Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Evidence for Evolution

***Directions***: Evolution is defined as the change in the inherited characteristics of biological populations over successive generations. For each question below, identify whether the evidence is **anatomical** *– homologous structures*, **anatomical** – *analogous structures*, **anatomical** – *vestigial structures*, **DNA analysis**, **embryological**, or from the **fossil record**. Then, using complete sentences, explain how it serves as evidence for evolution.

***Example:*** **Humans and dolphins have the same bones making up their arms and fins.**

* 1. *Identify* the evidence for evolution.

Anatomical – Homologous Structures

* 1. *Explain* how this serves as evidence for evolution.

The arm and fin have similar construction, yet perform different functions. This means these are anatomically similar structures inherited from a common ancestor.

1. **Scientists discover preserved bones of a large animal that no longer exists today.**
   1. *Identify* the evidence for evolution.
   2. *Explain* how this serves as evidence for evolution.
2. **The human gene for muscle protein differs from the muscle protein in monkeys in 4 places. It differs from the muscle proteins in chickens in 25 places.** 
   1. *Identify* the evidence for evolution.
   2. *Explain* how this serves as evidence for evolution.
3. **Humans, rabbits and zebras all have an appendix, an extra piece in their digestive system. In humans, this structure is much smaller and is thought to no longer serve a purpose.**
   * + - 1. *Identify* the evidence for evolution.
   1. *Explain* how this serves as evidence for evolution.
4. **Honey possums lick nectar from flowers using a long tongue made of soft muscle. Butterflies lick nectar from flowers using a long tongue made of hard protein.**
   1. *Identify* the evidence for evolution.
   2. *Explain* how this serves as evidence for evolution.
5. **The cells of echinoderms (starfish, sea urchins, sand dollars) and the cells of vertebrates are strikingly similar in the earliest stages of development; they all exhibit deuterostome development.**
   1. *Identify* the evidence for evolution.
   2. *Explain* how this serves as evidence for evolution.

***Homologous Structures –*** The structures seen below are *formed* in similar ways during embryonic development and share like *arrangements*; however, they have somewhat different forms and functions. They are called *homologous structures*.

***Directions:*** Color the human arm first. Color the bones of the arm (humerus, ulna and radius) BLUE. Color the bones of the wrist (carpals) PURPLE. Color the bones of the hand (metacarpals and phalanges) YELLOW. Then color the corresponding bones (containing the same pattern) in each of the other animals the same color as the human bone (ex: if you color the humerus blue in the human, it should be blue in all the other animals).

