



**Totowa Public Schools**

**STEAM & Financial Literacy**

**Grades 3-5**

**Aligned to NJSL Standards**

**BOE Adopted: 8/31/2022**

**Revised 12/14/2022**

### Units of Study & Pacing Guide

<u>Unit of Study</u>	<u>Timeline</u>	<u>Notes</u>
Unit 1: STEAM is All Around Us: Coding and Robotics	9 Weeks	STEAM Unit
Unit 2: Building Our World: Design and Engineering	9 Weeks	STEAM Unit
Unit 1: Financial Literacy, Life Literacies, and Key Skills	18 Weeks	Financial Literacy Unit

<b>Title</b>	STEAM is All Around Us: Coding and Robotics
<b>Unit Duration</b>	9 Weeks
<b>Unit Summary &amp; Rationale</b>	This unit will be reviewing and discussing coding and how it relates to mathematics. Students will be learning coding commands such as looping, events, sequencing, and elementary binary code. Students will be expanding on their knowledge of algorithms, nested loops, while loops, conditionals, elementary functions, and events as coding techniques. Students will be relating coding to introductory robotics as an application of coding. In addition, students will be expanding on their creativity, critical thinking, problem solving skills, and collaborative skills
<b>Unit Goals</b>	
<b>Essential Questions</b>	<ul style="list-style-type: none"> <li>• How do you read code?</li> <li>• How can you predict outcomes from reading code?</li> <li>• What is ways code makes simple choices?</li> <li>• What are ways coding is used in our everyday world?</li> <li>• What is the importance of working together when developing code?</li> <li>• Why is it important to reflect on past mistakes?</li> <li>• How can system limitations affect project design?</li> <li>• What are reasons for having a well-detailed plan?</li> <li>• What is the importance of digital citizenship?</li> </ul>
<b>Enduring Understandings</b>	<ul style="list-style-type: none"> <li>• Students will learn fundamentals of interpreting and reading code.</li> <li>• Understanding ways to predict outcomes based on writing and reading coded instructions.</li> <li>• Identifying problems and overcoming mistakes by building persistence.</li> <li>• Discussing and relating ways coding and robotics are used throughout our everyday world.</li> <li>• Understanding the correlate between robotics and coding.</li> <li>• Being able to construct written code giving commands for robots to perform a task.</li> <li>• Student discussing and collaborating on a well-detailed plan to solve a problem using coding.</li> </ul>

	<ul style="list-style-type: none"> <li>• Discuss the importance of digital citizenship and the impact of a digital footprint</li> </ul>
<b>Learning Outcomes</b>	<ul style="list-style-type: none"> <li>• Develop an understanding of coding techniques such as building coding algorithms and functions, loops, and creating events. • Be relating coding to real world applications.</li> <li>• Utilize coding to channel creativity to a variety of performance tasks relating to the arts.</li> <li>• Investigate different problem-solving techniques and overcome different tasks using their problem-solving skills.</li> <li>• Be able to investigation and use critical thinking skills to program a variety of materials.</li> <li>• Discuss the importance of persistence when coding and developing innovative ideas.</li> <li>• Be able to read coding programs and build connections.</li> <li>• Be able to predict outcomes of a variety of prewritten and student develop programs.</li> <li>• Understand there are many ways to solve problems.</li> <li>• Be able to reflect on past problems to guide them through new problems.</li> <li>• Understand the importance collaboration and communication plays in developing programs with coding and robotics.</li> <li>• Develop programs that respond to timed events</li> <li>• Develop programs that respond to user input.</li> <li>• Create animations with code.</li> <li>• Explain how system limitations can affect project design.</li> <li>• Describe how compromise can help keep a project on track and inspire creativity.</li> <li>• Draft and implement plans to resolve any issues in their code.</li> <li>• Articulate the design process and how it helped shape the finished culminating project.</li> <li>• Use Ozobots to solve a variety of problems and develop critical thinking</li> </ul>

<b>Assessment Evidence</b>	
<b>Formative</b>	Collaborative Activities, Homework, Classwork, Discussion, Independent Class Assignment, Informal Observations of Students, Interactive Notebooks, Self-Assessments, Exit Tickets, Lego Building Tasks, Teacher Constructed Games, Student Pre-Planning, Group Self-Assessment, Code.Org Courses.
<b>Summative</b>	Tests, Pre-Assessments, Quizzes, Written Responses, Projects, Group Projects

	Code.org “Dance Party”, Code.org 4th Grade Project, Ozobot Maze Creation, Group Work Projects, Makey Makey Coding Projects
<b>Alternative and Benchmark</b>	Alternative – Project Based Learning, Graphic Organizers, Student Portfolio, Orally assessed responses  Benchmark – Teacher generated project or assessment, Tests, Student portfolio/project  <a href="#">Formative, Summative, Alternative and Benchmark Assessments</a>
<b>Resources to Promote Learning</b>	
<b>Resources &amp; Equipment Needed</b>	Smartboard, Computers, iPads, websites and digital interactives/models, multi-media presentations, video streaming, Brain Pop, Microsoft 365, Ozobots, Ozobot Coding Reference Sheet, Code.Org tools, Makey Makey STEM Pack <a href="#">Approved Class Resource List</a>
<b>Content &amp; Interdisciplinary Standards</b>	
<b>Computer Science and Design Thinking Practices</b>	
<b>Core Ideas</b>	<b>Performance Expectation</b>
Computing devices may be connected to other devices to form a system as a way to extend their capabilities.	<ul style="list-style-type: none"> <li>8.1.5.CS.1: Model how computing devices connect to other components to form a system.</li> </ul>
Software and hardware work together as a system to accomplish tasks (e.g., sending, receiving, processing, and storing units of information).	<ul style="list-style-type: none"> <li>8.1.5.CS.2: Model how computer software and hardware work together as a system to accomplish tasks.</li> </ul>
Shared features allow for common troubleshooting strategies that can be effective for many systems.	<ul style="list-style-type: none"> <li>8.1.5.CS.3: Identify potential solutions for simple hardware and software problems using common troubleshooting strategies.</li> </ul>

<p>Information needs a physical or wireless path to travel to be sent and received.</p>	<ul style="list-style-type: none"> <li>• 8.1.5.NI.1: Develop models that successfully transmit and receive information using both wired and wireless methods.</li> </ul>
<p>Distinguishing between public and private information is important for safe and secure online interactions. Information can be protected using various security measures (i.e., physical and digital).</p>	<ul style="list-style-type: none"> <li>• 8.1.5.NI.2: Describe physical and digital security measures for protecting sensitive personal information.</li> </ul>
<p>The development and modification of computing technology is driven by individual's needs and wants and can affect individuals differently.</p>	<ul style="list-style-type: none"> <li>• 8.1.5.IC.1: Identify computing technologies that have impacted how individuals live and work and describe the factors that influenced the changes.</li> <li>• 8.1.5.IC.2: Identify possible ways to improve the accessibility and usability of computing technologies to address the diverse needs and wants of users.</li> </ul>
<p>Data can be organized, displayed, and presented to highlight relationships.</p>	<ul style="list-style-type: none"> <li>• 8.1.5.DA.1: Collect, organize, and display data in order to highlight relationships or support a claim.</li> </ul>
<p>The type of data being stored affects the storage requirements.</p>	<ul style="list-style-type: none"> <li>• 8.1.5.DA.2: Compare the amount of storage space required for different types of data.</li> </ul>
<p>Individuals can select, organize, and transform data into different visual representations and communicate insights gained from the data.</p>	<ul style="list-style-type: none"> <li>• 8.1.5.DA.3: Organize and present collected data visually to communicate insights gained from different views of the data.</li> <li>• 8.1.5.DA.4: Organize and present climate change data visually to highlight relationships or support a claim.</li> </ul>

<p>Many factors influence the accuracy of inferences and predictions.</p>	<ul style="list-style-type: none"> <li>• 8.1.5.DA.5: Propose cause and effect relationships, predict outcomes, or communicate ideas using data.</li> </ul>
<p>Different algorithms can achieve the same result. Some algorithms are more appropriate for a specific use than others.</p>	<ul style="list-style-type: none"> <li>• 8.1.5.AP.1: Compare and refine multiple algorithms for the same task and determine which is the most appropriate.</li> </ul>
<p>Programming languages provide variables, which are used to store and modify data.</p>	<ul style="list-style-type: none"> <li>• 8.1.5.AP.2: Create programs that use clearly named variables to store and modify data.</li> </ul>
<p>A variety of control structures are used to change the flow of program execution (e.g., sequences, events, loops, conditionals)</p>	<ul style="list-style-type: none"> <li>• 8.1.5.AP.3: Create programs that include sequences, events, loops, and conditionals.</li> </ul>
<p>Programs can be broken down into smaller parts to facilitate their design, implementation, and review. Programs can also be created by incorporating smaller portions of programs that already exist.</p>	<ul style="list-style-type: none"> <li>• 8.1.5.AP.4: Break down problems into smaller, manageable sub-problems to facilitate program development.</li> <li>• 8.1.5.AP.5: Modify, remix, or incorporate pieces of existing programs into one's own work to add additional features or create a new program</li> </ul>
<p>Individuals develop programs using an iterative process involving design, implementation, testing, and review.</p>	<ul style="list-style-type: none"> <li>• 8.1.5.AP.6: Develop programs using an iterative process, implement the program design, and test the program to ensure it works as intended.</li> </ul>
<p>Engineering design is a systematic and creative</p>	<ul style="list-style-type: none"> <li>• 8.2.5.ED.1: Explain the functions of a system and its subsystems.</li> </ul>

