

# Chapter 7- Changes Over Time

## Section 2 Evidence of Evolution

- **EQ:** How do varying pieces of evidence support the theory of evolution and changes in Earth's history?
- **Text Pages:** 234-240
- **Vocab:** comparative anatomy, homologous structures, fossil, mold, cast, petrified fossil, trace fossil, paleontologist, gradualism, punctuated equilibria
- **For your Cornell Notes:**
  - Define the vocabulary words
  - Read the textbook pages and answer the questions given (not writing your own questions, you don't need complete sentences!)
  - Summarize! Full paragraph includes: Topic sentence that answers EQ broadly. Supporting sentences that have details from the notes to support the topic sentence. Use complete sentences, NO FLUFF!

- Questions:
  - How do the four forms of evidence support the theory of natural selection? Give examples of each.
  - How do fossils form? Give examples.
  - What do fossils tell paleontologists and other scientists about Earth's history? Be sure to describe both history of life on Earth and history of Earth's environment.
  - What are the two hypotheses that describes the rate of evolution?

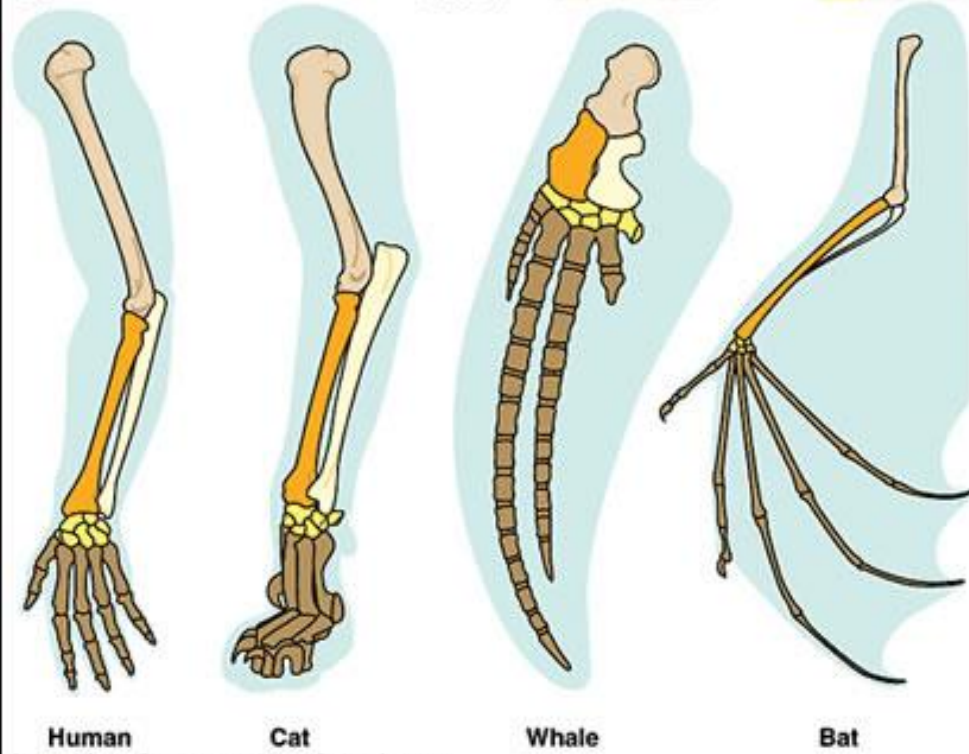
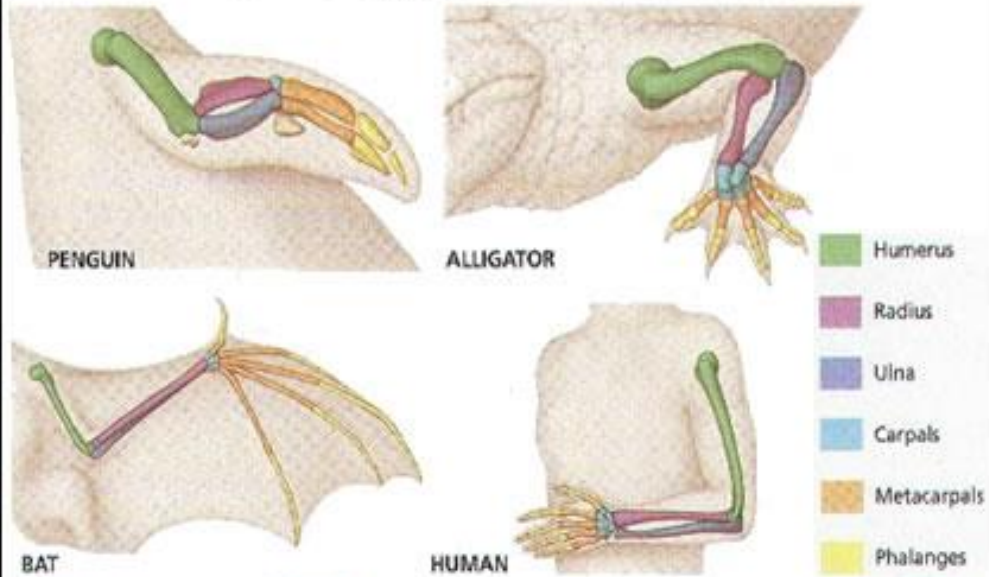
## Pg 30 Left Side Assignment

- Make a 3-part foldable for the 4 forms of evidence of evolution. Be sure to include a description, examples, and a sketch for each piece of evidence
- Compare and contrast types of fossils ( you may use illustrations)
- Attach the “Finding Clues in Rock Layers” activity (completed)
- Make sure to include at least one connection!

# Forms of Evidence for Evolution

- Modern day organisms can provide clues about evolution. Types of evidence that organisms have changed over time include:
  - Similar body structures
  - Patterns of early development
  - Molecular structure
  - Fossils
- **Comparative Anatomy**: comparison of the structures of different organisms
  - For example, fishes, amphibians, reptiles, birds, and mammals all have a backbone and so we are classified as vertebrates
    - Presumably we inherited this similarity in structure from a common ancestor
- **Homologous Structures**: similar structures that related species have inherited from a common ancestor
- Scientists make inferences about evolutionary relationships by comparing how different species develop before birth
  - **Patterns of early development**: During early development, all vertebrates have a tail and gill slits suggesting that vertebrate species share a common ancestor
  - **Molecular Structure**: Two species with similar DNA and proteins probably evolved from a common ancestor

# Homologous Structures



Can you guess which of these embryos are human?



# How Fossils Form

- Most fossils form when organisms die and become buried in sediments.
  - The most common are molds and casts
    - **Mold:** a hollow area in sediment in the shape of an organism
    - **Cast:** a solid copy of the shape of an organism (opposite of mold)
  - Other types of fossils:
    - **Petrified:** fossils in which minerals replace
    - **Trace:** provide evidence of the activity of ancient organisms (for example, chemicals that are made by living organisms that are trapped in rocks)
    - **Preserved Remains:** organisms preserved in tar, amber, or ice (etc.)

# Some Types of Fossils





# Learning from Fossils

- **Paleontologist:** a scientist who studies fossils to piece together the fossil record
  - **Fossil Record:** provides evidence about the history of life and past environments on Earth
    - Shows that life on Earth has changed over time
    - Shows that the environment has changed over time
- Scientists also use fossils to study the speed at which evolution has occurred.
  - Scientists are not entirely sure how fast species change
  - **Gradualism Hypothesis:** evolution occurs slowly but steadily
  - **Punctuated Equilibria Hypothesis:** species occurs quickly in relatively short spurts of time
    - Accounts for gaps in the fossil record