APE CART ADAPTATIONS TALKING POINTS

APE CART INVENTORY

- Orangutan skull replica (male)
- Chimpanzee skull
- Human skull replica (sex unknown)
- Western Lowland Gorilla skull replica (male)
- Gorilla hand replica (male)
- Gorilla foot replica (male)
- Apes Resource Notebook

GENERAL PRIMATE TALKING POINTS

PRIMATE EVOLUTIONARY HISTORY (Note: see primate taxonomy charts)

- Transitional, arboreal primate-like creatures appeared around 65 million years ago after the dinosaur extinction and the first primates evolved around 60 million yrs. ago, squirrel-like insectivores with grasping hands and feet.
- The Eocene Epoch (beginning 55 million years ago) saw the appearance of a proliferation of prosimians in North America, Europe and Africa, ultimately reaching Madagascar, where isolated, they evolved into lemurs.
- Changes occurred in some of the Eocene prosimians, resulting in larger brains and eyes, smaller snouts; the foramen magnum (hole at base of skull where the spinal column passes through) began to move from the back of the skull towards the center, giving some prosimians a more erect body posture.
- With the beginning of the Oligocene Epoch (o/a 34 million years ago) world temperatures cooled and the first monkeys appeared.
- Many prosimian species were outcompeted by the new species and became extinct, except on Madagascar, where there was no other primate competition.
- The first monkeys had fewer teeth, smaller snouts, larger brains and more forward looking eyes than did the prosimians; they lived in trees and mainly ate fruit.
- The evolution of monkeys brought larger brain size, more vertical posture, less reliance on sense of smell and different use of fore and hind limbs.
- New World monkeys appeared o/a 30 million years ago, perhaps isolated groups of Old World monkeys drifting on clumps of soil and grass from Africa to South America or via a land bridge to North America and then to South America.
- Apes evolved during the early Miocene Epoch, 17-23 million years ago.
- 14 million years ago the ancestors of all modern primates lived in southern Europe, but with climate change, migrated to Africa and South Asia.
- Eight to nine million years ago two lines emerged in Africa, one leading to gorillas and another to humans, chimpanzees and bonobos.
- Five to six million years ago there was a divergence separating the ancestors of modern chimpanzees and bonobos from hominids (human-like primates).

GENERAL PRIMATE TRAITS

- There are 13 living primate families with more than 500 species and subspecies.
- There are three major types of non-human primates: prosimians, monkeys and apes. (See attached taxonomic chart)
- 5 digits on each hand and foot.
- Flat nails on toes/fingers (Some with modified claws), allowing for easier manipulation of objects
- Two separate bones in the forearm and lower leg, allowing better limb motion and more precise movements
- At least one opposable pair of digits (except colobines)
- Large clavicle
- Eyes:
  - Surrounded completely by bone (except lemur, partially surrounded)
  - Generally facing forward
  - Stereoscopic vision, providing depth perception
  - Color vision to some degree
- Paired mammary glands
- General increase in size and complexity of brain's cerebral hemisphere
- Most give birth to single offspring
- Trend toward longer period of parental care
- Trend toward longer gestation period and life spans

LEMUR ADAPTATIONS

- Old world prosimian ("prosimian" means "before monkeys")
- Found only on island of Madagascar
- Long, dog-like muzzle with wet nose and nose leather
- Flat nails and fleshy pads on most digits with first fingers and toes opposable
- Claw on second toes used for grooming
- More developed sense of smell than monkeys or apes
- Prominent whiskers and good vision with large, forward facing eyes (not as forward as monkeys); eye size probably a result of nocturnal ancestry
- Relatively poor color vision
- Long and generally bushy tails
- Dental grooming comb present
- Smaller brain to body size than other primates
- Diverse behaviors – some species maintain family groups and others solitary
- Female dominant in most species; breeding seasonal
- Diurnal and nocturnal species; most species arboreal
- Use scent markings and vocalizations for communication
- Predominant diet of fruit

MONKEY ADAPTATIONS

- Four families, two each Old World (Africa, Europe and Asia) and New World (Central and South America)
- Dry nosed, without nose leather
- Larger, more developed brain than lemurs
- Tails of various lengths present
- Flat nails on digits (marmosets and tamarins with claw-like nails)

