

Anthropologist's Journal

This journal belongs to

Walk This Way: Why Humans Walk on Two Legs

**SAN DIEGO MUSEUM OF MAN
LANGUAGE ARTS AND ANTHROPOLOGY
A LITERACY PROGRAM FUNDED BY THE DE FALCO FOUNDATION**

Introduction

Ordering the Primates

Organisms can be placed in different groups, based on similarities and differences with other life forms. The group with the largest variety of similar life forms is the Kingdom. As you move down the diagram below, the groups become smaller and smaller, until you reach the group that only has one unique type of organism—the species.

Kingdom

A Kingdom is the largest group of similar life forms. Since animals and plants are so different from each other, they are placed in separate Kingdoms.

Class

A Class is a smaller group within a Kingdom, and is made of closely related Orders. Mammals are different from other animals since they are warm-blooded, give birth to live offspring, and nurse their young.

Order

An Order is a group of closely related Families. Monkeys, apes, and humans are all primates because they are more similar to each other than to other mammals.

Family

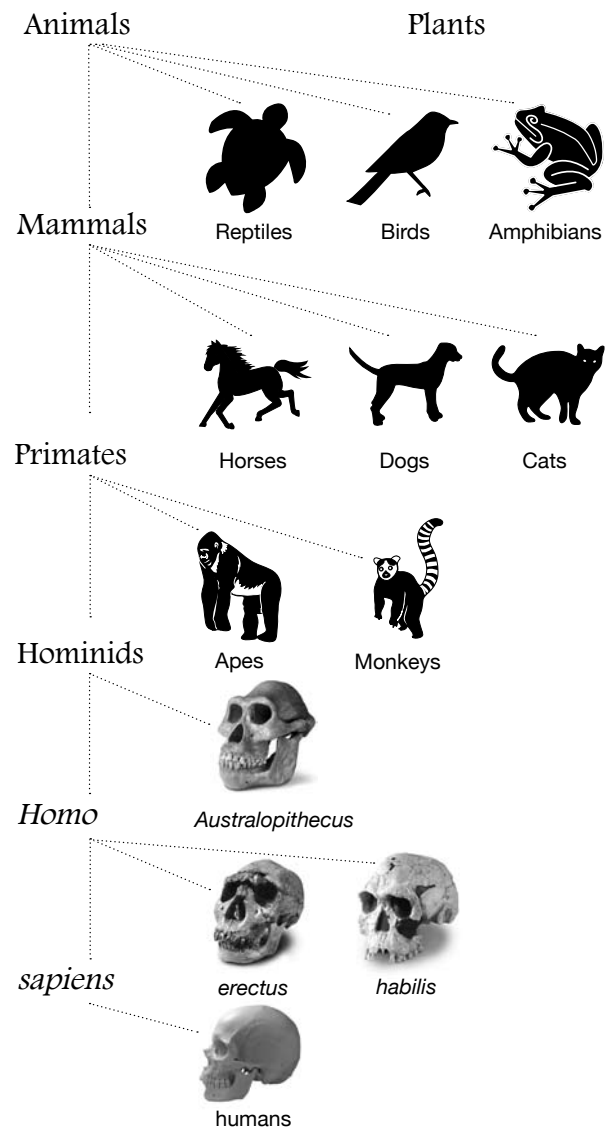
A Family is a group of closely related genera (plural of genus). Hominids walk on two legs, while other primates use all four limbs.

Genus

A genus is a group of closely related species. Hominids in the *Homo* genus used stone tools and had bigger brains.

Species

Each species is a unique form of life. Humans are the only living hominid.



The scientific name of each organism has the following form: Genus, species. Thus, the scientific name for humans is *Homo sapiens*.

Initial Questions

How are plants and animals different?

Write the following biological categories in order from smallest to largest:
Class, species, Order, Family, Kingdom, genus.

Reading Selection 1

Primate Quadrupedalism

Even though monkeys, apes, and humans look different, they have a lot in common. For example, all primates have grasping hands and feet. Primates can pick up food and bring it to their mouths, and hold onto branches as they climb through the trees. Primates also have nails instead of claws, as well as four types of teeth: incisors, canines, pre-molars, and molars.

All primates alive today, except for one, move using all four limbs. Arms and legs are limbs, therefore most primates move using both their arms and legs. Animals that walk using four limbs are quadrupedal. “Quadri” means “four” and “ped” means “foot,” so “quadrupedal” means “four-footed.”

Monkeys move through the trees by walking along tree branches, grasping them with their hands and feet to make sure they don't fall off. Sometimes they leap from branch to branch. Some monkeys have what are called prehensile, or grasping, tails. Having a prehensile tail means they can use their tails to hang from tree branches, or even to pick things up.

The great apes—chimpanzees, gorillas, and orangutans—are larger than monkeys and don't have tails. Orangutans, who are recognizable by their orange fur, are arboreal, which means they spend most of their time in the trees. Since they are large (a male orangutan can weigh 200 pounds), they climb very carefully, grasping branches with both their hands and their feet. Sometimes they even swing from branch to branch.

When chimpanzees and gorillas walk around on the ground, they curve the knuckles on their hands under, while keeping their feet flat. This is called knuckle-walking, because it looks like they are walking on their knuckles. You may have seen gorillas or chimpanzees standing up on two legs from time to time, but they can only do that for short periods. The rest of the time, they are walking on all four limbs.

Activity 1 Vocabulary

Write the word, used in the previous passage, next to the sentence that describes its meaning.

