

# CORE CONCEPTS

## PROCESSES OF LIFE

### Key Prior Knowledge (from the Matter and Energy Units)

- Energy is the ability to do work and exists in different forms. These forms include but are not limited to thermal, mechanical, chemical, electromagnetic, and nuclear. Energy cannot be created or destroyed, but may be converted from one form to another.
- Matter can undergo both physical and chemical changes.
- Matter and energy are neither created nor destroyed.

### CORE CONCEPTS

- Living things are made up of non-living matter and are subject to the same scientific laws as non-living things.
  - Especially important are the Laws of Conservation of Matter and Energy.  
(SC.G.1.2.4, SC.G.1.2.5, SC.G.1.2.6)
- Living things display all of the following characteristics at some stage in their life:
  - Cellular organization (the rest of the characteristics emerge from an organism's highly ordered structure)
  - Response to the environment
  - Reproduction and heredity
  - Energy utilization
  - Homeostasis
  - Growth and development
  - Evolutionary adaptation
  - Interdependence  
(SC.F.1.2.3, SC.F.2.2.1)
- All living organisms have **needs required for survival** and have developed a variety of adaptations (structural and reproductive) that allow them to meet these needs in their own environment. The basic needs for individual and population survival of a certain species are:
  - Water
  - Energy (food)
  - Shelter
  - Stable internal conditions
  - Reproduction ( *for population survival only* )  
(SC.F.1.2.1, SC.F.1.2.3, SC.F.2.2.1)

- **Structure and function are generally correlated at all levels of biological organization.**
  - The ability of a part to function is dependent on its structure.
  - The success of the structure determines if that part will be found in future generations of a species (natural selection).(SC.F.1.2.1)
  
- **Cells are an organism's basic units of structure and function.**
  - The cell is the lowest structure capable of performing all the activities of life.(SC.F.1.2.4)
  
- **Life requires the continual uptake of high quality energy (e.g. sunlight and chemical energy) and the release of lower quality energy (e.g. heat) to the surroundings.**  
(SC.F.1.2.2, SC.F.1.2.3)
  
- **Living organisms are classified into eight categories based on their evolutionary relationships (from most inclusive to least inclusive). They are placed into domains and kingdoms based on their cell type, their ability to make food, and the number of cells in their bodies:**
  - Domain
  - Kingdom
  - Phylum
  - Class
  - Order
  - Family
  - Genus
  - Species

# **SUNSHINE STATE STANDARDS BENCHMARKS**

- The student knows that living things are different but share similar structures. (SC.F.1.2.3)
- The student knows that the human body is made of systems with structures and functions that are related. (SC.F.1.2.1)
- The student knows how all animals depend on plants. (SC.F.1.2.2)
- The student knows that similar cells form different kinds of structures. (SC.F.1.2.4)
- The student knows that many characteristics of an organism are inherited from the parents of the organism, but that other characteristics are learned from an individual's interactions with the environment. (SC.F.2.2.1)