- Opposition of thumbs and big toes of varied degrees, better than prosimians, but not as good as apes
- Limbs roughly the same length
- Shoulders do not rotate; do not brachiate
- Eyes face forward; binocular vision with ability to distinguish colors
- Lower molars with 4 cusps
- Heads rounded; short muzzle
- Vegetarian diets
- Virtually all live in social communities with groups stable over generations
- Head held upright
- Females more tolerant of each other than are lemurs
- Flexible, pliable bodies, important for movement in trees
  - **New World Monkey (Platyrrhini) Adaptations**
    - 64 species found only in Central and South America
    - Most species smaller than Old World monkeys
    - Exclusively arboreal
    - Most move quadrupedally on branches of trees or leap from branch to branch
    - Some species with prehensile tails
    - Marked by broad, flat noses with widely placed nostrils opening to the side
    - 3 premolars and relatively large molars
    - Thumb oriented in line with other digits, opposing next digit in scissor like grip (spider monkeys do not have thumbs)
    - Male involvement common in infant care
    - Social groupings range from monogamous to polyandrous to polygynous
    - Rely largely on a diet of fruit
  - **Old World Monkeys (Catarrhini) Adaptations**
    - At least 78 species found in Africa and southeast Asia
    - Relatively large, ranging in size from small to medium sized dog
    - Down facing nose with nostrils close together, opening downward or forward
    - Two premolars and molars with sharply connected cusps (raised points on top of molars), facilitating chewing of fibrous plant material
    - Large, sharp canines with gap between canines and incisors
    - All have tails, but no prehensility
    - Ischial calliosities (sitting pads) on rumps to support sitting
    - Thumbs rotated and more opposable (exception – reduced or absent in colobine monkeys)
    - Most have color vision
    - Fingernails and toenails on all digits
    - Some species exhibit digitigrade walking (example: patas monkeys)
    - Male involvement in infant care rare or absent
    - Prominent sexual skin around anus and vagina in females that swells with estrous
    - Social groupings rarely monogamous; size of group varies among species and may vary with availability of food
    - Rely more on foliage in diet
    - Some species have special digestive tracts for processing low value, fibrous diet and some have cheek pouches for temporary food storage.
    - Have wider range of habitats
    - Species either spend some or most of the day on the ground; may seek shelter of trees at night or for defense – semi-terrestrial

APE ADAPTATIONS

- Two families, the lesser apes and the greater apes
  - Lesser apes: gibbons
  - Great apes: gorillas, chimpanzees, bonobos, orangutans and humans (humans excluded from discussion below)
- No external tail present
- Of apes, only gibbons have ischial callosities
- Flat nails on digits
- Thumbs and toes fully opposable
- Forelimbs longer than rear limbs
- Shorter, less mobile and less flexible spine than monkeys
- Noses flat; no muzzle; protruding jaws
- Shoulders rotate for full brachiation (brachiation varies with species)
- Live either in social groups of dominant male with several adult females and young or in case of orangutans, solitary life; some species form monogamous bonds
- Have larger brain size and are more intelligent and more dependent on learning behavior patterns than are monkeys; may exhibit tool using behaviors
- Sexual dimorphism varies with species
- Lower molars with five cusps; large canine teeth
- Forward facing eyes; vision in color and binocular
- Shoulders with rotating cup joint – gives ability to brachiate
- Gibbons most arboreal with excellent ability to brachiate
- Quadrupedal gait; chimpanzees and great apes walk on knuckles
- Predominantly vegetarians, though chimpanzees eat some meat

PRIMATES AT THE SAN FRANCISCO ZOO:

- **Lemurs:** blue-eyed black lemur, crowned lemur, red-bellied lemur, red-fronted brown lemur, black and white ruffed lemur, red ruffed lemur, ring-tailed lemur, Coquerel's sifaka
- **New World Monkeys:** black howler monkey
- **Old World Monkeys:** Francois' langur monkey, black and white colobus monkey, mandrill
- **Lesser Apes:**
- **Great Apes:** western lowland gorilla, chimpanzee, Borneo orangutan

WESTERN LOWLAND GORILLA (*Gorilla gorilla gorilla*) ADAPTATIONS TALKING POINTS

WESTERN LOWLAND GORILLA RANGE/HABITAT

- Can be found in wide range of areas and elevations in Africa depending on subgroup of Gorilla being viewed, from sea level for Western Lowland Gorillas in the Congo to altitudes of 7,000 to 13,000 feet for the Mountain Gorillas in Uganda. (see map)
- Habitat of tropical and subtropical forests in Africa

GORILLA PHYSICAL ADAPTATIONS:

- **Skull:** Distinctive ridge brow, and sagittal crest on top of skull designed to hold strong facial muscles, allowing chewing of tough plant matter.
- **Teeth:** Large canines for defensive bites, big molars for chewing tough vegetation.
- **Hands:** Smaller thumbs than humans, curved fingers, designed to knuckle walk, calluses to protect.
- **Feet /Toes:** Opposable toe can be used for grasping and climbing.
- **Arms** longer than legs designed to support body and heavily muscled.
- **Eyes** inset to protect from damage and injury due to moving through natural jungle habitat.
- **Hearing:** very good which is needed for communicating within their groups as well as for their protection from predators due to the thick vegetation in the areas they inhabit.
- **Eyesight:** Very good with the probability of seeing in color so they can identify ripe fruit in trees
- **Big stomachs** needed to digest plant fiber diet
- **Size:** Largest of the primates, Western Lowland males weight up to 480 pounds.
- **Longevity:** In wild about 35 years, in captivity up to 50 years. SF Zoo male silverback is 34 years old. (2015)
- **Sexual Dimorphism**: males are 2 x the size of the female, male has larger canines and saggital crests
- Male has **silverback**, which appears about 12-14 years**.** Young males are called **blackbacks**. (see photo)

