Orange Public Schools

Office of Curriculum & Instruction 2019-2020 Science Curriculum Guide



Grade 7

Module 3A: Structure and Function

March 02, 2020 – March 20, 2020

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	GRADE 7 Yearlong Scope and Sequence by Instructional Weeks													
W	eek 1	Week 2	Week	x 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week	9 Week 10	Week 11	Week 12	Week 13
	JNIT 1 – Ph	ysical Sciend	ce (Sept 9th	– Dec 20th)										
Comparison of the property of t			MATTER at the atomic rstanding rties and are	TOPIC 2INTERACTIONS OF MATTER (4 Weeks)Students are also able to apply an understanding of optimization design and process in engineering to chemical students provide molecular-level accounts of states of matter and changes between states, of how chemical reactions involve regrouping of atoms to form new substances, and of how atoms rearrange during chemical reactions.			TOPIC 3 CHEMICAL REACTIONS (5 Weeks) Students provide molecular-level accounts of states of matters and changes between states, of how chemical reactions involve regrouping of atoms to form new substances, and of how atoms rearrange during chemical reactions. Students also apply their understanding of optimization design and process in engineering to chemical reaction systems.			ters and toms neir eering to				
W	eek 14	We	ek 15	Wee	k 16	Wee	k 17	Week 18	Week	19	Week 20	Week 21	l We	ek 22
	UNIT 2 - Earth Science (Jan 2 nd - Feb 14 th) (6 weeks) Students examine geoscience data in order to understand processes and events in Earth's history. Important crosscutting concepts in this unit are scale, proportion, and quantity, stability and change, and patterns in relation to the different ways geologic processes operate over geologic time. Unit 3 - Life Science (Feb 24 th - Jun 12 th) TOPIC 1 Structure and Function (3 Weeks) Students examine geoscience data in order to understand processes and events in relation to the different ways geologic Students demonstrate age appropriate abilities to plan and carry out investigations to develop evidence that living organisms are made of cells. Students gather information to support explanations of the relationship between structure and function in cells.					;) s to plan ce that tther ationship								
W	eek 23	Week	x 24	Week 2	5 V	Veek 28	Week	29 We	ek 30	Week 31	Week 32	Weel	к 33 И	/eek 34
	Unit 3 – Lif	e Science (Fe	eb 24 th - M	ay 29th)										
	TOPIC 2 Body Systems (3 Weeks) Students develop a basic understanding of the role of cells in the body systems and how those systems work to support the life functions of the organism. Students will construct explanations for the interactions of systems in cells and organisms. Topic 3 Inheritance and Variation of Traits (4 Weeks) Students develop a basic understanding of the role of cells in the body systems and how those systems work to support the life functions of the organism. Students will construct explanations for the interactions of systems in cells and organisms. Students will construct explanations for the interactions of systems in cells and organisms.					rgy Flow now cells nd energy and ergy and nations for in								
W	eek 35	Weel	k 36	Week	37									
UNIT 4 Engineering Design (June 1 th – 19 th) TOPIC 1 ENGINEERING & DESIGN PROCESS (3 Weeks)														

Grade/Course Overview: Grade 7 Unit 3A: Structure and Function

This is a hands-on course in which science concepts are taught to 7th grade students in a 3-dimensional manner guided by the NJSLS. We will focus on studying concepts related to life science, specifically <u>Structure and Function</u>. The purpose of this course is to have students develop, model, and carry out investigations related to this topic by using strategies aligned with the <u>New Jersey Student Learning Standards</u> and the Next Generation Science Standards (<u>MS-LS1-1</u> and <u>MS-LS1-2</u>).

Students will focus on the following concepts and ideas:

- Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.
 - 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.
- Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.
 - 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.

Unit 1: Structure and Function

Unit Summary:

Students demonstrate age appropriate abilities to plan and carry out investigations to develop *evidence* that living organisms are made of cells. Students gather information to support explanations of the relationship between structure and function in cells. They are able to communicate an understanding of cell theory and understand that all organisms are made of cells. Students understand that special structures are responsible for particular functions in organisms. They then are able to use their understanding of cell theory to develop and use physical and conceptual models of cells. The crosscutting concepts of *scale, proportion, and quantity* and *structure and function* provide a framework for understanding the disciplinary core ideas. Students are expected to demonstrate proficiency in *planning and carrying out investigations, analyzing and interpreting data,* and *developing and using models*. Students are also expected to use these science and engineering practices to demonstrate an understanding of the disciplinary core ideas.

