

## TREE OF LIFE PROJECT

### Lesson Concepts:

- Everything living is related.
- The Tree of Life shows how living things are related to each other.
- Morphological (form and/or structure) features can be used to put organisms into different groups.
- Scientists classify organisms.

### Procedure:

1. Begin by locating examples of "the tree of life" on the internet. Review the examples, so that you understand the concept. All living things have a place on the tree of life. Organisms are grouped by their similarities and differences. In addition, the branches show how groups of organisms are evolutionarily related to each other.

2. Research the organisms listed in Chart 1 (below). Place key traits and descriptions on index cards. What are their characteristics? What other organisms are they closely related to? Any other details that will help you construct the tree? Index cards should be neat and detailed. Basic characteristics are listed below. Do NOT forget to note your references in APA format. Use only one side of the card. It will be glued to the back of your poster.

CHART 1. Branching of the "TREE"

After:	Character:
Viruses	Replicate their own DNA
Unicellular Prokaryotes	Organelles in the cell
Protists	Multicellular
Red & Brown Algae	Towards plants: Photosynthesis Towards animals: Consume other organisms for energy
Green Algae	Land plants
Moss	Vascular system
Ferns	No spores
Conifers	Cones
Flowering Plants	Flowers and fruits
Fungi	Circular symmetry
Sponges	Bilateral symmetry
Jellyfish	Centralized nervous system
Worms	More specialization of body areas
Mollusks	Towards insects: Exoskeleton **Towards vertebrates: ?
Millipedes & Centipedes	Many legs
Arachnids	Two body parts and chelicerae mouthparts
Insects	Three body segments

Crustaceans	Two pairs of antennae
Sea Stars & Urchins	Vertebrae
Fish	Ability to be out of water for extended time
Salamanders & Frogs	Eggs do not have to be in water
Mammals	Fur, mammary glands, and warm-blooded
Turtles	Backbone fused to form external shell
Lizards	Teeth on shelves
Snakes	No limbs
Crocodiles	Teeth in sockets, larger than lizards
Birds	Feathers and warm-blooded

CHART 2. Below are examples of characteristics to consider for major branches:

Character
Multicellular?
Photosynthesis?
Vertebrae?
Eggs that can be laid on land?
Warm-blooded?
Feathers?
Modified fingers?

3. Starting at the bottom of the tree, work to determine what characteristics all organisms beyond a branch have in common. These are just some of the characteristics that scientists use to group organisms based upon their evolutionary relationships. Other characters that we cannot directly see are also used to construct the tree of life: DNA sequences, development of embryos, and bone structure.

4. Students will construct a tree of life with all of the organisms that were listed in Chart 1. Organize your index cards in the order you intend to place them on the tree. Create a poster of the "Tree of Life". Students will need to include an illustration of the organism on its appropriate branch. Each organism must be labeled. Remember this is not a dead tree; it is "alive" and ever changing. I expect color and neatness. The tree of life is a thing of beauty!

5. Glue the index cards on the back of the poster.