Name: KEY Date: _____ Section: _____

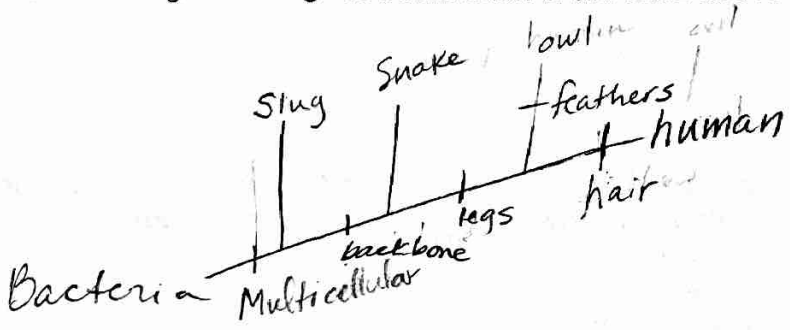
Evolutionary Relationships Worksheet

PROBLEM #1

a. Fill in the following table. Mark an "X" if an organism has the trait.

Organism	Derived Characteristic				
	Multicellular	Backbone	Legs	Feathers	Hair
Bacteria					
Slug	✓				
Owl	✓	✓	✓	✓	
Human	✓	✓	✓		✓
Snake	✓	✓			

b. Draw your own cladogram using the information in the table above.



c. Which trait separates the least closely related organism from the other animals?

Multicellular

d. List the animals in your cladogram in order of distance from the least closely related organism to the most closely related.

See above cladogram

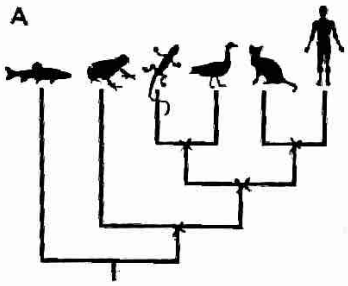
Bacteria (least) → owl/human (most)

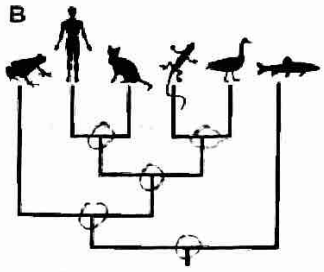
e. Where would you insert a frog if you were to add it to the cladogram? Explain your answer and indicate its location using an arrow on your cladogram.

After the development of legs, but before feathers.

PROBLEM #2

a. Are the two cladograms below the same or different? Explain your answer (in the space to the right).





Same, Both show the same organisms evolving due to some variations.

b. Looking at cladogram A, which group is the most closely related to fishes: frogs, lizards, birds, cats, or humans? Explain your reasoning.

Frogs, because there is only one trait that separates fish + frogs. The other organisms are separated by more than 1 trait.

c. On cladogram B (above) circle a ancestral node or root that indicates a shared common ancestor. Using the example you chose, explain what it means that it is **shared ancestor**.

Shared ancestor: an organism from which the other organisms are descended.

PROBLEM #3

a. Please explain the difference in theory between gradualism and punctuated equilibria.

Gradualism: Slow (gradual) evolution

Punctuated Equilibria: Period of rapid evolution between long periods of little to no change.

b. If you were a scientist, what evidence would you need to find in fossil records to be able to support the **theory of punctuated equilibria**?

I would need to find many fossils of either the same organisms or different organisms that died at the same time

PROBLEM #4

a. Which of the following organism is least likely to become a fossil? Please explain your answer.

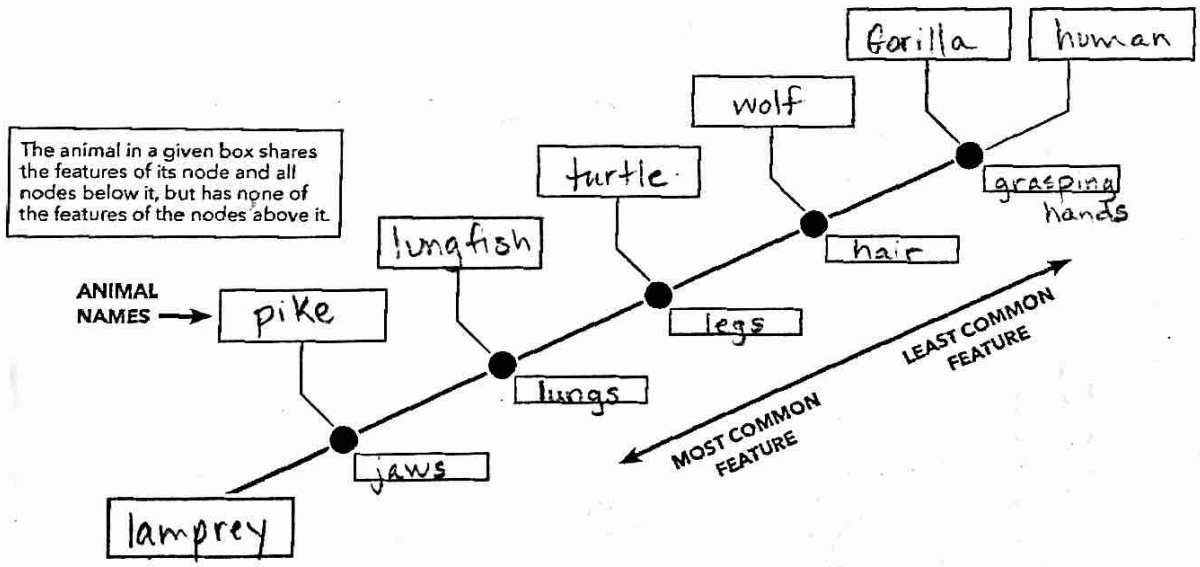
SNAIL DANDELION SQUIRREL

Because it does not have a shell or bones, only soft tissue that easily decomposes.