GORILLA BEHAVIORAL ADAPTATIONS

1. **Lifestyle**
   - Ground dwelling
   - Live in groups of 6-12 animals with oldest male Silverback leading
   - Forage during day, bed down at night in nests made by each gorilla
2. **Communicate** with each other using complex vocalizations, gestures and facial expressions, much like humans!
3. **Diet**
   - Herbivore diet consisting of leaves, shoots, roots, vines and fruits
   - Adult males can consume 40 pounds of vegetation daily.
4. **Breeding/Reproduction/Parental Care**
   - Gestation: 8 1/2 months
   - Litter: 1 baby
   - Young can crawl after 2 months
   - Walk at 8-9 months
   - Independent to a degree after 3 years, males join bachelor groups after being expelled by the Silverback. The silver coloration on the backs of the males develops after about 12 years of age.

- Maturity 9-11 years (F) 9-13 years (M)
- Breeding thoughout the year; dominant male has exclusive breeding rights

GORILLA SPECIES/SUBSPECIES:
Western Gorilla (*Gorilla gorilla*)
- Western Lowland Gorilla (*Gorilla gorilla gorilla*)
- Cross River Gorilla (*Gorilla gorilla diehli*)

Eastern Gorilla (Darker in coloration) (*Gorilla beringei*)
- Mountain Gorilla (Most endangered, only about 600 in wild)) (*Gorilla beringei beringei*)
- Eastern Lowland Gorilla (*Gorilla beringei graueri*)

WESTERN LOWLAND GORILLA PREDATORS: Leopards, crocodiles, and humans

GORILLA INTERESTING FACTS:
- Fingerprints and nose prints all unique to each animal
- Gorilla watching eco tourism is the 2nd largest source of income for Uganda after agriculture. Fee is $250 for permit, ranger led visit in National Park.
- Gorilla comes from the Greek meaning "a tribe of hairy women".
- Don't confuse "Gorilla "and "Guerrilla", the words sound the same and both can be fierce and dangerous animals.
- See a movie, *Gorillas in the Mist.* The story of Dian Fossey. (1988)

GORILLA CONSERVATION TALKING POINTS:
- **Loss of habitat**: increasing human populations, bush meat trade and market for gorilla hands, skulls and teeth as souvenirs. Logging, wars, conflicts in region.
- **Climate change:** Impacting agriculture in gorilla areas and increasing demand for more farmland to make up for crop failures.
- **Coltan Mining:** A mineral used in the electronic industry for such things as cell phones formal name is Columbrite Tantalite, the principal source of tantalum a hard dense element with the ability to hold a high electric charge. Democratic Republic of Congo has largest reserves in the world. Rush to mine has further threatened the habitat of the Gorillas.

CHIMPANZEE (*Pan troglodytes*) TALKING POINTS

CHIMPANZEE GENERAL INFORMATION:

Chimpanzees are tree-dwelling great apes native to the continent of Africa. Along with bonobos, chimpanzees are our closest living relatives. Chimpanzees are highly intelligent and live in complex social groups. Communication, behavior, diet, and tool use vary between chimpanzee communities; different groups of chimpanzees that live in different parts of Africa have unique behaviors, tools, and traditions that are passed down from generation to generation.

CHIMPANZEE RANGE/HABITAT

- Found in West and Central Africa, north of Zaire River, to Senegal and Tanzania (see map)
- Habitat of tropical rainforest and deciduous woodland to mixed savanna

