LAB #____ Homologous and Analogous Structures

Lab Instructor_____ Name_____
Date _____ Period_____

Objective: To learn how to identify homologous and analogous structures

******Use full sentences when answering all questions.******

Background

Could you tell if two strangers were related just by looking at them? What kinds of evidence would help you determine their relationship? In this activity you will compare and contrast structures found in various animal species. Some species will have different structures with remarkably similar functions. Other species will have similar structures with very different functions. You may also study structures that either became useless or that have disappeared as an organism changed by evolution.

Pre-Lab

Use a good dictionary. For each word, give the language from which the word originated, the original word in that language, the meaning of the original word, and another English word that probably came from the same root.

English Word	Original Language	Original Word In Other Language	Meaning Of Original Word	Another English Word From Root
1. homologous				
2. analogous				
3. vestigial				

LAB

Materials

diagrams of homologous, analogous and vestigial structures; color markers or pencils (at least five different colors)

Procedures and Observations

A. *Homologous Structures*

Look at the bones of the six different animals shown on the diagram of homologous structures. Look for similarities in location and shape. After identifying similar bones or bone groups, choose a single color for each bone or bone group and color it/them with the same color in each of the six animals. For example, the humerus in each animal could be colored blue, and the radius in each animal could be colored red, etc.

1. Explain the function of the forelimb in each of these six animals. Which limbs perform similar functions?

B. *Analogous Structures*

Observe the diagrams of the wings of the bird and the wings of the butterfly. Based on your observations and prior knowledge of birds and insects, list as many differences as possible in the number, shape and construction of the wings.

BIRD'S WING	BUTTERFLY'S WING
1.	1.
2.	2.
3.	3.

TABLE 1. Differences between bird and butterfly wings

Name_____

Period_____

1. On the basis of species survival and reproduction, list as many advantages of flying for a species as possible.

2. Even though both groups fly, what is the strongest evidence that birds and butterflies are not closely related animals?

C. ***Vestigial Structures*** Look at the diagrams of vestigial structures.

1. Blind salamanders from Arkansas and Missouri have become adapted to life in deep caves where sunlight never reaches. They possess eyes, but their eyes do not function. Why do you think blind salamanders have eyes if they cannot see?

2. Notice the bony parts of the python's pelvic girdle to which tiny limb bones attach. The legs serve no function. What might this evidence mean?

3. Most mammals have a well-developed tail, but this is lacking in apes and humans. Still the tail is represented by the last three to five bones (vertebrae) in the backbone of humans. What might the presence of the caudal vertebrae suggest about the relationship between humans and other animals?