<p>process of communicating and collaborating to meet a design challenge. Often, several design solutions exist, each better in some way than the others.</p>	<ul style="list-style-type: none"> <li>• 8.2.5.ED.2: Collaborate with peers to collect information, brainstorm to solve a problem, and evaluate all possible solutions to provide the best results with supporting sketches or models.</li> <li>• 8.2.5.ED.3: Follow step by step directions to assemble a product or solve a problem, using appropriate tools to accomplish the task.</li> </ul>
<p>Engineering design requirements include desired features and limitations that need to be considered.</p>	<ul style="list-style-type: none"> <li>• 8.2.5.ED.4: Explain factors that influence the development and function of products and systems (e.g., resources, criteria, desired features, constraints).</li> <li>• 8.2.5.ED.5: Describe how specifications and limitations impact the engineering design process.</li> <li>• 8.2.5.ED.6: Evaluate and test alternative solutions to a problem using the constraints and tradeoffs identified in the design process.</li> </ul>
<p>Societal needs and wants determine which new tools are developed to address real-world problems.</p>	<ul style="list-style-type: none"> <li>• 8.2.5.ITH.1: Explain how societal needs and wants influence the development and function of a product and a system.</li> </ul>
<p>A new tool may have favorable or unfavorable results as well as both positive and negative effects on society. Technology spurs new businesses and careers.</p>	<ul style="list-style-type: none"> <li>• 8.2.5.ITH.2: Evaluate how well a new tool has met its intended purpose and identify any shortcomings it might have.</li> <li>• 8.2.5.ITH.3: Analyze the effectiveness of a new product or system and identify the positive and/or negative consequences resulting from its use.</li> <li>• 8.2.5.ITH.4: Describe a technology/tool that has made the way people live easier or has led to a new business or career.</li> </ul>
<p>Technology innovation and improvement may be influenced by a variety of factors. Engineers create and modify technologies to meet people's needs and wants;</p>	<ul style="list-style-type: none"> <li>• 8.2.5.NT.1: Troubleshoot a product that has stopped working and brainstorm ideas to correct the problem.</li> <li>• 8.2.5.NT.2: Identify new technologies resulting from the demands, values, and interests of individuals, businesses, industries, and societies.</li> <li>• 8.2.5.NT.3: Redesign an existing product for a different purpose in a collaborative team.</li> <li>• 8.2.5.NT.4: Identify how improvement in the understanding of materials science impacts technologies.</li> </ul>



<p>scientists ask questions about the natural world.</p>	
<p>The technology developed for the human designed world can have unintended consequences for the environment. Technology must be continually developed and made more efficient to reduce the need for non-renewable resources.</p>	<ul style="list-style-type: none"> <li>• 8.2.5.ETW.1: Describe how resources such as material, energy, information, time, tools, people, and capital are used in products or systems.</li> <li>• 8.2.5.ETW.2: Describe ways that various technologies are used to reduce improper use of resources.</li> <li>• 8.2.5.ETW.3: Explain why human-designed systems, products, and environments need to be constantly monitored, maintained, and improved.</li> <li>• 8.2.5.ETW.4: Explain the impact that resources, such as energy and materials used to develop technology, have on the environment.</li> <li>• 8.2.5.ETW.5: Identify the impact of a specific technology on the environment and determine what can be done to increase positive effects and to reduce any negative effects, such as climate change.</li> </ul>
<p>Technological choices and opportunities vary due to factors such as differences in economic resources, location, and cultural values.</p>	<ul style="list-style-type: none"> <li>• 8.2.5.EC.1: Analyze how technology has contributed to or reduced inequities in local and global communities and determine its short- and long-term effects.</li> </ul>
<p><b>Computer Science and Design Thinking Practices</b></p>	
<p><b>Computer Science and Design Thinking Practices</b></p>	<ul style="list-style-type: none"> <li>• Fostering an Inclusive Computing and Design Culture</li> <li>• Collaborating Around Computing and Design</li> <li>• Recognizing and Defining Computational Problems</li> <li>• Developing and Using Abstractions</li> <li>• Creating Computational Artifacts</li> <li>• Testing and Refining Computational Artifacts</li> <li>• Communicating About Computing and Design</li> </ul>
<p><b>2020 SLS: Career Readiness, Life Literacies, and Key Skills</b></p>	
<p><b>Core Idea</b></p>	<p><b>Performance Expectation</b></p>

<p>An individual's passions, aptitude and skills can affect his/her employment and earning potential.</p>	<ul style="list-style-type: none"> <li>● 9.2.5.CAP.1: Evaluate personal likes and dislikes and identify careers that might be suited to personal likes.</li> <li>● 9.2.5.CAP.2: Identify how you might like to earn an income.</li> <li>● 9.2.5.CAP.3: Identify qualifications needed to pursue traditional and non-traditional careers and occupations.</li> <li>● 9.2.5.CAP.4: Explain the reasons why some jobs and careers require specific training, skills, and certification (e.g., life guards, child care, medicine, education) and examples of these requirements.</li> </ul>
<p>Income and benefits can vary depending on the employer and type of job or career.</p>	<ul style="list-style-type: none"> <li>● 9.2.5.CAP.5: Identify various employee benefits, including income, medical, vacation time, and lifestyle benefits provided by different types of jobs and careers.</li> </ul>
<p>There are a variety of factors to consider before starting a business.</p>	<ul style="list-style-type: none"> <li>● 9.2.5.CAP.6: Compare the characteristics of a successful entrepreneur with the traits of successful employees.</li> <li>● 9.2.5.CAP.7: Identify factors to consider before starting a business.</li> </ul>
<p>Individuals can choose to accept inevitable risk or take steps to protect themselves by avoiding or reducing risk.</p>	<ul style="list-style-type: none"> <li>● 9.2.5.CAP.8: Identify risks that individuals and households face.</li> <li>● 9.2.5.CAP.9: Justify reasons to have insurance.</li> </ul>
<p>Collaboration with individuals with diverse perspectives can result in new ways of thinking and/or innovative solutions.</p>	<ul style="list-style-type: none"> <li>● 9.4.5.CI.1: Use appropriate communication technologies to collaborate with individuals with diverse perspectives about a local and/or global climate change issue and deliberate about possible solutions (e.g., W.4.6, 3.MD.B.3,7.1.NM.IPERS.6).</li> <li>● 9.4.5.CI.2: Investigate a persistent local or global issue, such as climate change, and collaborate with individuals with diverse perspectives to improve upon current actions designed to address the issue (e.g., 6.3.5.CivicsPD.3, W.5.7).</li> </ul>
<p>Curiosity and a willingness to try new ideas (intellectual risk-taking) contributes to the</p>	<ul style="list-style-type: none"> <li>● 9.4.5.CI.3: Participate in a brainstorming session with individuals with diverse perspectives to expand one's thinking about a topic of curiosity (e.g., 8.2.5.ED.2, 1.5.5.CR1a).</li> </ul>

development of creativity and innovation skills.	<ul style="list-style-type: none"> <li>9.4.5.CI.4: Research the development process of a product and identify the role of failure as a part of the creative process (e.g., W.4.7, 8.2.5.ED.6).</li> </ul>
The ability to solve problems effectively begins with gathering data, seeking resources, and applying critical thinking skills.	<ul style="list-style-type: none"> <li>9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process (e.g., 2.1.5.EH.4, 4-ESS3-1, 6.3.5.CivicsPD.2).</li> <li>9.4.5.CT.2: Identify a problem and list the types of individuals and resources (e.g., school, community agencies, governmental, online) that can aid in solving the problem (e.g., 2.1.5.CHSS.1, 4-ESS3-1).</li> <li>9.4.5.CT.3: Describe how digital tools and technology may be used to solve problems.</li> <li>9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global (e.g., 6.1.5.CivicsCM.3).</li> </ul>
Intellectual property rights exist to protect the original works of individuals. It is allowable to use other people's ideas in one's own work provided that proper credit is given to the original source.	<ul style="list-style-type: none"> <li>9.4.5.DC.1: Explain the need for and use of copyrights.</li> <li>9.4.5.DC.2: Provide attribution according to intellectual property rights guidelines using public domain or creative commons media.</li> <li>9.4.5.DC.3: Distinguish between digital images that can be reused freely and those that have copyright restrictions.</li> </ul>
Sending and receiving copies of media on the internet creates the opportunity for unauthorized use of data, such as personally owned video, photos, and music.	<ul style="list-style-type: none"> <li>9.4.5.DC.4: Model safe, legal, and ethical behavior when using online or offline technology (e.g., 8.1.5.NI.2).</li> </ul>
Digital identities must be managed in order to create a positive digital footprint.	<ul style="list-style-type: none"> <li>9.4.5.DC.5: Identify the characteristics of a positive and negative online identity and the lasting implications of online activity.</li> </ul>
Digital tools have positively and negatively changed the way people interact socially.	<ul style="list-style-type: none"> <li>9.4.5.DC.6: Compare and contrast how digital tools have changed social interactions (e.g., 8.1.5.IC.1).</li> </ul>

