**Unit 3 Objectives**

**Cell Structure, Function, & Transport**

**Unit Objectives:**

* Define a cell and a few of the important characteristics of cells
* Describe the cell theory and relate this to the Louis Pasteur’s work
* Explain the biological hierarchy of life from cell to ecosystems
* Recognize the difference between eukaryotic cells and prokaryotic cells
* Build a model of cell with items found within the classroom, explaining why you chose each item to represent each organelle
* Illustrate the structure and function of the plasma membrane
* Hypothesize what may happen if the plasma membrane did not function properly
* Compare and contrast passive and active transport
* Define osmosis and diffusion, while relating them to cell transport
* Implement an understanding of homeostasis by completing real-life practice problems relating to hypertonic, hypotonic, and isotonic solutions
* Design an experiment using an egg (single cell) to demonstrate osmosis, analyze the data from the experiment, and conclude whether the solution was hypertonic, isotonic, or hypotonic compared to the egg
* Describe the function of the organelles, cytoplasm, flagella/cilia within a cell
* Label the organelles within a cell
* Categorize the various organelles within a eukaryotic cell, comparing and contrasting them to places around town (post office, school, etc.)
* Assess how well the organelles work with or against one another to maintain homeostasis within the cell
* Properly use and recognize parts of the light microscopes when observing cells
* Research and paraphrase your findings regarding the endosymbiotic theory with chloroplasts and mitochondria
* Critique the endosymbiotic theory by recognizing its possible strengths and weaknesses

**Next Generation Science Standards (NGSS):**

* **HS-LS1-A** Systems of specialized cells within organisms help them perform the essential functions of life; multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level
* **HS-LS1-2** Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms
* **HS-LS1-3** Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis

**Common Core:**

* **RST.9-10.1.** Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions
* **RST.9-10.2.** Determine the central ideas or conclusions of a text; trace the text’s explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text
* **RST.9-10.3** Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in text
* **RST.9-10.4.** Determine the meaning of symbols, key terms, and other domain specific words and phrases as they are used in a specific or technical context relevant to grades 9-10 texts and topics.
* **RST.9-10.7.** Translate quantitative or technical information expressed in words in a text into a visual form (table or chart, ex.) and translate information expressed visually or mathematically into words
* **RST.9-10.8.** Assess the extent to which the reasoning and evidence in a text support the author’s claim or a recommendation for solving a scientific or technical problem
* **WHST.9-10.1** Write arguments focused on discipline specific content
  + **a.** Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among the claim(s), counterclaims, reasons, and evidence
  + **b.** Develop claims and counterclaims fairly, supplying data and evidence for each while pointing out strengths and limitations of both claim(s) and counterclaims in discipline appropriate form and in manner that anticipates the audience’s knowledge level and concerns
  + **WHST.9-10.4** Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience
  + **WHST.9-10.6** Use technology, including the internet, to produce, publish, and update individual or shared writing products, taking advantage of technology’s capacity to link to other information and to display information flexibly and dynamically.
  + **WHST.9-10.7** Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
  + **WHST.9-10.8** Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation

\*Not every single portion of the NGSS or Common Core standards listed above will be met within this single unit. These standards will yet again be addressed in later units in order to fully complete all parts.