

## Lab: Constructing a Cladogram

(adapted from: [www.nclark.net/ConstructingACladogram.doc](http://www.nclark.net/ConstructingACladogram.doc))

1. Use the descriptions of the insect species in the table to draw the species in the space provided.
2. Use the historical times in the descriptions of the insect species, to make a chronological list of species (1-7).
3. Examine your insect species and make a table of all the traits you observe. Use the key to identify which species have which traits. The table below is an example of how you may want to set your table up.

7 Insect Species

List of Traits	1	2	3	4	5	6	7

**Key: 0 = does not have the characteristic      1 = has the characteristic**

4. Identify the characteristic(s) that all species have in common.
5. What characteristic do you consider to be the most common trait making these imaginary insects a unique group?

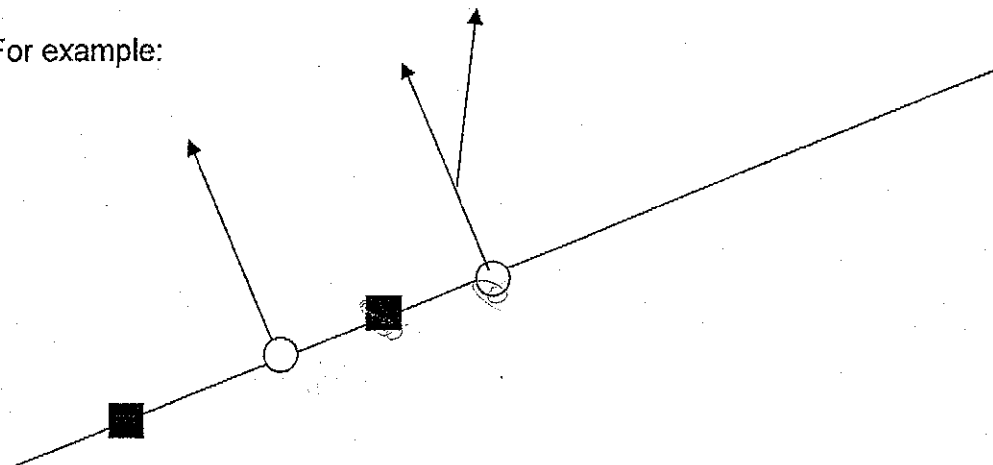
(This is referred to as a primitive or original characteristic. It is often of little value in analyzing the relationships within a group since all members have this characteristic.)

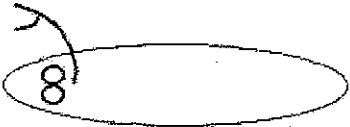

6. Determine what you consider to be the evolutionary development of these insect species. The traits that you determined to evolve over time are called derived or advanced characteristics. They are usually more advanced features that were added to the primitive features found earlier. Make a cladogram beginning with the most common traits.

### Tips:

1. Use the times to help determine positioning. Older organisms will appear at the bottom.
2. Remember in a cladogram species can come off of any branch of the tree.
3. ■ = the trait
4. ○ = species

For example:



Description of Insect Species	Insect Picture
<p>1 Species 1 - Fossils of this species date back to 30,000 years ago. The organism has a single antenna that is branched (like a Y). It has two eyes positioned on top of the head a non segmented body</p>	
<p>2 Species 2 - Fossils of this species date back to 8,000 years ago. This organism has branched antennae, 3 body segments, the middle segment has fleshy appendages with a bendable joint, and has eyes.</p>	
<p>3 Species 3 - Fossils of this species date back to 25,000 years ago. The organism has a branched antenna (like a Y), body is divided into 2 segments, and eyes positioned on the top of the head. In addition, the last segment of the body has a long curly tail.</p>	
<p>4 Species 4 - Fossils of this species date back to 10,000 years ago. This organism has branched antennae, 2 body segments, eyes positioned on the top of the head, fleshy appendages on the last segment have a bendable joint.</p>	
<p>5 Species 5 - Fossils of this species date back to 50,000 years ago. The organism has a single antenna, two eyes positioned on top of a head and a non segmented body.</p>	
<p>6 Species 6 - Fossils of this species date back to 20,000 years ago. This organism has branched antennae, 2 body segments, eyes positioned on the top of the head, and small flesh appendages on the last segment. This organism also has a ridge of spines on the last segment.</p>	
<p>7 Species 7 - Fossils of this species date back to 31,000 years ago. The organism has a single branched antenna (like a Y) and a club like structure at the end of the branches of the antennae. It has two eyes positioned on top of the head and a non segmented body.</p>	

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