

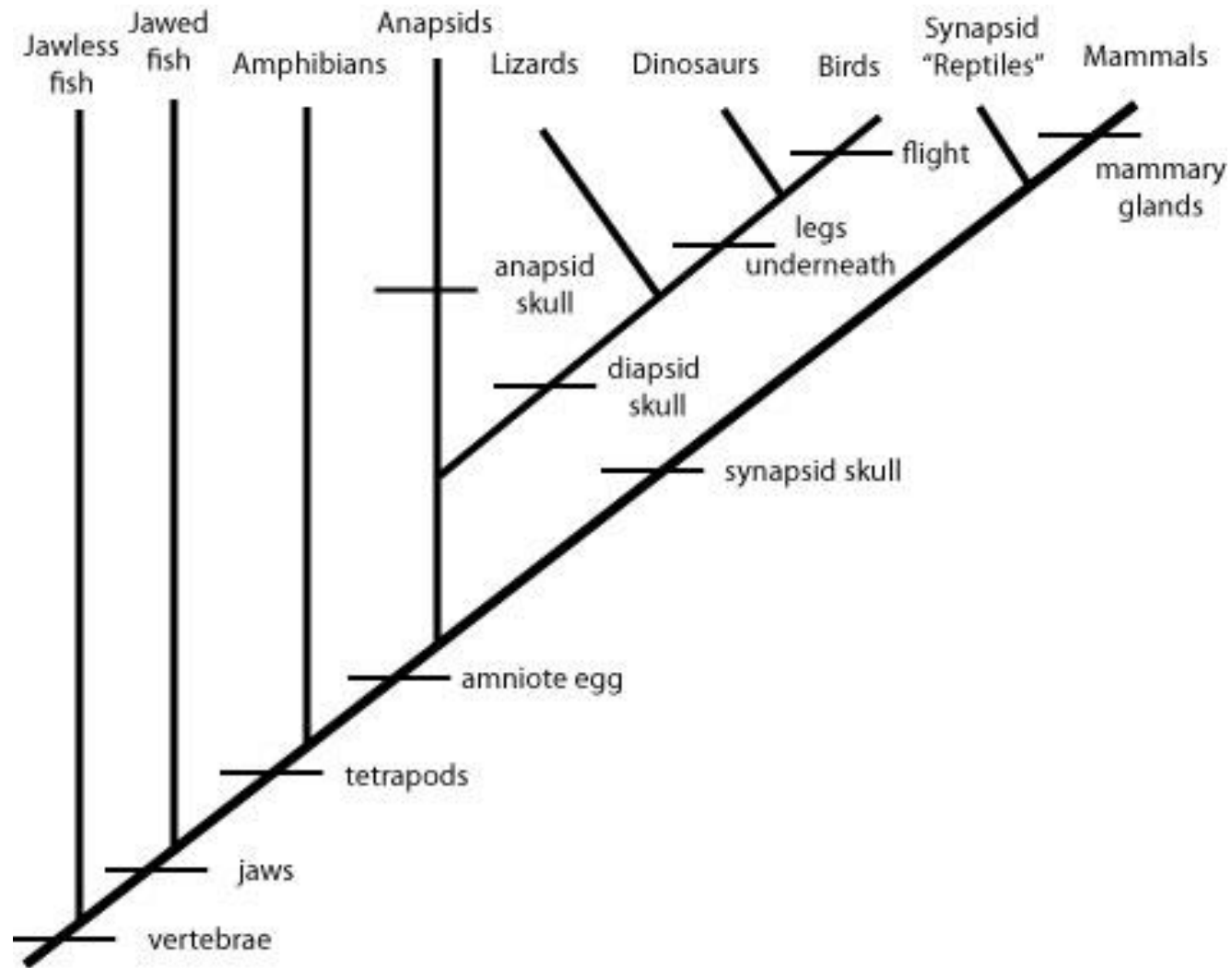
We Came From What!?

