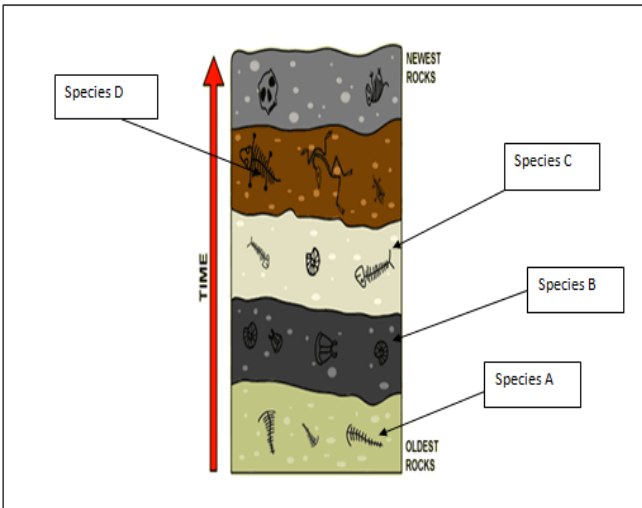


EVOLUTION, EVIDENCE AND MECHANISMS: Student Practice Sheet

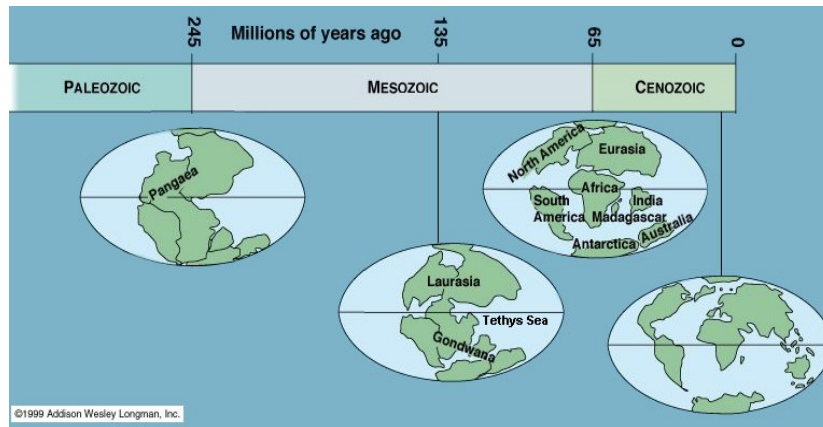


How can evidence of evolution be determined from a fossil record?

Where in the fossil record would you expect to see older common ancestors?

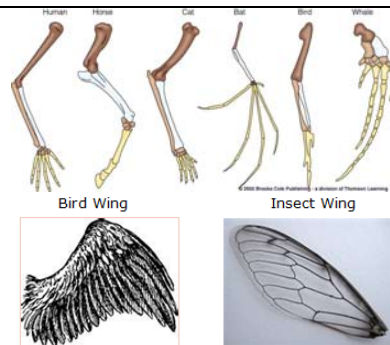
How would gradualism present in the fossil record?

How would punctuated equilibrium show in the fossil record?



Even though they are now separated by the Atlantic Ocean, the northeastern coast of North America and the Scandinavian coast of Europe were once connected as part of the original supercontinent Pangaea. What would biogeography predict about fossils that might be excavated in both of these locations?

What do homologous and analogous structures have in common?



How are homologous and analogous structures different?

Which of these two structures supports theories of common ancestry? Why? _____

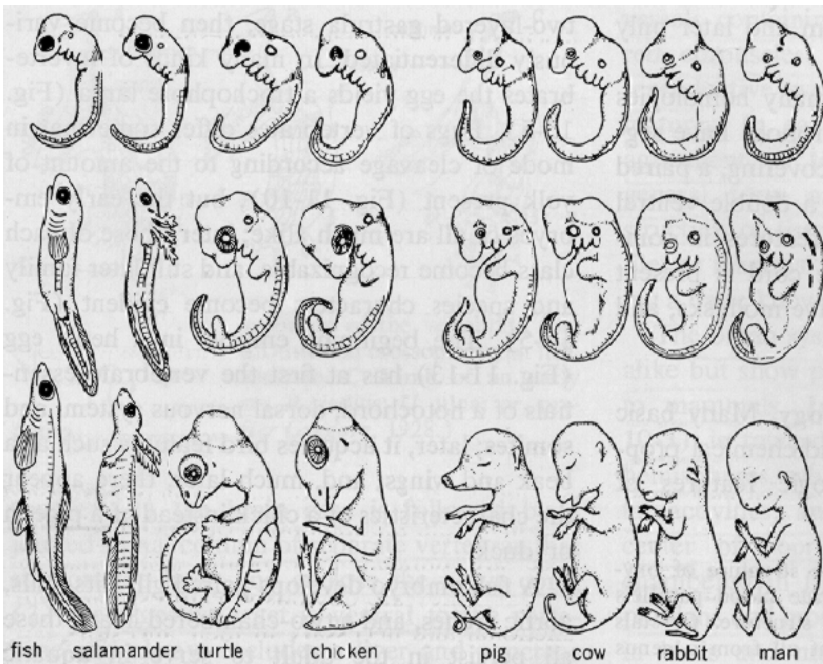
Species	Sequence of Amino Acids in the Same Part of the Hemoglobin Molecules
Human	Lys-Glu-His-Iso
Horse	Arg-Lys-His-Lys
Gorilla	Lys-Glu-His-Lys
Chimpanzee	Lys-Glu-His-Iso
Zebra	Arg-Lys-His-Arg

