Unit 4: Scale, Structure, and Functions of Living Things

Standard(s):

7.3.1 Plan and carry out an investigation that provides evidence that the basic structures of living things are cells. Emphasize that cells can form single-celled or multicellular organisms, and multicellular organisms are made of different types of cells. (LS1.A)

7.3.2 Develop and use a model to describe the function of a cell in living systems and the way parts of cells contribute to cell function. Emphasize the cell as a system, including the interrelating roles of the nucleus, chloroplasts, mitochondria, cell membrane, and cell wall. (LS1.A)

7.3.3 Construct an explanation using evidence to explain how body systems have various levels of organization. Emphasize that cells form tissues, tissues form organs, and organs form systems specialized for particular body functions. Examples could include relationships between the circulatory, excretory, digestive, respiratory, muscular, skeletal, or nervous systems. Specific organ functions will be taught at the high school level. (LS1.A)

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Constructing Explanations Students construct explanations about the world using observations that are consistent with current evidence and scientific principles.	**LS1.A Structure and Function**	**Structure and Function** Students relate the shape and structure of an object or living thing to its properties and functions. **Scale, Proportion and Quantity** Students compare the scale, proportions, and quantities of measurements within and between various systems.

Big Ideas:

- Organisms and their parts are made of cells, which are the structural units of life and which themselves have molecular substructures that support their functioning.
- Organisms range in composition from a single cell (unicellular microorganisms) to multicellular organisms, in which different groups of large numbers of cells work together to form systems of tissues and organs (e.g., circulatory, respiratory, nervous, musculoskeletal), that are specialized for particular functions.

Preceding Grade Bands:	Target Grade Band:	Following Grade Band:
• All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water and air. • Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction.	• 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 or many different numbers and types of cells (multicellular). • 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. These subsystems are groups of cells that work together to form tissues or organs that are specialized for particular body functions.	• Systems of specialized cells within organisms help them perform the essential functions of life, which involve chemical reactions that take place between different types of molecules, such as water, proteins, carbohydrates, lipids, and nucleic acids. • Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. • Feedback mechanisms maintain a living system's internal conditions within certain limits and mediate behaviors, allowing it to remain alive and functional even as external conditions change within some range.

Proficiency Scale:

4 **Advanced**	3 **Proficient**	2 **Approaching Proficiency**	1 **Beginning Proficiency**
I can: Use evidence and scientific principles to **construct an explanation** that supports the claim that all living things are made of cells. The explanation includes the major structures of the cell and their functions as well as how cells form the bases for the organization of living things at various scales. AND Predict how changing the number or functioning of a cell part would affect the cell and the organism as a whole.	**I can:** Use evidence and scientific principles to **construct an explanation** that supports the claim that all living things are made of cells. The explanation includes the major structures of the cell and their functions as well as how cells form the bases for the organization of living things at various scales.	**I can:** **Construct an explanation** that living things are made of cells. The explanation includes the major structures of the cell and their functions OR how cells form the bases for the organization of living things at various scales.	**I can:** **Explain** that living things are made of cells.

Anchoring Phenomenon:

Day in the Life of Type 1 Diabetic

Essential Question:

How do the structures in our bodies perform the functions we need to survive?

Learning Goals:

Students will be able to:

- Use data from investigations to determine what all living things are made of.
- Develop a model to show the different structures found in cells and the function of each part.
- Explain how cells are organized and specialized to perform specific functions inside human bodies.

	Learning Opportunities	Formative Assessments
Engage 		**Suggested for this activity** **Options:** ● Student questions ● Student discussions
Learning Goal 4A: Use data from investigations to determine what all living things are made of. (Proficiency Scale)		
Explore	● Cells Phenomenon (Student), (Teacher copy) ● Living vs. Nonliving Inquiry Lab (Student), (Teacher Copy) *Warning you need to make links on this assignment before giving it to students. See the teacher copy for details.	**Suggested for this activity** **Options:** ● Exit ticket
Explain	● Living vs. Nonliving Image Sorting Form (Student), (Teacher Instructions) ● Multi-celled vs. Single Celled (student), (Teacher copy)	**Suggested for this activity** **Options:** ● Exit ticket ● Cells Quiz ○ Cells Quiz Answer Key ○ *A version of these quiz questions can be found in the Jordan District Item Bank on Mastery Connect.*

Learning Goal 4B: Develop a model to show the different structures found in cells and the function of each part. (Proficiency Scale)		
Explore	● Organelles Phenomenon (Student), (Teacher Copy) ● How do the organelles work together? (Student), (teacher copy) ● Cell Task Game	**Suggested for this activity** **Options:** ● Exit ticket
Explain	● Organelles Meet Needs (Student), (Teacher Copy) ● Cell City (Student), (Teacher Copy) ● Modeling the Interrelated Roles of the Organelles (Student), (Teacher copy)	**Suggested for this activity** **Options:** ● Exit ticket ● Cells and Organelles Nearpod ○ This is the presentation used to make the Nearpod. You can edit this version. ● Organelles Quiz ○ Organelles Quiz Answer Key ○ *A version of these quiz questions can be found in the Jordan District Item Bank on Mastery Connect.*

Learning Goal 4C: Explain how cells are organized and specialized to perform specific functions inside human bodies. (Proficiency Scale)		
Explore	● 5 Levels Phenomenon (Student), (Teacher Copy) ● Lego Town (Student), (Teacher Copy)	**Suggested for this activity** **Options:** ● Exit ticket
Explain	● Organ System Interactions (Student), (Teacher Copy) ● Escape Room (Student), (Teacher Copy) ● Escape room google form ● Escape room Teacher copy (Print most of this)	**Suggested for this activity** **Options:** ● Exit ticket ● 5 Levels of Organization of Life Quiz ○ 5 Levels of Organization of Life Quiz Answer Key ○ *A version of these quiz questions can be found in the Jordan District Item Bank on Mastery Connect.*

Elaborate		
Evaluate		