**Notes: Evidence of Evolution**

**Evidence of Evolution**

* Remember, evolution is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, so there must be extensive evidence that supports it!
* Lines of evidence:

**Fossil Record**

* Show \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ between extinct organisms and organisms living today
* Many types of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, imprints (footprints, leaves), \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, plants, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, eggs, fossilized amber (insects)
* Transitional Species
  + Show link between \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of organisms
    - Example: Archaeopteryx–Link between reptiles and birds
* Shows \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ between living and extinct species
  + - Example:

**Anatomical Features**

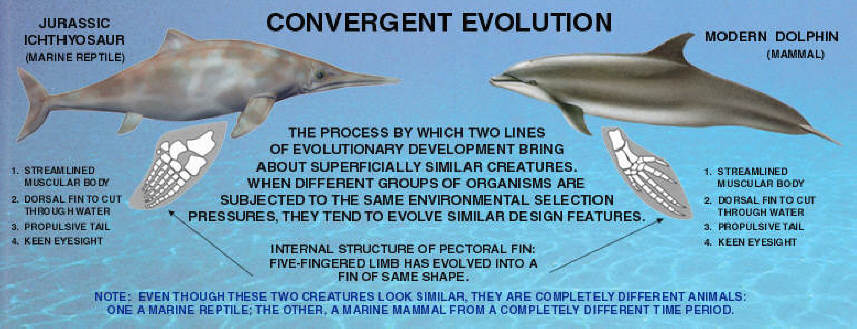
* Similarities in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ suggest common descent/ancestry among organisms

**Homology vs. Analogy**

* Homology- traits inherited by two \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ organisms from a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ancestor (forelimbs of a dog and human arm)
* Analogy- similarity due to convergent evolution \_\_\_\_\_\_\_\_\_\_ common \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (wings of a bird and wings of a butterfly)

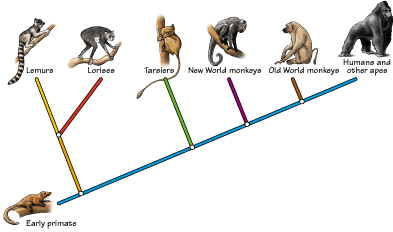
**Convergent Evolution**

* Convergent evolution
  + Two separate organisms evolve similar characteristics \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of one another
  + Happens when two species are facing similar selective pressures/same \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ pressures



**Divergent Evolution**

* Divergent evolution is the accumulation of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_; results in different \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



**Homologous Structures**

* Definition:
  + Bones or organs that appear in different organisms but share a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ancestry
  + Same basic \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, but \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Example:
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of vertebrates:




      * These bones are very similar but have **very different functions**

**Vestigial Structures**

* Definition
  + Body structure that has been \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in size and function
  + But, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ a fully functional structure in another organism
* Examples
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (coccyx) in humans
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in humans
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in flightless birds
    - Related to wings used for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ fold in human eye
    - Remnant of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ membrane
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in humans
    - Attempt to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_ fur when cold

**Embryology**

* Embryology Definition:
  + The study of embryos and their \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Different organisms show very \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ developmental patterns and structures
  + Suggests \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ancestry between species
* Example:
  + All vertebrates have \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ at some point during development

**Biochemistry**

* Nucleic acids carry \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ information in all organisms
  + \_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ genetic code
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ code and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ acids are the same for all organisms
  + \_\_\_\_\_\_\_\_\_\_\_ sequences
  + The more closely related organisms are, the more similar their \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ sequences
* Proteins
  + Vital proteins are found in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ organisms
  + Example:
* ATP
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ source for all organisms