Unit 03: Cell Structure and Function

Content Area: **Template**
Course(s):
Time Period:
Length:
Status: **Published**

State Mandated Topics Addressed in this Unit

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N/A	N/A

Unit 3: Cell Structure and Function

Essential Questions

- How are cell structures adapted to their functions?
- How do cells maintain conditions necessary for survival?
- How do cells maintain homeostasis in changing environments?
- How do multicellular organisms grow and develop from a single cell?
- How does the structure of a molecule relate to its function in a living thing?

Learning Objectives

- Compare and contrast plant and animal cells.
- Demonstrate how cells maintain internal stability (homeostasis).
- Describe modern applications of the regulation of cell differentiation and analyze the benefits and risks (e.g. stem cells, sex determination).
- Describe the structure and function of major organelles in eukaryotic and prokaryotic cells.
- Explain the processes of osmosis, diffusion, and active transport.
- Interpret models of cellular processes like transport and signaling.
- Predict a cell's response in a given set of environmental conditions.

Standards

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.

9-12.HS-LS1-3	Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.
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.

Instructional Tasks/Activities

- Cell City Poster: students draw a city, school, etc. representing all organelles as parts of that structure. Label part of cell, part of city/school. Explain how their functions are related.
- Cellular Models: students identify cellular organelles using 3D models in groups
- Chapter Tests
- Comparison chart, microscope lab with pond water
- Diffusion/Osmosis lab with gummy bears or dialysis tubing
- Microscope Lab: students examine plant and animal cells to identify organelles
- Organelle roles in Protein Synthesis Enactment: students are assigned an organelle and carry out the role in protein synthesis using legos as a manipulative
- Organelle stations, coloring and labeling
- Osmosis in red blood cells or plant wilt scenarios
- Phospholipid bilayer modeling
- Protein Synthesis Story: students write a creative story about how proteins are made using the proper organelles and their functions
- Review game
- Scientists Worksheet: students cut, arrange, and glue scientists, their discovery, and the year of their discovery in the proper order that led to the cell theory
- Vocabulary Quizzes

Assessment Procedure

- Classroom Total Participation Technique
- Classwork
- DBQ
- Essay
- Exit Ticket/Entrance Ticket/Do Now
- Foldables – organization of material (prokaryotes vs. eukaryotes, types of microscopes, plant vs. animal organelles, function of organelles, passive vs. active transport)
- Group discussion
- Journal / Student Reflection
- Kahoot
- Other named in lesson
- Peer Review
- Performance

- PowerPoint presentation of material
- Problem Correction
- Project
- Quiz
- Rubric
- Teacher Collected Data
- Test
- Think, pair, share (read assigned section of text individually, discuss with a partner, present material in pairs to class – use PowerPoint as a reference)
- Worksheet

Recommended Technology Activities

- Appropriate Content Specific Online Resource
- Chromebook
- Gimkit
- GoGuardian
- Google Classroom
- Google Docs
- Google Forms
- Google Slides
- Kahoot
- MagicSchool AI
- Other- Specified in Lesson
- Quiziz

Accommodations & Modifications & Differentiation

Accommodations and Modifications should be used to meet individual needs. Their IEP and 504 plans should be used in addition to the following suggestions.

Gifted and Talented

- Compare & Contrast
- Conferencing
- Debates
- Jigsaw
- Peer Partner Learning

- Problem Solving
- Structured Controversy
- Think, Pair, Share
- Tutorial Groups

Instruction/Materials

- alter format of materials (type/highlight, etc.)
- color code materials
- eliminate answers
- extended time
- extended time
- large print
- modified quiz
- modified test
- Modify Assignments as Needed
- Modify/Repeat/Model directions
- necessary assignments only
- Other (specify in plans)
- other- named in lesson
- provide assistance and cues for transitions
- provide daily assignment list
- read class materials orally
- reduce work load
- shorten assignments
- study guide/outline
- utilize multi-sensory modes to reinforce instruction

Environment

- alter physical room environment
- assign peer tutors/work buddies/note takers
- assign preferential seating
- individualized instruction/small group
- modify student schedule (Describe)
- other- please specify in plans
- provide desktop list/formula

Honors Modifications

N/A

Resources

- Resource 1
- Resource 2
- Resource 3
- Resource 4
- Resource 5