	<ul style="list-style-type: none"> <li>9.4.5.DC.7: Explain how posting and commenting in social spaces can have positive or negative consequences.</li> </ul>
Digital engagement can improve the planning and delivery of climate change actions.	<ul style="list-style-type: none"> <li>9.4.5.DC.8: Propose ways local and global communities can engage digitally to participate in and promote climate action (e.g., 6.3.5.GeoHE.1).</li> </ul>
Culture and geography can shape an individual's experiences and perspectives.	<ul style="list-style-type: none"> <li>9.4.5.GCA.1: Analyze how culture shapes individual and community perspectives and points of view (e.g., 1.1.5.C2a, RL.5.9, 6.1.5.HistoryCC.8).</li> </ul>
Digital tools and media resources provide access to vast stores of information, but the information can be biased or inaccurate.	<ul style="list-style-type: none"> <li>9.4.5.IML.1: Evaluate digital sources for accuracy, perspective, credibility and relevance.</li> </ul>
Digital tools can be used to modify and display data in various ways that can be organized to communicate ideas.	<ul style="list-style-type: none"> <li>9.4.5.IML.2: Create a visual representation to organize information about a problem or issue (e.g., 4.MD.B.4, 8.1.5.DA.3).</li> <li>9.4.5.IML.3: Represent the same data in multiple visual formats in order to tell a story about the data.</li> </ul>
Accurate and comprehensive information comes in a variety of platforms and formats and is the basis for effective decision-making.	<ul style="list-style-type: none"> <li>9.4.5.IML.4: Determine the impact of implicit and explicit media messages on individuals, groups, and society as a whole.</li> <li>9.4.5.IML.5: Distinguish how media are used by individuals, groups, and organizations for varying purposes. (e.g., 1.3A.5.R1a).</li> </ul>
Specific situations require the use of relevant sources of information.	<ul style="list-style-type: none"> <li>9.4.5.IML.6: Use appropriate sources of information from diverse sources, contexts, disciplines, and cultures to answer questions (e.g., RI.5.7, 6.1.5.HistoryCC.7, 7.1.NM.IPRET.5).</li> <li>9.4.5.IML.7: Evaluate the degree to which information meets a need including social emotional learning, academic, and social (e.g., 2.2.5. PF.5).</li> </ul>

<p>Different digital tools have different purposes.</p>	<ul style="list-style-type: none"> <li>● 9.4.5.TL.1: Compare the common uses of at least two different digital tools and identify the advantages and disadvantages of using each.</li> <li>● 9.4.5.TL.2: Sort and filter data in a spreadsheet to analyze findings.</li> <li>● 9.4.5.TL.3: Format a document using a word processing application to enhance text, change page formatting, and include appropriate images graphics, or symbols.</li> </ul>
<p>Collaborating digitally as a team can often develop a better artifact than an individual working alone.</p>	<ul style="list-style-type: none"> <li>● 9.4.5.TL.4: Compare and contrast artifacts produced individually to those developed collaboratively (e.g., 1.5.5.CR3a).</li> <li>● 9.4.5.TL.5: Collaborate digitally to produce an artifact (e.g., 1.2.5CR1d).</li> </ul>

**NJ: 2016 SLS: English Language Arts**

- RI.3.1. Ask and answer questions, and make relevant connections to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.
- RI.3.2. Determine the main idea of a text; recount the key details and explain how they support the main idea.
- RI.3.5. Use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information relevant to a given topic efficiently. Idea.
- W.3.2. Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
- W.3.4. With guidance and support from adults, produce writing in which the development and organization are appropriate to task and purpose.
- W.3.6. With guidance and support from adults, use technology to produce and publish writing as well as to interact and collaborate with others.
- W.3.10. Write routinely over extended time frames (time for research, reflection, metacognition/self-correction and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline- specific tasks, purposes, and audiences.
- SL.3.3. Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.
- SL.3.4. Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.
- L.3.6. Acquire and use accurately grade-appropriate conversational, general academic, and domain-specific words and phrases, including those that signal spatial and temporal relationships (e.g., After dinner that night we went looking for them).

- RI.4.1. Refer to details and examples in a text and make relevant connections when explaining what the text says explicitly and when drawing inferences from the text.
- RI.4.2. Determine the main idea of a text and explain how it is supported by key details; summarize the text.
- W.4.2. Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
- W.4.4. Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience.
- W.4.6. With some guidance and support from adults, use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of one page in a single sitting.
- RI.4.10. By the end of year, read and comprehend literary nonfiction (see Appendix A) at grade level text-complexity (see Appendix A) or above, with scaffolding as needed.
- W.4.7. Conduct short research projects that build knowledge through investigation of different aspects of a topic.
- W.4.10. Write routinely over extended time frames (time for research, reflection, metacognition/self-correction and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline- specific tasks, purposes, and audiences.
- SL.4.4. Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.
- L.4.6. Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including those that signal precise actions, emotions, or states of being (e.g., quizzed, whined, stammered) and that are basic to a particular topic (e.g., wildlife, conservation, and endangered when discussing animal preservation).
- RI.5.1. Quote accurately from a text and make relevant connections when explaining what the text says explicitly and when drawing inferences from the text.
- RI.5.4. Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 5 topic or subject area.
- RI.5.7. Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.
- W.5.2. Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
- W.5.4. Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience
- W.5.6. With some guidance and support from adults and peers, use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of two pages in a single sitting.

- W.5.7. Conduct short research projects that use several sources to build knowledge through investigation of different perspectives of a topic.
- W.5.10. Write routinely over extended time frames (time for research, reflection, metacognition/self-correction and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline- specific tasks, purposes, and audiences.
- SL.5.3. Summarize the points a speaker makes and explain how each claim is supported by reasons and evidence.
- SL.5.5. Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes.
- SL.5.6. Adapt speech to a variety of contexts and tasks, using formal English when appropriate to task and situation.
- L.5.6. Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including those that signal contrast, addition, and other logical relationships (e.g., however, although, nevertheless, similarly, moreover, in addition).

### Interdisciplinary Connections

#### Mathematics

- 3.MD.B.4. Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.
- 4.MD.A.1. Know relative sizes of measurement units within one system of units including km, m, cm. mm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two column table.
- 4.MD.C 6. Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.
- 4.G.A.1. Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.
- 5.MD.A.1. Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.
- 5.MD.C.4. Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and non-standard units.
- 5.MD.C.5.b. Apply the formulas  $V = l \times w \times h$  and  $V = B \times h$  for rectangular prisms to find volumes of right rectangular prisms with whole number edge lengths in the context of solving real world and mathematical problems.

	<ul style="list-style-type: none"> <li>• 5.G.A. 2. Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.</li> </ul>
Science	<ul style="list-style-type: none"> <li>• 3-5-ETS1-1 Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.</li> <li>• 3-5-ETS1-2 Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.</li> <li>• 3-5-ETS1-3 Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.</li> </ul>
Connections and Skills	<ul style="list-style-type: none"> <li>• Critical thinking &amp; Problem Solving</li> <li>• Digital Citizenship</li> <li>• Collaboration and Teamwork</li> <li>• Global and Cultural Awareness</li> <li>• Creativity and Innovation</li> <li>• Technology Literacy</li> <li>• Information and Media Literacy</li> </ul>

<b>Title</b>	Building Our World: Design and Engineering
<b>Unit Duration</b>	9 Weeks
<b>Unit Summary &amp; Rationale</b>	This unit will be giving students the opportunity to plan, test, and innovate design and engineering concepts through a variety of concepts. Students will be enhancing their knowledge of design by creating real world models and tools through problem-based learning. Students will be exploring design through a variety of forms of technology, building materials, renewable energy resources, and models. In addition, students will be expanding on their creativity, critical thinking, problem solving skills, and collaborative skills. The unit will empower student creativity, innovation, persistence, and technological literacy.



## Unit Goals

### Essential Questions

- Why is planning an important part of building a design?
- How can you determine what materials are needed to construct your design?
- What is the importance of engineering throughout our everyday world?
- What are examples of products created to improve our world?
- What type of careers do you think solve problems from building designs?
- What type of materials would builders use to create your design?
- What careers use creating models and designs using STEAM?
- How is renewable energy utilized throughout our world?
- What is the importance of teamwork?
- How and why was your design successful or unsuccessful?
- What role did mathematics play in the creation of your design?
- What were the most challenging aspects of your design?
- How can you create a better design to accomplish the goal you established?

