

PHYLOGENETIC TREE Concept Development (sect 10.4 2nd OR 11.4 3rd)

In a phylogenetic tree, similar characteristics that are believed to come from a common ancestor are used to divide organisms into groups. The tree begins by grouping organisms based on a characteristic displayed by all the members of the group; called the **PRIMITIVE CHARACTERISTIC**. Subsequently, the larger group will contain increasingly smaller groups that share the traits of the groups before them, but also exhibit distinct changes as the organism evolves. These new characteristics are called **DERIVED CHARACTERISTICS**.

Lets try one!

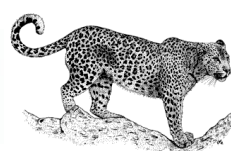
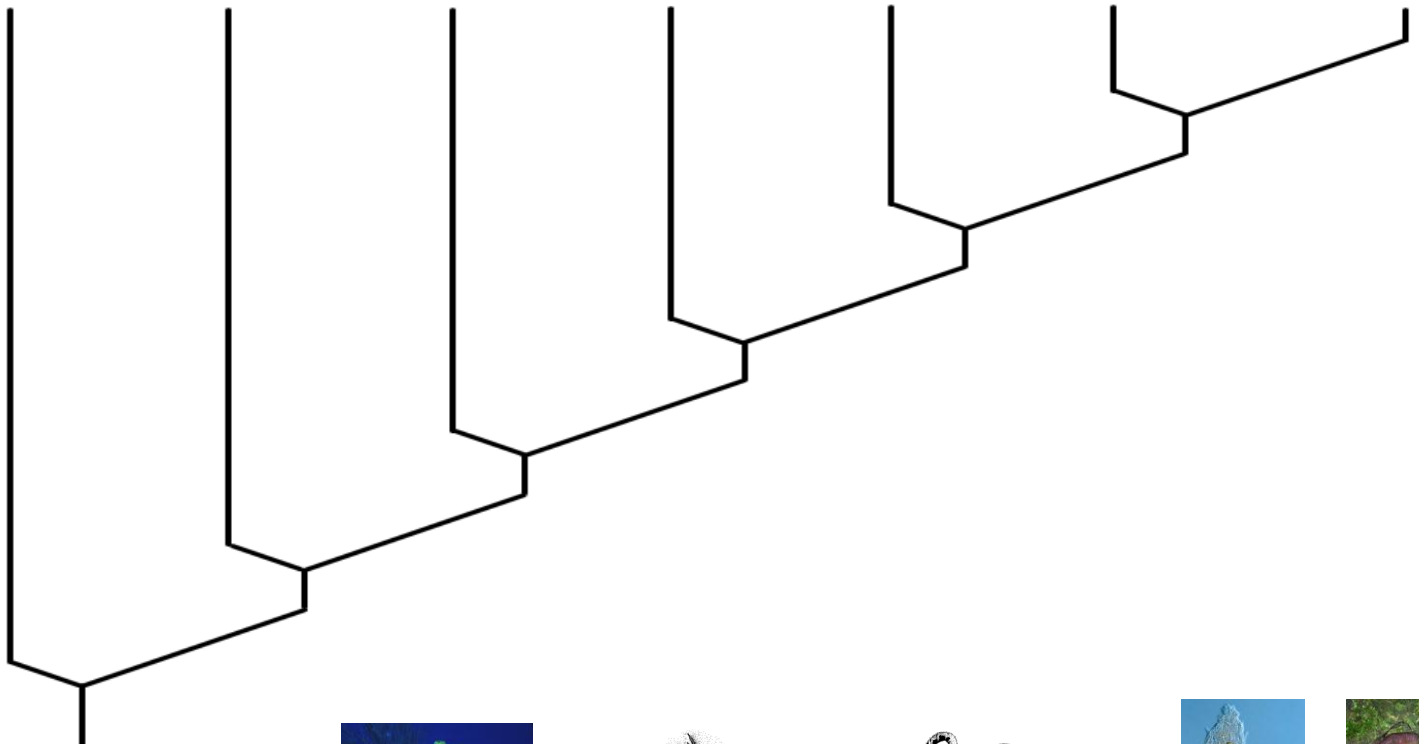
Step 1: Use this chart to determine which organism have which characteristics. Is there a characteristic that ALL of the organisms share? This is the PRIMITIVE characteristic and should be placed at the base of your tree. Place a '1' if the organism has the characteristic or a '0' if they do not.

Step 2: Add up the total # of characteristics displayed by each organism and put that # in the 'Total #' column.

