

Grade 7: Discovering Cells

Stage 1 Desired Results		
ESTABLISHED GOALS: <u>Competencies:</u> • <i>Structure and Function- Students will analyze the relationship among structure and function of natural or human designed objects, using evidence to redesign or support claims about survival and/or improved performance.</i> • <i>Systems and System Models- Students will investigate and analyze a natural or human designed system in order to develop and justify a model that accurately represents the system or aspects of the system (e.g., boundaries, inputs, outputs, interactions, and behaviors).</i> • <i>Scale, Proportion, and Quantity- Students will apply reasoning and modeling to determine the proportional relationships in observable and non-observable phenomena in terms of relative scale and quantity.</i> • <i>Students will demonstrate the ability to analyze and summarize text and integrate knowledge to make meaning of discipline-specific materials.</i> • <i>Students will demonstrate the ability to produce coherent and supported writing in order to communicate effectively for a range of discipline-specific tasks, purposes, and audiences.</i> • <i>Students will demonstrate the ability to speak purposefully and effectively by strategically making decisions about content, language use, and discourse style.</i> <u>Content Standards:</u> • 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-LS1-6. Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.	Transfer	
	<i>Students will be able to independently use their learning to apply their understanding of cell structure and function to both unicellular and multicellular life.</i>	
	Meaning	
	ENDURING UNDERSTANDINGS <i>Students will understand that...</i> • the smallest unit of life is a cell. • organisms can be unicellular or multicellular. • there are a variety of cell types. • cells have organelles that carry out specific functions; these organelles work together to help cells meet their needs.	ESSENTIAL QUESTIONS • Is any one living thing more important than another? • How can something so small meet its basic needs for survival?
	Acquisition	
	<i>Students will know...</i> • that systems may interact with other systems; they may have sub-systems and be a part of larger complex systems. • that complex and microscopic structures and systems can be visualized, modeled, and used to describe how their function depends on the relationships among its parts, therefore complex natural structures/systems can be analyzed to determine how they function. • that all living things are made up of cells, which is the smallest unit that can be said to be alive. An organism may consist of one single cell (unicellular) or many different numbers and types of cells (multicellular). • that within cells, special structures are responsible for particular functions, and the cell membrane forms the boundary that controls what enters and leaves the cell.	<i>Students will be skilled at...</i> • describing the structure and interactions of systems that may exist independently, or be composed of subsystems, or be part of a larger complex system. • determining the limitations of a model when it represents only certain aspects of the system under study. • modeling systems and their interactions including inputs, processes, and outputs. • modeling complex and microscopic structures and systems that are quite small. • analyzing complex natural structures/systems to determine how they function. • using a variety of methods and tools to make measurements and observations.

● 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.	● that cellular respiration in plants and animals involve chemical reactions with oxygen that release stored energy. In these processes, complex molecules containing carbon react with oxygen to produce carbon dioxide and other materials. ● that the chemical reaction by which plants produce complex food molecules (sugars) requires an energy input (i.e., from sunlight) to occur. In this reaction, carbon dioxide and water combine to form carbon-based organic molecules and release oxygen. ● that plants, algae (including phytoplankton), and many microorganisms use the energy from light to make sugars (food) from carbon dioxide from the atmosphere and water through the process of photosynthesis, which also releases oxygen. These sugars can be used immediately or stored for growth or later use. ● that 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. <u>vocabulary:</u> cell, photosynthesis, microscopic cell respiration, organelle, autotroph, cell membrane, heterotroph, nucleus, specialized cell, cytoplasm, diffusion, ribosome, osmosis, chloroplast, cell division, mitochondria	
Content Area Literacy Standards		21st Century Skills
● RST.6-8.1 Cite specific textual evidence to support analysis of science and technical texts. ● 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. ● RST.6-8.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as		● <i>reason effectively</i> ● <i>make judgments and decisions</i> ● <i>communicate clearly</i> ● <i>collaborate with others</i>

they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics. • RST.6-8.8 Distinguish among facts, reasoned judgment based on research findings, and speculation in a text. • WHST.6-8.1 Write arguments focused on discipline-specific content. • WHST.6-8.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. • WHST.6-8.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. • WHST.6-8.5 With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed. • WHST.6-8.6 Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently. • 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. • 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. • WHST.6-8.9 Draw evidence from informational texts to support analysis, reflection, and research.	• <i>access and evaluate information</i> • <i>use and manage information</i> • <i>be flexible</i>
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Stage 2 - Evidence	
Evaluative Criteria	Assessment Evidence
	PERFORMANCE TASK(S):
	OTHER EVIDENCE:

Stage 3 – Learning Plan

Summary of Key Learning Events and Instruction

Language Arts Integration	Mathematics Integration
1.OA.1 Use	1.OA.1 Use
Technology Integration	District Materials
1.OA.1 Use	
Science and Engineering Practices	