CHIMPANZEE PHYSICAL ADAPTATIONS

1. **Size/Weight/Lifespan**
   - A male chimp stands up to 4 – 5.5 feet.
   - Sexually dimorphic: males average 88 -130 pounds, females 70 -104 pounds
   - Life span is 40-50 years in the wild and up to 60 years in captivity.
2. **Skull/head**
   - Chimpanzees have a hairless face but a short, white beard is common in both sexes.
   - Chimpanzees have a prominent brow ridge that is more prominent in males than females; brow ridges may serve as a buttress against stress from the jaw muscles or protection for the eyes.
   - All apes (including humans) have the same dental formula; non-human apes have much larger canines than humans. These large canines serve the purpose of threat.
   - Chimps are capable of many expressions. (i.e. a worried chimp makes a lip-puckering face; a frightened chimp will bare its teeth; a smile indicates a relaxed, friendly chimp.)
3. **Body/Extremities**
   - Chimpanzees are apes and do not have a tail.
   - The long, muscular arms have a spread equal to 1.5 times the height of an individual; adult chimps are estimated to be at least more than twice as strong as humans.
   - Legs are shorter than are the arms, allowing chimps to walk on all fours with the anterior portion of the body higher than the posterior.
   - Hair is coarse, long and generally black or brown in color (except fingers, palms and bottoms of chimp's feet are hairless).
   - Chimpanzees have very long hands and fingers, with short thumbs. This hand morphology allows chimpanzees to use their hands as "hooks" while climbing, without interference from the thumb.
   - Opposable thumb is adapted for climbing, picking fruits and catching insects.
   - Although useful in locomotion, the shortness of the thumb relative to the fingers prevents precision grip between the index finger and thumb. Instead, fine manipulations require using the middle finger in opposition to the thumb.
   - Chimpanzees have opposable big toes, so they can grab things with their feet.
4. **Senses**
   - A chimpanzee's senses of sight, taste, and hearing are similar to those of humans.
   - Large ears that stick out a tad help them hear other chimps in a dense forest.

- Trichromatic vision allows them to see blue, green and red colors and helps them locate choice leaves and fruit in the tree canopies.

CHIMPANZEE BEHAVIORAL ADAPTATIONS

1. **Life Style**
   - Chimpanzee communities may range in size from 15 to 120 chimps of both sexes and all ages.
   - Chimpanzees do have a hierarchy, and generally each community has an alpha male, who is considered the most powerful member of the group. However, a male's success as alpha is often dependent upon the support of the females, conferring upon them a great deal of influence as well. Chimp hierarchies are not characterized by a strict "pecking order", but are complex, fluid, flexible, and change often.
   - Grooming not only serves the purpose of mutual cleaning, but also serves to cement bonds of family and friendship. By running their fingers through each other's hair, chimpanzees remove dirt, dead skin, and parasites. They will also clean any cuts or scrapes another chimp may have. Grooming is also the single most important social activity and takes up a lot of each day's rest periods. (see photo)
   - Chimpanzees most often eat in trees and move among the trees by swinging their arms in a form of brachiation.
   - Although they normally walk on all fours by knuckle-walking, chimpanzees are capable of walking on their hind legs. (**Note:** a human's thigh bones slope inward from the hip to the knee, allowing the human foot to fall directly under our center of gravity. Chimps' thigh bones (femurs) slope outwards causing them to stand and walk with its feet wide apart. What's more, its pelvic muscles are much weaker than ours, so that they have to move its entire body from side to side with each step, just to keep its center of gravity over whichever leg is bearing weight. Most importantly, weight is not placed across the whole chimp foot. Weight is bore to the outside of the foot.) (see diagram)
   - Chimps build a tree nest of vegetation each night. Adults sleep alone, and infants sleep with its mothers until the next sibling is born.
2. **Communication**
   - Chimpanzees communicate with one another through a complex, subtle system of vocalizations, facial expressions, body postures, and gestures.
   - Chimpanzees, like humans, use facial expressions to convey emotions; chimpanzees have emotions similar to those we call joy, anger, grief, sorrow, pleasure, boredom, and depression. They also comfort and reassure one another by kissing and embracing.
   - They can communicate with each other over long distances with loud calls or by drumming the buttresses of trees.
   - Groups are territorial and will use vocalizations to reinforce boundaries, although violent conflicts are not uncommon.
3. **Diet/Eating Habits**
   - Chimpanzees are omnivores. They rely heavily on a wide variety fruit and leaves, but also eat insects, bark, eggs, nuts, and even hunt monkeys and other small animals for meat.
   - Chimpanzees spend a large part of their day looking for food and eating, but they do not wander aimlessly through the forest hoping to find food. They know where they are going and remember from year to year where food is located and when a particular fruit is ripe.
   - When they hunt, chimps coordinate their efforts and share the meat amongst each other.