### Enduring Understandings

- Establishing collaborative student-centered ideologies where students gain an understanding of the purpose of working together to accomplish a mutual goal.
- Gaining an understanding of the importance of preplanning and the role it plays regarding the final product.
- Exploring examples of products and designs that have changed our world. In addition, products that scientists are currently working on.
- Understanding types of careers which use STEAM concepts. Creating a connection between concepts taught and STEAM careers.
- Relating materials such as Legos, pipe cleaners, KEVA planks, cardboard, and other classroom materials to materials of a larger scale project.
- Understanding the importance of renewable energy. The roles of solar, hydro, and wind energy.
- Building connections between designing models to mathematical concepts.
- Determining ways to improve designs created by students through evidence and testing.

### Learning Outcomes

- Be able to apply engineering and design to solve a series of authentic problems.
- Investigate ways of designing structures by problem solving, collaboration, creativity, and critical thinking.

- Be able to plan and test a series of designs based on preplanning, drawing, and trial and error.
- Brainstorm a variety of ideas including how to solve a problem and build a product.
- Develop an understanding of the role of troubleshooting, research and development, invention and innovation, and experimentation in problem solving.
- Be able to discuss and demonstrate why their design works, the strengths, weaknesses, and modifications of their designed product.
- Identify and list the resources needed to complete their design.
- Develop, test, and refine prototypes as part of a design process.
- Be able to generate ideas, test theories, create innovative samples, or solve authentic problems.
- Utilize different forms of renewable energy and understand how solar, wind, and hydro energy work.
- Ask questions to determine cause and effect relationships between different objects.

<b>Assessment Evidence</b>	
<b>Formative</b>	Collaborative Activities, Homework, Classwork, Discussion, Independent Class Assignment, Informal Observations of Students, Interactive Notebooks, Self-Assessments, Exit Tickets, Lego Building Tasks, Teacher Constructed Games, Student Pre-Planning, Group Self-Assessment, Code.Org Courses.
<b>Summative</b>	Tests, Pre-Assessments, Quizzes, Written Responses, Projects, Group Projects  Code.org “Dance Party”, Code.org 4th Grade Project, Ozobot Maze Creation, Group Work Projects, Makey Makey Coding Projects
<b>Alternative and Benchmark</b>	Alternative – Project Based Learning, Graphic Organizers, Student Portfolio, Orally assessed responses  Benchmark – Teacher generated project or assessment, Tests, Student portfolio/project  <a href="#">Formative, Summative, Alternative and Benchmark Assessments</a>
<b>Resources to Promote Learning</b>	

<b>Resources &amp; Equipment Needed</b>	Smartboard, Computers, iPads, websites and digital interactives/models, multi-media presentations, video streaming, Brain Pop, Microsoft 365, Legos, KEVA Planks, Building straws, Pipe Cleaners, Cardboard, Carolina Science Renewable Energy Kits, Makey Makey STEM Pack Classroom Literacy Kit, MakerBot 3-D Printer, Ozobots, Ozobot Coding Reference Sheet, Code.Org tools, Makey Makey STEM Pack <a href="#">Approved Class Resource List</a>
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**Content & Interdisciplinary Standards**

**Computer Science and Design Thinking Practices**

<b>Core Ideas</b>	<b>Performance Expectation</b>
Computing devices may be connected to other devices to form a system as a way to extend their capabilities.	<ul style="list-style-type: none"> <li>• 8.1.5.CS.1: Model how computing devices connect to other components to form a system.</li> </ul>
Software and hardware work together as a system to accomplish tasks (e.g., sending, receiving, processing, and storing units of information).	<ul style="list-style-type: none"> <li>• 8.1.5.CS.2: Model how computer software and hardware work together as a system to accomplish tasks.</li> </ul>
Shared features allow for common troubleshooting strategies that can be effective for many systems.	<ul style="list-style-type: none"> <li>• 8.1.5.CS.3: Identify potential solutions for simple hardware and software problems using common troubleshooting strategies.</li> </ul>
Information needs a physical or wireless path to travel to be sent and received.	<ul style="list-style-type: none"> <li>• 8.1.5.NI.1: Develop models that successfully transmit and receive information using both wired and wireless methods.</li> </ul>
Distinguishing between public and private information is important for safe and secure online interactions. Information can be protected	<ul style="list-style-type: none"> <li>• 8.1.5.NI.2: Describe physical and digital security measures for protecting sensitive personal information.</li> </ul>

using various security measures (i.e., physical and digital).	
The development and modification of computing technology is driven by individual's needs and wants and can affect individuals differently.	<ul style="list-style-type: none"> <li>• 8.1.5.IC.1: Identify computing technologies that have impacted how individuals live and work and describe the factors that influenced the changes.</li> <li>• 8.1.5.IC.2: Identify possible ways to improve the accessibility and usability of computing technologies to address the diverse needs and wants of users.</li> </ul>
Data can be organized, displayed, and presented to highlight relationships.	<ul style="list-style-type: none"> <li>• 8.1.5.DA.1: Collect, organize, and display data in order to highlight relationships or support a claim.</li> </ul>
The type of data being stored affects the storage requirements.	<ul style="list-style-type: none"> <li>• 8.1.5.DA.2: Compare the amount of storage space required for different types of data.</li> <li>•</li> </ul>
Individuals can select, organize, and transform data into different visual representations and communicate insights gained from the data.	<ul style="list-style-type: none"> <li>• 8.1.5.DA.3: Organize and present collected data visually to communicate insights gained from different views of the data.</li> <li>• 8.1.5.DA.4: Organize and present climate change data visually to highlight relationships or support a claim.</li> </ul>
Many factors influence the accuracy of inferences and predictions.	<ul style="list-style-type: none"> <li>• 8.1.5.DA.5: Propose cause and effect relationships, predict outcomes, or communicate ideas using data.</li> </ul>
Different algorithms can achieve the same result. Some algorithms are more	<ul style="list-style-type: none"> <li>• 8.1.5.AP.1: Compare and refine multiple algorithms for the same task and determine which is the most appropriate.</li> </ul>

appropriate for a specific use than others.	
Programming languages provide variables, which are used to store and modify data.	<ul style="list-style-type: none"> <li>• 8.1.5.AP.2: Create programs that use clearly named variables to store and modify data.</li> </ul>
A variety of control structures are used to change the flow of program execution (e.g., sequences, events, loops, conditionals)	<ul style="list-style-type: none"> <li>• 8.1.5.AP.3: Create programs that include sequences, events, loops, and conditionals.</li> </ul>
Programs can be broken down into smaller parts to facilitate their design, implementation, and review. Programs can also be created by incorporating smaller portions of programs that already exist.	<ul style="list-style-type: none"> <li>• 8.1.5.AP.4: Break down problems into smaller, manageable sub-problems to facilitate program development.</li> <li>• 8.1.5.AP.5: Modify, remix, or incorporate pieces of existing programs into one's own work to add additional features or create a new program</li> </ul>
Individuals develop programs using an iterative process involving design, implementation, testing, and review.	<ul style="list-style-type: none"> <li>• 8.1.5.AP.6: Develop programs using an iterative process, implement the program design, and test the program to ensure it works as intended.</li> </ul>
Engineering design is a systematic and creative process of communicating and collaborating to meet a design challenge. Often, several design solutions exist, each better in some way than the others.	<ul style="list-style-type: none"> <li>• 8.2.5.ED.1: Explain the functions of a system and its subsystems.</li> <li>• 8.2.5.ED.2: Collaborate with peers to collect information, brainstorm to solve a problem, and evaluate all possible solutions to provide the best results with supporting sketches or models.</li> <li>• 8.2.5.ED.3: Follow step by step directions to assemble a product or solve a problem, using appropriate tools to accomplish the task.</li> </ul>

<p>Engineering design requirements include desired features and limitations that need to be considered.</p>	<ul style="list-style-type: none"> <li>• 8.2.5.ED.4: Explain factors that influence the development and function of products and systems (e.g., resources, criteria, desired features, constraints).</li> <li>• 8.2.5.ED.5: Describe how specifications and limitations impact the engineering design process.</li> <li>• 8.2.5.ED.6: Evaluate and test alternative solutions to a problem using the constraints and tradeoffs identified in the design process.</li> </ul>
<p>Societal needs and wants determine which new tools are developed to address real-world problems.</p>	<ul style="list-style-type: none"> <li>• 8.2.5.ITH.1: Explain how societal needs and wants influence the development and function of a product and a system.</li> </ul>
<p>A new tool may have favorable or unfavorable results as well as both positive and negative effects on society. Technology spurs new businesses and careers.</p>	<ul style="list-style-type: none"> <li>• 8.2.5.ITH.2: Evaluate how well a new tool has met its intended purpose and identify any shortcomings it might have.</li> <li>• 8.2.5.ITH.3: Analyze the effectiveness of a new product or system and identify the positive and/or negative consequences resulting from its use.</li> <li>• 8.2.5.ITH.4: Describe a technology/tool that has made the way people live easier or has led to a new business or career.</li> </ul>
<p>Technology innovation and improvement may be influenced by a variety of factors. Engineers create and modify technologies to meet people's needs and wants; scientists ask questions about the natural world.</p>	<ul style="list-style-type: none"> <li>• 8.2.5.NT.1: Troubleshoot a product that has stopped working and brainstorm ideas to correct the problem.</li> <li>• 8.2.5.NT.2: Identify new technologies resulting from the demands, values, and interests of individuals, businesses, industries, and societies.</li> <li>• 8.2.5.NT.3: Redesign an existing product for a different purpose in a collaborative team.</li> <li>• 8.2.5.NT.4: Identify how improvement in the understanding of materials science impacts technologies.</li> </ul>
<p>The technology developed for the human designed world can have unintended consequences for the environment. Technology must be</p>	<ul style="list-style-type: none"> <li>• 8.2.5.ETW.1: Describe how resources such as material, energy, information, time, tools, people, and capital are used in products or systems.</li> <li>• 8.2.5.ETW.2: Describe ways that various technologies are used to reduce improper use of resources.</li> </ul>

