6th Grade Science Curriculum

Unit 3: Structure, Function, and Information Processing

Number of Days: 25

Unit Focus	Essential Questions	Next Generation Standards	Disciplinary Core Ideas (DCI)
How do cells, the basic unit of life, function and how is that related to the function of the organism as a whole? Students Investigate "How one can explain the ways cells contribute to the function of living organisms." Students can gather information and use this information to support explanations of the structure and function relationship of cells. They can communicate understanding of cell theory. They have a basic understanding of the role of cells in body systems and how those systems work to support the life functions of the organism. Students will use data and conceptual models to understand how the environment and other factors determine the growth of an individual cell to maintain homeostasis. They connect this idea to the sensory perception of their environment. Students provide evidence to support their understanding of the structures and behaviors of stimuli and stimulus. The crosscutting concepts of cause and effect and structure and function provide a framework for understanding the disciplinary core ideas. Students demonstrate grade-appropriate proficiency in analyzing and interpreting data, using models, conducting investigations, and communicating information. Students are also expected to use these practices to demonstrate understanding of the core ideas.	• What is the cell theory and how does the cell theory pertain to the organism as a whole? • How do organisms receive stimuli to respond to the environment? **Link to Unit :** https://njctl.org/courses/archived-courses-units/7th-grade-science/structure-and-function-information-processing/attachments/structure-and-function-information-processing-2/ ***All teachers must register at** http://www.NJCTL.org	MS-LS1-1 MS-LS1-2 MS-LS1-3 MS-LS1-8	• LS1.A: Structure and Function • LS1.D: Information Processing

Camden City School District

NGSS Framework		
Science and Engineering Practices	**Disciplinary Core Ideas**	**Crosscutting Concepts**

Developing and Using Models • Develop and use a model to describe phenomena. (MS-LS1-2) **Planning and Carrying Out Investigations** • Conduct an investigation to produce data to serve as the basis for evidence that meet the goals of an investigation. (MS-LS1-1) **Engaging in Argument from Evidence** • Use an oral and written argument supported by evidence to support or refute an explanation or a model for a phenomenon. (MS-LS1-3) **Obtaining, Evaluating, and Communicating Information** • Gather, read, and synthesize information from multiple appropriate sources and assess the credibility, accuracy, and possible bias of each publication and methods used, and describe how they are supported or not supported by evidence. (MS-LS1-8)	**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). (MS-LS1-1) • Within cells, special structures are responsible for particular functions, and the cell membrane forms the boundary that controls what enters and leaves the cell. (MS-LS1-2) • In multicellular organisms, the body is a system of multiple interacting subsystems. These subsystems are groups of cells that work together to form tissues and organs that are specialized for particular body functions. (MS-LS1-3) **LS1.D: Information Processing** • Each sense receptor responds to different inputs (electromagnetic, mechanical, chemical), transmitting them as signals that travel along nerve cells to the brain. The signals are then processed in the brain, resulting in immediate behaviors or memories. (MS-LS1-8)	**Cause and Effect** • Cause and effect relationships may be used to predict phenomena in natural systems. (MS-LS1-8) **Scale, Proportion, and Quantity** • Phenomena that can be observed at one scale may not be observable at another scale. (MS-LS1-1) **Systems and System Models** • Systems may interact with other systems; they may have sub-systems and be a part of larger complex systems. (MS-LS1-3) **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. (MS-LS1-2) --- **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. (MS-LS1-1) --- **Connections to Nature of Science** **Science is a Human Endeavor** • Scientists and engineers are guided by habits of mind such as intellectual honesty, tolerance of ambiguity, skepticism, and openness to new ideas. (MS-LS1-3)

English Language Arts	Mathematics
Cite specific textual evidence to support analysis of science and technical texts. (MS-LS1-3) **RST.6-8.1** Trace and evaluate the argument and specific claims in a text, distinguishing claims that are supported by reasons and evidence from claims that are not. (MSLS1-3) **RI.6.8** Write arguments focused on discipline content. (MS-LS1-3) **WHST.6-8.1** 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. (MS-LS1-1) **WHST.6-8.7** Gather relevant information from multiple print and digital sources; assess the credibility of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and providing basic bibliographic information for sources. (MS-LS1-8) **WHST.6-8.8** Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest. (MS-LS1-2) **SL.8.5**	Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. (MS-LS1-1),(MS-LS1-2),(MS-LS1-3) **6.EE.C.9**

Camden City School District

Unit 3: Structure, Function, and Information Processing **Approximate Days: # 25**

Standard(s):

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-LS1-3. Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.

MS-LS1-8. Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.

Student Outcomes	Inquiry Based Learning Activities	Materials/Resources
Students will know: • The various types of Cells and cell classification • Cell Structure and Function • The Levels of Organization from cell to organism • The functions of the main organ systems • How organisms Receive Stimuli from the environment ***Students will be able to:*** • **Investigate** the Needs and Characteristics of	**Lab 1:** Cell City Project https://njctl.org/courses/archived-courses-units/7th-grade-science/structure-and-function-information-processing/attachments/cell-city-project/ **Lab 2:** Dissecting a Chicken Wing https://njctl.org/courses/archived-courses-units/7th-grade-science/structure-and-function-information-processing/attachments/dissecting-a-chicken-wing-lab/ **Lab 3:** Organ Systems Activity https://njctl.org/courses/archived-courses-units/7th-grade-science/structure-and-function-information-processing/attachments/organ-systems-activity/	**Materials Needed:** • Arts and Craft materials (glue, poster paper, construction paper, paint, markers, etc.) **Materials Needed:** • Fresh Chicken Wings • Dissection Plates and pins • Scissors • Disinfectant or Soapy Water • Paper towels

living things using humans and plants as models • **Distinguish** between the types of cells and what sets them apart from one another • **Compare and Contrast** the types of organelles and **Distinguish** between their functions • **Model** a cell • **Distinguish** between biotic and abiotic factors • **Compare and Contrast** single and multi celled organisms • **Investigate** and **Hypothesis** about reactions to stimuli and **Justify** why the reactions happened • **Investigate and Justify** why the size of cells is vital to life	processing/attachments/organ-systems-activity/ **Lab 4:** Can You Trust Your Senses? https://njctl.org/courses/archived-courses-units/7th-grade-science/structure-and-function-information-processing/attachments/can-you-trust-your-senses-lab/	**Resources:** • **www.NJCTL.org** • **www.nicerc.org**

Differentiated Instruction: **Modifications / Extensions:** How will I differentiate the curriculum for ESL, gifted, at-risk, etc.? • **All Learners:** Guided Notes/ Graphic Organizers/ Study Guides Opportunities to rework and re-submit work • **Assessments**: Extra Time/ Use of notebook or reference cards/ Break into smaller tasks/ Word Banks/ Reduce choices on multiple choice questions	What evidence will I collect that demonstrate that the students have achieved the objective? • ***Teacher Created:*** Formative Assessments, Lab Reports Mid Terms Final Exams • **Alternate Assessments**: Journal Responses OEQ/Short Responses grade using a 0-3 Rubric Lab Reports Oral Assessments Portfolio Projects
Assessments: DOQ exams	