



'Ologies' Activity Guide Biodiversity Camp

What you need

- Activity Guide Worksheet, included in the final pages of this Activity Guide
- Scissors

Preparation

Etymology is a way to understand a word and its meaning. A word and its meaning can be studied by taking the word apart and separating it into specific sections. Looking at the etymology of words is one way to understand the many different types of scientists that study biodiversity, or the variety of living things.

Mammalogy is the study of mammals, so a mammalogist studies mammals. Botany is the study of plants, so a botanist studies plants. Although these scientists study specific organisms, it is important to realize the interconnectedness of these different living things. Evolutionary trees are tools that can be used to better understand how living things from the past and present, including organisms that have gone extinct, are related to one another.

What to do

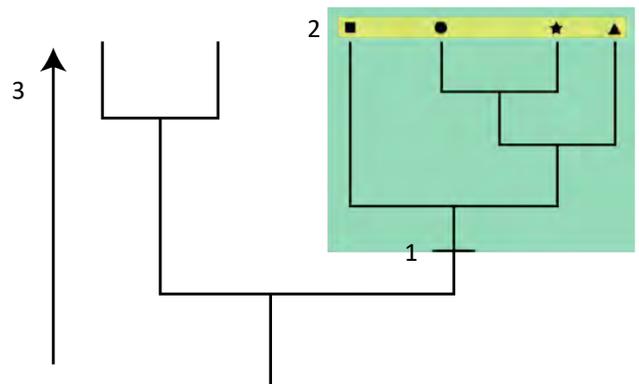
Use the Activity Guide Worksheet to explore the interconnectedness of life on earth.

What is happening?

Evolution is descent with modification and can be studied using an evolutionary tree. Evolutionary trees have several important features including common ancestors, shared derived characters, and descendants.

Using the evolutionary tree at the right, review several important features of an evolutionary tree.

- 1) Shared derived character – The shared derived character (1) of descendant lineages on the tree, a feature that all the lineages share with their common ancestor. All the descendant lineages belong to a clade (the green highlighted rectangle) because they have a shared derived character.
- 2) Descendant lineages – The descendant lineages (2, the long, yellow highlighted rectangle) share a common ancestor.
- 3) Timeline – Time is represented by a timeline (3). The most recent time is at the top of the tree near the descendant lineages. The oldest time is at the bottom.





'Ologies' Activity Guide Worksheet
Biodiversity Camp

Part 1.

Using scissors and the squares on pages 1 and 2, cut along the dashed lines and cut out the pieces for the memory and matching game. After cutting the pieces out, shuffle them and lay them on a flat surface. Make sure the cards are placed face down on the surface! You do not want to see what is on the pieces. Then, turn two pieces over. If the two pieces do not match, return them to the playing area, face down. If the two pieces match, remove them from the playing area. A match is made when a piece that contains the name of a scientific study and a piece that contains an image representative of that field of study are paired together.

The purpose of this game is to make as many matches as possible. You can play by yourself or with others. If you play with others, remember to take turns!

<p>Botany</p>	 <p>Botany Image from Sara Zenner, NPS</p>	<p>Entomology</p>	 <p>Entomology Image from R. Cammauf, NPS</p>
<p>Herpetology</p>	 <p>Herpetology Image from A. Sanchez, NPS</p>	<p>Ichthyology</p>	 <p>Ichthyology Image from Larry Perez, NPS</p>

**Invertebrate
Zoology**



Invertebrate Zoology
Image from Cape Hatteras
National Seashore, NPS

Mammalogy



Mammalogy
Image from NPS

Ornithology



Ornithology
Image from R. Cammauf, NPS

Paleontology



Paleontology
Image from Bruce Avera
Hunter, USGS

Part 2.

Using scissors and the squares on page 3, cut along the dashed lines and cut out the images of the animals. Using these images, fill in the missing organisms with the images of animals and complete the evolutionary tree on page 4 based on what you know about reading evolutionary trees.