<p>continually developed and made more efficient to reduce the need for non-renewable resources.</p>	<ul style="list-style-type: none"> <li>• 8.2.5.ETW.3: Explain why human-designed systems, products, and environments need to be constantly monitored, maintained, and improved.</li> <li>• 8.2.5.ETW.4: Explain the impact that resources, such as energy and materials used to develop technology, have on the environment.</li> <li>• 8.2.5.ETW.5: Identify the impact of a specific technology on the environment and determine what can be done to increase positive effects and to reduce any negative effects, such as climate change.</li> </ul>
<p>Technological choices and opportunities vary due to factors such as differences in economic resources, location, and cultural values.</p>	<ul style="list-style-type: none"> <li>• 8.2.5.EC.1: Analyze how technology has contributed to or reduced inequities in local and global communities and determine its short- and long-term effects.</li> </ul>
<p><b>Computer Science and Design Thinking Practices</b></p>	<ul style="list-style-type: none"> <li>• Fostering an Inclusive Computing and Design Culture</li> <li>• Collaborating Around Computing and Design</li> <li>• Recognizing and Defining Computational Problems</li> <li>• Developing and Using Abstractions</li> <li>• Creating Computational Artifacts</li> <li>• Testing and Refining Computational Artifacts</li> <li>• Communicating About Computing and Design</li> </ul>
<p><b>2020 SLS: Career Readiness, Life Literacies, and Key Skills</b></p>	
<p><b>Core Idea</b></p>	<p><b>Performance Expectation</b></p>
<p>An individual’s passions, aptitude and skills can affect his/her employment and earning potential.</p>	<ul style="list-style-type: none"> <li>• 9.2.5.CAP.1: Evaluate personal likes and dislikes and identify careers that might be suited to personal likes.</li> <li>• 9.2.5.CAP.2: Identify how you might like to earn an income.</li> <li>• 9.2.5.CAP.3: Identify qualifications needed to pursue traditional and non-traditional careers and occupations.</li> </ul>

	<ul style="list-style-type: none"> <li>9.2.5.CAP.4: Explain the reasons why some jobs and careers require specific training, skills, and certification (e.g., life guards, child care, medicine, education) and examples of these requirements.</li> </ul>
Income and benefits can vary depending on the employer and type of job or career.	<ul style="list-style-type: none"> <li>9.2.5.CAP.5: Identify various employee benefits, including income, medical, vacation time, and lifestyle benefits provided by different types of jobs and careers.</li> </ul>
There are a variety of factors to consider before starting a business.	<ul style="list-style-type: none"> <li>9.2.5.CAP.6: Compare the characteristics of a successful entrepreneur with the traits of successful employees.</li> <li>9.2.5.CAP.7: Identify factors to consider before starting a business.</li> </ul>
Individuals can choose to accept inevitable risk or take steps to protect themselves by avoiding or reducing risk.	<ul style="list-style-type: none"> <li>9.2.5.CAP.8: Identify risks that individuals and households face.</li> <li>9.2.5.CAP.9: Justify reasons to have insurance.</li> </ul>
Collaboration with individuals with diverse perspectives can result in new ways of thinking and/or innovative solutions.	<ul style="list-style-type: none"> <li>9.4.5.CI.1: Use appropriate communication technologies to collaborate with individuals with diverse perspectives about a local and/or global climate change issue and deliberate about possible solutions (e.g., W.4.6, 3.MD.B.3, 7.1.NM.IPERS.6).</li> <li>9.4.5.CI.2: Investigate a persistent local or global issue, such as climate change, and collaborate with individuals with diverse perspectives to improve upon current actions designed to address the issue (e.g., 6.3.5.CivicsPD.3, W.5.7).</li> </ul>
Curiosity and a willingness to try new ideas (intellectual risk-taking) contributes to the development of creativity and innovation skills.	<ul style="list-style-type: none"> <li>9.4.5.CI.3: Participate in a brainstorming session with individuals with diverse perspectives to expand one's thinking about a topic of curiosity (e.g., 8.2.5.ED.2, 1.5.5.CR1a).</li> <li>9.4.5.CI.4: Research the development process of a product and identify the role of failure as a part of the creative process (e.g., W.4.7, 8.2.5.ED.6).</li> </ul>
The ability to solve problems effectively begins with gathering data, seeking	<ul style="list-style-type: none"> <li>9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process (e.g., 2.1.5.EH.4, 4-ESS3-1, 6.3.5.CivicsPD.2).</li> </ul>



<p>resources, and applying critical thinking skills.</p>	<ul style="list-style-type: none"> <li>● 9.4.5.CT.2: Identify a problem and list the types of individuals and resources (e.g., school, community agencies, governmental, online) that can aid in solving the problem (e.g., 2.1.5.CHSS.1, 4-ESS3-1).</li> <li>● 9.4.5.CT.3: Describe how digital tools and technology may be used to solve problems.</li> <li>● 9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global (e.g., 6.1.5.CivicsCM.3).</li> </ul>
<p>Intellectual property rights exist to protect the original works of individuals. It is allowable to use other people's ideas in one's own work provided that proper credit is given to the original source.</p>	<ul style="list-style-type: none"> <li>● 9.4.5.DC.1: Explain the need for and use of copyrights.</li> <li>● 9.4.5.DC.2: Provide attribution according to intellectual property rights guidelines using public domain or creative commons media.</li> <li>● 9.4.5.DC.3: Distinguish between digital images that can be reused freely and those that have copyright restrictions.</li> </ul>
<p>Sending and receiving copies of media on the internet creates the opportunity for unauthorized use of data, such as personally owned video, photos, and music.</p>	<ul style="list-style-type: none"> <li>● 9.4.5.DC.4: Model safe, legal, and ethical behavior when using online or offline technology (e.g., 8.1.5.NI.2).</li> </ul>
<p>Digital identities must be managed in order to create a positive digital footprint.</p>	<ul style="list-style-type: none"> <li>● 9.4.5.DC.5: Identify the characteristics of a positive and negative online identity and the lasting implications of online activity.</li> </ul>
<p>Digital tools have positively and negatively changed the way people interact socially.</p>	<ul style="list-style-type: none"> <li>● 9.4.5.DC.6: Compare and contrast how digital tools have changed social interactions (e.g., 8.1.5.IC.1).</li> <li>● 9.4.5.DC.7: Explain how posting and commenting in social spaces can have positive or negative consequences.</li> </ul>
<p>Digital engagement can improve the planning and</p>	<ul style="list-style-type: none"> <li>● 9.4.5.DC.8: Propose ways local and global communities can engage digitally to participate in and promote climate action (e.g., 6.3.5.GeoHE.1).</li> </ul>

delivery of climate change actions.	
Culture and geography can shape an individual's experiences and perspectives.	<ul style="list-style-type: none"> <li>9.4.5.GCA.1: Analyze how culture shapes individual and community perspectives and points of view (e.g., 1.1.5.C2a, RL.5.9, 6.1.5.HistoryCC.8).</li> </ul>
Digital tools and media resources provide access to vast stores of information, but the information can be biased or inaccurate.	<ul style="list-style-type: none"> <li>9.4.5.IML.1: Evaluate digital sources for accuracy, perspective, credibility and relevance.</li> </ul>
Digital tools can be used to modify and display data in various ways that can be organized to communicate ideas.	<ul style="list-style-type: none"> <li>9.4.5.IML.2: Create a visual representation to organize information about a problem or issue (e.g., 4.MD.B.4, 8.1.5.DA.3).</li> <li>9.4.5.IML.3: Represent the same data in multiple visual formats in order to tell a story about the data.</li> </ul>
Accurate and comprehensive information comes in a variety of platforms and formats and is the basis for effective decision-making.	<ul style="list-style-type: none"> <li>9.4.5.IML.4: Determine the impact of implicit and explicit media messages on individuals, groups, and society as a whole.</li> <li>9.4.5.IML.5: Distinguish how media are used by individuals, groups, and organizations for varying purposes. (e.g., 1.3A.5.R1a).</li> </ul>
Specific situations require the use of relevant sources of information.	<ul style="list-style-type: none"> <li>9.4.5.IML.6: Use appropriate sources of information from diverse sources, contexts, disciplines, and cultures to answer questions (e.g., RI.5.7, 6.1.5.HistoryCC.7, 7.1.NM.IPRET.5).</li> <li>9.4.5.IML.7: Evaluate the degree to which information meets a need including social emotional learning, academic, and social (e.g., 2.2.5. PF.5).</li> </ul>
Different digital tools have different purposes.	<ul style="list-style-type: none"> <li>9.4.5.TL.1: Compare the common uses of at least two different digital tools and identify the advantages and disadvantages of using each.</li> <li>9.4.5.TL.2: Sort and filter data in a spreadsheet to analyze findings.</li> </ul>

