Teach, *continued*

Teaching Key Ideas

Neanderthal Care Tell students that Neanderthal skeletons have been found with healed broken bones. The fractures probably would have incapacitated the individuals until the bones healed. Scientists also found an adult male's skeleton with severe deformities that would have prevented the individual from caring for himself. What does this evidence suggest about Neanderthals? (They cared for the sick and injured.)

LS Logical

Close

Formative Assessment

What *unique* characteristic of monkeys, apes and humans causes scientists to relate them more closely than other primates?

A. binocular vision (Incorrect. All primates have this characteristic.)

B. opposable thumbs (Correct. Other primates do not have opposable thumbs.)

C. S-shaped spine that exits from the base of the skull (Incorrect. Only hominids have this trait.)

D. grasping hands (Incorrect. All primates have grasping hands.)



Figure 15 Early modern humans painted the walls of this cave (top) in France about 20,000 years ago. This early tool (bottom) was made from a brittle stone called *flint*.

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Modern Humans

Modern humans are members of *Homo sapiens,* the only surviving species of hominid.

Neanderthals Fossils of an advanced hominid species, *Homo neanderthalensis,* were found in 1856 in Germany. Called *Neanderthals,* they were short and powerfully built. Their heavy skulls had large brow ridges. The average Neanderthal brain was slightly larger than that of a modern human. Neanderthals lived in Europe and Asia starting about 230,000 years ago. They cared for their injured and often buried their dead. They died out about 30,000 years ago.

Homo sapiens The oldest fossils of primitive *H. sapiens,* our own species, are about 500,000 years old. These fossils have much in common with *H. erectus* fossils and with modern humans. The earliest *H. sapiens* fossils of a truly modern type are about 195,000 years old and were found in eastern Africa. How did modern humans, which live all over Earth, arise? Did they evolve from *H. ergaster* and *H. erectus* populations at the same time in different locations? Or did they evolve in a single location?

Studies of fossils and the genes of modern populations indicate that modern humans evolved in Africa between 100,000 and 200,000 years ago. They then probably migrated in waves to Europe and Asia. They may have reached North America from Asia as early as 15,000 years ago. As they populated Earth, modern humans replaced *H. erectus, H. ergaster,* Neanderthals, and other hominid species.

Several qualities unique to humans have contributed to our success. Humans can make and use tools. Humans can think abstractly, applying existing knowledge to new situations. Humans can plan for future events. And humans have symbolic communication: spoken and written language. Language allows for non-genetic communication. Concepts can be conveyed across space and through time, paving the way for a new kind of evolution: cultural evolution.

Section 3 Review

KEY IDEAS

1. **Name** two unique features of primates.
2. **Name** the three groups of primates alive today.
3. **Describe** how early hominids differed from the primates that came before them.
4. **Explain** what the hominid fossil record tells us about the path to modern humans.
5. **State** where and when scientists think that modern humans evolved.

CRITICAL THINKING

6. **Explaining Relationships** How does the location of a primate's eyes help it live high above the ground in the branches of trees? Explain your answer.

ALTERNATIVE ASSESSMENT

7. **Group Project** Select a hominid described in this section, and write a report about who found the fossils and when the fossils were found. Be sure to include a map of where the fossils were found and a description of the fossils. Present your findings in the form of an oral report to the class.

Answers to Section Review

1. grasping hands and forward placement of eyes
2. lemurs and their relatives, tarsiers and anthropoids (monkeys, apes and humans)
3. Hominids were bipedal. They had short arms and a bowl-shaped pelvis. Their spines were S-shaped rather than C-shaped, and their spinal cord exited from the bottom of the skull rather than at the rear. Their canine teeth were smaller than those of other primates.
4. Many hominid species lived over the past 7 million years. More than one species lived at the same time. Except for the direct ancestors of modern humans, all ancient hominid species died out.
5. Modern humans evolved in Africa between 100,000 and 200,000 years ago.
6. The forward placement of the eyes on the front of the face produces binocular vision, providing the ability to judge depth, which is crucial for moving over varied distances. To quickly jump from one branch to another, a primate must be able to judge the orientation and amount of movement required for the leap. Without depth perception, a primate would not be able to jump and leap with accuracy and would fall more frequently, probably leading to injuries or death.
7. Make sure that students cite their sources and that those sources are reliable.