

EVIDENCE SUPPORTING EVOLUTION

VOCABULARY – Use the resources on Mr. Hanna’s website to define the following key terms related to heredity.

- 1) EVOLUTION – *change over time*
- 2) LAW OF SUPERPOSITION – *lower rock layers are older*
- 3) EMBRYO – *earliest growth stage of an organism*
- 4) HOMOLOGOUS STRUCTURES – *body parts in different species that are similar in structure and suggest a common origin*
- 5) VESTIGIAL STRUCTURES – *body parts in modern organisms that appear to NOT have a function*

SHORT RESPONSE – Provide a short answer (a few sentences or less) in response to each prompt.

- 6) What does it mean to say that species have “evolved”?
Life forms we observe today are different from the life forms of the past; they have changed
- 7) How does the law of superposition help us interpret the fossil record to provide evidence supporting the theory of evolution?
If we find fossils in deeper rock layers, we can infer that they are older than fossils found in layers closer to the surface. In this way, we can compare what species looked over time.
- 8) Because insects often live short lives and go through many generations in a short time, scientists often observe them to study heredity. How have we observed evidence of evolution in populations of mosquitos?
Scientists have observed that if a population of mosquitoes is exposed to pesticide, the individuals who are NOT immune to the pesticide will die without reproducing, but the individuals who ARE immune to the pesticide will reproduce. Over many generations, the majority of the mosquito population will be immune to the pesticide (the population will have changed).
- 9) When scientists compare the early-stage embryos of very different species such as fish, chickens, and humans, what do they notice?
Comparing embryos of some species shows us that at these very early stages of life, the species look and develop VERY similarly to each other. This suggests that they may have shared a common ancestor in the distant past.
- 10) When we compare the bone structure of a human arm with a cat leg, a whale fin, or even a bat wing, we notice similar bones with a similar layout. What does this suggest about these organisms?
Homologous structures suggest that the species who share them may have evolved from a common ancestor with a similar structure.
- 11) Scientists have found pelvic bones in species such as whales and snakes that don’t have legs. Why might these animals have pelvic bones?
Scientists suggest that vestigial structures are left over from ancestors who once needed them, but since then the species has evolved so that those structures are no longer necessary. Since the structures did no harm to the individuals, there was no reason for them to be selected out of the population, so these structures remain even though they are useless.

Pelvic bones in whales and snakes suggest that the ancestors of these species may once have had legs, but have since evolved to what we recognize today without legs.

12) Why do scientists say that humans are more closely related to chimpanzees than orangutans (we share a more-recent common ancestor with chimps)? What evidence do we have to support this statement?

When scientists compare the DNA of animals, samples that are more similar suggest a common ancestor in the more recent past. Samples that are less similar suggest a common ancestor in the more distant past. Human DNA is more similar to chimpanzee DNA than any other primate, suggesting that we shared a common ancestor with chimps more recently than any other primate. Because our DNA is more different than orangutan DNA, it suggest our ancestors branched off from their line longer ago.