



Primate:

A primate is a member of the mammalian order Primates, which comprises two suborders: the prosimians (lemurs, lorises, and tarsiers) and the anthropoids (monkeys, apes, and man). According to fossil records, primates originated in the Late Cretaceous (97.5 to 66.4 million years ago) as forest-dwelling creatures. Evidence that modern man is a descendant of these early primates was first provided by Charles Darwin in his *Origin of Species*, published in 1859.

The anatomical and behavioral features that distinguish primates from members of other mammalian orders include a lack of strong specialization in structure; prehensile hands and feet, usually with opposable thumbs and great toes; flattened nails instead of claws on the digits; acute vision with some degree of binocular vision; relatively large brain exhibiting a degree of cortical folding; and prolonged postnatal dependency. No primate exhibits all these features, and indeed the diversity of primate forms has produced disagreement as to their proper classification.

Taxonomically the primate order can be arranged in 11 families: The prosimians include the lemurs (Lemuridae), the aye-aye (a single species comprising the Daubentoniidae), galagos and lorises (Lorisidae), tarsiers (Tarsiidae), and a little-known group of arboreal creatures including the avahi, sifaka, and indri (Indriidae). The anthropoids include marmosets and tamarins (Callitrichidae), South American monkeys other than marmosets (Cebidae), African and Asian monkeys (Cercopithecidae), siamangs and gibbons (Hylobatidae, the lesser apes), orangutans, gorillas, chimpanzees (Pongidae, the great apes), and man and his direct ancestors (Hominidae). The tree shrews (Tupaiaidae) are included among the prosimians by some authorities but by others among the insectivores.

A wide range of size, weight, and habitat is found among members of the primate order. The smallest primates are weighed in tens of grams, while the gorilla typically weighs 140 to 180 kg (300 to 400 pounds). Nonhuman primates are found throughout the tropical areas of India, Africa, Asia, and South America. A few species also live in temperate latitudes, but lack of winter food supply limits their adaptability to these climates.

The combination of an unspecialized physical structure and highly specialized behaviour has made the primates a very successful order. An unspecialized structure helps primates flourish in changing environments, while their well-developed brains allow them to adapt their behaviour to suit their specific

needs. Most primates have binocular vision and forward-facing eyes, two characteristics that are necessary for depth perception. Although their vision is highly developed, primates have shortened muzzles and a correspondingly reduced sense of smell. These modifications are a reflection of the predominantly arboreal life that has long characterized primates. Except for two species, all primates have five digits on each hand and foot. All have prehensile (grasping) hands, and all except man have prehensile feet. Although the opposable (freely moving) thumb is present in most primates, it is particularly developed in man, making him capable of delicate manipulation.

One of the striking features of the primate order, wherein it differs from other mammalian orders, is that its existing members fall into a graded series, or scale of organization, which suggests an actual evolutionary trend leading from the most primitive (tree shrews) to the most advanced (humans).

A trend in primate evolution has been toward a more elaborate brain. In higher primates the neocortex functions to receive, analyze, and synthesize information from the senses. The brain of anthropoids is larger, relative to body weight, than that of prosimians and is characterized by a complicated pattern of folds and fissures on the surface. Another evolutionary trend in primates involves the development of offspring both before and after birth. Gestation periods are relatively long, allowing for the development of the more complex brain. **The more sophisticated species also exhibit longer infant and juvenile stages, which are probably related to the time required for their more advanced mental development and their integration into complex social systems.** The reproductive cycle of copulation, gestation, birth, and lactation occupies the higher female primates for a year or more. The female does not usually come into estrus again until the offspring of the previous pregnancy is weaned. Primate infants are generally born fully furred and with their eyes open. Except in the case of man, chimpanzee, and gorilla, the newborns are able to cling to the mother's fur and need no support. Physical dependency ends when the young are weaned, but it is followed by an extended period of psychological maternal dependency lasting from 2 1/2 years in lemurs to 14 years or so in man.

Primates exhibit four different forms of locomotion: vertical clinging and leaping; quadrupedalism, which involves use of both the forelimbs and the hind limbs in walking, climbing, and swinging; brachiation, in which the primary form of movement is swinging by the forelimbs; and bipedalism, the upright striding of man. All primates are able to sit upright, many can stand upright, and some can even walk upright for short periods, but only man is capable of the upright striding gait.

Primates are omnivorous, and their teeth are multipurpose, allowing them to cut, tear, and grind. Although nonhuman primates will occasionally eat the flesh of other mammals, their diet consists primarily of leaves, fruit, bark, nuts and other vegetable matter, birds, eggs, rodents, insects, and frogs.

For centuries man has recognized the superior intelligence of monkeys and has valued them as pets. Because the biology of all primates is very similar, nonhuman species have become increasingly important to man in medical research and space science. More than a quarter of a million wild monkeys are used in laboratories every year. Although most primates are still plentiful in the wild, certain species, including the orangutan and gorilla, are in danger of extinction from hunting, poaching, or loss of habitat.

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