Unit 01C: Structure and Function - Cell Differentiation

Content Area: **Science**
Course(s): **Generic Course**
Time Period: **Semester 1**
Length: **2 weeks**
Status: **Published**

Standards

LS1.A

- Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)
- All cells contain genetic information in the form of DNA molecules. Genes are regions in the DNA that contain the instructions that code for the formation of proteins, which carry out most of the work of cells. (HS-LS1-1) *(Note: This Disciplinary Core Idea is also addressed by HS-LS3-1.)*
- 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)
- Feedback mechanisms maintain a living system's internal conditions within certain limits and mediate behaviors, allowing it to remain alive and functional even as external conditions change within some range. Feedback mechanisms can encourage (through positive feedback) or discourage (negative feedback) what is going on inside the living system. (HS-LS1-3)

SCI.9-12.HS-LS1	From Molecules to Organisms: Structures and Processes
SCI.9-12.HS-LS1-1	Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins, which carry out the essential functions of life through systems of specialized cells.
SCI.9-12.HS-LS1-2	Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.
SCI.9-12.HS-LS1-7	Use a model to illustrate that cellular respiration is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and the bonds in new compounds are formed, resulting in a net transfer of energy.
SCI.9-12.HS-LS1-4	Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.
SCI.9-12.HS-LS1-5	Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy.
SCI.9-12.HS-LS1-6	Construct and revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements to form amino acids and/or other large carbon-based molecules.
SCI.9-12.HS-LS1-3	Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.

Essential Questions

- Why is it important for a cell to maintain a stable internal environment?
- how is cell structure related to its function?

Content / Skills

Content

- plasma membrane structure and function
- predict a cells response to a given set of environmental conditions
- structure and function of cellular organelles
- structure and function of the eukaryotic and prokaryotic cells
- the cell theory

Skills

- compare/Contrast plant and animal cells
- describe how homeostasis relates to the cell
- describe the importance of the plasma membrane
- describe the transport of materials into and out of the cell
- list and define parts of the cell
- proper use of the microscope