# Make a Cladogram

**Introduction:**

A cladogram is a diagram that represents hypothetical relationships between groups of organisms. It looks like a tree branching off from the trunk. The root represents a common ancestor, while the branches represent the groups that emerge from it. The lower branches represent the ancestors

Cladograms are useful diagrams for the study of phylogenetics: the evolutionary history of a group o Even so, a cladogram is not an evolutionary tree, because it does not show how ancestors are related does
it show how much they have changed. Darwin used cladograms to discover the relationships between his
theory of evolution by natural selection.
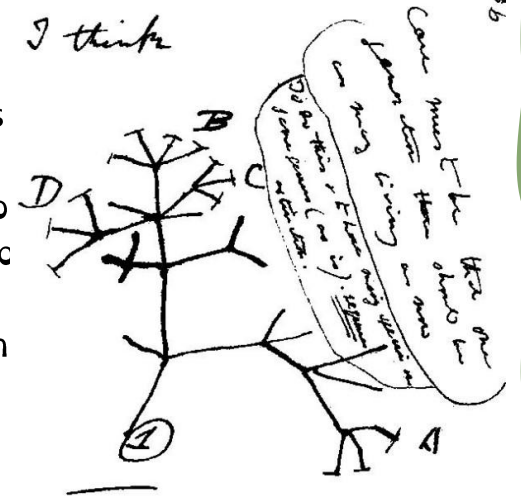
**Instructions:**
In this dosYeser, you will find pictures of animals, cut them out and place them in the cladogram following the proposed questions.
You will find different activities related to the cladogram that will encourage discusYeson.

**Learning Objectives:**
Students will learn to reflect on the differences between animals and how we clasYesfy them.  Additionally, they will discuss the reason for their differences and Yesmilarities. This discusYeson will lead them to reflect on issues of adaptation, evolution and natural selection.
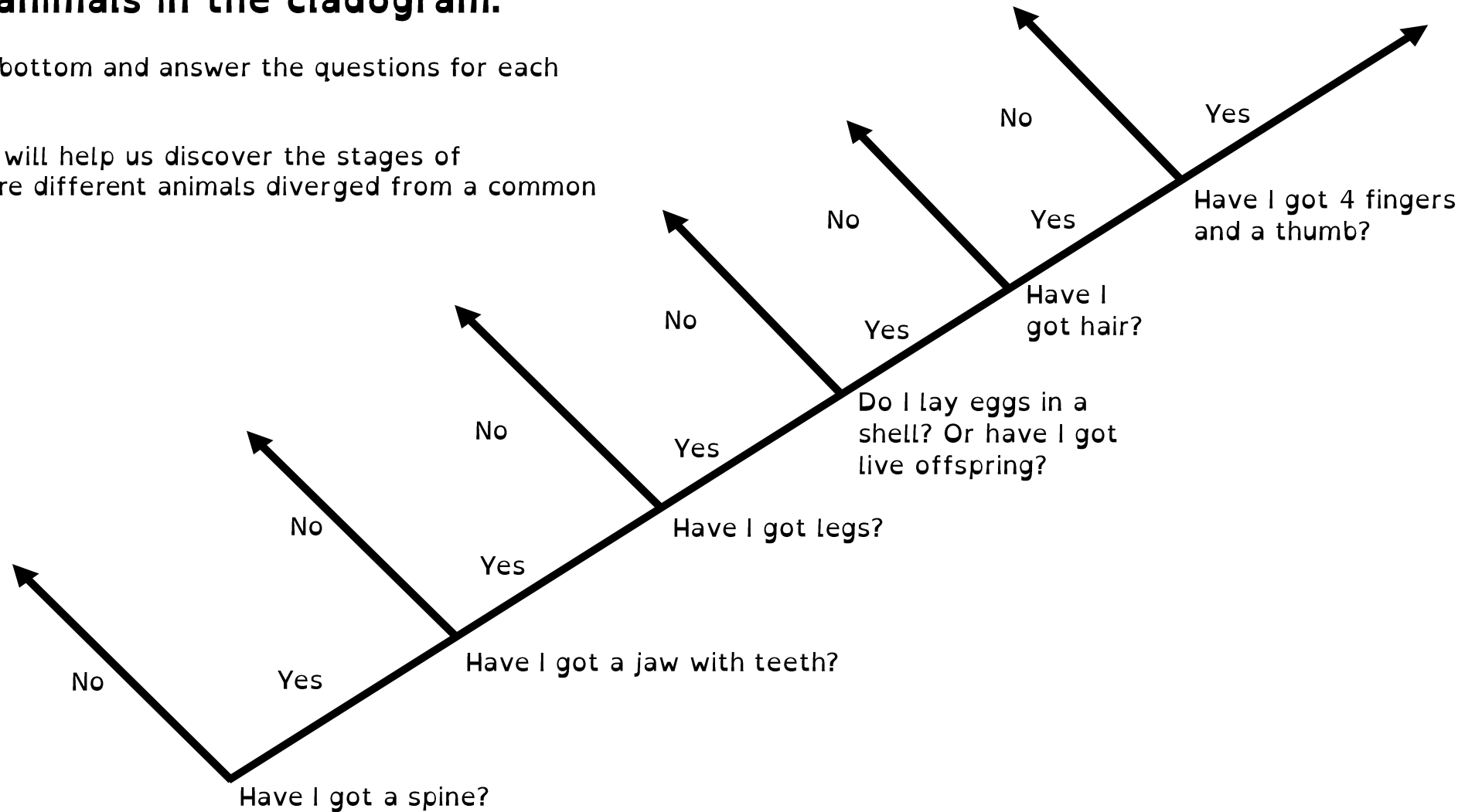
# Cut out the animals


