

Unit 4: Life Science - Why Do Organisms Look the Way They Do?

Content Area: **Science**
Course(s):
Time Period: **Full Year**
Length: **1 MP**
Status: **Published**

General Overview, Course Description or Course Philosophy

Science and engineering—significant parts of human culture that represent some of the pinnacles of human achievement—are not only major intellectual enterprises but also can improve people’s lives in fundamental ways. Although the intrinsic beauty of science and a fascination with how the world works have driven exploration and discovery for centuries, many of the challenges that face humanity now and in the future—related, for example, to the environment, energy, and health—require social, political, and economic solutions that must be informed deeply by knowledge of the underlying science and engineering.

OBJECTIVES, ESSENTIAL QUESTIONS, ENDURING UNDERSTANDINGS

What Is Going on Inside Me?

Learning Set 1: What Is Inside Me? How do organisms live, grow, respond to their environment, and reproduce? How do the structures of organisms enable life’s functions?

Learning Set 2 How Do Cells Get the Things They Need? How do organisms live, grow, respond to their environment, and reproduce? How do the structures of organisms enable life’s functions? How do organisms obtain and use the matter and energy they need to live and grow? How and why do organisms interact with their environment and what are the effects of these interactions? How do organisms interact with the living and nonliving environments to obtain matter and energy?

Learning Set 3 Movement and Control. How do organisms live, grow, respond to their environment, and reproduce? How do the structures of organisms enable life’s functions? How do organisms grow and develop? How do organisms obtain and use the matter and energy they need to live and grow?

CONTENT AREA STANDARDS

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| 6-8.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. |
| 6-8.MS-LS1-2 | Develop and use a model to describe the function of a cell as a whole and ways the parts of cells contribute to the function. |
| 6-8.MS-LS1-7 | Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism. |
| 6-8.MS-LS1-4 | Use argument based on empirical evidence and scientific reasoning to support an |

explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.

6-8.MS-LS2-2

Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.

6-8.MS-LS1-3

Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.

RELATED STANDARDS (Technology, 21st Century Life & Careers, ELA Companion Standards are Required)

LA.RST.6-8	Reading Science and Technical Subjects
LA.RST.6-8.1	Cite specific textual evidence to support analysis of science and technical texts.
LA.RST.6-8.2	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
LA.RST.6-8.7	Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).
LA.RST.6-8.8	Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.
LA.WHST.6-8.1	Write arguments focused on discipline-specific content.
LA.WHST.6-8.2	Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.
LA.WHST.6-8.7	Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.
LA.WHST.6-8.8	Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.
LA.WHST.6-8.9	Draw evidence from informational texts to support analysis, reflection, and research.
TECH.9.4.8.CI.1	Assess data gathered on varying perspectives on causes of climate change (e.g., cross-cultural, gender-specific, generational), and determine how the data can best be used to design multiple potential solutions (e.g., RI.7.9, 6.SP.B.5, 7.1.NH.IPERS.6, 8.2.8.ETW.4).
TECH.9.4.8.CT.1	Evaluate diverse solutions proposed by a variety of individuals, organizations, and/or agencies to a local or global problem, such as climate change, and use critical thinking skills to predict which one(s) are likely to be effective (e.g., MS-ETS1-2).
TECH.9.4.8.CT.2	Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option (e.g., MS-ETS1-4, 6.1.8.CivicsDP.1).
TECH.9.4.8.CT.3	Compare past problem-solving solutions to local, national, or global issues and analyze the factors that led to a positive or negative outcome.

STUDENT LEARNING TARGETS

Declarative Knowledge

Students will understand that:

- All living things are made up of cells, which is the smallest unit that can be said to be alive.
- In multicellular organisms, the body is a system of multiple interacting subsystems.
- Within cells, special structures are responsible for particular functions, and the cell membrane forms the boundary that controls what enters and leaves the cell.
- In multicellular organisms, the body is a system of multiple interacting subsystems.
- Within individual organisms, food moves through a series of chemical reactions in which it is broken down and rearranged to form new molecules, to support growth, or to release energy.
- Cellular respiration in plants and animals involve chemical reactions with oxygen that release stored energy.
- Growth of organisms and population increases are limited by access to resources.
- Within cells, special structures are responsible for particular functions, and the cell membrane forms the boundary that controls what enters and leaves the cell.
- In multicellular organisms, the body is a system of multiple interacting subsystems.
- Animals engage in characteristic behaviors that increase the odds of reproduction.
- Plants reproduce in a variety of ways, sometimes depending on animal behavior and specialized features for reproduction.
- Within individual organisms, food moves through a series of chemical reactions in which it is broken down and rearranged to form new molecules, to support growth, or to release energy.
- Cellular respiration in plants and animals involve chemical reactions with oxygen that release stored energy.