How to read a cladogram

Vocabulary

- **Trait:** an attribute the organism has.
A typical character for an animals might be eye color.
For plants, it might be petal number.
- **Derived Trait:** – has changed compared to the old, or “ancestral”, trait.
(homologous structures)
- **Evolution-** descent with modification
- **Homology-** similarity between structures due to common ancestry.
Ex. Bat wing and human arm
- **Speciation** – When a single species splits into two species. Usually as the result of a new character state developing
- **Cladogram:** what scientists call an evolutionary tree.

Example of Cladogram



Is a hippopotamus more closely related to a pig or to a whale? Be able to support your answer.



HIPPO → WHALE



Based on physical comparisons (particularly dental structure and number of toes) it was originally thought that hippos were most closely related to pigs but DNA analysis indicates that hippos are more closely related to whales!

Evolutionary Link

- Whales and hippos had a common water-loving ancestor 50 to 60 million years ago that evolved and split into two groups:

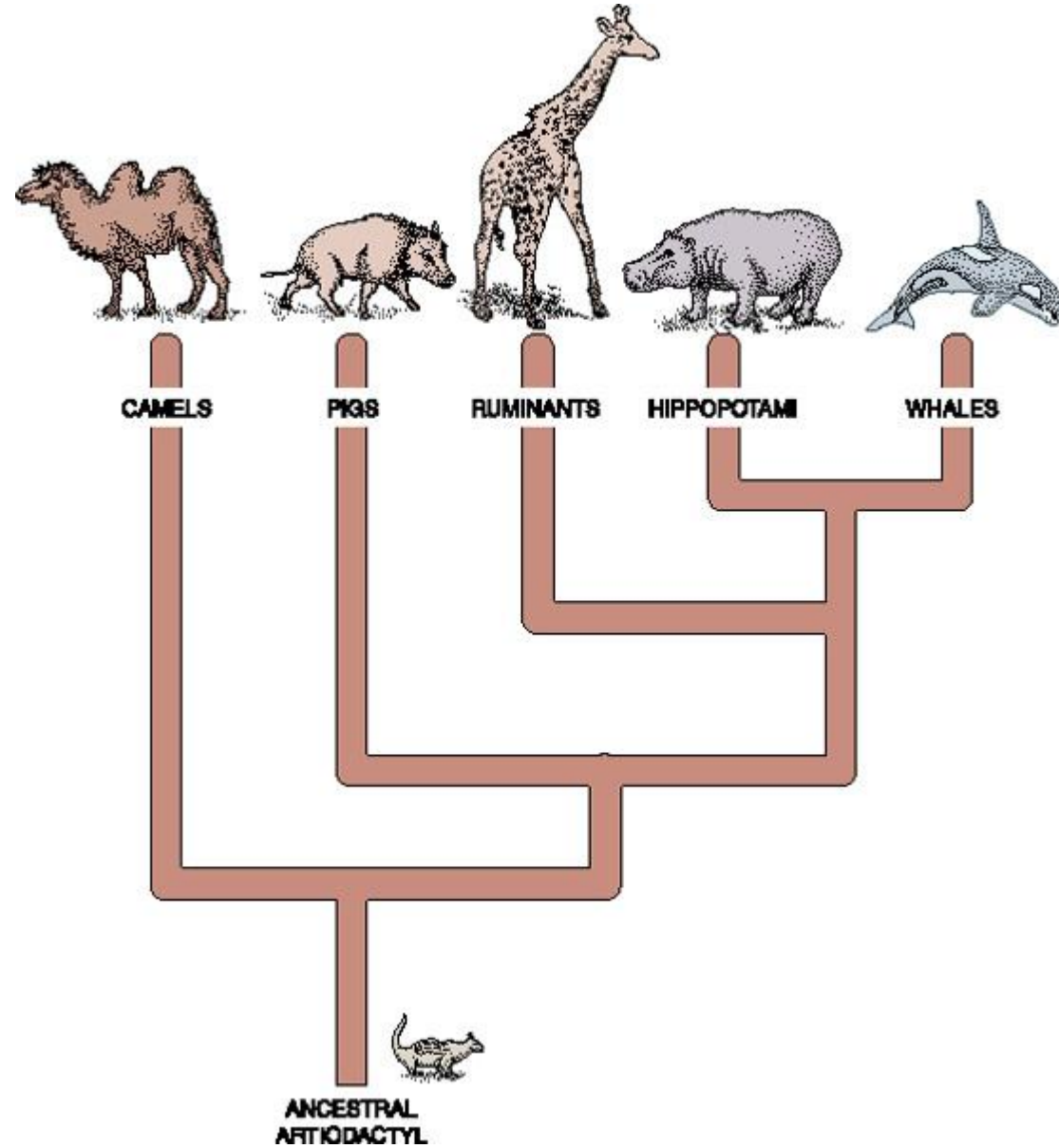


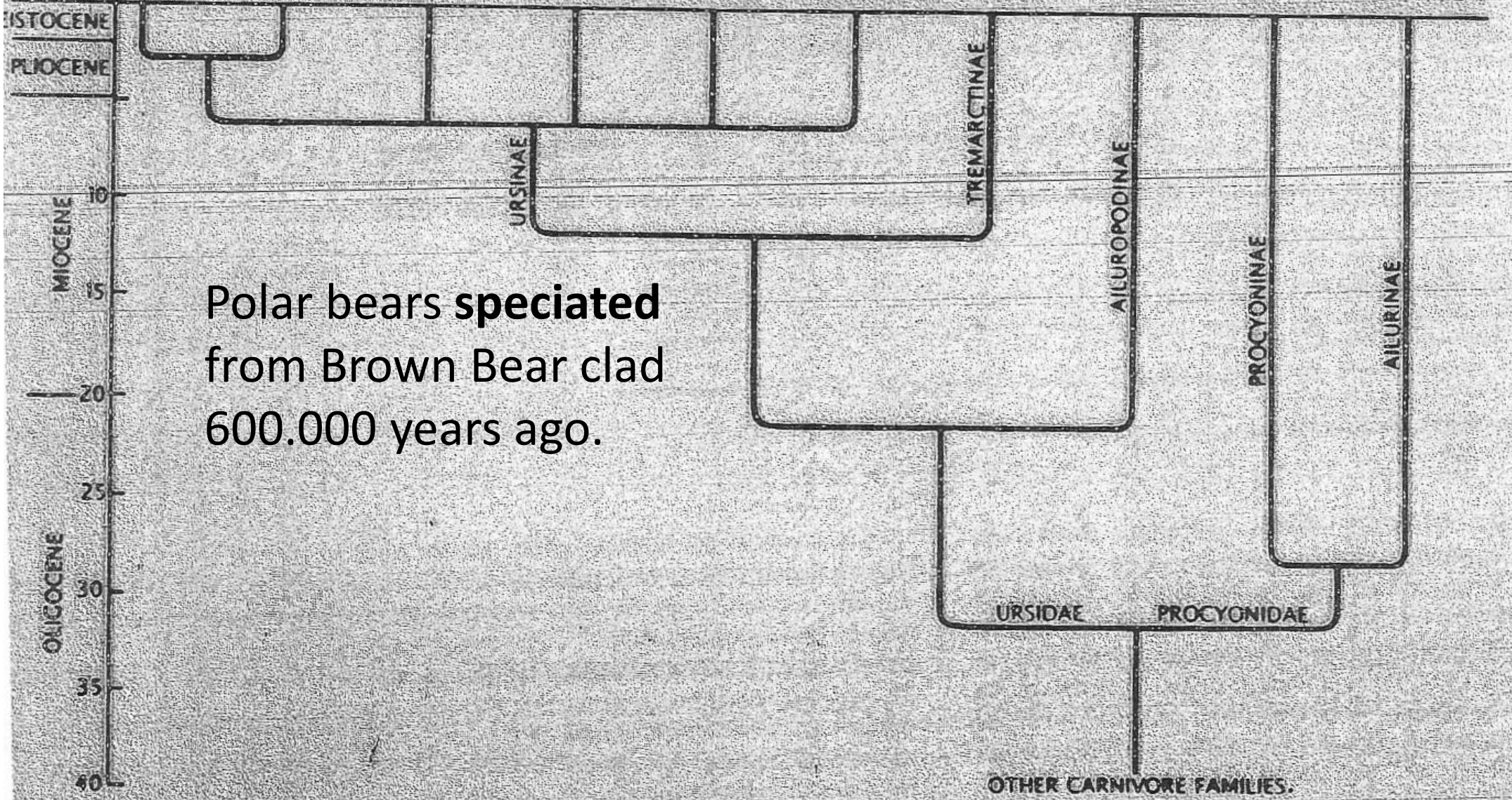
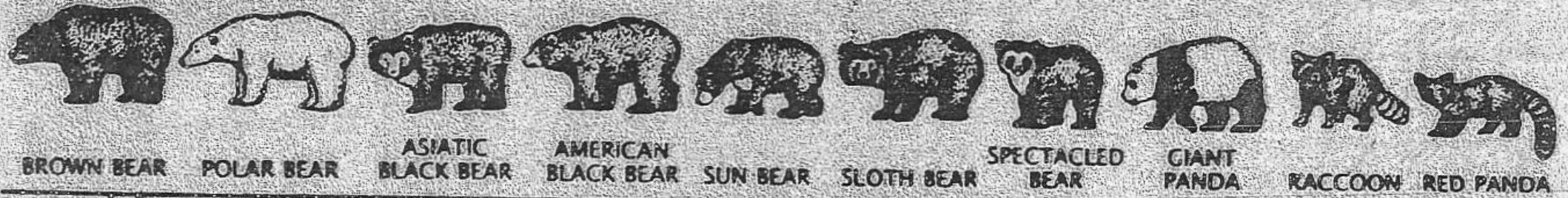
The cetaceans (whales, dolphins, and porpoises)