This unit is based on <u>MS-LS1-1</u> and <u>MS-LS1-2</u>.

Related Phenomena: The following links can be referenced for Life Science related phenomena:

NGSS Based Phenomena - <u>https://thewonderofscience.com/phenomenal</u>

#ProjectPhenomena - <u>https://sites.google.com/site/sciencephenomena/</u>

Phenomena for NGSS - https://www.ngssphenomena.com/how-to-use-phenomena

Sunrise Science (a collection of free websites) - http://sunrisescience.blog/free-websites-ngss-anchoring-phenomena/

Teaching Channel Phenomena - https://www.teachingchannel.org/video/using-phenomena-achieve

STEMscopes (Develop Student Inquiry with Phenomena) - https://www.stemscopes.com/phenomena

Essential Questions:	Enduring Understandings:
How do cells contribute to the functioning of an organism?	Distinguish between living and nonliving things.
How will astrobiologists know if they have found life elsewhere in the solar system?	Cells are the smallest unit of life that can be said to be alive.

What are the building blocks of life?	All living things are made up of cells, either one cell or many different
How does each part of a cell function?	numbers and types of cells.
How do the functions of cells support an entire organism?	Organisms may consist of one single cell (unicellular).
What evidence supports the cell theory?	Nonliving things can be composed of cells.
How are the cell's structures related to their functions?	Organisms may consist of many different numbers and types of cells (multicellular).
How do cells relate to the structures of simple and complex organisms?	Cells than can be observed at one scale may not be observable at another
How is the body a system of interacting subsystems composed of groups of	scale.
cells?	Engineering advances have led to important discoveries in the field of cells.
What are the fundamental differences between animal and plant cells pertaining to cell reproduction?	Biology and scientific discoveries have led to the development of entire industries and engineered systems.
How do our sensory receptors send information to our brain?	The cell functions as a whole system.
How do organisms live, grow, respond to their environment, and reproduce?	Identify parts of the cell, specifically the nucleus, chloroplasts, mitochondria,
How do the structures of organisms enable life's functions?	cell membrane, and cell wall.
	Within cells, special structures are responsible for particular functions.
	Within cells, the cell membrane forms the boundary that controls what enters and leaves the cell.
	Complex and microscopic structures and systems in cells can be visualized, modeled, and used to describe how the function of the cell depends on the relationships among its parts.
	Complex natural structures/systems can be analyzed to determine how they function.
	A model can be used to describe the function of a cell as a whole.

A model can be used to describe how parts of cells contribute to the cell's
function.
The structures of the cell wall and cell membrane are related to their
function.

Possible Student Misconceptions:

Preliminary research indicates that it may be easier for students to understand that the cell is the basic unit of structure (which they can observe) than that the cell is the basic unit of function (which has to be inferred from experiments). Research also shows that students may hold various misconceptions about cells after traditional instruction.

NGSS Performance Expectations: Students who demonstrate understanding can...

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-LS1-1) 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. (MS-LS1-2)

Planning and Carrying Out Investigations	LS1.A: Structure and Fun	iction	Scale, Proportion, and Quantity
Conduct an investigation to produce data to serve as the basis for evidence that meet the goals of an investigation. (MS-LS1-1) Developing and Using Models Develop and use a model to describe phenomena. (MS-LS1-2)	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)		Scale, Proportion, and Quantity Phenomena that can be observed at one scale may not be observable at another scale. (MS-LS1-1) 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)
Primary CCSS ELA/Literacy Connections:		Primary CCSS Mathemati	cs Connections:
WHST.6-8.7 Conduct short research projects to ans a self-generated question), drawing on several sour additional related, focused questions that allow for exploration. (MS-LS1-1) SL.8.5 Integrate multimedia and visual displays into information, strengthen claims and evidence, and a	wer a question (including ces and generating multiple avenues of presentations to clarify dd interest. (MS-LS1-2)	6.EE.C.9 Use variables to that change in relationshi quantity, thought of as th quantity, thought of as th between the dependent a and relate these to the ec	represent two quantities in a real-world problem p to one another; write an equation to express one e dependent variable, in terms of the other e independent variable. Analyze the relationship and independent variables using graphs and tables, quation. (MS-LS1-1 & MS-LS1-2)

