

# Chapter Seven: The Evolution of Living Things

## Section 1: Change Over Time

**Adaptation:** a characteristic that helps an organism survive and reproduce in its environment

- Can be physical (long neck or stripped fur) or behaviors that can help an organism (protect itself, find food, or reproduce)

**Species:** a group of organisms that are closely related and can mate to produce fertile offspring

*Populations:* groups of individuals of the same species living in the same place

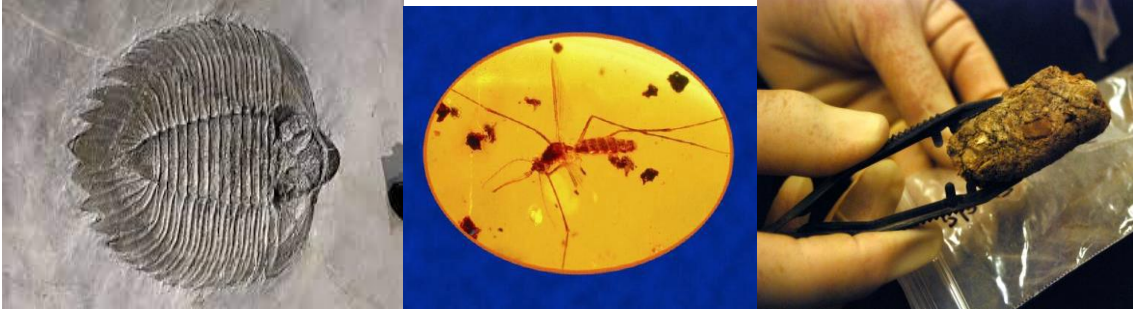
Scientists estimate that the planet is 4.6 billion years old.

**Evolution:** the process in which populations gradually change over time

- As populations change over time, new species form
- newer species descend from older species
- Evidence is buried within Earth
  - Earth's crust is arranged in layers
  - *Sediments:* particles of sand, dust, or soil
    - Carried by wind and water and deposited causing the old layers to be buried deeper within Earth

**Fossil:** the remains or imprints of once-living organisms found in the layers of rock

- Form when a dead organism is covered by a layer of sediment



**Fossil Record:** a timeline of life that scientist have made by studying fossils

- Organizes fossils by their estimated ages and physical similarities

Scientists have named and described hundreds of thousands of living and ancient species.

- Scientists believe that all species alive today evolved from common ancestors
- Scientists use information about these species to sketch out a “tree of life” that includes all known organisms.
- Fossils are rare because specific conditions are necessary for fossils to form (discuss this in earth science)

Discussion and examining organisms

- Scientists are discussing the evolution of mammals
  - mammals breathe air, give birth to live young, produce milk, and are warm-blooded (produce own body heat and don't rely on the environment to regulate its own body temperature)
  - compare a fish to a whale
  - ancestor of whales was probably a mammal that lived on land or spent time on both land and in water
  - evidence also shows although whales don't have hind limbs, but they have tiny hip bones that may have been inherited from a four-legged ancestor

Every organism inherits DNA therefore every organism inherits the traits that determined DNA. Organisms contain evidence that populations and species undergo changes over time.

- Skeletal structures – the bone structures and order of many animals are similar but have evolved to perform different functions for each animal.
- DNA - Scientists find that species that have many traits in common do have similarities in their DNA.
  - Compare a cat to a tiger then to a dog
  - This supports that all species share a common ancestor