The pig-like anthracotheres – died out less than 2.5 million years ago, leaving only the hippo as a descendent

Cladogram / Molecular Tree





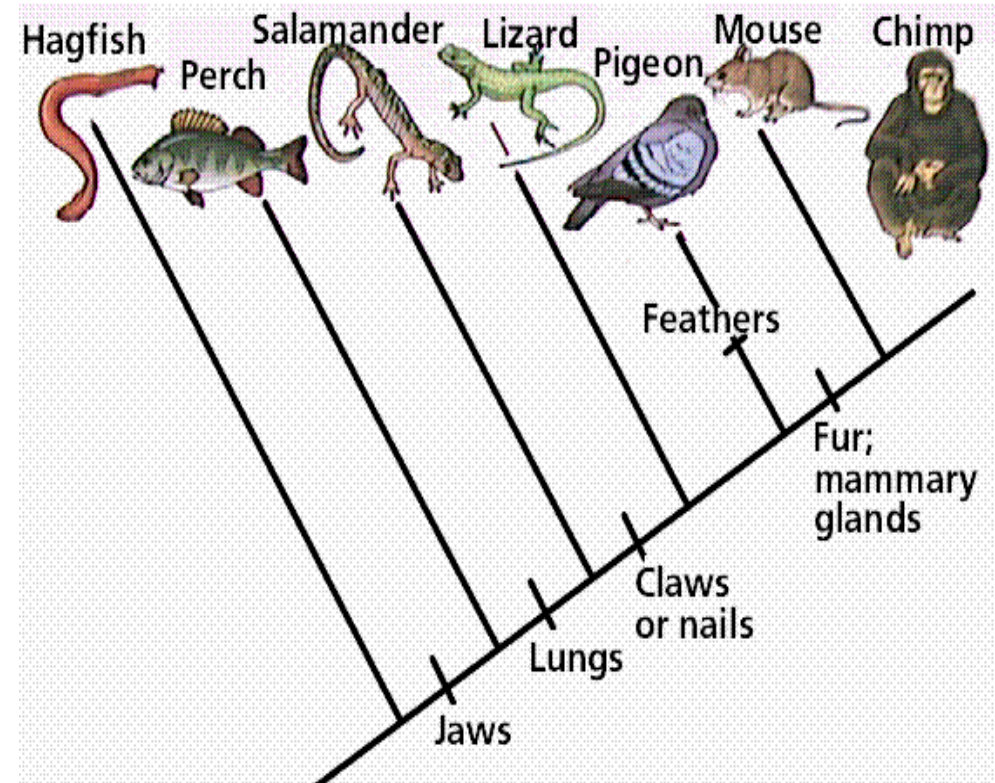
Polar bears **speciated** from Brown Bear clad 600.000 years ago.