Eastern Bluebird (Bird)
Image from R. Cammauf, NPS



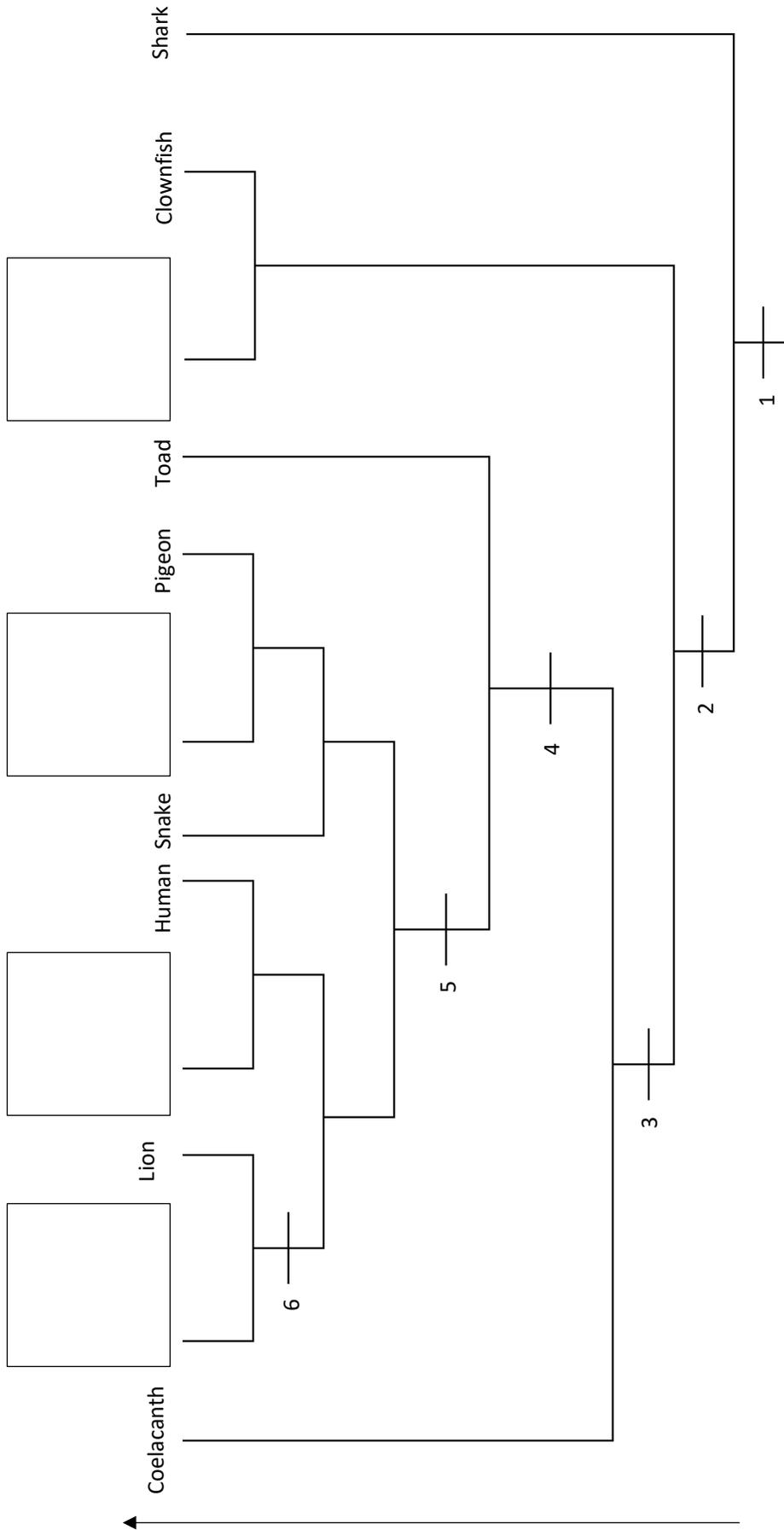
Chimpanzee (Mammal)
Image from Jenny via Flickr,
CC BY-NC-ND 2.0



American Black Bear
(Mammal)
Image from Eileen Hornbaker,
USFWS



Bluegill Sunfish (Bony Fish)
Image from Larry Perez, NPS



Shared Derived Characters

- 1 - Jaws
- 2 - Bony skeleton
- 3 - Appendage composed of single bone that articulates with the shoulder called the humerus
- 4 - Four limbs
- 5 - Amniotic egg
- 6 - Specialized slicing teeth