4. **Breeding/Reproduction/Parental Care**
    - Sexual maturity: female 13 – 14 years, male 15 – 16 years
    - Male and female chimpanzees breed throughout the year with multiple mates
    - Females have an estrus cycle of approximately 36 days.
    - Gestation is 230 – 260 days (8 months)
    - Average # of offspring 1; females can give birth at any time of year, typically to a single infant that clings to its mother's fur and later rides on her back until the age of two.
    - Infant has a white tuft of fur on its rump.
    - Average birth weight is 4 lbs.
    - Like human infants, newborn chimpanzees are entirely dependent on their mothers for warmth, protection, transportation, and nourishment.
    - Weaning at 4 – 5 years; before they are weaned, young chimps learn what to eat and what to avoid by watching their mothers and other adult chimpanzees.
    - A female chimp will not be fertile again until her child is fully weaned, so at most a female chimp will give birth every five years. She may have approximately 4-6 offspring in her lifetime.
    - Chimpanzee mothers may enjoy life-long bonds with their adult sons and daughters.
    - The anogenital swelling of females is very important in the sexual behavior of these animals; swelling signals to males when females are sexually receptive.
    - Anogenital swelling may aid females in obtaining food resources including meat. Females who are maximally swollen are often able to supplant more dominant animals at a food source, and are more successful at begging food from males than are unswollen females.
    - Juvenile males will remain with the birth group, while females will leave to join another group by the time they reach sexual maturity.

CHIMPANZEE INTERESTING FACTS

- Chimpanzees are known for making and using simple tools, such as twigs for eating termites and rocks for cracking nuts. They will also create leaf “sponges” for getting water out of tree-boles and crevices and manufacture spears to kill small mammals. (see photo)
- Chimpanzees, and their cousins the bonobos, are more closely related genetically to us – sharing 98.4% of our DNA – than they are to gorillas and other animals!
- There is evidence that in addition to their regular diet, chimpanzees may eat certain plants for their medicinal value, such as to soothe an upset stomach or get rid of intestinal parasites.
- Even though chimpanzees’ habitat is often near water, chimps cannot swim, due to the structure and density of their bodies.
- Many older captive chimpanzees suffer from cardiac disease and take the same medications that humans take for heart conditions.
- Unlike most other animals, chimpanzees can recognize themselves in a mirror.

CHIMPANZEE CONSERVATION TALKING POINTS

- Chimpanzees are listed as Endangered on the IUCN Red List. Fifty years ago, there were probably a million chimpanzees living in Africa. Today, there are as few as 170,000 left in the wild.
- Chimpanzees are listed on Appendix I of CITES
- Chimpanzees are completely protected by national and international laws in all countries of their range, and it is, therefore, illegal to kill, capture or trade in live chimpanzees or their body parts.
- Populations have been reduced due to habitat loss, hunting for bushmeat, collection for animal trade and disease.
- Although chimpanzees are the most abundant and widespread of the apes, with many populations in protected areas, the declines that have occurred are expected to continue unless significant progress is made toward conservation.
- Increased contact with humans, both local people and eco-tourists, has also brought the threat of diseases, which may be mild in humans but lethal to chimps. Infectious diseases that threaten apes include Ebola, HIV/AIDS, SARS, and polio.

What can you do to help chimpanzees?

- Buy sustainable wood and paper products! Deforestation is a major threat to chimp populations.
- Consider supporting conservation organizations that are working to save the chimpanzee.
- Spread the word about chimpanzee conservation!

Chimpanzee Information Sources:

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BORNEO ORANGUTAN (*Pongo pygmaeus*) TALKING POINTS

ORANGUTAN GENERAL INFORMATION:

Orangutans are the only great apes of Asia. They are the largest arboreal mammal usually spending over 95% of their time in the trees. Orangutans play a vital role in seed dispersal since fruit makes up more than 60% or their diet. There are three distinct species of orangutans: *Pongo pygameus* on the island of Borneo, *Pongo abelii* on the island of Sumatra and the recently discovered *Pongo tapanuliensis* on the island of Sumatra. The Bornean orangutan has three subspecies. Orangutans are the most sexually dimorphic of primates with males much larger than females.

BORNEO ORANGUTAN RANGE/HABITAT

- Endemic to the island of Borneo (see range map)
- Habitat of tropical and subtropical rainforest in lowlands and up to 4,900 ft.

