

Activity: Taxonomy and Cladograms

PART 1: Interpreting Graphics - Taxonomy

A) Answer true or false to the following statements. Use the graphic on the back of this sheet to determine the answers.

1. _____ Dogs belong to the order Felidae.
2. _____ A fox belongs to the phylum Arthropoda.
3. _____ Snakes belong to the phylum Reptilia.
4. _____ Lions belong to the class mammalia
5. _____ All arthropods belong to the Class Insecta
6. _____ All rodents belong to the phylum chordata.
7. _____ All amphibians belong to the class reptilia.
8. _____ All primates are mammals.
9. _____ The class mammalia includes dogs, cats and rats.
10. _____ A lion belongs to the genus Felis.
11. _____ All mammals are primates.#
12. _____ Insects and lobsters are arthropods.



B) In each set, circle the pair that is most closely related.

13. snakes & crocodiles | snakes & frogs
14. rats & cats | cats & dogs
15. insects & lobsters | insects & birds
16. lions & tigers | lions & cougars
17. foxes & rats | foxes & dogs
18. cats & dogs | cats & lions

19. List (use species name) all the animals pictured that belong in the Felidae family.

20. The image does not show orders of insects. Suggest three categories of insects that would likely be grouped into orders. Hint: think about what kind of insects there are. Add your three categories to the image.

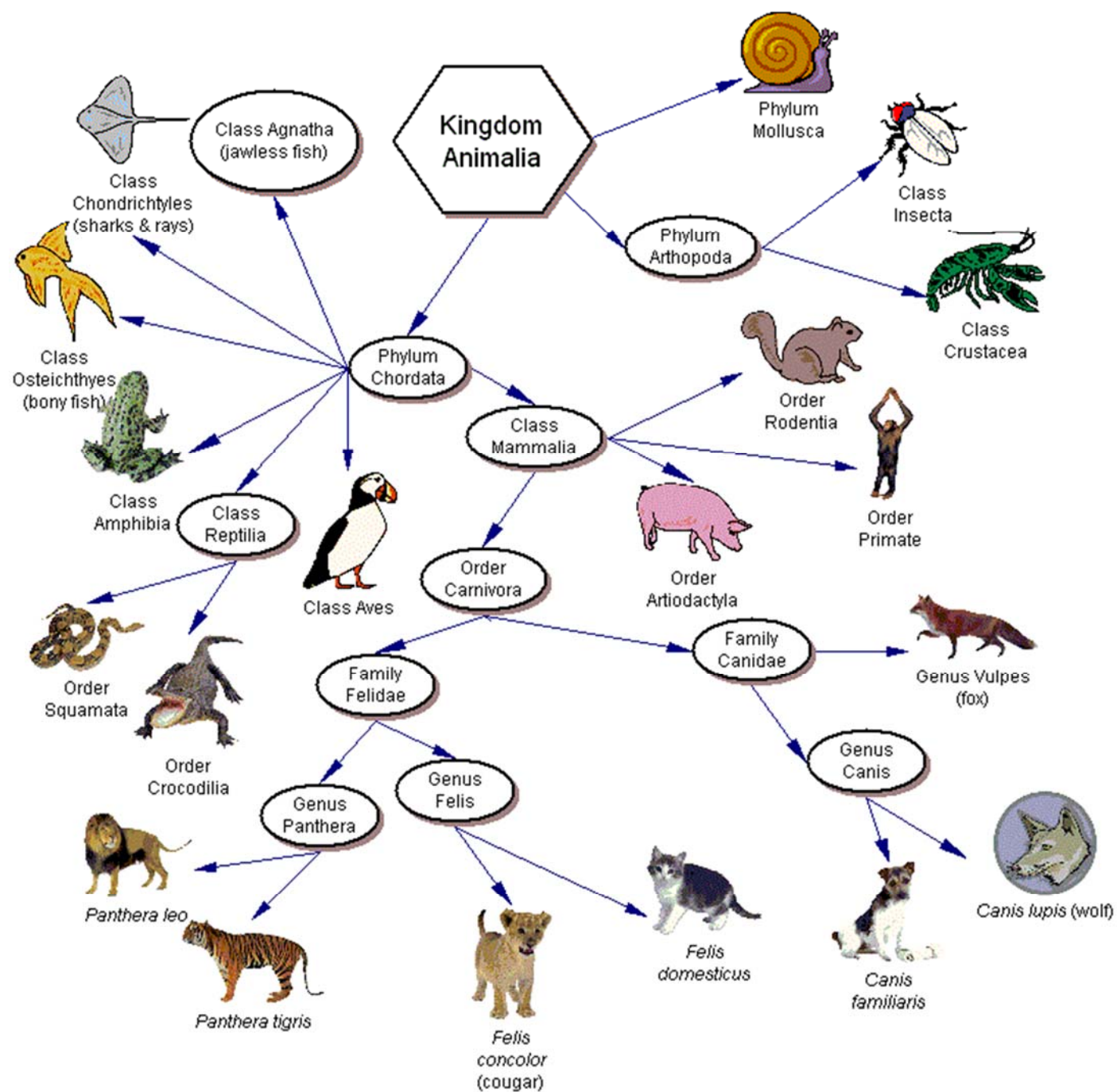
21. Create an addition to the image on the back of this sheet given the following information.

