Unless otherwise specified, "descriptions" referenced in the evidence statements could include but are not limited to written, oral, pictorial, and kinesthetic descriptions.

MS-LS1-1 From Molecules to Organisms: Structures and Processes

Students who demonstrate understanding can:

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. [Clarification Statement: Emphasis is on developing evidence that living things are made of cells, distinguishing between living and non-living things, and understanding that living things may be made of one cell or many and varied cells.]

The performance expectation above was developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

Science and Engineering Practices

Planning and Carrying Out Investigations

Planning and carrying out investigations in 6-8 builds on K-5 experiences and progresses to include investigations that use multiple variables and provide evidence to support explanations or solutions.

- Conduct an investigation to produce data to serve as the basis for evidence that meet the goals of an investigation.

Disciplinary Core Ideas

LS1.A: Structure and Function

- 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).

Crosscutting Concepts

Scale, Proportion, and Quantity

- Phenomena that can be observed at one scale may not be observable at another scale.

Connections to Engineering, Technology and Applications of Science

Interdependence of Science, Engineering, and Technology

- Engineering advances have led to important discoveries in virtually every field of science, and scientific discoveries have led to the development of entire industries and engineered systems.

Observable features of the student performance by the end of the course:		
1	Identifying the phenomenon under investigation	
	a	From the given investigation plan, students identify and describe* the phenomenon under investigation, which includes the idea that living things are made up of cells.
	b	Students identify and describe* the purpose of the investigation, which includes providing evidence for the following ideas: that all living things are made of cells (either one cell or many different numbers and types of cells) and that the cell is the smallest unit that can be said to be alive.
2	Identifying the evidence to address the purpose of the investigation	
	a	From the given investigation plan, students describe* the data that will be collected and the evidence to be derived from the data, including:
		i. The presence or absence of cells in living and nonliving things.
		ii. The presence or absence of any part of a living thing that is not made up of cells.
		iii. The presence or absence of cells in a variety of organisms, including unicellular and multicellular organisms.
		iv. Different types of cells within one multicellular organism.
	b	Students describe* how the evidence collected will be relevant to the purpose of the investigation.
3	Planning the investigation	
	a	From the given investigation plan, students describe* how the tools and methods included in the experimental design will provide the evidence necessary to address the purpose of the investigation, including that due to their small-scale size, cells are unable to be seen with the unaided eye and require engineered magnification devices to be seen.
	b	Students describe* how the tools used in the investigation are an example of how science depends on engineering advances.
4	Collecting the data	
	a	According to the given investigation plan, students collect and record data on the cellular composition of living organisms.

	b	Students identify the tools used for observation at different magnifications and describe* that different tools are required to observe phenomena related to cells at different scales.
	c	Students evaluate the data they collect to determine whether the resulting evidence meets the goals of the investigation, including cellular composition as a distinguishing feature of living things.