Unit Performance Task:

Students demonstrate age appropriate abilities to plan and carry out investigations to develop *evidence* that living organisms are made of cells. Students gather information to support explanations of the relationship between structure and function in cells. They are able to communicate an understanding of cell theory and understand that all organisms are made of cells. Students understand that special structures are responsible for particular functions in organisms. They then are able to use their understanding of cell theory to develop and use physical and conceptual models of cells. The crosscutting concepts of *scale, proportion, and quantity* and *structure and function* provide a framework for understanding the disciplinary core ideas. Students are expected to demonstrate proficiency in *planning and carrying out investigations, analyzing and interpreting data,* and *developing and using models*, Students are also expected to use these to use these science and engineering practices to demonstrate understanding of the disciplinary core ideas.

This unit is based on MS-LS1-1 and MS-LS1-2.

Instructional Resources:

- <u>https://ngss.nsta.org/DisplayStandard.aspx?view=pe&id=176</u> (MS-LS1-1)
 - This link will take you to the National Science Teaching Association webpage. It provides information about the particular standard and offers many resources and activities to use in the classroom (new resources are added each week).
- https://ngss.nsta.org/DisplayStandard.aspx?view=pe&id=177 (MS-LS1-2)
 - This link will take you to the National Science Teaching Association webpage. It provides information about the particular standard and offers many resources and activities to use in the classroom (new resources are added each week).

Unit Pacing and Duration *This unit should be completed within an approximate time of 15 days. Modules should take 3 class periods (block scheduling).	Focus Standards with CCSS Connections	Primary Resources & Supplements	Assessment
# of Minutes (135 mins)	 NGSS: 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-LS1-2.2.1 Develop and use a model to describe phenomena. MS-LS1-2.6.1 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.LS1.A.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-LS1-3. Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells. MS-LS1-3.7 Engaging in argument from evidence in 6–8 builds on K–5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed world(s). MS-LS1-3.LS1.A Structure and Function CCSS for ELA: 	 Primary Resources: Discovery Education - Life Science Unit 1: Cells Concept 1.1 Cell Theory Supplements: Hands-on Activities: (Discovery Education) Mentally Modelling the Cell Design and Create a Terrarium Cell Theory Evidence BrainPOP Modules: Cellular Life & Genetics Unit Readorium: Life Science Mitosis and Meiosis- The Formation and Growth of Human Life Genetics: Why We Look the Way We Do 	 <u>STC- Structure and Functions Kit</u> <u>Discovery Education: (Test/Authentic Assessment)</u> Cell Theory Assessment - Constructed Response Cell Theory Summative Assessment - Multiple Choice (Online/Printed Version) Exploration: One is Not the Loneliest Number Hands-on Activities <u>BrainPOP: (Formative - Classwork/Quiz Grade)</u> Offers video and lesson quizzes for each lesson/module <u>Readorium: (Classwork/Quiz Grade, Extension/Lesson Closer, Homework):</u> PDF versions of multiple choice book quizzes

	 RST.6-8.1 Cite specific textual evidence to support analysis of science and technical texts. RI.6.8 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. WHST.6-8.1 Write arguments focused on discipline content. SL.8.5 Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest. CCSS for Math: 6.EE.C.9 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. 		
# of Minutes (135 mins)	 NGSS: 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-LS1-1.3.1 Conduct an investigation to produce data to serve as the basis for evidence that meet the goals of an investigation. MS-LS1-1.3.1 Phenomena that can be observed at one scale may not be observable at another scale. 	Primary Resources: - STC-Structure and Function Kit - Lesson 3 - Lesson 8 - Discovery Education - Life Science - Unit 1: Cells - Concept 1.2 Structure of Life Supplements: - - Hands-on Activities: (Discovery Education) - Plant or Animal - Cell Size	<u>STC-Structure and Function Kit</u> - <u>Discovery Education: (Test/Authentic Assessment)</u> - Structure of Life Assessment - Constructed Response - Structure of Life Summative Assessment - Multiple Choice (Online/Printed Version) - Exploration: One is Not the Loneliest Number - Hands-on Activities <u>BrainPOP: (Formative - Classwork/Quiz Grade)</u> - Offers video and lesson quizzes for each

