. They may have evolved as early as 230,000 years ago. Neanderthals hunted large animals, made fires, and wore clothing. They may have cared for their sick and buried their dead. About 30,000 years ago, Neanderthals disappeared. Scientists do not know why they went extinct.

HOMO SAPIENS

Modern humans are members of the species **Homo sapiens**. The earliest members of *Homo sapiens* probably evolved in Africa 150,000 to 100,000 years ago. Some members of this species migrated out of Africa between 100,000 and 40,000 years ago. Compared to Neanderthals, *Homo sapiens* have smaller and flatter faces and more rounded skulls. *Homo sapiens* is the only species of hominid that is still alive. ✓

Like modern humans, early *Homo sapiens* produced large amounts of art. They made sculptures, carvings, and paintings. Scientists have also found preserved villages and burial grounds from early *Homo sapiens*. These remains show that these early humans had an organized and complex society, like humans today.



This photo shows a museum recreation of early *Homo sapiens*.

Critical Thinking

10. Infer What kinds of evidence may scientists have used to determine that early hominids used tools and wore clothing?

 **READING CHECK**

11. Identify How many species of *Homo* are still alive?

Section 3 Review

NSES LS 1a, 3d, 5a, 5b, 5c

SECTION VOCABULARY

hominid a type of primate characterized by bipedalism, relatively long lower limbs, and lack of a tail; examples include humans and their ancestors

Homo sapiens the species of hominids that includes modern humans and their closest ancestors and that first appeared about 100,000 to 150,000 years ago

primate a type of mammal characterized by opposable thumbs and binocular vision

1. **Identify** What feature separates hominids from other primates?

2. **Identify** When did humans, chimpanzees, and other apes begin to evolve different features?

3. **Describe** Give three features of the australopithecines that scientists think evolved into modern humans.

4. **List** Give three species of *Homo* and tell when each evolved.

5. **Compare** How are *Homo sapiens* different from Neanderthals? Give two ways.

6. **Explain** How do scientists know that many species of hominids once existed?

7. **Infer** What advantages could larger brains have given hominids? Give three examples.