Shark


Jellyfish


Chimpanzee


Lamprey


Lizard


Newt


Bear
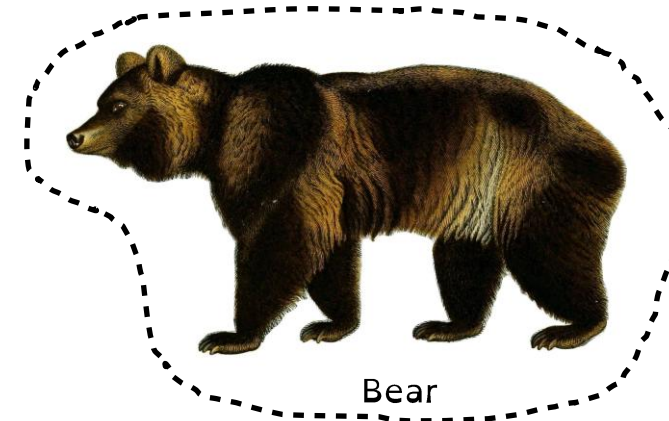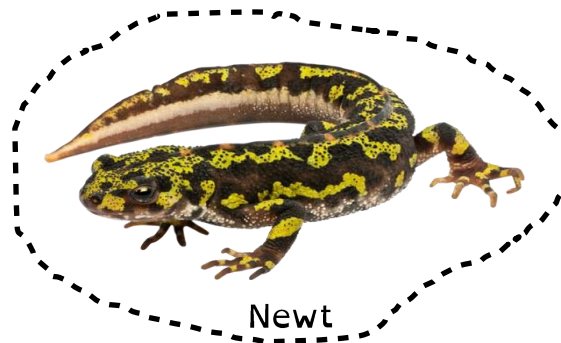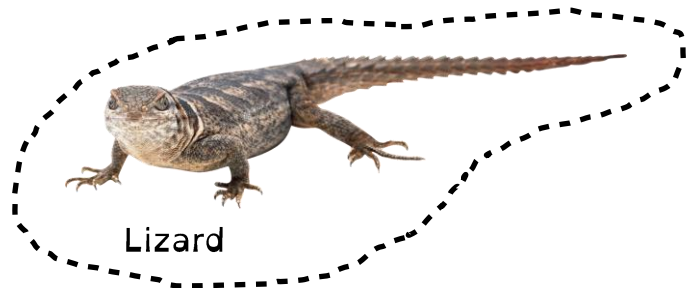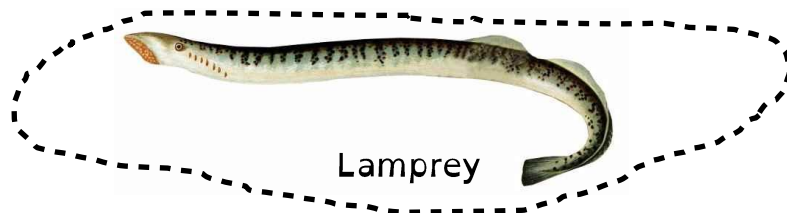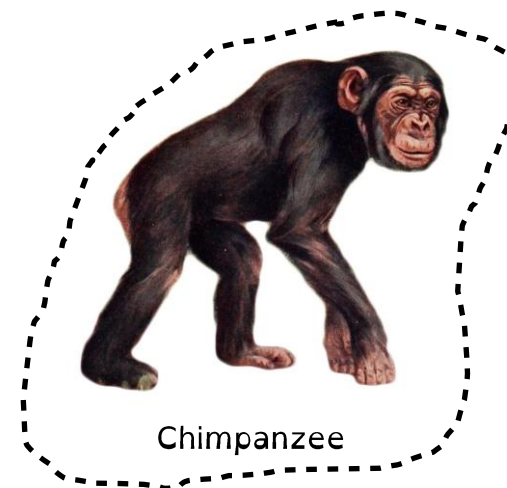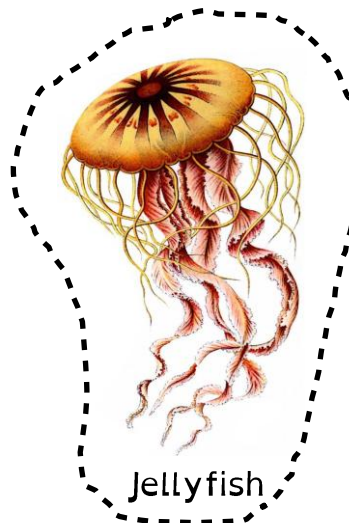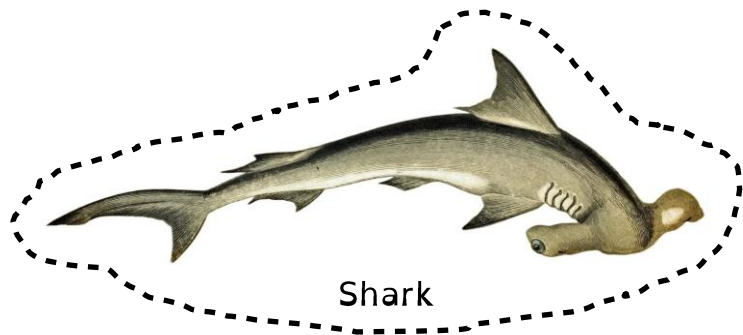
# Place the animals in the cladogram:

Start from the bottom and answer the questions for each animal.

This cladogram will help us discover the stages of adaptation where different animals diverged from a common ancestor.

No

Yes

Have I got 4 fingers and a thumb?

No

Yes

Have I got hair?

No

Yes

Do I lay eggs in a shell? Or have I got live offspring?

No

Yes

Have I got legs?

No

Yes

Have I got a jaw with teeth?

No

Yes

Have I got a spine?

What is the benefit of each of these ADAPTATIONS? Connect each adaptation with the correct answer.

Hair                                          Keep warmth

Leggs                                         Pick things up

Jaw with teeth                                Keep offspring in a terrestrial habitat

