

Educational Resources from *Phenomenon Science Education*  
Student Proficiency Goals for **NGSS MS-LS1-2**



**Information about MS-LS1-2**

**NGSS Performance Expectation 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.

**Clarification Statement.**

*Emphasis is on the cell functioning as a whole system and the primary role of identified parts of the cell, specifically the nucleus, chloroplasts, mitochondria, cell membrane, and cell wall.*

**Assessment Limits.**

*Assessment of organelle structure/function relationships is limited to the cell wall and cell membrane. Assessment of the function of the other organelles is limited to their relationship to the whole cell. Assessment does not include the biochemical function of cells or cell parts.*

**Science and Engineering Practice (Developing and Using Models)**

- Develop and use a model to describe phenomena.

**Disciplinary Core Idea (LS1.A: Structure and Function)**

- Within cells, special structures are responsible for particular functions, and the cell membrane forms the boundary that controls what enters and leaves the cell.

**Crosscutting Concept (Structure and Function)**

- 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.

## Educational Resources from *Phenomenon Science Education*

### Student Proficiency Goals for **NGSS MS-LS1-2**



#### Student Proficiency Goals

##### SEP (Developing and Using Models):

- Students identify and describe the functions of a cell that they will model.
- Students identify and describe specific cell parts that they will include in their model.
- Students develop a model of a plant cell that includes the nucleus, chloroplasts, mitochondria, the cell membrane, and the cell wall.
- Students develop a model of a plant cell that describes how the nucleus, chloroplasts, mitochondria, the cell membrane, and the cell wall contribute to the function of the cell.
- Students develop a model of an animal cell that includes the nucleus, mitochondria, and the cell membrane.
- Students develop a model of an animal cell that describes how the nucleus, mitochondria, and the cell membrane contribute to the function of the cell.
- Students use their models to describe the relationships among the parts of cells and how those parts contribute to the overall function of a plant or animal cell.
- Students use their models to describe phenomena related to the functions of cells as a whole and ways the parts of cells contribute to those functions.

##### DCI (LS1.A Structure and Function):

- Students know that a cell functions as a system.
- Students know that cells have special structures responsible for particular cellular functions.
- Students know that the nucleus is where genetic information is stored in a cell and that it acts as the control center.
- Students know that mitochondria are involved in respiration.
- Students know that chloroplasts are important in photosynthesis and allow plant cells to produce energy.
- Students know that the cell membrane forms the boundary that controls what leaves and enters the cell.
- Students know that plant cells have cell walls that provide structure to the plant.
- Students know that the structures within the cell function together to contribute to the cell's function.

##### CCC (Structure and Function):

- Students consider how the microscopic structures in a cell can be visualized and modeled.
- Students describe the relationships between the structures of a cell and their functions.
- Students analyze the structures of a cell to determine how the cell functions as a whole.