Procedural Knowledge

Students will be able to:

- Conduct an investigation to provide evidence that living things are made of cells.
- Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.
- Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.
- Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.

- Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.
- Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.
- Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.
- Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.
- Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect
- Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an the probability of successful reproduction of animals and plants respectively.

EVIDENCE OF LEARNING

Formative Assessments

MS - LS1-1:

Life Science 2: What is Going On Inside Me? Activity 1.1: What is Inside Me?, Reading 1.1: How Did Scientists Find These Tiny Cells?, Activity 1A.1: Preparing a Wet Mount., Activity 1A.2: Determining Field of View., Activity 1A.3: Moving Objects on the Slide., Activity 2.1: What is In My Yogurt?, Activity 2.2: Are There Cells in a Drop of Water?, Activity 2.3: How Do All These Compare?, Reading 2.3: Cells: Here, There, Everywhere., Activity: Introducing the Scientific Principles List.

MS - LS1-2:

Life Science 2: What is Going On Inside Me? Activity 5.2: Can Water Move Into the Cell?, Reading 5.2: The Ins and Outs of Osmosis., Activity 5.3: Can Food Move Into the Cell?, Activity 7.2: How Do Cells Make More Cells?, Activity 8.1: What is the Rate?, Activity 9.1: Where is Food Used in My Body?, Reading 9.1: SimCell.

MS - LS1-3:

Life Science 2: What is Going On Inside Me? Activity 3.1: Dissecting a Simple System., Reading 3.1: Systems, Systems, and More Systems., Activity 3.2: Am I a System?, Activity 4.1: Lab: Grind, Slush, and Down., Activity 4.2: Itsier, Bitsier Foodstuff., Activity 4.3: Food's Journey Continues., Activity 5.1: Can Food Molecules Move Through My Body?, Activity 6.2: Inspector Bio: What Happened to the Oxygen and Why?, Reading 6.3: Aahhh Choo! Cough, Cough! Whh-eeez! Activity 7.1: What is Inside a Bone?, Reading 7.1: What is My Skeleton Made Of?, Activity 10.1: Who Has the "Touch"?, Reading 10.1: What Happens When I Get the Chills?, Activity 11.1: How Does Everything Work Together?

MS - LS1-4:

Life Science 2: What is Going On Inside Me? Reading 8.1: Organism's Balancing Acts.

MS - LS1-7:

Life Science 2: What is Going On Inside Me? Activity 4.4: What Happens to the Food Molecules in the Small Intestine?, Activity 5.4: Can Cells Use Sugar As Food?, Activity 6.1: "Breathe In...Breathe Out...", Activity 6.3: What is the Motive?

MS - LS2.2:

Life Science 2: What is Going On Inside Me? Reading 4.4: Out with the Bad, In with the Good!

Summative Assessments

- Benchmark Assessments
 - Multiple Choice Assessment administered at the end of each marking period.

Alternative Assessments

- Oral Presentations
- Questions for Comprehension
- Performance Tasks
- Scientific Journals/Notebooks
- Self-Assessment
- WebQuests

RESOURCES (Instructional, Supplemental, Intervention Materials)

IQWST Unit Materials for Life Science 3, Learning Sets 1 - 3

A Framework For K-12 Science Education

Online Resources provided by IQWST not included in the program (to be used as support/reinforcement/enrichment): https://docs.google.com/spreadsheets/d/1VpyFCL4_50_-1w2NhcGpdNNZ2jj6aJJegcIUNCy_uzQ/pubhtml

INTERDISCIPLINARY CONNECTIONS

Collaboration with Math and Language Arts teachers is an essential part of the IQWST curriculum.

Information Writing

Current Events

Topography

Data collection/analysis

Computations

Statistics

Engineering

ACCOMMODATIONS & MODIFICATIONS FOR SUBGROUPS

See link to Accommodations & Modifications document in course folder.

IQWST provides audio recording for all readings in student workbook-available through teacher portal online

Reading differentiation strategies are embedded in the IQWST program and all students prepare for reading through a 'Getting Reading' section which begins each reading.

The sections are designed to engage students, generate interest, activate prior knowledge and provide a purpose for reading. Teachers use advance organizers for desired readings and to encourage students to plan

and annotate the passages.

A word wall is developed through vocabulary acquisition in the program. Students develop the word wall as words are learned in context and through experience in class. This helps to build meaning and understanding which support students when reading text.

Students are encouraged to ask questions and post them to the Driving Question Board. This DQB helps students develop a greater level of understanding and encourages students to work together to solve problems in and outside of class.

Support will be provided to students when writing in the student manual and use of the computer, printing, and pasting into the manual is acceptable if there is a present need.