

Unit 4: Cells

6th Grade Science

13 Class Meetings

Revised May 2024

Essential Questions

- How do the structures of cells enable life's functions?
- How do the organelles within a cell support the cell?

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:** Investigate 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:

- **RI 6.1:** Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.
- **RI 6.3:** Analyze in detail how key individuals, events, or ideas are introduced, illustrated, and elaborated in a text.
- **RI 6.8:** Trace and evaluate the argument and specific claims in a text, distinguishing claims that are supported by reasons and evidence from claims that are not.

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- **W 6.1:** Write arguments to support claims with clear reasons and relevant evidence.
- **W 6.2:** Write informative/explanatory texts to examine and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.
- **RST.6-8.:** Cite specific textual evidence to support analysis of science and technical texts.
- **RST.6-8.9:** Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

ISAAC Vision of the Graduate Competencies

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.

Key Terms and Vocabulary: eukaryotic, prokaryotic, organelle, mitochondria, nucleus, lysosome, centriole, vacuole, cell, cell membrane, cytoplasm, cytoskeleton, osmosis, ribosomes

Interdisciplinary Connection:

Language Arts, Humanities

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Daily Learning Objectives with TWPS

Students will be able to...

- Discover what a cell is and how it supports life. **
 - *What do you know about the word cell?*
 - *What are cells considered the basic unit of life?*
- Compare and contrast prokaryotic and eukaryotic cells.
 - *Explain the difference between prokaryotic and eukaryotic cells.*
 - *How is a prokaryotic cell similar to a eukaryotic cell?*
- Evaluate the unique features for eukaryotic cell types.
 - *What makes a eukaryotic cell unique?*
- Apply knowledge of cells to compare and contrast plant and animal cells. ***
 - *What structures do plant cells have the animal cells do not have?*
 - *Looking under a microscope, how would a scientist tell the difference between a plant cell and an animal cell?*
 - *How do cells get the energy they need to function?*
- Analyze the structure of different organelles as they relate to cell function. ***
 - *Why is the cell membrane compared to a gatekeeper?*
 - *Why is the nucleus often called the control center of the cell?*
 - *How can you compare organelles within a cell to a city?*
- Apply cell structures, functions, types, and relationships to discover how plant cells create food from sunlight.
 - *What is photosynthesis, and why is it important for cells?*
 - *Why do plant cells need a large central vacuole?*

Instructional Strategies/Differentiated Instruction

- Whole group instruction
- Guided notes
- Interactive Notebook
- Vocabulary Wall
- Investigative Labs and Experiments
- 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

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Assessments

FORMATIVE ASSESSMENTS:

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

SUMMATIVE ASSESSMENTS:

- Quiz - EU 1
- Quiz – EU 2
- Performance Task- Build-a-Cell
 - Literacy Rubric/Teacher’s Scoring Rubric

Unit Task

Unit Task Name: “Build-a-Cell”

Description: In this task, students will use their knowledge of cells to build a plant or animal cell. Students will use an assortment of craft supplies and materials to recreate a cell and all its major organelles. Students will label or create a key to identify the organelles. Students will then write an informative piece that explains the cell structures, functions, organelle types and jobs, and relationships (EU 1) and (EU 2).

Evaluation: Literacy Rubric/Teacher’s Scoring Rubric

Unit Resources

- Next Gen Science Standards
- Khan Academy
- OpenSciEd
- Flipped Google Classroom Videos
- Worksheets
- Labs
- NewsEla
- Readworks
- Interactive Notebooks
- Calculator
- Laptops