

Tree of Life Student Handout

Part 1. Carefully observe the organisms in the bins, taking notes on each organism. How are the organisms similar, and how are they different? How does each organism move? How/what does it eat? What senses does it use? What is the color/texture? How do you think it protects itself?

Organism 1:

Organism 2:

Organism 3:

Organism 4:

Organism 5:

Organism 6:

Organism 7:



Tree of Life Student Handout

Part II. Working in a small group of 2-3, you will use your notes to fill in a character matrix. This is a method that scientists use to formally compare groups of organisms.

- 1. Write the names of the organisms in the spaces above the columns. Your teacher will tell you the name of the organism we will use as the outgroup.
- 2. Brainstorm a list of at least four characters that you could use to sort the organisms into two groups. For example, you might use the character 'Locomotion' and then categorize the organisms as 'swimming' or 'crawling'. *Important: no more than two categories per character*.
- 3. Write each character at the beginning of a row. 'Character A' should be the character that you think is most important.
- 4. Fill in the chart for your outgroup and for your organisms.

	Out gro up:	Org anis m 1:	Org anis m 2:	Org anis m 3:	Org anis m 4:	Org anis m 5:	Org anis m 6:	Org anis m 7:
Character A:								
Character B:								
Character C:								
Character D:								





Tree of Life Student Handout

Part III. Build your phylogenetic tree! A phylogenetic tree is a visual hypothesis about evolutionary relationships.

- 1. Mentally divide the organisms into two groups according to Character A. Categorize the outgroup according to Character A and write it in the space provided. Next, write the categories for Character A in the spaces below. It doesn't matter which is Category 1 and which is Category 2.
- 1. Move over one column, and repeat step 1 for Character B.
- 2. Move over one column, and repeat step 1 for Character C.
- 3. Fill in the organism names at the ends of the tree branches. Cross out any 'empty branches'.



Tree of Life Student Handout



Part IV. Answer the questions:

- 1. Give an example of two organisms from your phylogeny that are closely related. What do they have in common? How does your tree show their relationship?
- 2. Give an example of two organisms from your phylogeny that are distantly related. How do they differ? Do they have anything in common? How does your tree show their relationship?
- 3. The numbered nodes on the tree represent common ancestors. In the space below, write the number for a node that represents a common ancestor of the two similar organisms you identified in Question 1.
- 4. In the space below, write the number for a node that represents a common ancestor of the two different organisms you identified in Question 2.
- 5. Which node represents a common ancestor of ALL the organisms in your tree, including the outgroup? What traits do you think that organism had?
- 6. Pick a trait that probably was NOT present in the common ancestor. When do you think it might have appeared?