Mollusks are divided into three classes: Class Cephalopoda (squids), Class Gastropoda (snails), Class Bivalve (clams and oysters)

Cephalapods have a few orders, one of which is Octopoda (octopus) and another is Teuthida (squids)

The scientific name for the common octopus is *Octopus vulgaris*.

The scientific name for the common european squid is *Loligo vulgaris*



PART 2: Analyze the Bug Cladogram

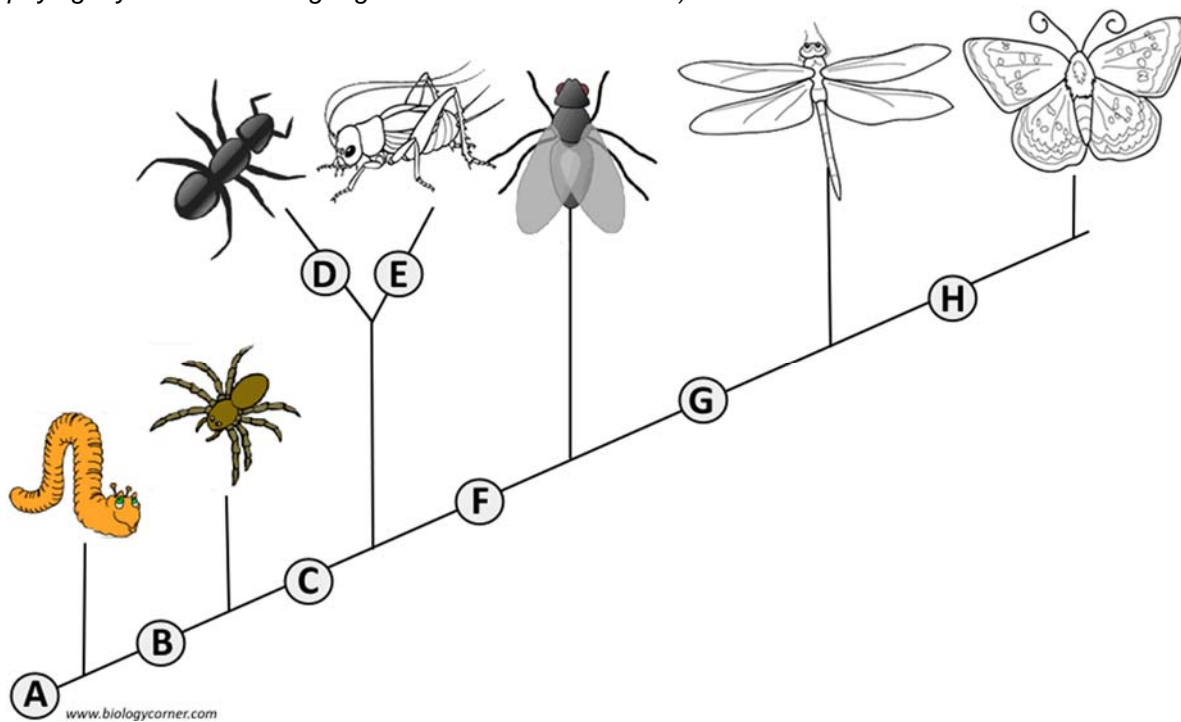
What is a cladogram? It is a diagram that depicts evolutionary relationships among groups. It is based on PHYLOGENY, which is the study of evolutionary relationships. Sometimes a cladogram is called a phylogenetic tree (though technically, there are minor differences between the two).

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.

Directions: 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 evolutionary character.

(Note: These cladograms were created for simplicity and understanding, it does not represent the established phylogeny for the following organisms and their relatives.)



- | | |
|------------------------------|-------------------------------------|
| 1. _____ Wings | 5. _____ Jumping Legs |
| 2. _____ 6 Legs | 6. _____ Has a queen who reproduces |
| 3. _____ Organs | 7. _____ Legs |
| 4. _____ Double set of wings | 8. _____ Curly Antennae |

PART II - Create a Cladogram with Given Traits:

Directions: For the animals on the tables, indicate whether the characteristic is present or not. Based on that chart, create a cladogram for each table like the one pictured on the front in the spaces below.

A) Cladogram #1

	Cells	Backbone	Legs	Hair	Thumbs
Slug					
Fish					
Frog					
Tiger					
Human					

B) Cladogram #2

	Eyes	Skeleton	Teeth	Lungs	Walking Limbs
Squid					
Whale Shark					
Great White Shark					
Bottlenose Dolphin					
Polar Bear					