	<ul style="list-style-type: none"> <li>9.4.5.TL.3: Format a document using a word processing application to enhance text, change page formatting, and include appropriate images graphics, or symbols.</li> </ul>
Collaborating digitally as a team can often develop a better artifact than an individual working alone.	<ul style="list-style-type: none"> <li>9.4.5.TL.4: Compare and contrast artifacts produced individually to those developed collaboratively (e.g., 1.5.5.CR3a).</li> <li>9.4.5.TL.5: Collaborate digitally to produce an artifact (e.g., 1.2.5CR1d).</li> </ul>

**NJ: 2016 SLS: English Language Arts**

- RI.3.1. Ask and answer questions, and make relevant connections to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.
- RI.3.2. Determine the main idea of a text; recount the key details and explain how they support the main idea.
- RI.3.5. Use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information relevant to a given topic efficiently. Idea.
- W.3.2. Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
- W.3.4. With guidance and support from adults, produce writing in which the development and organization are appropriate to task and purpose.
- W.3.6. With guidance and support from adults, use technology to produce and publish writing as well as to interact and collaborate with others.
- W.3.10. Write routinely over extended time frames (time for research, reflection, metacognition/self-correction and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline- specific tasks, purposes, and audiences.
- SL.3.3. Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.
- SL.3.4. Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.
- L.3.6. Acquire and use accurately grade-appropriate conversational, general academic, and domain-specific words and phrases, including those that signal spatial and temporal relationships (e.g., After dinner that night we went looking for them).
- RI.4.1. Refer to details and examples in a text and make relevant connections when explaining what the text says explicitly and when drawing inferences from the text.
- RI.4.2. Determine the main idea of a text and explain how it is supported by key details; summarize the text.
- W.4.2. Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

- W.4.4. Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience.
- W.4.6. With some guidance and support from adults, use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of one page in a single sitting.
- RI.4.10. By the end of year, read and comprehend literary nonfiction (see Appendix A) at grade level text-complexity (see Appendix A) or above, with scaffolding as needed.
- W.4.7. Conduct short research projects that build knowledge through investigation of different aspects of a topic.
- W.4.10. Write routinely over extended time frames (time for research, reflection, metacognition/self-correction and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline- specific tasks, purposes, and audiences.
- SL.4.4. Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.
- L.4.6. Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including those that signal precise actions, emotions, or states of being (e.g., quizzed, whined, stammered) and that are basic to a particular topic (e.g., wildlife, conservation, and endangered when discussing animal preservation).
- RI.5.1. Quote accurately from a text and make relevant connections when explaining what the text says explicitly and when drawing inferences from the text.
- RI.5.4. Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 5 topic or subject area.
- RI.5.7. Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.
- W.5.2. Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
- W.5.4. Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience
- W.5.6. With some guidance and support from adults and peers, use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of two pages in a single sitting.
- W.5.7. Conduct short research projects that use several sources to build knowledge through investigation of different perspectives of a topic.

- W.5.10. Write routinely over extended time frames (time for research, reflection, metacognition/self-correction and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline- specific tasks, purposes, and audiences.
- SL.5.3. Summarize the points a speaker makes and explain how each claim is supported by reasons and evidence.
- SL.5.5. Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes.
- SL.5.6. Adapt speech to a variety of contexts and tasks, using formal English when appropriate to task and situation.
- L.5.6. Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including those that signal contrast, addition, and other logical relationships (e.g., however, although, nevertheless, similarly, moreover, in addition).

### Interdisciplinary Connections

#### Mathematics

- 3.MD.B.4. Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.
- 4.MD.A.1. Know relative sizes of measurement units within one system of units including km, m, cm. mm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two column table.
- 4.MD.C.6. Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.
- 4.G.A.1. Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.
- 5.MD.A.1. Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.
- 5.MD.C.4. Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and non-standard units.
- 5.MD.C.5.b. Apply the formulas  $V = l \times w \times h$  and  $V = B \times h$  for rectangular prisms to find volumes of right rectangular prisms with whole number edge lengths in the context of solving real world and mathematical problems.

	<ul style="list-style-type: none"> <li>• 5.G.A. 2. Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.</li> </ul>
Science	<ul style="list-style-type: none"> <li>• 3-5-ETS1-1 Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.</li> <li>• 3-5-ETS1-2 Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.</li> <li>• 3-5-ETS1-3 Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.</li> </ul>
Connections and Skills	<ul style="list-style-type: none"> <li>• Critical thinking &amp; Problem Solving</li> <li>• Digital Citizenship</li> <li>• Collaboration and Teamwork</li> <li>• Global and Cultural Awareness</li> <li>• Creativity and Innovation</li> <li>• Technology Literacy</li> <li>• Information and Media Literacy</li> </ul>

<b>Title</b>	Financial Literacy, Life Literacies, and Key Skills
<b>Unit Duration</b>	18 Weeks
<b>Unit Summary &amp; Rationale</b>	In this unit, students will continue learning about the economy and personal finance. Intertwined in the unit students are working on important digital literacy skills.
<b>Unit Goals</b>	
<b>Essential Questions</b>	<ul style="list-style-type: none"> <li>• Why do individuals volunteer and give back to their community?</li> <li>• Why is it important to have a strong credit history?</li> <li>• How does our government use tax money?</li> <li>• What role does our government play in the economy?</li> <li>• What are financial institutions?</li> </ul>

	<ul style="list-style-type: none"> <li>• What services do financial services provide that we may need?</li> <li>• What influences our spending and savings habits?</li> <li>• Why is budgeting important?</li> <li>• What is the purpose of insurance?</li> <li>• What skills do I need to obtain the job I want?</li> <li>• How do I start a business? What steps do I need to take?</li> <li>• Why is digital citizenship important?</li> <li>• How does culture and geography shape an individual's experiences and perspectives.</li> </ul>
<b>Enduring Understandings</b>	<ul style="list-style-type: none"> <li>• Having a strong background in understanding our economic habits coupled with digital literacy skills makes individuals critical consumers of information, and puts them on the path to making better economic decisions.</li> </ul>
<b>Learning Outcomes</b>	<ul style="list-style-type: none"> <li>• Explain the benefits to volunteering and giving back to the community.</li> <li>• Explain the importance of having a good credit history.</li> <li>• Explain how our government uses tax money.</li> <li>• Explain how our choices affect our personal finances and that of the economy.</li> <li>• Explain how the government protect us as consumers.</li> <li>• Identify and explain the different products financial institutions offer. (credit cards debit cards, banks, credit unions)</li> <li>• Explain how our moods and choices affect how we spend money.</li> <li>• Create a budget.</li> <li>• Identify risks and how we can minimize our loses.</li> <li>• Evaluate personal likes and dislikes and identify careers that might be suited to personal likes.</li> <li>• Identify how you might like to earn an income.</li> <li>• Identify qualifications needed to pursue traditional and non-traditional careers and occupations.</li> <li>• Explain the reasons why some jobs and careers require specific training, skills, and certification (e.g., life guards, child care, medicine, education) and examples of these requirements.</li> </ul>

- Identify various employee benefits, including income, medical, vacation time, and lifestyle benefits provided by different types of jobs and careers.
- Compare the characteristics of a successful entrepreneur with the traits of successful employees.
- Identify factors to consider before starting a business.
- Identify risks that individuals and households face.
- Justify reasons to have insurance.
- Demonstrate openness to new ideas and perspectives.
- Demonstrate originality and inventiveness in work.
- Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem.
- Identify possible approaches and resources to execute a plan.
- Use a variety of types of thinking to solve problems (e.g., inductive, deductive).
- Explain differences between ownership and sharing of information.
- Explain the importance of respecting digital content of others.
- Explain how to be safe online and follow safe practices when using the internet.
- Compare information that should be kept private to information that might be made public.
- Explain what a digital footprint is and how it is created.
- Identify respectful and responsible ways to communicate in digital environments.
- Describe actions peers can take to positively impact climate change.
- Articulate the role of culture in everyday life by describing one's own culture and comparing it to the cultures of other individuals.
- Identify a simple search term to find information in a search engine or digital resource.
- Represent data in a visual format to tell a story about the data.
- Use a variety of sources including multimedia sources to find information about topics such as climate change, with guidance and support from adults.
- Compare and contrast the way information is shared in a variety of contexts (e.g., social, academic, athletic).
- Identify the basic features of a digital tool and explain the purpose of the tool.



- Create a document using a word processing application.
- Enter information into a spreadsheet and sort the information.
- Navigate a virtual space to build context and describe the visual content.
- Describe the difference between real and virtual experiences.
- Illustrate and communicate ideas and stories using multiple digital tools.
- Describe the benefits of collaborating with others to complete digital tasks or develop digital artifacts.

