

Investigation – Levels of Classification

You will investigate some of the structural characteristics that taxonomists use in separating animal groups at different classification levels. Because you will use the observations of other people (recorded as drawings), your conclusions can be no more valid than those drawings.

Materials (per person)
none

Procedure

1. In your data book, prepare 4 forms similar to Table 1.1, or tape into your data book the forms your teacher provides. Label the forms *Table A*, *Table B*, *Table C*, and *Table D*.

TABLE 1.1 Structural Characteristics

Characteristics	Animals		
	1.	2.	3.
a.			
b.			
c.			
d.			
e.			
Classification level			

Figure 1.2

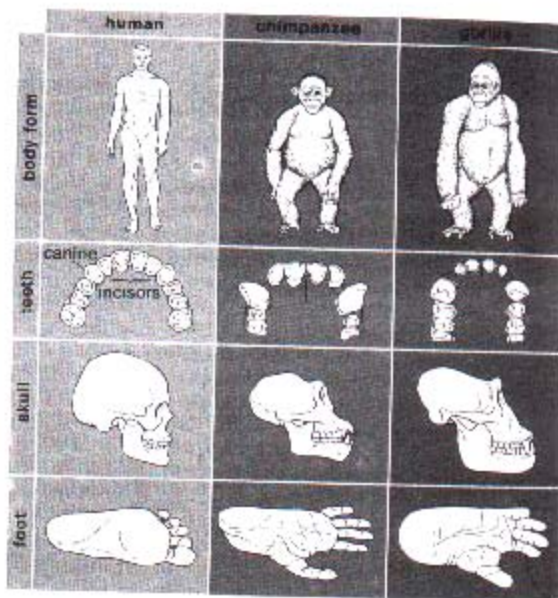
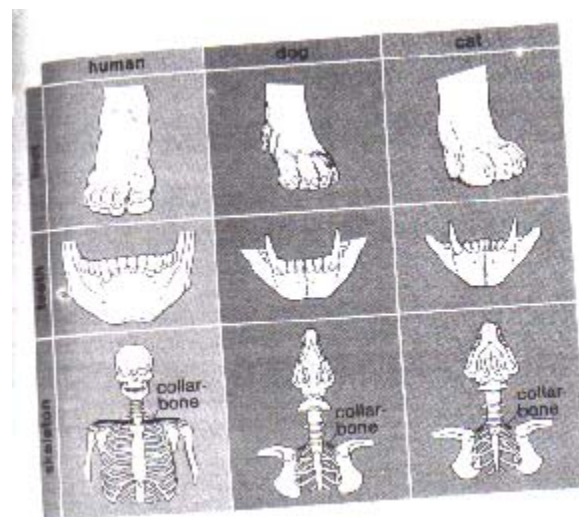


Figure 1.3



2. For Table A, use the information in Figure 1.2. In the spaces under *Animals*, write *human*, *chimpanzee* and *gorilla*. In the spaces under *Characteristics*, copy the italicized key words in each of the following questions when you review the table.
 - a. How does the *length of the arms* of the animal compare with the length of its legs?
 - b. Are the *canine teeth large*, or are they *small* as compared with other teeth of the same organism?
 - c. How many *incisor teeth* are present in the upper jaw?
 - d. Is the *brain case* of the skull *large*, or is it *small* as compared with the overall size of the skull?
 - e. Is there an *opposable first toe on the foot*? (An opposable toe is one that can be pressed against all the others, just as your thumb can press against your other fingers.)

3. After studying Figure 1.2, fill in all the spaces in Table A with your answers for each animal. Then write *Family* in the space following *Classification level*. Refer to the Internet to find the family into which each of these organisms has been placed. Write this information in the spaces at the bottom of the table.

4. For Table B, use the information in Figure 1.3. Under *Animals*, write *human*, *dog* and *cat*. Under *Characteristics*, copy the italicized words in each of these questions:
 - a. How many paired *appendages* (arms and legs) does the animal have?
 - b. Are *nails or claws* present on the toes of the foot?
 - c. How does the size of the *canine teeth* compare with that of other teeth in the lower jaw?
 - d. How many *incisor teeth* are present in the lower jaw?
 - e. How does the size of the *collarbone* compare with that of the other organisms.

5. After studying figure 1.3, fill in the spaces in Table B with your answers for each animal. Write *Order* in the blank space following *Classification level*. From the Internet, select the order into which each of these organisms has been placed. Enter this information in the table.

6. For Table C, use the information in Figure 1.4 and the following questions:
 - a. What type of *body covering* (hair, feathers, scales, none) does the animal have?
 - b. How many paired *appendages* (arms and legs) does the animal have?
 - c. Do the *ears project from* the surface of the *head*?
 - d. Is the *body temperature* similar to the temperature of the environment or not?
 - e. How many *ventricles* are *in the heart*?

7. The classification level for this table is *Class*. Determine the class for each organism in Figure 1.4 and write it in the table.

Figure 1.4

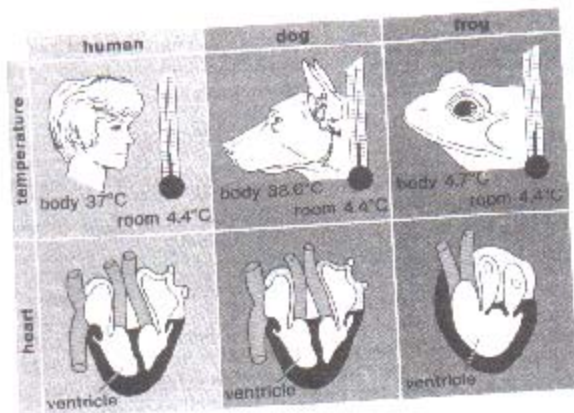
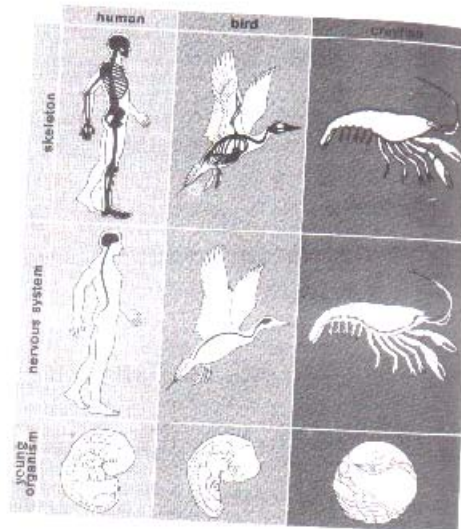


Figure 1.5



8. For Table D, use the information in Figure 1.5 and the following questions:

- What type of *skeleton* (internal or external) does the animal have?
- Is the *position of the nerve cord* along the back or along the belly?
- Compared with the rest of the nervous system, is the *brain* large or small?
- Are paired *appendages* present, or are they absent?
- Are there *grooves behind the head region* of the very young organism?

9. Write *Phylum* in the space following Classification level and add the name of the phylum into which each animal in Figure 1.5 is placed.

Discussion

1. There are more structural similarities between chimpanzees and gorillas than between chimpanzees and humans. How does the classification system you used express this fact? Focus on the levels in the classification system into which these organisms are placed.

2. How does the classification system you used express the following:

- There are more structural similarities between dogs and cats than dogs and humans
- There are more structural similarities between humans & dogs than humans & frogs.
- There are more structural similarities between humans & birds than humans & crayfish
- There are more structural similarities between humans and chimpanzees than humans and dogs.

3. You are told species A and B are classified in the same kingdom, but different phyla. You are also told that species C and D are classified into the same phylum, but different classes. What general statement can you make about similarities among species A, B, C and D?