BORNEO ORANGUTAN PHYSICAL ADAPTATIONS

1. **Size/Weight/Lifespan**
   - A male orangutan stands up to 3.9 - 4.6; female height is 3.3 – 3.9 feet.
   - Sexually dimorphic: males average 110 - 220 pounds, females 66 -110 pounds
   - Life span is 35-45 years in the wild and up to 60 years in captivity.
2. **Skull/head**
   - Adult males have large cheek pads, called flanges, which enhance males' visual impact, making their threats more convincing; flanges widen as they grow older.
   - Adult males have a large pendulous throat sac, which serves as a resonator for their loud, roaring, territorial "long call." Some vocalizations can be heard one half mile away.
   - Orangutans have powerful jaws capable of cracking, crushing, and chewing fibrous foods such as fruit with spiny coverings, nuts, and tree bark.
   - Orangutans do have some hair on their faces including a beard and mustache
   - There are two "types" of mature male orangutans: flanged and unflanged males; both are sexually mature and able to father offspring; the flanged male is more dominant and is preferred by the female.
3. **Body/Extremities**
   - Orangutans have a distinctive body shape with very long arms that are one and a half times longer than their legs. When stretched out to the sides, a large adult male orangutan's arms may measure up to 7 ft. in length. Strong, muscular arms enable them to swing from tree to tree and, along with its shoulders, support the weight of their body. Orangutans are about seven times stronger than a human.
   - Orangutans have grey skin, and a coarse, shaggy, reddish coat; the reddish-orange coloration is an adaption for a forested environment.
   - Orangutan fingers and toes are long and curved to help hold and quickly release branches as they traverse the treetops.
   - The thumb and big toe of orangutans opposable, enabling them to grasp and manipulate objects using their hands or just their feet. This agility allows them to even place a foot in their mouth while hanging from a branch. Their feet grasp branches and serve as an extra support, in addition to their hands, when hanging upside-down.
   - The opposable thumbs and big toes are small in size so they do not hinder swinging through the forest.

- All primates have individualized fingerprints and toeprints, which may be used for identification purposes in the field.
- Hips and shoulder joints are highly mobile (ball and socket joints).
- Flexible knee and ankle joints, enabling them to jump, twist, grip and balance as they swing from branch to branch.
- Apes have larger cerebellums than humans, a trait that probably reflects the demands of an arboreal, tree-dwelling lifestyle. The cerebellum is the part of the brain that controls posture and movement.

4. Senses

- Binocular vision enables orangutan to accurately assess distances and depth, which is extremely useful for maneuvering among the trees.
- Keen eyesight and color vision. Color vision helps primates detect ripe fruits and vegetation.
- Sense of smell plays a role in reproduction, communication, and food evaluation.

BORNEO ORANGUTAN BEHAVIORAL ADAPTATIONS

1. Life Style

- Orangutans are primarily solitary; adult females are less solitary than males. Males share company with females only for reproductive purposes.
- Orangutans spend 95% of their time in the trees' canopies.
- Orangutans construct nests in trees just before sunset each night.
- Orangutans move through trees by brachiation. Their long fingers hook over each branch as they move hand over hand.
- When on the ground, orangutans walk on all fours, using their palms or fists. Unlike the African apes, orangutans are not built to be knuckle-walkers.
- Orangutans are not territorial.
- Orangutans will use their lips, tongues, hands, and feet to assist with self-grooming. Because they are highly flexible, orangutans can groom almost any part of their bodies.
- Female orangutans engage in social grooming more often than males.
- Males are generally intolerant of each other and will avoid each other in overlapping home ranges. If two males meet, a confrontation is likely to occur. Threatening displays often include staring, inflating their throat pouches, producing long call vocalizations, and shaking branches.
- Orangutans will carry large objects in their mouths while keeping their hands and feet free for traveling.

2. Communication

- Orangutans are highly visual in nature and use a variety of visual expressions to communicate.
- Adult males produce a musk-scent that is marked throughout their home range as an attractant for receptive females.
- Male orangutans are capable of a "long call," exceptionally loud calls that carry through forests for up to ½ mile.
- Orangutans use their lips to detect food textures before biting into them and to exaggerate facial expressions used in communication.

3. Diet/Eating Habits

- Primarily frugivorous; more than 60% of their diet is composed of fruit.
- They diet consists of over 500 different plant species.

- Orangutans favor a fruit called durians. Durians are covered in sharp spines and have a pungent smell. Orangutans use a variety of tools and their powerful jaws to break into such fruits. (see photo)
- Orangutans get most of their water from the succulent fruits they eat, but will also drink from rivers and streams.

4. **Breeding/Reproduction/Parental Care**
   - Sexual maturity: female 6 – 11 years, male 8 – 15 years; Females tend to give birth at about 14–15 years
   - Estrous cycle lasts 22 - 30 days
   - Weaning at 4 years.
   - Infant orangutans are in constant physical contact with their mothers for the first two years of their lives; during the first year of its life, the young clings to its mother's abdomen.
   - Young orangutans will travel and sleep with their mothers until they reach five to seven years
   - Young orangutans are highly social, establishing bonds with same gender and age mates. As they approach adolescence (seven to ten years of age), males move off on their own and females will often establish home ranges near their mothers.

BORNEO ORANGUTAN INTERESTING FACTS

- Orangutans have been known to use tools; sticks help knock fruit down from trees and act as visual deterrents when threatened (shaking and/or throwing them); leaves have been used as a sponge to obtain water from streams and to wipe unwanted substances from their hair.
- Orangutans share 97% of their DNA with humans.
- In Malay “orang” means “person” and “utan” is derived from “hutan”, which means “forest.” Thus, orangutan literally means “person of the forest.”