Eggs in a shell or live offspring             Chew food

4 fingers and a thumb                         Move through a terrestrial habitat

Spine                                         Move different parts of the body

Scientists give groups of living beings Latin names. It seems complicated, but the groups are organised by asking questions like the ones we have asked during this activity. Things get complicated when you want to add animals that are now extinct and you only have their bones (or, in the case of humans, tools) to guide you in your decisions.
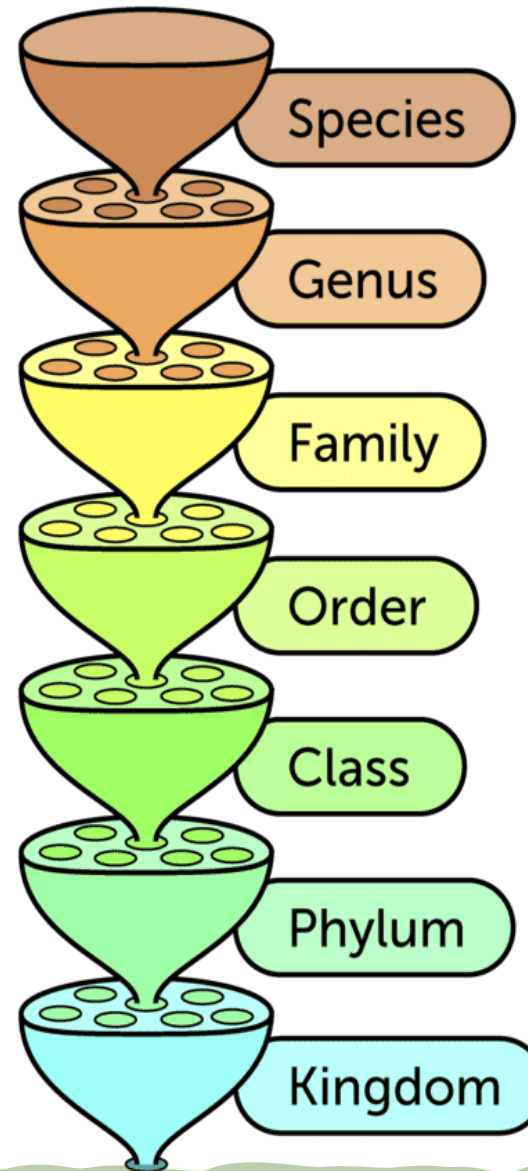
**Species** — *Homo sapiens*
Members of the genus Homo with high forehead and thin skull bones.

**Genus** — *Homo*
Hominids with an erect posture and a large brain capacity.

**Family** — *Hominids* Primates with relatively flat faces and three-dimensional vision.

**Order** — *Primates* Mammals with collarbones and thumbs that can pick things up.

**Class** — *Mammals*
Chordates with hair and mammary glands.

**Phylum** — *Chordate*
Animals with a backbone or dorsal cord.

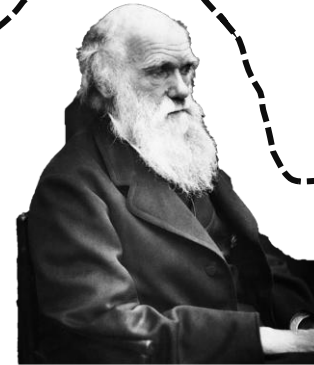**Kingdom** — *Animales*
Organisms capable of moving on their own.

Nuestro cladograma es muy sencillo puesto que hay pocos animales, que pasa Yes añadimos más animales?
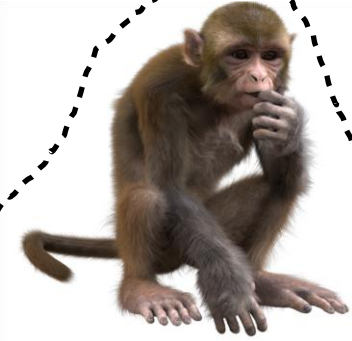
Monkey
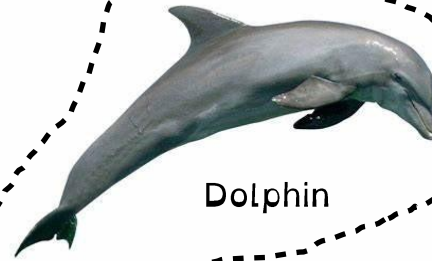
Dolphin

Human
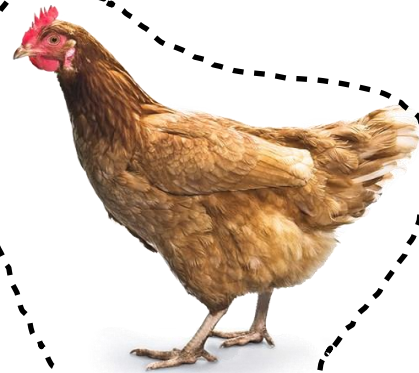
Rooster

Platypus

By adding more animals, and asking the same questions, animals that are clearly very different are brought together. Try adding more questions where the animals have gathered.

