PHENOMENA, DRIVING QUESTIONS AND STORYLINE

FROM CELLS TO ORGANISMS

This unit explores the anchoring phenomenon: When you look through a microscope, organisms as different as humans, plants, and many microorganisms that make people sick are all made of cells. Examples include cells from various animal tissues like blood cells, plant cells, protozoa, and bacteria, including specific microorganisms that cause certain infectious diseases. Students generate and answer questions such as: How are the cells of various organisms alike? How are they different? How do these similarities and differences relate to the functions of these cells??

Phenomenon	Driving Questions	Guiding Questions	Activities	PE	Storyline/Flow (How an activity leads to subsequent activities)
Some diseases can be spread from person to person.	How did scientists discover that microbes could cause and spread disease?	How do scientists figure out the source of an infectious disease outbreak? (Activity 1)	1, 2, 3, 4 (14, 15)	MS-LS1-1	An infectious disease can be transmitted from person to person.
		What can cause an infectious disease? (Activity 2)			Microscopic living organisms are the cause of some infectious diseases.
		How can tools such as microscopes help scientists provide evidence about living organisms? (Activity 3)			Microscopes provide evidence of organisms at scales too small to be observed by the human eye.
		How did the cell theory lead to the germ theory of disease? (Activity 4)			The idea that all living organisms are made of cells led to the germ theory of disease.
Even though organisms may look different on the outside, their cells have a lot in common.	What structures and functions do living cells have in common?	What evidence can you gather that cells are alive? (Activity 5)	5, 6, 7, 8	MS-LS1-2	Cells are alive and respire.
		How do the structures in animal and plant cells relate to their functions? (Activity 6)			Cells of all organisms have similar structures, and these structures function similarly in each organism.
		What is the function of a cell membrane? (Activity 7)			The cell membrane is an example of a cell structure that functions similarly in different organisms.
		How do the parts of a cell work together? (Activity 8)			Models can be used to demonstrate and describe cell structures and their functions.

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FROM CELLS TO ORGANISMS (continued)

Phenomenon	Driving Questions	Guiding Questions	Activities	PE	Storyline/Flow (How an activity leads to subsequent activities)
Some organisms are just one cell, while other organisms have many cells.	What is the difference between unicellular and multicellular organisms?	How do the cells of multicellular organisms compare with the cells of single-celled organisms? (Activity 9)	9, 10	MS-LS1-1 MS-LS1-3	Microscopes provide evidence that living things are made of one or many cells and that cells of different organisms share certain structures.
		What is the relationship between cells, tissues, organs, and organ systems within a multicellular organism? (Activity 10)			Animals and plants have levels of organization, including cells, tissues, organs, organ systems, and organisms.
Living organisms need food to survive.	How do living organisms obtain and use the matter and energy they need to survive?	How does food provide energy and matter for organisms? (Activity 11)	11, 12, 13	MS-LS1-6 MS-LS1-7	Food is rearranged through chemical reactions that support growth and/or release energy for cells.
		What structures in plant cells convert energy from the sun into energy stored in food? (Activity 12)			Plant cells contain structures for photosynthesis, a process that uses sunlight to synthesize food.
		What is the evidence that plants both produce and break down sugars? (Activity 13)			Experiments can provide evidence of photosynthesis and respiration in plants.
Infectious diseases can be diagnosed and treated.	How can knowledge of cells be used to identify and treat microbial diseases?	How can knowledge of cell structure and function be used to treat disease? (Activity 14)	14, 15	MS-LS1-1 MS-LS1-2	Knowledge of cell structure and function has helped scientists develop drugs that treat diseases caused by unicellular organisms.
		What microbe caused the outbreak? (Activity 15)			An understanding of cells and infectious agents can help identify the source and transmission of infectious diseases.