

Unit 2: Cells
7th Grade Science
9 Class Meetings

Edited July 2021

Essential Questions

- How do the structures of cells enable life's functions?

Enduring Understandings with Unit Goals

EU 1: In multicellular organisms, the body is a system of multiple interacting subsystems. These subsystems are groups of cells that work together to form tissues and organs that are specialized for particular body functions

- Discover that all living things are made of cells (either one cell or many different numbers and types of cells) and that the cell is the smallest unit that is alive.
- Identify and describe different types of cells and their functions.
- Determine the presence or absence of cells in a variety of organisms, including unicellular and multicellular organisms.

EU 2: Cells contribute to overall cellular functions that describe the structure of the cell membrane or cell wall and its relationship to the function of the organelles and the whole cell.

- Describe the purpose of a cell as a whole and ways parts of cells contribute to the overall function of the cell.
- Examine the structure of the cell membrane or cell wall and its relationship to the function of the organelles and the whole cell.

Standards

Next Generation Science Standards:

- **MS-LS1-1:** Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.
- **MS-LS1-2:** Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.
- **MS-LS1-3:** Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.

Common Core State Standards:

- **CCSS.ELA-LITERACY.RL.7.1:** Cite several pieces of textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.

ISAAC Vision of the Graduate Competencies

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- Competency 1:** Write effectively for a variety of purposes.
- Competency 2:** Speak to diverse audiences in an accountable manner.
- Competency 3:** Develop the behaviors needed to interact and contribute with others on a team.
- Competency 4:** Analyze and solve problems independently and collaboratively.
- Competency 5:** Be responsible, creative, and empathetic members of the community.

Unit Content Overview

1. Prokaryotes and Eukaryotes

- Compare and contrast prokaryotic and eukaryotic cells.
- Assemble cell models depicting the general structure of cell types.
- Describe the function of different cell parts.

2. The Purpose of Cells

- Identify where each discussed type of cell is located.
- Describe unique features to each given cell type.
- Explain how muscle cells contract (ATP hydrolysis).
- Describe the purpose of epithelial cells.
- Illustrate and describe how neurons transfer information through the body and brain.
- Compare and contrast muscle and connective tissue cells.
- Differentiate between the different types of neurons.

3. The Structure of Cells

- Create models depicting the general structures.
- Compare and contrast plant and animal cells.
- Explain how chloroplasts make food.

Interdisciplinary Connection:

- Language Arts - Word Problems
- Art – Illustration of cells

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Daily Learning Objectives with *Do Now Activities*

Students will be able to...

- Compare and contrast prokaryotic and eukaryotic cells.
- Evaluate the unique features for eukaryotic cell types.
- Apply knowledge of cells to compare and contrast plant and animal cells.
- Analyze the structure of different neurons as they relate to cell function.**
- Construct and describe a diagram of neuron pathways
- Demonstrate how sensory neurons receive information and send it to neurotransmitters.
- Compare and contrast the structure and function of muscles and connective tissues.**
- Discover how ATP hydrolysis impacts muscle tissue**
- Apply cell structures, functions, types, and relationships to discover how plant cells create food from sunlight.
- Demonstrate content knowledge for success on the unit exam.

Instructional Strategies/Differentiated Instruction

- Whole group instruction
- Guided notes
- Student-led instruction
- Independent problem-solving
- Collaborative problem-solving
- Graphic Organizer
- Cross-curricular problem solving (independent and collaborative)
- Homework
- Word walls with visuals
- Small group instruction
- Alternative test strategies

Assessments

FORMATIVE ASSESSMENTS:

- Warm-ups (NGSS)
- Whiteboards
- Mid-class check-ins
- Exit Slips
- Accountable Talk Discussions
- Do Now
- Student-led instruction
- Homework

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SUMMATIVE ASSESSMENTS:

- Quiz - EU 1
- Quiz – EU 2
- Performance Task- “Escape the Ice Caves”
- Unit 2 Test

Unit Task

Unit Task Name: “Escape the Ice Caves”

Description: In this task, students will use their knowledge on cells to escape a series of mazes with their avatar by answering scaffolded questions based on cell structures, functions, types, and relationships. To begin, they will solve a series of multiple-choice questions about cell structure and function to lead their avatar out of the first set of caves and then they will be given directions to escape the next set of caves. The third set of caves will be “in the dark” so students will have to answer another series of questions to escape a cave when they can’t see anything but the light coming from the exit. If they get a question wrong, it will lead them to a hole in the floor that will bring them back to a previous level of the cave. The final questions will be based on a final question about cell structures, functions, types, and relationships (EU 1) and (EU 2).

Evaluation: Summative Assessment and Future Rubric in 2021-2022 school year

Unit Resources

- Next Gen Science Standards
- Khan Academy
- OpenSciEd
- Flipped Google Classroom Videos
- Worksheets
- Calculator
- Laptops