Unit 1: Cell Structure and Function

Unit #:	APSDO-00018794	Duration:	5.0 Week(s)	Date(s):	

Team:
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Grades:
7
Subjects:
Science

Unit Focus

In this unit, students will understand that all living things are made of cells, with specialized structures responsible for particular functions. Students will learn how unicellular organisms carry out basic life functions such as movement, food-getting, digestion, and reproduction. They will acquire the laboratory skills necessary to independently use compound microscopes to observe, compare and contrast unicellular organisms of the Kingdom Protista and Kingdom Monera (bacteria) and their interaction with a variety of species. Summative assessments may include application problems, experimental designs, laboratory practices, data analyses, models, projects, and position statements. These may be in the form of stand-alone tasks or as part of quizzes, tests, labs, or other assignments. The primary instructional materials include the textbook Parade of Life: Monerans, Protists, Fungi, and Plants, compound microscopes, prepared and living organisms, and other related laboratory equipment and materials.

Stage 1: Desired Results - Key Understandings

Established Goals

Next Generation Science Standards (DCI)
Science: 7

- All living things are made up of cells, which is the smallest unit that can be said to be alive. An organism may consist of one single cell (unicellular) or many different numbers and types of cells (multicellular). *LS1.6.A1*
- Organisms reproduce, either sexually or asexually, and transfer their genetic information to their offspring. *LS1.6.B2*

Transfer

T1 (T3) Collect, analyze, and evaluate the quality of evidence in relation to a question.
T2 (T5) Communicate scientific information clearly, thoroughly, and accurately.
T3 (T2) Design an investigation or model using appropriate scientific tools, resources, and methods.
T4 (T4) Develop a valid scientific conclusion, assess its validity and limitations, and determine future course of actions to inspire further questions.
T5 (T1) Integrate knowledge from a variety of disciplines and apply it to new situations to make sense of information, formulate insightful questions, and/or solve problems.
T6 (T6) Use mathematics to represent physical variables and their relationships, to make quantitative predictions, and to solve problems.

Meaning

- Organisms, and populations of organisms, are dependent on their environmental interactions both with other living things and with nonliving factors. *LS2.6.A1*
- Within cells, special structures are responsible for particular functions, and the cell membrane forms the boundary that controls what enters and leaves the cell. *LS1.6.A2*
- Within individual organisms, food moves through a series of chemical reactions in which it is broken down and rearranged to form new molecules, to support growth, or to release energy. *LS1.6.C2*

Understandings	Essential Questions
U1 (U306) All cells contain specific structures that interact with each other to carry out a variety of functions. **U2** (U302) Reproduction is essential to the survival of all species and is accomplished in a variety of ways. **U3** (U309) Photosynthesis provides a mechanism for converting light energy into chemical energy (sugars) while cellular respiration breaks down sugar to create a usable form of chemical energy. **U4** (U303) All organisms utilize sense receptors to process and respond to information from their environment in order to survive.	**Q1** (Q301) How do plant and animal adaptations help them to survive in their environments? **Q2** (Q305) How does a cell`s structure enable it to carry out a variety of functions in response to its environment?

Acquisition of Knowledge and Skill

Knowledge	Skills
K1 Describe how major cell organelles are used to conduct basic life functions in a variety of unicellular organisms (bacteria and protists) **K2** Recognize mitosis and meiosis and understand their roles in reproduction of cells and production of gametes **K3** Understand the role of chloroplasts in the process of photosynthesis **K4** Understand the role of mitochondria in the process of cellular respiration	**S1** Use a compound microscope and electron microscope images to locate and identify a variety of unicellular organisms (bacteria and protists) **S2** Prepare accurate biological diagrams from microscope observations **S3** Prepare and view wet-mount slides
