

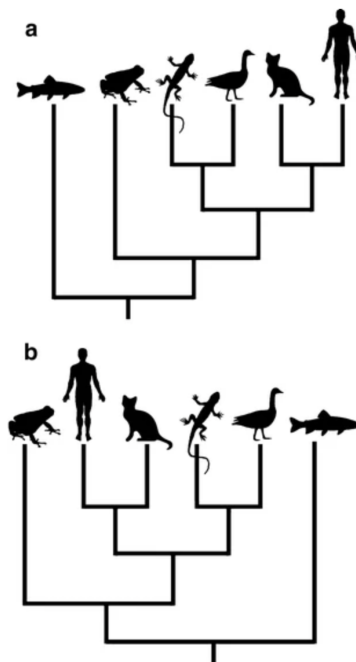
Preliminary Assessment

Name: _____

- 1) Oldfield mice (*Peromyscus polionotus*) can have either white or brown fur, depending on their genotype at a single locus. White is recessive to brown. A researcher captures a large number of white and brown mice, lets the mice mate randomly in the lab, and then releases their offspring into a large enclosure where they have plenty of food and are safe from owls and other predators. The researcher lets the mice live and breed in the enclosure for ten generations. What will the researcher most likely observe at the end of this experiment? Circle the best answer
 - a) The percentage of white and brown mice in the enclosure will remain the same.
 - b) The percentage of white mice will gradually decline and then stay constant.
 - c) The percentage of white mice will drop and eventually reach zero.
 - d) The percentage of white mice will be 25%.
- 2) What is evolution and what causes it? Answer briefly. A few words or a list is sufficient.

- 3) Consider the evolutionary trees (*phylogenies*) below (from Gregory 2008, *Evolution: Education and Outreach*):

- Do they show the same set of relationships? (Y / N)
- In tree **a**, is the frog more closely related to the fish or the lizard? (Fish / Lizard)



- 4) Describe or structure of DNA and proteins in 1-2 sentences. How are these molecules related to each other?
- 5) Where is DNA found in a plant or animal, and in what format? Your answer may include a drawing.
- 6) Phenylketonuria (PKU) is a metabolic disorder caused by a mutation in the gene for the enzyme that breaks down phenylalanine. PKU is a recessive trait and is not sex-linked. PKU affects about one in 10,000 Americans. If children with PKU do not severely restrict phenylalanine from their diet, phenylalanine will accumulate and can cause mental retardation. Imagine you are a genetic counselor advising soon-to-be parents. If the mother has PKU and the father does not (but his mother did), what, if anything, can you say about the probability their child will be born with the disease?
- 7) The Bobcats are playing an out-of-state team unaccustomed to cold weather. If the weather snows on game day, we will have an 80% chance of winning. If it doesn't snow, we will have a 40% chance of winning. The weather forecast says the chance of snow is 25%. What is the probability the Bobcats will win?