PROBLEM #5

Group	Hair	Lungs	Legs	Grasping hands	Jaws
Lamprey	-	-	-	-	-
Turtle	-	+	+	-	+
Gorilla	+	+	+	+	+
Lungfish	-	+	-	-	+
Pike	-	-	-	-	+
Wolf	+	+	+	-	+
Human	+	+	+	+	+

a. Using the table above, fill in the following cladogram.



b. Based on your cladogram, which two species are most closely related?

Gorilla & human

c. Are pike more closely related to lungfish or to gorillas? Explain.

lungfish - only 1 trait separates pike & lungfish

d. What trait is common to all the organisms on the table except for the lamprey?

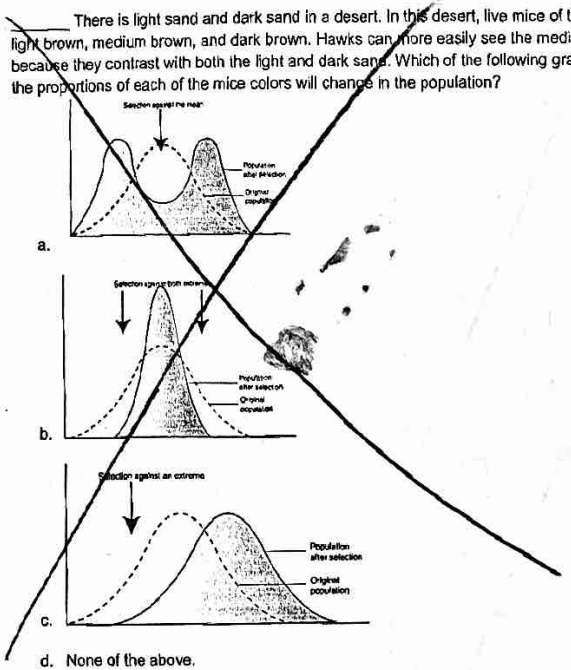
jaws

Name: _____ Date: _____ Period: _____

Unit 5 Evolution Practice Multiple Choice Questions

Multiple Choice. Choose the best answer for each of the following questions and write the CAPITAL LETTER of your answer choice on the line to the right of the question number.

1. _____ There is light sand and dark sand in a desert. In this desert, live mice of three different colors: light brown, medium brown, and dark brown. Hawks can more easily see the medium brown mice because they contrast with both the light and dark sand. Which of the following graphs describes how the proportions of each of the mice colors will change in the population?



   d. None of the above.

2. C The Viceroy butterfly mimics the coloring of the Monarch butterfly. This is advantageous as birds associate eating Monarchs with getting sick because Monarchs are poisonous to them. This is an example of which of the following evolutionary concepts?
   a. divergent evolution
   b. co-evolution
   c. convergent evolution
   d. homologous structures

3. b Which of the following statements is true about the pelvic bone in whales?
   a. The pelvic bone in whales is an analogous structure and indicates that whales likely descended from fish.
   b. The pelvic bone in whales is a vestigial structure and indicates that whales likely descended from four-legged land mammals.
   c. The pelvic bone in whales is an analogous structure and indicates that whales likely descended from four-legged land mammals.
   d. The pelvic bone in whales is a vestigial structure and indicates that whales likely descended from fish.

4. C Which of the following is considered a vestigial structure in humans?
   a. spleen
   b. kidney
   c. tailbone
   d. tonsils

5. b A snake population becomes physically separated by a road they cannot cross. Eventually, different selective pressures acting on the now separated species result in two different snake species that can no longer mate and produce fertile offspring. What type of speciation is this scenario an example of?
   a. convergent speciation
   b. allopatric speciation
   c. sympatric speciation
   d. divergent speciation

6. d Differences between members of the same species are called…
   a. predators.
   b. selections.
   c. traits.
   d. variations.

7. d What did Darwin infer from his observations of organisms in South America and the Galapagos Islands?
   a. The organisms on the Galapagos Islands were virtually identical to mainland organisms.
   b. A small number of different plant and animal species had come to the mainland from the Galapagos Islands.
   c. The organisms on the Galapagos Islands were completely unrelated to mainland organisms.
   d. A small number of different plant and animal species had come to the Galapagos Islands from the mainland.

8. d What are fossils?
   a. molds and casts of organisms that live today
   b. drawings of ancient animals and other organisms
   c. footprints or burrows of small animals that live today
   d. the preserved remains or traces of organisms that lived in the past