Organism	Is Eukaryotic	Is Multicellular	Segmented Body	Has Jaws	Has 4 Limbs	Has Hair	Placental Birth	Total #
Kangaroo								
Sponge								
Lizard								
Salmon								
Leopard								
Amoeba								
Earthworm								

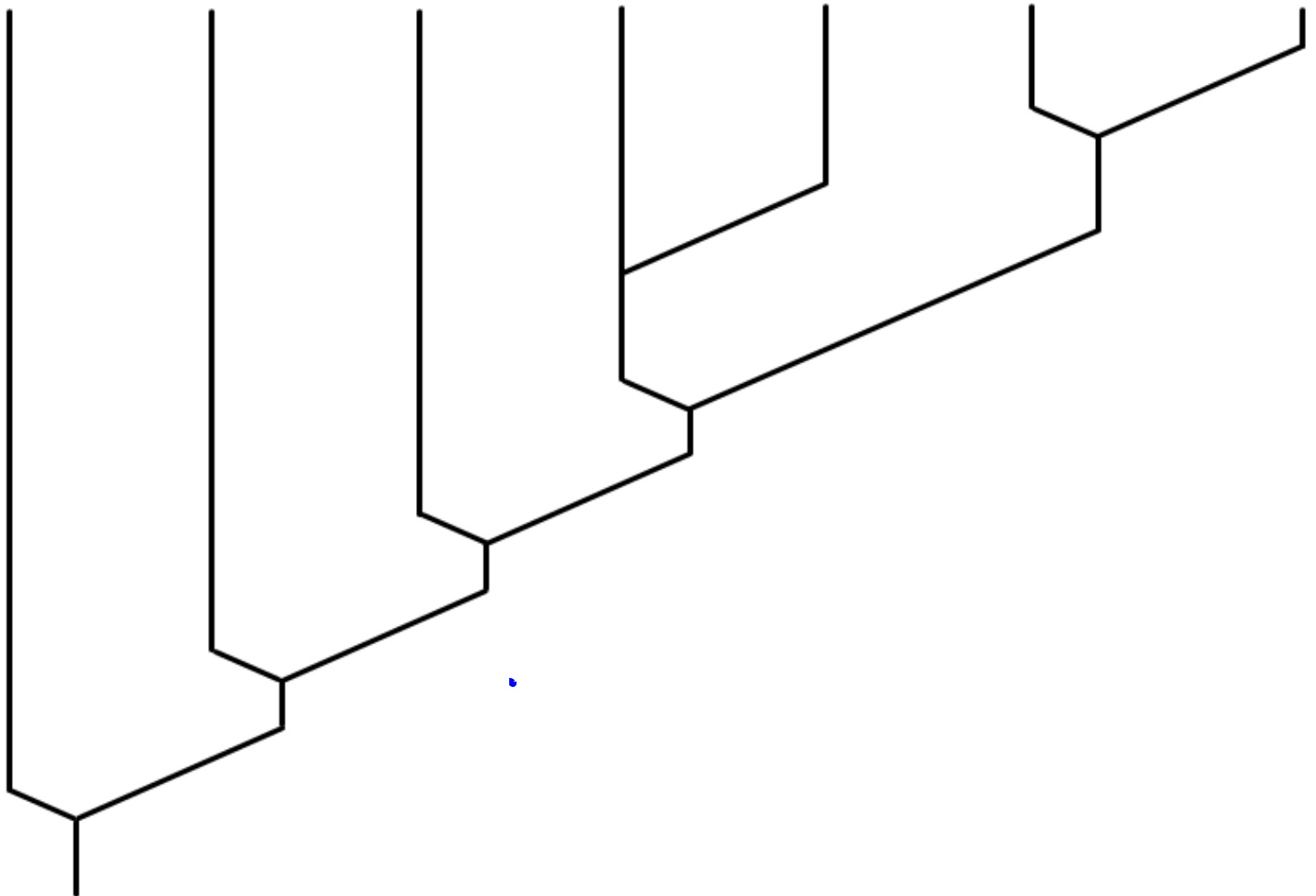
Step 3: Place the organisms at the top of the appropriate branch. Use the 'Total #' value to help you determine which organism goes on which branch of the tree.

Step 4: Place the appropriate DERIVED characteristic at the base of the appropriate branches to show the emergence of a new characteristic. Organisms to the right should display this characteristic but organisms to the left will not.



VERTEBRATE PHYLOGENETIC TREE

Organism	Has Feathers	Is A Vertebrate	Tetrapod (4 Limbs)	Bone Skeleton	Placental Birth	Prehensile Limbs	Amniotic Egg	Total #
Fox								
Hawk								
Frog								
Gecko								
Shark								
Gorilla								
Fish								



Some Helpful Information:

- Amniotic egg is a watertight egg in which the embryo develops inside of a protective amnion membrane. This type of egg allowed for a fully terrestrial life (on land). (There are some mammals that lay amniotic eggs!)
- Prehensile limbs give the organism the ability to grasp or pick up objects with hands feet or tail.
- Placental birth means that the developing offspring are nourished via a placental in the mother's womb.
- Sharks belong to the class Chondrichthyes, which means they have a skeleton made of cartilage.