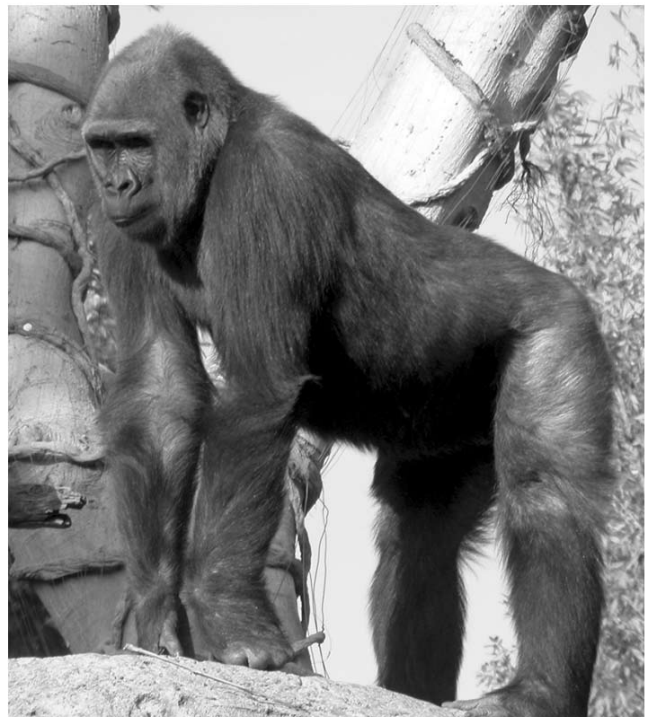
_____ : What primates have instead of claws.

_____ : A type of tail that can be used to pick up things or hang from trees.

_____ : The group of primates that includes chimpanzees, gorillas, and orangutans.

_____ : To live in the trees.

_____ : How chimpanzees and gorillas move around on the ground.



Reading Selection 2

The Hominid Family

Maybe you've already guessed by now which primate uses only two limbs to move. I'll give you a clue: how many limbs do you use to walk? Two, right? Most of the time anyway. Humans are the only living primates who walk on two legs all the time. The word for walking on two legs is bipedal. "Bi" means "two." You already know what "ped" means.

Today, humans are the only bipedal primate. But in the past, there have been many different species of primates that walked on two legs like us. These bipedal primates are called hominids, and they belong to the Hominid Family. Some hominids have scientific names like *Australopithecus afarensis*, *Australopithecus africanus*, *Homo habilis*, *Homo erectus*, and us—*Homo sapiens*. As you can tell, there are two main genera of hominids—the Australopithecines, who have the genus name of *Australopithecus*, and our genus, *Homo*. All hominids, other than humans, have gone extinct, making humans the only living representative of the Hominid family.

So why do hominids walk on two legs, when most other primates get along just fine walking on four? Well, part of what happens when you only use two limbs to move is that it frees up your hands to carry things like food from place to place. In particular, if you need to carry food or other items a long distance, then having your hands free to do that is very helpful.

Even though all hominids are bipedal there are important differences. For example not all hominids had big brains like us. The Australopithecines were bipedal, but had brains that were only about one-third the size of ours.



Activity 2

Fill-in-the-blank

The following is a brief summary of the above passage. Using words from the above reading, fill in the correct words in the passage below.

Humans are one species of bipedal primates, also known as _____.


Bipedalism probably helped hominids to _____ food from place to place, and to walk _____ distances. Not all hominids had large _____ like us. The _____, an extinct group of hominids, had brains that were about _____ the size of modern human brains.

Now, go back and review *Reading Selection 1. Primate Quadrupedalism*. Write a short summary of that section in the space below using the words you wrote in *Activity 1. Vocabulary*.

Reading Selection 3

Bones and Bipedalism

Some of the bones of hominids, especially those in the legs and hips, look different from the bones of other primates. In particular the upper leg bone, the femur, and the lower leg bone, the tibia, look different—they come together in a straight line at the knee. Think about what happens when you walk. In the middle of each stride, one of your legs is straight. This helps you keep your balance, plus you can use the strength in your bones to support your weight. The knees of gorillas and chimpanzees are always bent—they cannot straighten out their knees like we can.

The bones in the spine, called vertebrae, also look different. In primates such as chimpanzees and gorillas, the spine is shaped like an upside down smile . This shape makes sense for how they walk. In hominids, the spine is shaped like an S—it curves in and out. This S-shape helps to support the upper body when walking upright.

The bones in the feet are also very different. If you were to look at the shape of a gorilla's foot, you might think it looked basically like a hand, and you would be right. Gorillas can pick up things and grab onto branches with their feet, as well as with their hands. But our feet, just like the feet of other hominids, look very different from

our hands. For example, our heel bone is very large, and there is an arch between the heel and the toes. Also, our big toe is in line with the other toes, and does not stick out like our thumbs do. Have you ever wondered why your big toe is so, well, big? Think about what happens when you walk. You start by placing your heel down, then you roll through the arch in your foot, and the last thing to leave the ground is your big toe. So, having a big toe helps us to walk the way we do.



Activity 3

Short answer

Using the information provided in the previous reading, answer the following questions in complete sentences. Be sure to include the words listed in parentheses in your answer.

Describe how the leg bones of hominids differ from the leg bones of other primates. (femur, tibia, knee)

Why are our feet shaped the way they are? (big toe, heel, arch)

Other Activities

Use the bipedalism lesson plan available at the following webpage: www.abouthumanevolution.net/html/lesson1.htm

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