<b>Assessment Evidence</b>	
<b>Formative</b>	Collaborative Activities, Homework, Classwork, Discussion, Independent Class Assignment, Informal Observations of Students, Interactive Notebooks, Self-Assessments, Exit Tickets, Lego Building Tasks, Teacher Constructed Games, Student Pre-Planning, Group Self-Assessment, Code.Org Courses.
<b>Summative</b>	Tests, Pre-Assessments, Quizzes, Written Responses, Projects, Group Projects
<b>Alternative and Benchmark</b>	<p>Alternative – Project Based Learning, Graphic Organizers, Student Portfolio, Orally assessed responses</p> <p>Benchmark – Teacher generated project or assessment, Tests, Student portfolio/project</p> <p><a href="#">Formative, Summative, Alternative and Benchmark Assessments</a></p>
<b>Resources to Promote Learning</b>	
<b>Resources &amp; Equipment Needed</b>	Smartboard, Computers, iPads, websites and digital interactives/models, multi-media presentations, video streaming, Brain Pop, Microsoft 365, Next Gen Personal Finance <a href="#">Approved Class Resource List</a>
<b>Content &amp; Interdisciplinary Standards</b>	
<b>Computer Science and Design Thinking Practices</b>	
<b>Core Ideas</b>	<b>Performance Expectation</b>
Computing devices may be connected to other devices to	<ul style="list-style-type: none"> <li>• 8.1.5.CS.1: Model how computing devices connect to other components to form a system.</li> </ul>

form a system as a way to extend their capabilities.	
Software and hardware work together as a system to accomplish tasks (e.g., sending, receiving, processing, and storing units of information).	<ul style="list-style-type: none"> <li>• 8.1.5.CS.2: Model how computer software and hardware work together as a system to accomplish tasks.</li> </ul>
Shared features allow for common troubleshooting strategies that can be effective for many systems.	<ul style="list-style-type: none"> <li>• 8.1.5.CS.3: Identify potential solutions for simple hardware and software problems using common troubleshooting strategies.</li> </ul>
Information needs a physical or wireless path to travel to be sent and received.	<ul style="list-style-type: none"> <li>• 8.1.5.NI.1: Develop models that successfully transmit and receive information using both wired and wireless methods.</li> </ul>
Distinguishing between public and private information is important for safe and secure online interactions. Information can be protected using various security measures (i.e., physical and digital).	<ul style="list-style-type: none"> <li>• 8.1.5.NI.2: Describe physical and digital security measures for protecting sensitive personal information.</li> </ul>
The development and modification of computing technology is driven by individual's needs and wants and can affect individuals differently.	<ul style="list-style-type: none"> <li>• 8.1.5.IC.1: Identify computing technologies that have impacted how individuals live and work and describe the factors that influenced the changes.</li> <li>• 8.1.5.IC.2: Identify possible ways to improve the accessibility and usability of computing technologies to address the diverse needs and wants of users.</li> </ul>

Data can be organized, displayed, and presented to highlight relationships.	<ul style="list-style-type: none"> <li>8.1.5.DA.1: Collect, organize, and display data in order to highlight relationships or support a claim.</li> </ul>
The type of data being stored affects the storage requirements.	<ul style="list-style-type: none"> <li>8.1.5.DA.2: Compare the amount of storage space required for different types of data.</li> <li></li> </ul>
Individuals can select, organize, and transform data into different visual representations and communicate insights gained from the data.	<ul style="list-style-type: none"> <li>8.1.5.DA.3: Organize and present collected data visually to communicate insights gained from different views of the data.</li> <li>8.1.5.DA.4: Organize and present climate change data visually to highlight relationships or support a claim.</li> </ul>
Many factors influence the accuracy of inferences and predictions.	<ul style="list-style-type: none"> <li>8.1.5.DA.5: Propose cause and effect relationships, predict outcomes, or communicate ideas using data.</li> </ul>
Different algorithms can achieve the same result. Some algorithms are more appropriate for a specific use than others.	<ul style="list-style-type: none"> <li>8.1.5.AP.1: Compare and refine multiple algorithms for the same task and determine which is the most appropriate.</li> </ul>
Programming languages provide variables, which are used to store and modify data.	<ul style="list-style-type: none"> <li>8.1.5.AP.2: Create programs that use clearly named variables to store and modify data.</li> </ul>
A variety of control structures are used to change the flow of program execution (e.g., sequences, events, loops, conditionals)	<ul style="list-style-type: none"> <li>8.1.5.AP.3: Create programs that include sequences, events, loops, and conditionals.</li> </ul>

<p>Programs can be broken down into smaller parts to facilitate their design, implementation, and review. Programs can also be created by incorporating smaller portions of programs that already exist.</p>	<ul style="list-style-type: none"> <li>• 8.1.5.AP.4: Break down problems into smaller, manageable sub-problems to facilitate program development.</li> <li>• 8.1.5.AP.5: Modify, remix, or incorporate pieces of existing programs into one's own work to add additional features or create a new program</li> </ul>
<p>Individuals develop programs using an iterative process involving design, implementation, testing, and review.</p>	<ul style="list-style-type: none"> <li>• 8.1.5.AP.6: Develop programs using an iterative process, implement the program design, and test the program to ensure it works as intended.</li> </ul>
<p>Engineering design is a systematic and creative process of communicating and collaborating to meet a design challenge. Often, several design solutions exist, each better in some way than the others.</p>	<ul style="list-style-type: none"> <li>• 8.2.5.ED.1: Explain the functions of a system and its subsystems.</li> <li>• 8.2.5.ED.2: Collaborate with peers to collect information, brainstorm to solve a problem, and evaluate all possible solutions to provide the best results with supporting sketches or models.</li> <li>• 8.2.5.ED.3: Follow step by step directions to assemble a product or solve a problem, using appropriate tools to accomplish the task.</li> </ul>
<p>Engineering design requirements include desired features and limitations that need to be considered.</p>	<ul style="list-style-type: none"> <li>• 8.2.5.ED.4: Explain factors that influence the development and function of products and systems (e.g., resources, criteria, desired features, constraints).</li> <li>• 8.2.5.ED.5: Describe how specifications and limitations impact the engineering design process.</li> <li>• 8.2.5.ED.6: Evaluate and test alternative solutions to a problem using the constraints and tradeoffs identified in the design process.</li> </ul>
<p>Societal needs and wants determine which new tools are developed to address real-world problems.</p>	<ul style="list-style-type: none"> <li>• 8.2.5.ITH.1: Explain how societal needs and wants influence the development and function of a product and a system.</li> </ul>

<p>A new tool may have favorable or unfavorable results as well as both positive and negative effects on society. Technology spurs new businesses and careers.</p>	<ul style="list-style-type: none"> <li>● 8.2.5.ITH.2: Evaluate how well a new tool has met its intended purpose and identify any shortcomings it might have.</li> <li>● 8.2.5.ITH.3: Analyze the effectiveness of a new product or system and identify the positive and/or negative consequences resulting from its use.</li> <li>● 8.2.5.ITH.4: Describe a technology/tool that has made the way people live easier or has led to a new business or career.</li> </ul>
<p>Technology innovation and improvement may be influenced by a variety of factors. Engineers create and modify technologies to meet people’s needs and wants; scientists ask questions about the natural world.</p>	<ul style="list-style-type: none"> <li>● 8.2.5.NT.1: Troubleshoot a product that has stopped working and brainstorm ideas to correct the problem.</li> <li>● 8.2.5.NT.2: Identify new technologies resulting from the demands, values, and interests of individuals, businesses, industries, and societies.</li> <li>● 8.2.5.NT.3: Redesign an existing product for a different purpose in a collaborative team.</li> <li>● 8.2.5.NT.4: Identify how improvement in the understanding of materials science impacts technologies.</li> </ul>
<p>The technology developed for the human designed world can have unintended consequences for the environment. Technology must be continually developed and made more efficient to reduce the need for non-renewable resources.</p>	<ul style="list-style-type: none"> <li>● 8.2.5.ETW.1: Describe how resources such as material, energy, information, time, tools, people, and capital are used in products or systems.</li> <li>● 8.2.5.ETW.2: Describe ways that various technologies are used to reduce improper use of resources.</li> <li>● 8.2.5.ETW.3: Explain why human-designed systems, products, and environments need to be constantly monitored, maintained, and improved.</li> <li>● 8.2.5.ETW.4: Explain the impact that resources, such as energy and materials used to develop technology, have on the environment.</li> <li>● 8.2.5.ETW.5: Identify the impact of a specific technology on the environment and determine what can be done to increase positive effects and to reduce any negative effects, such as climate change.</li> </ul>
<p>Technological choices and opportunities vary due to factors such as differences in</p>	<ul style="list-style-type: none"> <li>● 8.2.5.EC.1: Analyze how technology has contributed to or reduced inequities in local and global communities and determine its short- and long-term effects.</li> </ul>

