Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Exploring Evolution Web-Lab

http://www2.edc.org/weblabs/ExploringEvolution/evolution.swf

In this web lab, you will explore competing hypotheses for the evolution of the whale and evaluate them for their validity. You will use three of the many lines of evidence used by scientists to construct and support claims about evolution.

You will solve the mystery of the evolution of the whale. The three competing hypotheses are listed below. Keep track of your evidence on the check chart located below. For each checkmark you make in the simulation, explain why you have checked it on paper. Write “N/A” if there is no evidence.

Hypothesis 1: Whales evolved from a land mammal.

1. DNA Evidence:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Anatomical Evidence:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Fossil Evidence:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Hypothesis 2: Whales evolved from the mesonychids, an extinct group of perissodactyls.

1. DNA Evidence:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Anatomical Evidence:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Fossil Evidence:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Hypothesis 3: Whales evolved from a group of artiodactyls (even-toed land mammals).

1. DNA Evidence:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Anatomical Evidence:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Fossil Evidence:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

DNA Evidence

Read the information provided in the top right-hand corner. Click on and investigate each type of animal, then click and drag the DNA molecules to compare them.

1. When it’s said that two animals are related, it does not mean that they evolved from one another. What does it mean?
2. Based on the DNA evidence, which group is most similar to the whale?
3. All the DNA samples are from mammals. Does the DNA suggest that the mammals are related? What does that imply?

Fossil Evidence

Read the information provided in the top right-hand corner. Then, click on the rock layers to hunt for fossils. Drag the fossils to the collection drawer to order them by age.

1. Fossils are found in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ rock.
2. The Law of Superposition explains:
3. What similarities do the fossils share? Are there some similarities that seem to disappear?
4. What are the differences between the fossils?
5. Describe the changes in the skeletal anatomy overall. For example, the earliest fossilized skeleton has legs, but later species do not appear to have legs.
6. The most recent skeleton does not have legs. Is there any evidence that its ancestors had legs?

Comparative Anatomy

Read the information in the upper right hand corner. View the example.

1. What is a homologous trait? What do homologous traits suggest?
2. List some examples of homologous traits between horses, humans and whales.
3. The whale has a pelvis and femur, despite the fact that those bones no longer seem to be of any use to modern whales. What are these body parts called? Why might a whale have a pelvis, even if it doesn’t need it?