BORNEO ORANGUTAN CONSERVATION TALKING POINTS

- Borneo orangutans are listed as Critically Endangered on the IUCN Red List and Appendix I of CITES.
- The destruction and degradation of the tropical rain forest, particularly lowland forest, in Borneo and Sumatra is the main reason orangutans are threatened with extinction. Illegal logging, conversion of forest to palm oil plantations, mining, roads and human settlement all contribute to the loss of habitat. Also contributing to their decline is the bushmeat trade, and young orangutans are captured for the pet trade, usually entailing the killing of their mothers.
- During the past decade orangutan populations have probably decreased by 50% in the wild.
- As fruit-eating animals, orangutans are important propagators of tropical plants. Many fruit seedlings sprout only after having passed through an animal's digestive system. Therefore, orangutans have a vital ecological role as seed dispersers in their rainforest environment and affect forest regeneration and plant-species diversity.
- Climate change is another threat to Bornean orangutan conservation. The affects that human activity have had on Indonesian rainfall have made food less abundant and so Bornean orangutans are less likely to receive full nutrients so that they can be sufficiently healthy to breed. The birth rate for orangutans has been decreasing largely due to a lack of sufficient nutrients as a result of habitat loss.

- A number of orangutan rescue and rehabilitation projects operate in Borneo; the Borneo Orangutan Survival; Orangutan Foundation International (founded by Dr Birutė Galdikas and the Sepilok Orang Utan Rehabilitation Centre. These three organizations are dedicated to the conservation of the orangutans.

What can you do to help the orangutan?

- Humans can protect Bornean orangutans by supporting political efforts against orangutan hunting, against climate change, and using products that do not contain palm oil.
- Consider supporting conservation organizations that are working to save the orangutan.
- Spread the word about orangutan conservation!

Borneo Orangutan Information Sources:

Primate Adaptation and Evolution, Third Edition, John G. Fleagle, © 2013 Elsevier Science
Walker's Mammals of the World, 6th edition, Ronald M. Nowak, © 1999 Johns Hopkins University Press
The Natural History of the Primates, Napier, J.R. © 1985 The MIT Press, Cambridge, Mass.
https://www.worldwildlife.org/species/bornean-orangutan
https://animaldiversity.org/accounts/Pongo_pygmaeus/
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https://orangutan.org/
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RANGE MAP OF GORILLAS

RANGE MAP OF CHIMPANZEES

RANGE MAP OF ORANGUTANS

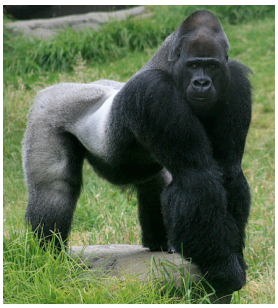
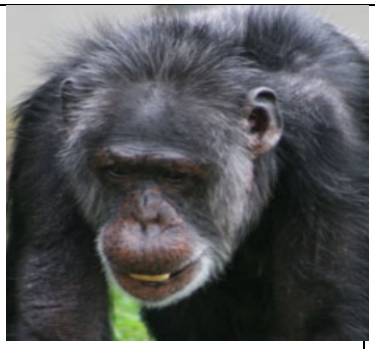
GORILLA PHOTOS