Cladograms are used to...

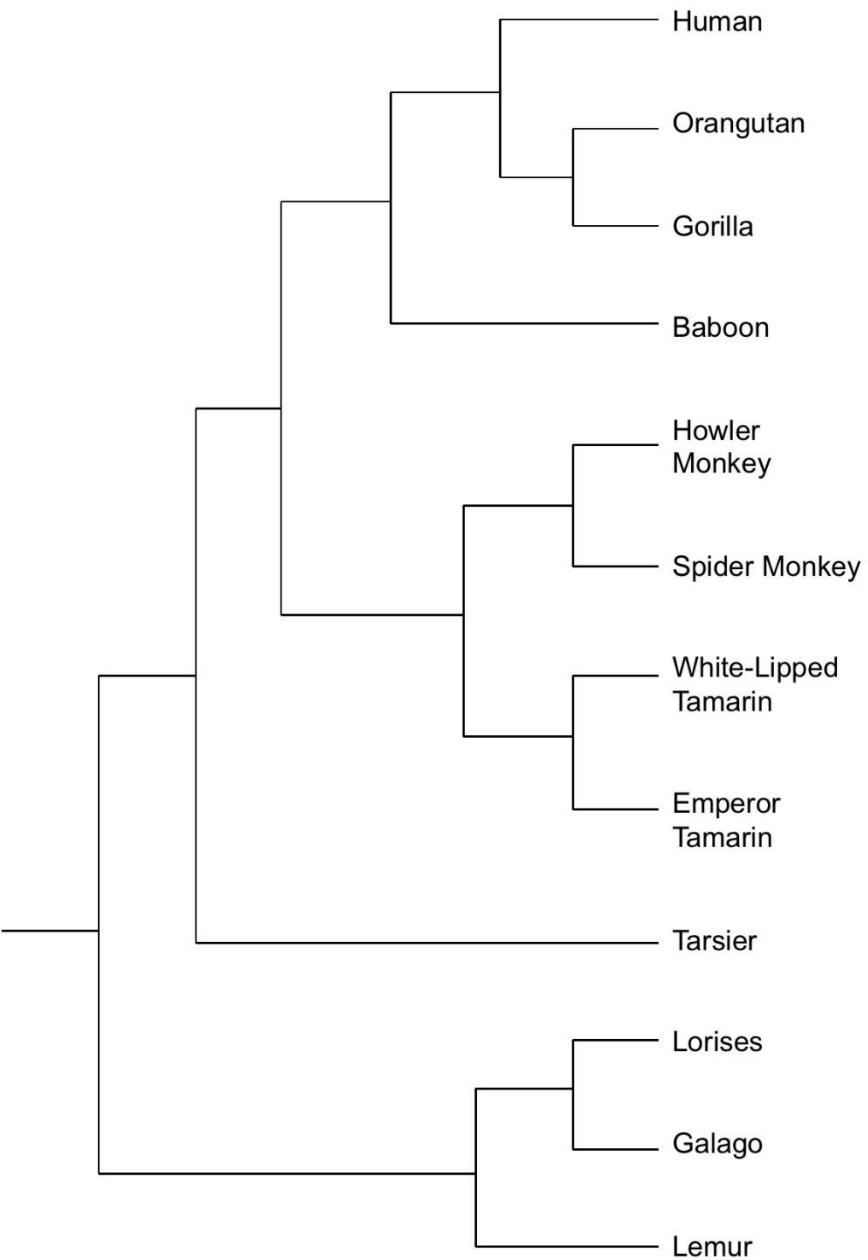
- Organize organisms based on evolutionary relationships (phylogeny).
- In other words... who is related to who and where did we come from...

Organisms are grouped together based on their shared derived characteristics (trait modified from the ancestral trait).

- Which animals have claws/nails?
- Which animals have fur/mammary glands?
- To what is the chimp most closely related to?
- What traits do the lizard and pigeon have in common?



Primate Family



• Who is more closely related?

- Tarsier and Spider Monkey
- Baboon and Howler Monkey
- Spider Monkey and White-Lipped Tamarin
- Human and Orangutan
- Gorilla and Orangutan