

## Definitions for Evolutionary Evidence Lab

This lab activity was designed to provide you with opportunities to make inferences and draw conclusions about evolution and the common ancestry of various animals based on their anatomical characteristics and comparative anatomy. You will be given tasks to accomplish or questions to answer at each of 11 stations. In order to do this successfully, you must make careful observations of the specimens on display. You must also know the following definitions before beginning this activity:

- A) **Homologous structures** = structures on different organisms that have the same evolutionary origin (i.e., structures derived from the same ancestral structure). Homologous structures can be identified in that they originate from the same part of the embryo, have the same basic structural organization, and have the same relative anatomical position or placement on the body. Homologous structures may or may not have the same function, and they may or may not have the same superficial appearance. An example is the human forelimb (arm) and the forelimb (fin) of a whale.
- B) **Analogous structures** = structures on different organisms that have the same superficial appearance and the same function, but separate or independent evolutionary origins. The structural similarities in analogous traits are superficial. A careful examination of these traits will reveal that they have different developmental origins, different types of structural organization, and anatomical positions that cannot be considered the same. Analogous structures do not suggest descent from a common ancestor. An example is the leg of a spider and the leg of a human.
- C) **Vestigial structure** = a structure that has no function, or has only an extremely limited or nonessential function that is different from the primary function for that structure. Quite often vestigial structures are much reduced in size. Small size, however, is not what makes a structure vestigial. The functional ovaries of an earthworm are very small, but they are not vestigial since they are completely functional. Although a vestigial structure has little or no function in the organism that possesses it, this same structure can be found in its completely functional form in other species. A couple of examples of vestigial structures include the tiny wings of flightless kiwis and the eyes of blind cavefish.
- D) **Phylum** = a level of taxonomic classification below the level of kingdom and above the level of class. [Note: The levels of taxonomic classification from least specific to most specific are Kingdom, Phylum, Class, Order, Family, Genus, and Species]. Animal species that share sets of homologous characteristics are placed into the same phylum. Animal species with no anatomical/structural homologies belong to different phyla.