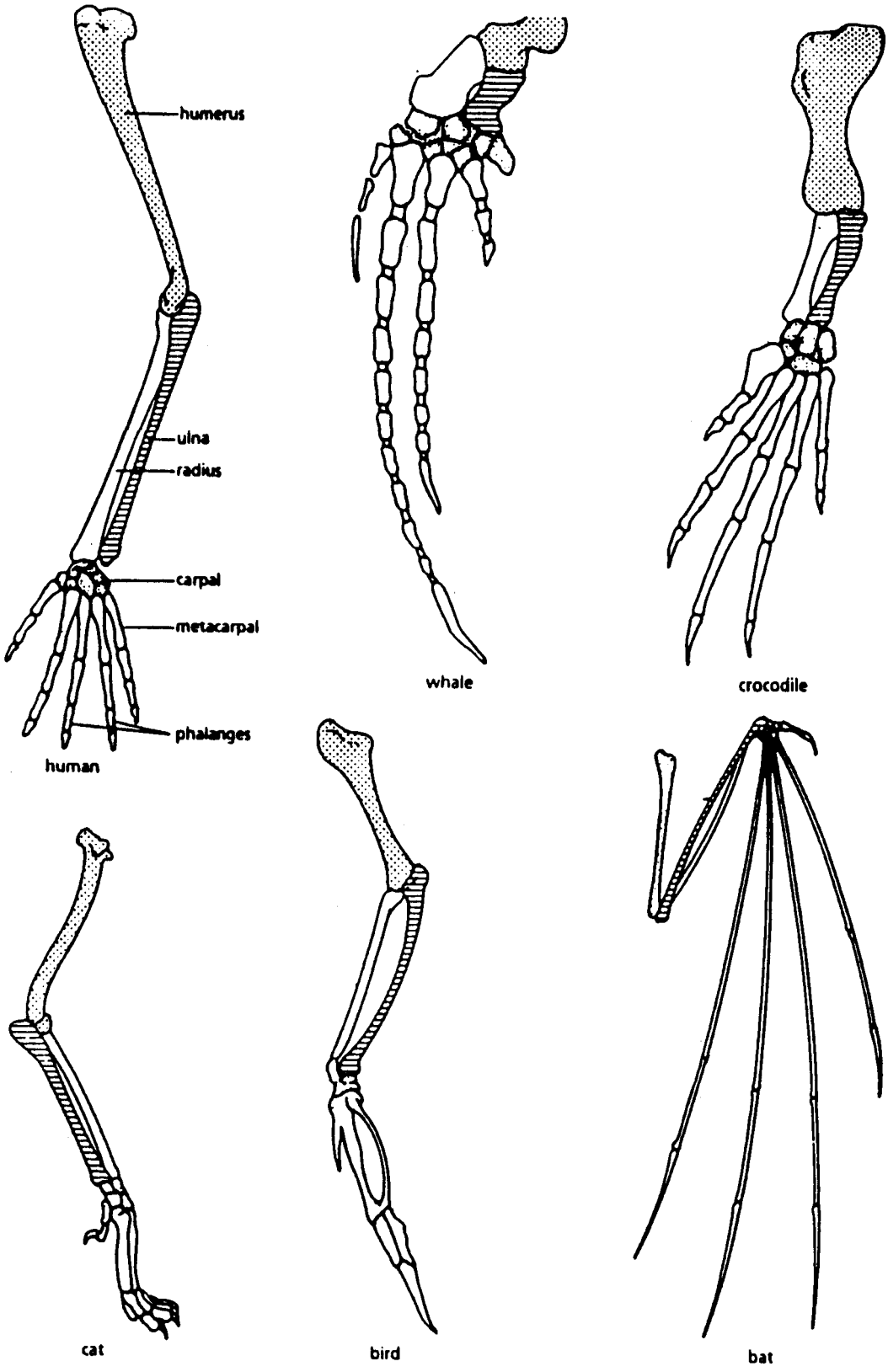
Conclusions

1. Write a paragraph *in your own words*, in which you summarize what you have learned. You must include at least:
   - a definition for homologous structure and an example
   - a definition for analogous structure and an example
   - a definition for vestigial structure and an example in *Homo sapiens*

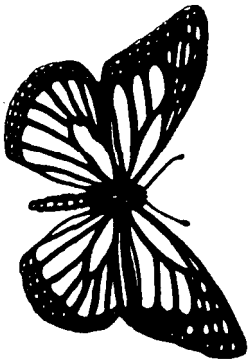
2. Which is a better indicator of the relationship between two organisms -- structure or function? Explain your reasoning.

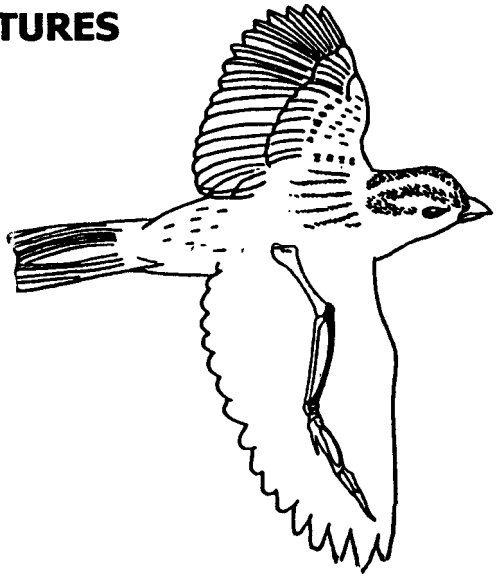
Extra credit: Conduct library research to find out what is meant by convergent, divergent and parallel evolution. Relate homologous, analogous, and vestigial structures to you findings. Prepare a written report including all sources of information.

A. HOMOLOGOUS STRUCTURES



B. ANALOGOUS STRUCTURES





C. VESTIGIAL STRUCTURES

1

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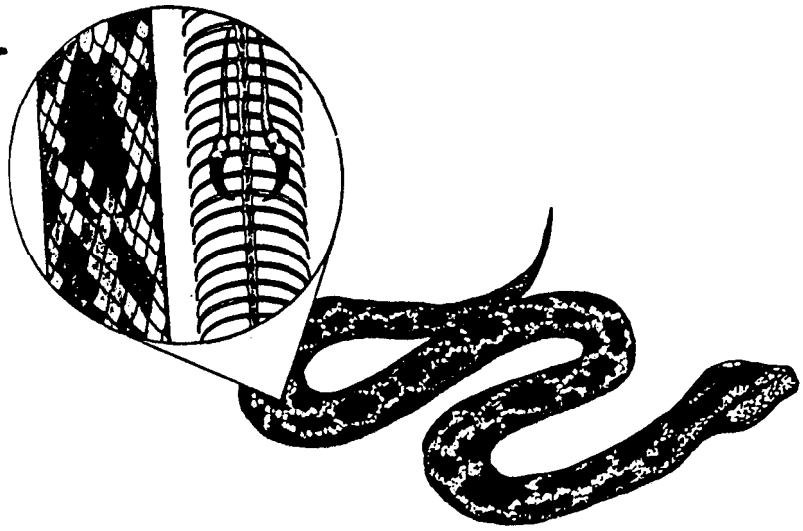

3