	MS-LS1-1.LS1.A.1 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).	 Organ Dissection BrainPOP Modules: Cellular Life & Genetics Unit 	<u>Readorium: (Classwork/Quiz Grade,</u> <u>Extension/Lesson Closer, Homework):</u> - PDF versions of multiple choice book quizzes
	CCSS for ELA: WHST.6-8.7 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)	- Readorium: - Life Science Books	
	<u>CCSS for Math:</u> 6.EE.C.9 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.		
# of Minutes (135 mins)	 NGSS: MS-LS1-7 Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism. MS-LS1-7.2.1 Develop a model to describe unobservable mechanisms. MS-LS1-7.5.1 Matter is conserved because atoms are conserved in physical and chemical processes. MS-LS1-7.LS1.C.1 Within individual organisms, food moves through a series of chemical reactions in the later through the later the later through the later	Primary Resources: - STC-Structure and Function Kit - Lesson 3 - Lesson 8 - Discovery Education - Life Science - Unit 1: Cells - Concept 1.3 Cellular Respiration Supplements: - Hands-on Activities: (Discovery Education) - The Case of the Flat Bread - Observing Fermentation	STC- Structure and Function Kit - Discovery Education: (Test/Authentic Assessment) - Cellular Respiration Assessment - Constructed Response - Cellular Respiration Summative Assessment - Multiple Choice (Online/Printed Version) - Exploration: One is Not the Loneliest Number - Hands-on Activities BrainPOP: (Formative - Classwork/Quiz Grade) - Offers video and lesson quizzes for each lesson/module
	which it is broken down and rearranged to form new molecules, to support growth, or to release energy. MS-LS1-7.PS3.D.1 Cellular respiration in plants and animals involve chemical reactions with oxygen that release stored energy. In these processes, complex	 BrainPOP Modules: Cellular Life & Genetics Unit Readorium: Life Science Books	Readorium: (Classwork/Quiz Grade, Extension/Lesson Closer, Homework): - PDF versions of multiple choice book quizzes

	molecules containing carbon react with oxygen to produce carbon dioxide and other materials. <u>CCCS for ELA:</u> SL.8.5 Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest. <u>CCCS for Math:</u> N/A		
# of Minutes (135 mins)	 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-LS1-1.3.1 Phenomena that can be observed at one scale may not be observable at another scale. MS-LS1-3.LS1.A.1 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. CCCS for ELA: WHST.6-8.7Conduct 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. CCCS for Math: 6.EE.C.9 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. 	 <u>Primary Resources:</u> STC-Structure and Function Kit Lesson 3 Lesson 8 Discovery Education - Life Science Unit 1: Cells Concept 1.4 Meiosis <u>Supplements:</u> Hands-on Activities: (Discovery Education) Meiosis Simulation BrainPOP Modules: Cellular Life & Genetics Unit Readorium: Life Science Mitosis and Meiosis- The Formation and Growth of Human Life Genetics: Why We Look the Way We Do 	 <u>STC-Ecosystems and Their Interactions Kit</u> Lesson 1: Pre-Assessment: Ecosystems and Their Interactions Lesson 11: Assessment: Ecosystems and Their Interactions <u>Discovery Education: (Test/Authentic Assessment)</u> Meiosis Assessment - Constructed Response Meiosis Summative Assessment - Multiple Choice (Online/Printed Version) Exploration: One is Not the Loneliest Number Hands-on Activities <u>BrainPOP: (Formative - Classwork/Quiz Grade)</u> Offers video and lesson quizzes for each lesson/module <u>Readorium: (Classwork/Quiz Grade, Extension/Lesson Closer, Homework):</u> PDF versions of multiple choice book quizzes
# of Minutes (90 mins)	<u>NGSS:</u> MS-LS1-6 Construct a scientific explanation based on evidence for the role of photosynthesis in the	<u>Primary Resources:</u> - STC-Structure and Function Kit -	STC-Structure and Function Kit - Discovery Education: (Test/Authentic Assessment)

cycling of matter and flow of energy into and out of organisms.

