Structure and Function of Life

*Organ Systems, Anatomy (Structure) and Physiology (Function), Homeostasis*

**Standard 2 / Objectives 5, 6 and 7**

**Goals**:

* I can construct an explanation about the role of mitosis in the production, growth, and maintenance of systems within complex organisms.
* I can model and explain the major events of the cell cycle, including cell growth and DNA replication, separation of chromosomes, and separation of cell contents (cytokinesis).
* I can ask questions to develop an argument for how the structure and function of interacting organs and organ systems make up multicellular organisms.
* I can ask questions to develop an argument for how organ systems contribute to homeostasis within the organism.
* I can construct an explanation for the interactions of organs and organ systems.
  + Examples may include, but are not limited to: digestive system, cardiovascular system, respiratory system, muscular system, nervous system, skeletal system, integumentary system, urinary system, excretory system, endocrine system, exocrine system, immune system.
* I can plan and carry out an investigation to provide evidence that feedback mechanisms maintain stability in organisms.
  + Examples may include, but are not limited to: heart rate response to changes in activity, stomata response to changes in moisture or temperature, root development in response to variations in water level.

**Lab Book:**

* Definitions
  + Organ, organ system, multicellular, homeostasis, digestive system, cardiovascular system, respiratory system, muscular system, nervous system, skeletal system, integumentary system, urinary system, excretory system, endocrine system, exocrine system, immune system, feedback mechanism, mitosis, cell cycle, DNA replication, chromosome
* Videos: *Anatomy, Physiology and Homeostasis* (lavender handout)
  + Characteristics of Human Life
  + Levels of Organization of Body Structure and Function
  + Anatomical Positions and Directional Terms
  + Body Planes
  + Body Cavities
  + Abdominopelvic Regions and Abdominal Quadrants
  + Homeostasis
  + Homeostatic Control Mechanisms or Systems
  + Positive and Negative Feedback
  + Example of Homeostasis: Bone Breaks and Healing
* Homeostasis Game - *Code Fred Survival Mode*
  + Description of Situation and Body’s Response
    - Twelve (12) Levels
* Fetal Pig Discovery
  + Questions/observations – twelve (12) stations
    - Ventricle Walls
    - Lungs - tissues
    - Diaphragm and/or Liver
    - Stomach – smooth muscle tissue
    - Small intestine
    - Large intestine
    - Spine
    - Gender
    - Muscle
    - Digestive system
    - Mulberry Disease – affected tissues
    - Porcine Reproductive and Respiratory Syndrome (PRRS) – affected tissues
* Organ System Models (at least four)
  + Digestive System: Human
  + Digestive System: Ruminant
  + Digestive System: Avian
  + Heart: Mammals/Birds
  + Heart: Reptiles/Amphibians
  + Heart: Fish
* PowerPoint Slides – Notes/Observations: Organ Systems Investigations/Observations
* Mitosis Model – Diagram and Explanation
  + Prophase
  + Metaphase
  + Anaphase
  + Telophase
  + Cytokinesis
* Spider Plant Propagation
  + Lab Procedure and Description
  + Definition of Asexual Reproduction
* Stomata Lab
  + Procedure
  + Description
  + Results