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Evidence of Evolution 1: Structures

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Structures

In order to investigate linage, evolutionary history, and common ancestry, you need to be familiar with the following structures.

A) **Homologous structures** = 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. All of these characteristics can best be explained by the organisms in question sharing a common ancestor. 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 do not share the other similarities seen in homologous structures. 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. This suggests that analogous structures do not suggest descent from a common ancestor, but that similarly functioning structures developed in more distantly related species. 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. 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. These structures give us information about an organisms' evolutionary history, as well as evidence of common ancestry with other species. A couple of examples of vestigial structures include the tiny wings of flightless kiwis and the eyes of blind cavefish.

Remember:

Homologous: similar shape/make up, development, and organization (position) ; may have similar function

Analagous: similar function but NOT the other criteria listed above

Vestigial: lacking in function; may be found fully formed in other organisms