MS-LS1-6.5.1 Within a natural system, the transfer of energy drives the motion and/or cycling of matter.

MS-LS1-6.6.1 Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students' own experiments) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

MS-LS1-6.LS1.C.1 Plants, algae (including phytoplankton), and many microorganisms use the energy from light to make sugars (food) from carbon dioxide from the atmosphere and water through the process of photosynthesis, which also releases oxygen. These sugars can be used immediately or stored for growth or later use.

MS-LS1-6.PS3.D.1 The chemical reaction by which plants produce complex food molecules (sugars) requires an energy input (i.e., from sunlight) to occur. In this reaction, carbon dioxide and water combine to form carbon-based organic molecules and release oxygen.

CCCS for ELA:

RST.6-8.1 Cite specific textual evidence to support analysis of science and technical texts.

RST.6-8.2 Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.

WHST.6-8.2 Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content

WHST.6-8.9 Draw evidence from informational texts to support analysis, reflection, and research.

CCCS for Math:

6.EE.C.9 Use variables to represent two quantities in a real-world problem that change in relationship to

- Discovery Education Life Science - Unit 1: Cells
 - Concept 1.5 Photosynthesis

Supplements:

- Hands-on Activities: (Discovery Education)
 - Starch and Photosynthesis
 - Photosynthesis
- BrainPOP Modules:
 - Cellular Life & Genetics Unit
- Readorium:
 - Life Science Books

- Photosynthesis Assessment Constructed Response
- Photosynthesis Summative Assessment -Multiple Choice (Online/Printed Version)
- Exploration: One is Not the Loneliest Number
- Hands-on Activities

BrainPOP: (Formative - Classwork/Quiz Grade)

- Offers video and lesson quizzes for each lesson/module

Readorium: (Classwork/Quiz Grade,

- Extension/Lesson Closer, Homework):
 - PDF versions of multiple choice book quizzes

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.	

Mouncations							
Special Educa	tion/ 504:		English Language Learners:				
 Adhere to all modifications stated in each IEP. Give students a MENU of to choose assignments from difficulty. Accommodate Instruction post-its, reading aloud te one-on-one instruction, of Classroom), handouts, deextended time Allow extra time to comp Allow students to demonda problem by drawing a fanswer and then explain and/or writing. Provide breaks between the reinforcement, use proximation of the strategies for students. Strategies for students. 	ns and health concerns options, allowing them om different levels based hal Strategies: use of xt, graphic organizers, class website (Google efinition list with visuals, efficient assignments or tests strate understanding of unctional model of the ng the reasoning orally tasks, use positive mity aille, or digital texts ts with 504 plans	 S U U U A d d S U F 	Simplify written and verbal instructions Use manipulatives to promote conceptual inderstanding and enhance vocabulary usage Allow for alternate forms of responses- lrawing or speaking instead of writing to lemonstrate knowledge when you are not pecifically assessing writing Allow the use of an online dictionary to look up the definition and hear the pronunciation of unknown words Provide graphic representations, gestures, Irawings, equations, and pictures during all egments of instruction Itilize program translations tools such as Gap and Read (if available) Itilize graphic organizers which are oncrete, pictorial ways of constructing snowledge and organizing information Jse sentence frames and questioning trategies so that students will explain their hinking/ process of how to solve real life problems. Reword questions in simpler language Provide class notes ahead of time to allow tudents to preview material and increase omprehension Provide extended time				