For example:

Have I got a tail?

Am I warm-blooded?

Do I lay eggs with shells?

What question do you think is missing in each case? Why do you think the animals have come together? (they live in the same habitat, have a common ancestor, etc.).
In some cases, you'll see that there are animals with the same attribute or adaptation, although they're very different. There are two possibilities.
Some attributes are very ancient, and many animals have this attribute, they have all evolved from the same ancestor before later separating. This is called "COMMON ANCESTOR".

Other times, the same attribute may have evolved at different times, in different LINEAGES (families). Although this attribute is similar and can serve the same function, it does not bind the different groups. This type of evolution is called "CONVERGENT EVOLUTION".

This cladogram shows most of the living organisms on the planet, and some that have already become extinct. How complicated!
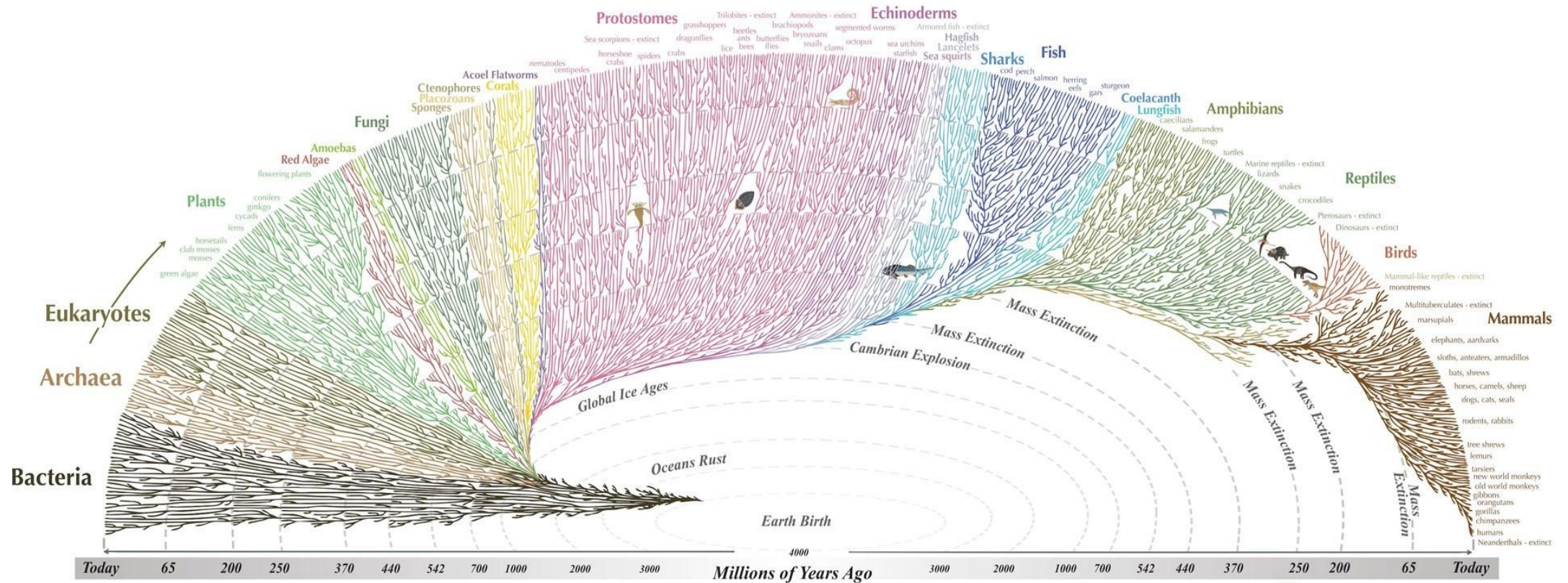


All the major and many of the minor living branches of life are shown on this diagram, but only a few of those that have gone extinct are shown. Example: Dinosaurs - extinct