

# CLADOGRAM ANALYSIS

Class set

Name

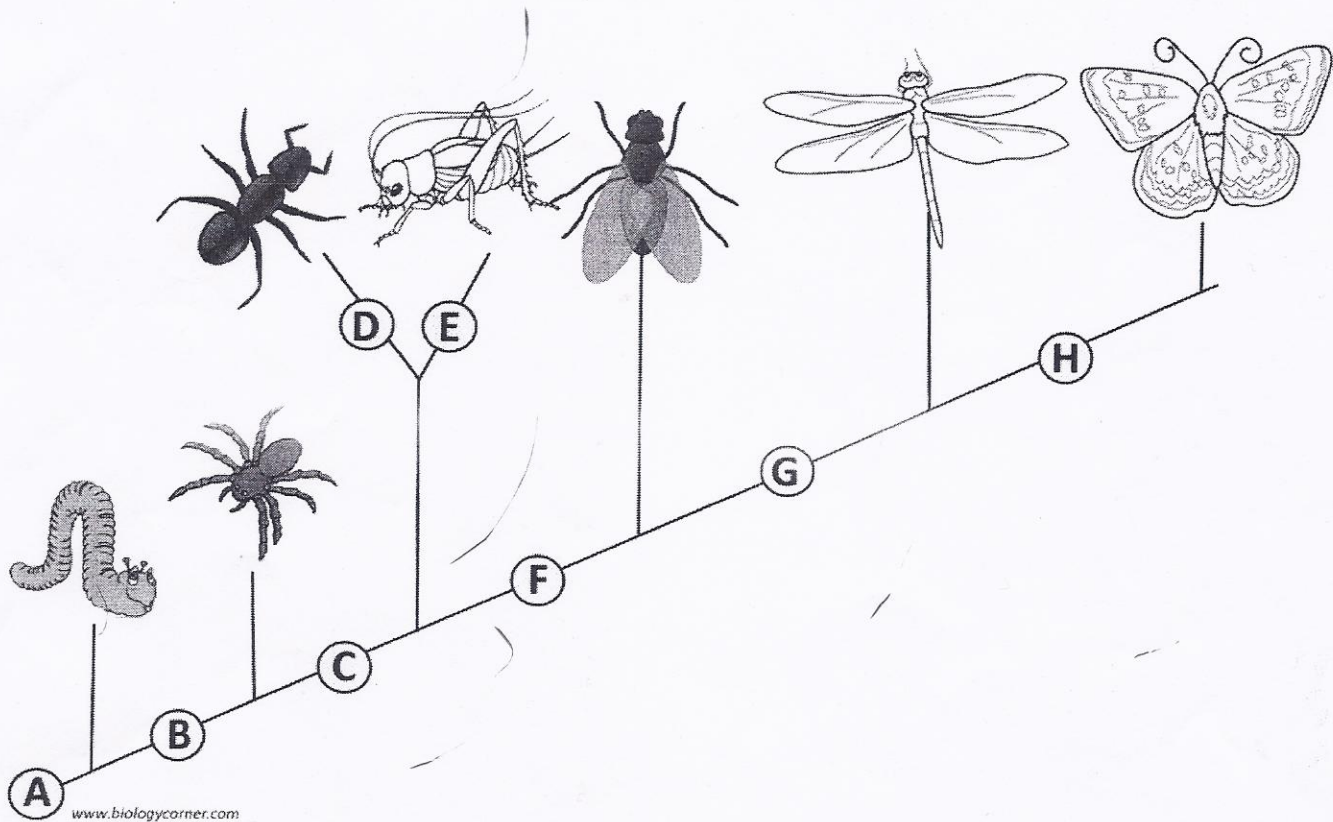
What is a cladogram? It is a diagram that depicts evolutionary relationships among groups. It is based on **PHYLOGENY**, which is the study of evolutionary relationships. Sometimes a cladogram is called a phylogenetic tree (though technically, there are minor differences between the two).

In the past, biologists would group organisms based solely on their physical appearance. Today, with the advances in genetics and biochemistry, biologists can look more closely at individuals to discover their pattern of evolution, and group them accordingly - this strategy is called **EVOLUTIONARY CLASSIFICATION**

**CLADISTICS** is form of analysis that looks at features of organisms that are considered "innovations", or newer features that serve some kind of purpose. (Think about what the word "innovation" means in regular language.) These characteristics appear in later organisms but not earlier ones and are called **DERIVED CHARACTERS**.

## PART I - Analyze the Cladogram

Examine the sample cladogram, each letter on the diagram points to a derived character, or something different (or newer) than what was seen in previous groups. Match the letter to its character. *Note: this cladogram was created for simplicity and understanding, it does not represent the established phylogeny for insects and their relatives.*



1. \_\_\_\_\_ Wings
2. \_\_\_\_\_ 6 Legs
3. \_\_\_\_\_ Segmented Body
4. \_\_\_\_\_ Double set of wings
5. \_\_\_\_\_ Jumping Legs
6. \_\_\_\_\_ Crushing mouthparts
7. \_\_\_\_\_ Legs
8. \_\_\_\_\_ Curly Antennae

## PART II - Create Your Own Cladogram

To make a cladogram, you must first look at the animals you are studying and establish characteristics that they share and ones that are unique to each group. For the animals on the table, indicate whether the characteristic is present or not. Based on that chart, create a cladogram like the one pictured above.

	Cells	Backbone	Legs	Hair	Opposable Thumbs
Slug					
Catfish					
Frog					
Tiger					
Human					

DRAWING OF YOUR CLADOGRAM

CLADISTICS is a form of analysis that looks at features of organisms that are considered "innovations" or newly evolved traits. A cladogram is a diagram that shows the relationships between groups of organisms. The word "cladogram" means in regular language "These characteristics appear in few organisms but not others and are called DERIVED CHARACTERS".

PART 1 - Analyze the Cladogram

Examine the sample cladogram, each letter on the diagram points to a derived character or something different (or new) that was first seen in a group of organisms. Match the letter to its character. Write the character next to the letter on the diagram. A character that is shared by two or more groups is called a SYMPLESIOMORPHY. A character that is shared by all members of a group is called an ANCESTRAL CHARACTER.



1. Wings
2. 6 legs
3. Segmented body
4. 4 pairs of wings
5. Jumping legs
6. Claws on front legs
7. Legs
8. Cleft mandible

PART 2 - Create Your Own Cladogram

To make a cladogram, you must first look at the animals you are studying and select characters that they share and ones that are unique to each group. For the animals on the table, indicate whether the characteristic is present or not. Based on that data, draw a cladogram like the one pictured above.

Create a cladogram from the table below.

Taxon	Traits				
	Hair	Amniotic	Tetrapod	Jaws	Backbone
Lancet	0	0	0	0	0
Tuna	0	0	0	1	1
Turtle	0	1	1	1	1
Leopard	1	1	1	1	1
Lamprey	0	0	0	0	1
Salamander	0	0	1	1	1