CHIMPANZEE PHOTOS

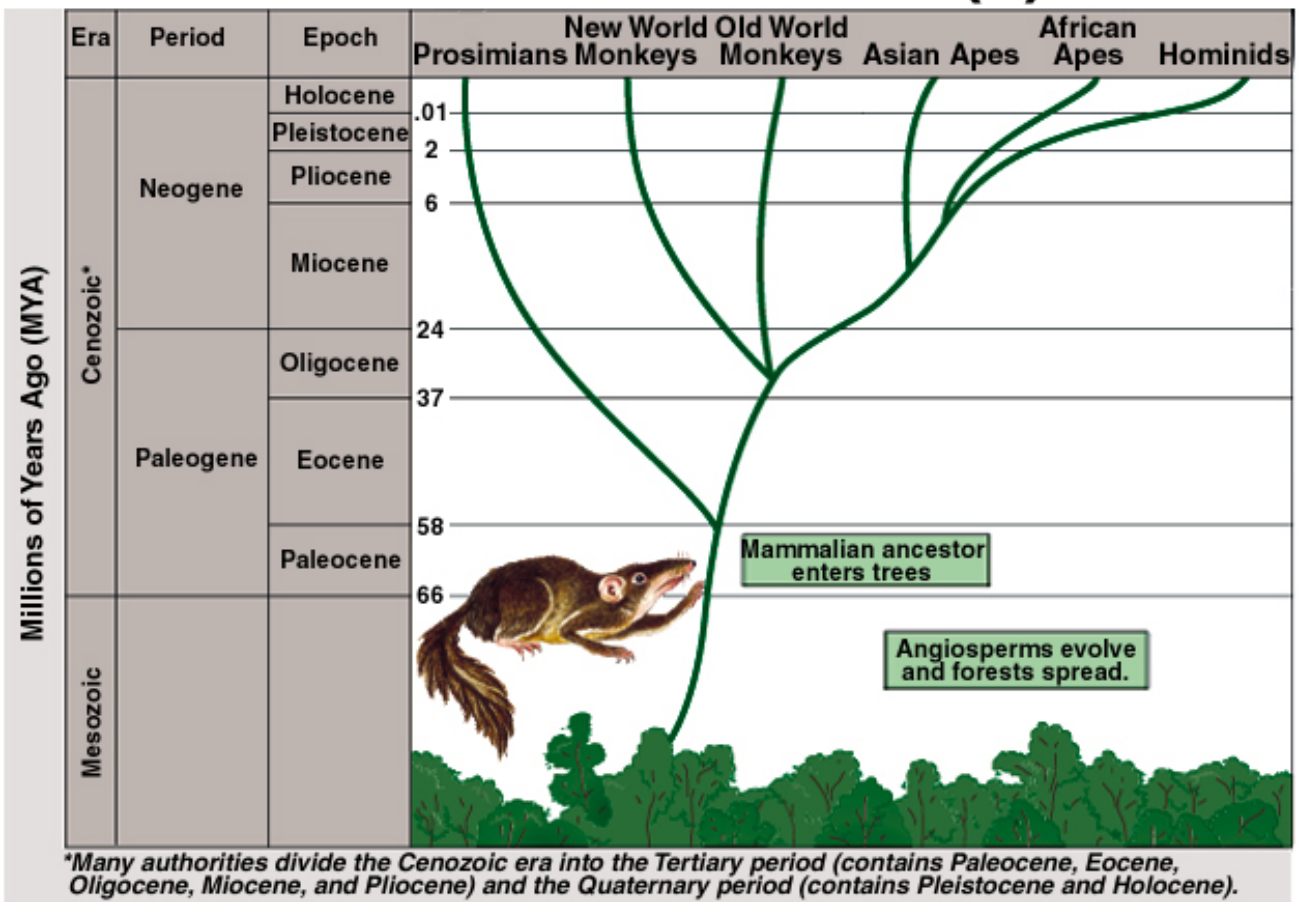
Left: chimp foot, Right: human foot; notice the opposing big toe of the chimp using for grasping tree branches, has moved to the direction of the other toes in humans, which helps us walk on the ground**.**

ORANGUTAN PHOTOS

Durian Fruit

			
	WESTERN LOWLAND GORILLA ***Gorilla gorilla gorilla***	**CHIMPANZEE** ***Pan Troglodytes***	**BORNEO ORANGUTAN** ***Pongo pygmaeus***
Weight	Males 300-600 lbs Females 150-300 lbs	Males 85-180 lbs Females 75-150 lbs	Males 110-220 lbs Females 66-110 lbs
Lifespan	35 yrs in wild 50+ yrs in captivity	40-45 yrs in wild 50+ yrs captivity	35-45 yrs in wild 50+ yrs in captivity
Group Dynamics	Usually peaceful. Fighting is rare but aggression may consist of bluffs and threats	Chimps are excitable! Aggression may consist of bluffs, threats (tree branch shaking and screaming) and fights.	Usually gentle and placid. Relatively unsociable.
Society	1 adult male (silverback), several females and their offspring.	Large multi-male communities, which break into small groups. Males have strong bonds and unrelated females rarely interact.	Adults are solitary but mothers stay with their young up to 8 years. Regularly seen in very small feeding aggregations and travel bands.
Group Size	Consist of 5-10 permanent members. Some groups can be up to 30.	Communities 20-100. Fission/Fusion society.	Primarily solitary. Adult females are less solitary than males. Males are generally intolerant of each other and avoid one another.
Mating	Silverback stays with group for life and breeds with females. Females do not develop a sexual swelling.	Females develop swellings during breeding cycle. Males stay with the females during breeding cycle but will then move to other groups	Male-male competition for access to sexually receptive females is a major factor in orangutan extreme sexual dimorphism.
Homes	Spend most of the time on the ground where they build nests for sleeping. Females and young may build nests in trees	Spend more time in the trees where they build nests for sleeping.	Almost exclusively arboreal in the canopy. Orangutans are not territorial.
IUCN Red List	Critically Endangered	Endangered	Critically Endangered; most endangered of great apes.

Primate evolution (1)



*Many authorities divide the Cenozoic era into the Tertiary period (contains Paleocene, Eocene, Oligocene, Miocene, and Pliocene) and the Quaternary period (contains Pleistocene and Holocene).