

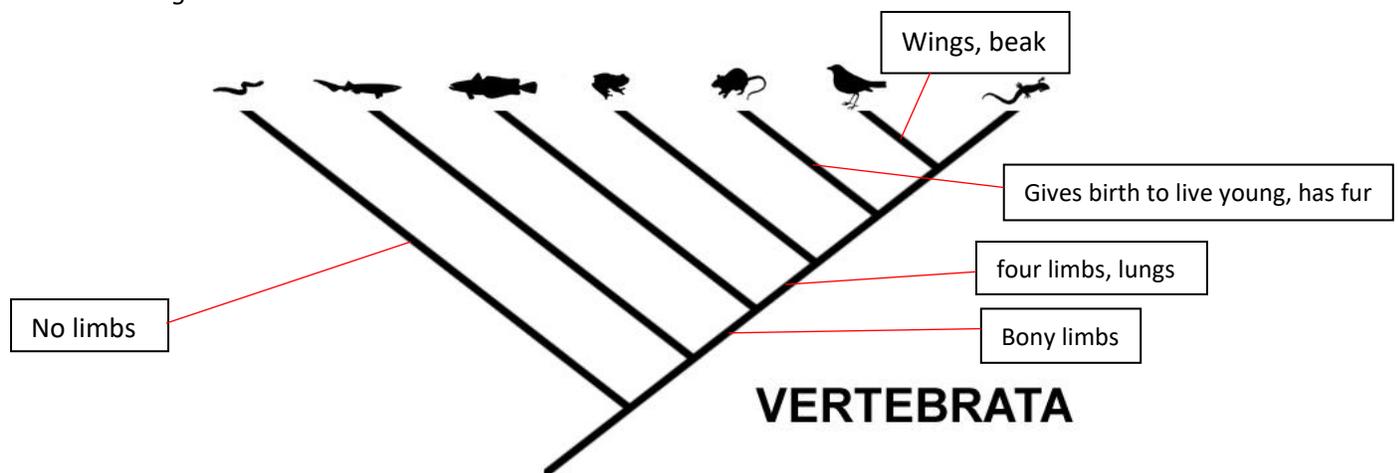
Animal Classification Activity

Note to Parents and Guardians: This is only a very basic introduction to how animals are classified. For further information, visit the website of the Tree of Life Web Project at <http://tolweb.org/tree/>

One important aspect of paleontology is determining how prehistoric animals are related to each other and modern animals. Paleontologists use a method called taxonomy to help determine how different organisms are related. Every animal on the planet shares some common ancestry, but some animals are more closely related than others. One relationship commonly discussed at The Mammoth Site of Hot Springs, South Dakota is that which exists between mammoths and their modern cousins the elephants. Both are members of a group called proboscideans. When looking at modern elephants and their cousins the other proboscideans, their closest living land relative is actually a small rodent-like animal called the hyrax.

Directions:

1. Gather at least five different toy animals from around your home. If you don't have five different ones, or you want more variety, feel free to use internet resources to choose your animals (with your parent or guardian's permission!). This is easiest to do with stuffed animals and plastic toy animals.
2. Describe each animal, here are some helpful questions to ask:
 - a. Does it have a skeleton on the inside or outside? (Parents and Guardians can help answer that question)
 - b. Is it a bird, mammal, reptile, fish, amphibian, or insect?
 - c. How many legs does it walk on...or does it not have legs?
 - d. Does it live in the water or on land?
 - e. Does it have feet, wings or flippers? If yes, which ones?
 - f. Does it have horns? Tusks? Antlers?
 - g. Can it fly?
 - h. Can you think of any other traits your animal has? List them!
3. After you answer these questions for each animal, sort them into groups, based on the number of similarities each has.
 - a. For example, do they all have four limbs? Put them in a group. Do some in that group walk on two legs? Put them in a sub group.
 - b. Draw your groupings in a branching diagram. In science, this is called a 'cladogram'. For some examples, look at internet resources, one is mentioned above. Below is an example of a cladogram, but note that yours can look a little different. Where two lines meet, that is a common ancestor. The important part of a cladogram is that the branches reflect how closely you think two animals are related. On the example below, the fish are more closely related to the amphibian than the bird. You can also think of this being similar to a family tree. Some example traits have also been included to give you an idea of how they work. *Note: The red lines are there to help you see where the labels go. You may want to also label your cladogram.*



- c. Some of your animals might fit into multiple subgroups. That is okay! In paleontology, it can take years of research to determine what group an animal belongs to. In some cases, that has even changed several times!
4. Want to see if your grouping was correct?
 - a. Go online with your student and see what clades your animals belong to.
 - b. Don't be discouraged if your answers don't match up. Scientists have debated the grouping of animals, especially prehistoric ones, for decades, even centuries.

Discussion

- Just because two animals share a trait, does it mean that they are related based on that trait? Answer: No, look at bats, birds, and pterosaurs. All can fly, but they are distant relatives.
- Can an animal's appearance be deceiving when it comes to classification? Answer: Yes, some animals, like elephants, rhinoceroses, and hippopotamuses have similar appearance traits. However, these animals are distant relatives. Hippopotamuses are actually more closely related to cows. Rhinos are more closely related to horses! Rhinos and hippos are no more closely related to elephants than we are! Dinosaurs, for decades portrayed as giant lizards, were actually quite closely related to birds. In fact, birds are the only extant member of the group—they are dinosaurs.