Gifted and Talented:	Students at Risk for Failure:
 Organize and offer flexible small group learning opportunities / activities. Utilize elevated contextual complexity Inquiry based or open ended assignments, performance tasks and projects Allow more time to study concepts with greater depth Provide options, alternatives and choices to differentiate and broaden the curriculum. Promote the synthesis of concepts and making real world connections Provide students with enrichment practice that are imbedded in the curriculum allowing students to design problems to be addressed by the class allowing students to modify the lesson by introducing a related phenomena allow for interest-based extension activities Utilize an enhanced set of introductory activities (e.g. phenomena, organizers, concept maps etc) Provide whole group enrichment explorations. Teach cognitive and methodological skills Allow for the use of stations Organize integrated problem-solving simulations. 	 Assure students have experiences that are on the Concrete- Pictorial- Abstract spectrum Modify Instructional Strategies; extended time, reading aloud text, graphic organizers, flexible grouping, one-on-one instruction, class website (Google Classroom), inclusion of more visuals and manipulatives, Utilize Scaffolded Questioning, Field Trips, Google Expeditions, Peer Support, Modified Assignments, Chunking of Information, Peer Buddies Assure constant parental/ guardian contact throughout the year with successes/ challenges Provide academic contracts to students and guardians Create an interactive notebook with samples, key vocabulary words, student goals/ objectives. Always plan to address students at risk in the designing of learning tasks, instructions, and directions. Try to anticipate where the needs will be and then address them prior to lessons. Teacher should allow for preferential seating Include Visual Cues/Modeling Allow for technology Integration, especially Assistive Technology

21st Century Life and Career Skills:

Career Ready Practices describe the career-ready skills that all educators in all content areas should seek to develop in their students. They are practices that have been linked to increase college, career, and life success. These skills enable students to make informed decisions that prepare them to engage as active citizens in a dynamic global society and to successfully meet the challenges and opportunities of the 21st century workplace. As such, they should be taught and reinforced in all career exploration and preparation programs, with increasingly higher levels of complexity and expectation as a student advances through a program of study.

https://www.state.nj.us/education/cccs/2014/career/9.pdf

- **CRP1**. Act as a responsible and contributing citizen and employee.
- **CRP2**. Apply appropriate academic and technical skills.
- **CRP3**. Attend to personal health and financial well-being.
- **CRP4**. Communicate clearly and effectively and with reason.
- **CRP5**. Consider the environmental, social and economic impacts of decisions.
- **CRP6**. Demonstrate creativity and innovation.

- **CRP7**. Employ valid and reliable research strategies.
- **CRP8**. Utilize critical thinking to make sense of problems and persevere in solving them.
- **CRP9**. Model integrity, ethical leadership and effective management.
- **CRP10**. Plan education and career paths aligned to personal goals.
- **CRP11**. Use technology to enhance productivity.
- **CRP12**. Work productively in teams while using cultural global competence.

Students are provided with an equitable opportunity to communicate with peers effectively, clearly, and with the use of technical language. They are also encouraged to reason through experiences and exposure to phenomena that promote critical thinking and emphasize the importance of perseverance. Students are exposed to various mediums of technology, such as digital learning, and educational websites.

Technology Standards:

All students will be prepared to meet the challenge of a dynamic global society in which they participate, contribute, achieve, and flourish through universal access to people, information, and ideas. https://www.state.nj.us/education/cccs/2014/tech/

8.1 Educational Technology:

All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.

- A. Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations.
- B. Creativity and Innovation: Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.
- C. **Communication and Collaboration:** Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
- D. Digital Citizenship: Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.
- E. **Research and Information Fluency:** Students apply digital tools to gather, evaluate, and use of information.
- F. Critical thinking, problem solving, and decision making: Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.

8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming:

All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as

they relate to the individual, global society, and the environment.

- A. The Nature of Technology: Creativity and Innovation- Technology systems impact every aspect of the world in which we live.
- B. Technology and Society: Knowledge and understanding of human, cultural, and societal values are fundamental when designing technological systems and products in the global society.
- C. **Design:** The design process is a systematic approach to solving problems.
- D. **Abilities in a Technological World:** The designed world in a product of a design process that provides the means to convert resources into products and systems.
- E. **Computational Thinking: Programming-**Computational thinking builds and enhances problem solving, allowing students to move beyond using knowledge to creating knowledge.