Some of the strongest evidence of common ancestry is contained in our genetic code. Look at the table above which lists sequences of amino acids in the protein hemoglobin. Hemoglobin is used in all organisms to deliver oxygen to the tissues, but there are slight differences among the species.

Which two species would to share the closest common ancestor? Why? _____

What are additional species that might share close common ancestors? What do you know about these pairs of animals that might make it seem true that they are closely related? _____

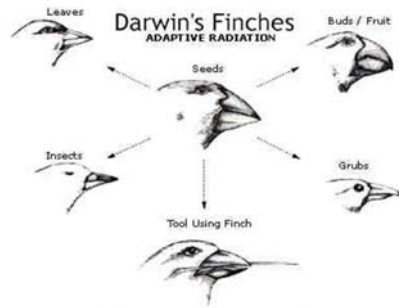
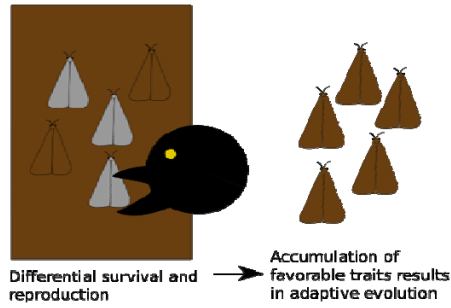
Which pair of animals do you think would least likely to share a common ancestor? Why? _____



Embryology also allows us to see evidence of common ancestry. As you can see in the top of the diagram, early stages of embryonic development show many similarities. As the embryos develop, differences among the species become more apparent.

Which pairs of embryos indicate species that are likely to share closer common ancestors? Why?

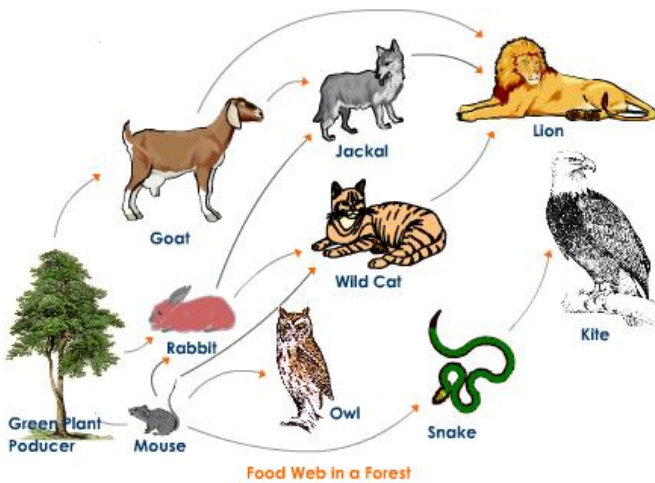
Which pairs of species are probably have only distant common ancestors? Why? _____



The diagrams above represent a possible mechanism and some possible outcomes of natural selection.

Describe how natural selection causes changes in a population. _____

An observer makes detailed observations about a bird and its song for over two years. One day, she notes that the birdsong has changed. She postulates that natural selection caused this change. Why is she wrong?



Consider this food web. Suppose that some of the mice in the food web had a mutation that caused their fur to become darker, thus camouflaging their appearance from their predators.

According to natural selection, what would happen to the population of mice over time? Why?

The ability of a mouse to burrow underground is one of its defenses. Suppose that the climate of the forest became drier over time and that only snakes which have a mutation that allows them to dig in dry earth would be able to prey upon those mice. How would the snake population be affected, according to natural selection?

The eggs that snakes lay for reproduction fare better in wetter soils than what the forest develops. How will the reproductive success be affected? What does this mean for the population of snakes? Which snakes will survive?

The following table lists mechanisms by which populations can change. For each of the following, complete the table with descriptions, what happens to the population, and an example of each.

Type of Change	Description	What change happens in the population?	Example
Genetic Drift: Bottleneck Effect			
Genetic Drift: Founder's Effect			
Gene Flow: Migration			
Mutation			