Unit 3 Cell Structure and Function

Content Area: **Science**
Course(s): **Generic Course, AP Biology**
Time Period: **Semester 1**
Length: **3 weeks**
Status: **Published**

Standards

SCI.9-12.5.1.12	All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.
SCI.9-12.5.3.12	All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.
SCI.9-12.5.3.12.A	Living organisms are composed of cellular units (structures) that carry out functions required for life. Cellular units are composed of molecules, which also carry out biological functions.
SCI.9-12.5.3.12.B	Food is required for energy and building cellular materials. Organisms in an ecosystem have different ways of obtaining food, and some organisms obtain their food directly from other organisms.
SCI.9-12.5.3.12.C	All animals and most plants depend on both other organisms and their environment to meet their basic needs.
TECH.8.2.12.C.CS3	The role of troubleshooting, research and development, invention and innovation and experimentation in problem solving.

Essential Questions

How do organelles function together in cellular processes?
How does the structural organization of membranes provide for transport of materials and recognition of cell types?

How does potential energy in concentration gradients assist in maintaining homeostasis in cells?
How are chemical messages received, transduced, and responded to by cells?

Enduring Understandings - College Board AP Biology

Enduring understanding 2.A: Growth, reproduction, and maintenance of the organization of living systems require free energy and matter.

Enduring understanding 2.B: Growth, reproduction, and dynamic homeostasis require that cells create and maintain internal environments that are different from their external environments.

Enduring understanding 2.D: Growth and dynamic homeostasis of a biological system are influenced by

changes in the system's environment.

Knowledge and Skills

Students will be able to:

predict flow of water and ions in specific somatic solutions inside and outside the cell.
trace the pathway of metabolized materials through the ECM and internal membrane system.
account for the structures that contribute to cell motility.
account for the traffic of materials across the membrane.

compare mechanisms of signal reception and transduction.

describe second messengers and amplification of intracellular responses.

Assessments

https://docs.google.com/document/d/1wR7bQF-8AQoRrt0g4C3hKja0yjwDjC9_BiAmONWbTcI/edit

Modifications

https://docs.google.com/document/d/1ODqaPP69YkcFiyG72fIT8XsUIe3K1VSG7nxuc4CpCec/edit

Resources

Chapters 4 and 5 of *Principles of Life*

Cell Membrane model materials from U of Utah Learn Genetics

Kinesthetic activity - "Pathways with Friends" to model cell signalling

AP Investigation 4 - Diffusion and Osmosis