economic resources, location, and cultural values.	
<b>Computer Science and Design Thinking Practices</b>	<ul style="list-style-type: none"> <li>• Fostering an Inclusive Computing and Design Culture</li> <li>• Collaborating Around Computing and Design</li> <li>• Recognizing and Defining Computational Problems</li> <li>• Developing and Using Abstractions</li> <li>• Creating Computational Artifacts</li> <li>• Testing and Refining Computational Artifacts</li> <li>• Communicating About Computing and Design</li> </ul>
<b>2020 SLS: Career Readiness, Life Literacies, and Key Skills</b>	
<b>Core Idea</b>	<b>Performance Expectation</b>
You can give back in areas that matter to you.	<ul style="list-style-type: none"> <li>• 9.1.5.CR.1: Compare various ways to give back and relate them to your strengths, interests, and other personal factors.</li> </ul>
There are benefits to having a positive credit history.	<ul style="list-style-type: none"> <li>• 9.1.5.CP.1: Identify the advantages of maintaining a positive credit history.</li> <li>•</li> </ul>
Taxes are collected on a variety of goods and services at the local, state, and federal levels.	<ul style="list-style-type: none"> <li>• 9.1.5.EG.1: Explain and give examples of what is meant by the term “tax.”</li> <li>• 9.1.5.EG.2: Describe how tax monies are spent.</li> </ul>
There is a broader economic system that influences your financial goals.	<ul style="list-style-type: none"> <li>• 9.1.5.EG.3: Explain the impact of the economic system on one’s personal financial goals.</li> <li>• 9.1.5. EG.4: Describe how an individual’s financial decisions affect society and contribute to the overall economy.</li> <li>•</li> </ul>

There are agencies, laws, and resources to protect individuals as consumers.	<ul style="list-style-type: none"> <li>• 9.1.5. EG.5: Identify sources of consumer protection and assistance.</li> <li>•</li> </ul>
People can choose to save money in many places such as home in a piggy bank, bank, or credit union.	<ul style="list-style-type: none"> <li>• 9.1.5.FI.1: Identify various types of financial institutions and the services they offer including banks, credit unions, and credit card companies.</li> <li>•</li> </ul>
An individual's financial traits and habits affect his/her finances.	<ul style="list-style-type: none"> <li>• 9.1.5.FP.1: Illustrate the impact of financial traits on financial decisions.</li> <li>• 9.1.5.FP.2: Identify the elements of being a good steward of money.</li> </ul>
Spending choices and their intended and unintended consequences impact financial outcomes and personal well-being.	<ul style="list-style-type: none"> <li>• 9.1.5.FP.3: Analyze how spending choices and decision-making can result in positive or negative consequences.</li> <li>• 9.1.5.FP.4: Explain the role of spending money and how it affects well-being and happiness (e.g., "happy money," experiences over things, donating to causes, anticipation, etc.).</li> </ul>
Not all financial information is accurate or truthful.	<ul style="list-style-type: none"> <li>• 9.1.5.FP.5: Illustrate how inaccurate information is disseminated through various external influencers including the media, advertisers/marketers, friends, educators, and family members.</li> </ul>
There are specific steps associated with creating a budget.	<ul style="list-style-type: none"> <li>• 9.1.5.PB.1: Develop a personal budget and explain how it reflects spending, saving, and charitable contributions.</li> </ul>
Saving money can impact an individual's ability to address emergencies and accomplish their short-and long-term goals.	<ul style="list-style-type: none"> <li>• 9.1.5.PB.2: Describe choices consumers have with money (e.g., save, spend, donate).</li> </ul>
Individuals can choose to accept inevitable risk or take	<ul style="list-style-type: none"> <li>• 9.1.5.RMI.1: Identify risks that individuals and households face.</li> <li>• 9.1.5.RMI.2: Justify reasons to have insurance.</li> </ul>

<p>steps to protect themselves by avoiding or reducing risk.</p>	
<p>An individual's passions, aptitude and skills can affect his/her employment and earning potential.</p>	<ul style="list-style-type: none"> <li>● 9.2.5.CAP.1: Evaluate personal likes and dislikes and identify careers that might be suited to personal likes.</li> <li>● 9.2.5.CAP.2: Identify how you might like to earn an income.</li> <li>● 9.2.5.CAP.3: Identify qualifications needed to pursue traditional and non-traditional careers and occupations.</li> <li>● 9.2.5.CAP.4: Explain the reasons why some jobs and careers require specific training, skills, and certification (e.g., life guards, child care, medicine, education) and examples of these requirements.</li> </ul>
<p>There are a variety of factors to consider before starting a business.</p>	<ul style="list-style-type: none"> <li>● 9.2.5.CAP.6: Compare the characteristics of a successful entrepreneur with the traits of successful employees.</li> <li>● 9.2.5.CAP.7: Identify factors to consider before starting a business.</li> </ul>
<p>Individuals can choose to accept inevitable risk or take steps to protect themselves by avoiding or reducing risk.</p>	<ul style="list-style-type: none"> <li>● 9.2.5.CAP.8: Identify risks that individuals and households face.</li> <li>● 9.2.5.CAP.9: Justify reasons to have insurance.</li> </ul>
<p>Collaboration with individuals with diverse perspectives can result in new ways of thinking and/or innovative solutions.</p>	<ul style="list-style-type: none"> <li>● 9.4.5.CI.1: Use appropriate communication technologies to collaborate with individuals with diverse perspectives about a local and/or global climate change issue and deliberate about possible solutions (e.g., W.4.6, 3.MD.B.3,7.1.NM.IPERS.6).</li> <li>● 9.4.5.CI.2: Investigate a persistent local or global issue, such as climate change, and collaborate with individuals with diverse perspectives to improve upon current actions designed to address the issue (e.g., 6.3.5.CivicsPD.3, W.5.7).</li> </ul>
<p>Curiosity and a willingness to try new ideas (intellectual risk-taking) contributes to the</p>	<ul style="list-style-type: none"> <li>● 9.4.5.CI.3: Participate in a brainstorming session with individuals with diverse perspectives to expand one's thinking about a topic of curiosity (e.g., 8.2.5.ED.2, 1.5.5.CR1a).</li> </ul>



development of creativity and innovation skills.	<ul style="list-style-type: none"> <li>9.4.5.CI.4: Research the development process of a product and identify the role of failure as a part of the creative process (e.g., W.4.7, 8.2.5.ED.6).</li> </ul>
The ability to solve problems effectively begins with gathering data, seeking resources, and applying critical thinking skills.	<ul style="list-style-type: none"> <li>9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process (e.g., 2.1.5.EH.4, 4-ESS3-1, 6.3.5.CivicsPD.2).</li> <li>9.4.5.CT.2: Identify a problem and list the types of individuals and resources (e.g., school, community agencies, governmental, online) that can aid in solving the problem (e.g., 2.1.5.CHSS.1, 4-ESS3-1).</li> <li>9.4.5.CT.3: Describe how digital tools and technology may be used to solve problems.</li> <li>9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global (e.g., 6.1.5.CivicsCM.3).</li> </ul>
Intellectual property rights exist to protect the original works of individuals. It is allowable to use other people's ideas in one's own work provided that proper credit is given to the original source.	<ul style="list-style-type: none"> <li>9.4.5.DC.1: Explain the need for and use of copyrights.</li> <li>9.4.5.DC.2: Provide attribution according to intellectual property rights guidelines using public domain or creative commons media.</li> <li>9.4.5.DC.3: Distinguish between digital images that can be reused freely and those that have copyright restrictions.</li> </ul>
Sending and receiving copies of media on the internet creates the opportunity for unauthorized use of data, such as personally owned video, photos, and music.	<ul style="list-style-type: none"> <li>9.4.5.DC.4: Model safe, legal, and ethical behavior when using online or offline technology (e.g., 8.1.5.NI.2).</li> </ul>
Digital identities must be managed in order to create a positive digital footprint.	<ul style="list-style-type: none"> <li>9.4.5.DC.5: Identify the characteristics of a positive and negative online identity and the lasting implications of online activity.</li> </ul>
Digital tools have positively and negatively changed the way people interact socially.	<ul style="list-style-type: none"> <li>9.4.5.DC.6: Compare and contrast how digital tools have changed social interactions (e.g., 8.1.5.IC.1).</li> </ul>

	<ul style="list-style-type: none"> <li>9.4.5.DC.7: Explain how posting and commenting in social spaces can have positive or negative consequences.</li> </ul>
Digital engagement can improve the planning and delivery of climate change actions.	<ul style="list-style-type: none"> <li>9.4.5.DC.8: Propose ways local and global communities can engage digitally to participate in and promote climate action (e.g., 6.3.5.GeoHE.1).</li> </ul>
Culture and geography can shape an individual's experiences and perspectives.	<ul style="list-style-type: none"> <li>9.4.5.GCA.1: Analyze how culture shapes individual and community perspectives and points of view (e.g., 1.1.5.C2a, RL.5.9, 6.1.5.HistoryCC.8).</li> </ul>
Digital tools and media resources provide access to vast stores of information, but the information can be biased or inaccurate.	<ul style="list-style-type: none"> <li>9.4.5.IML.1: Evaluate digital sources for accuracy, perspective, credibility and relevance.</li> </ul>
Digital tools can be used to modify and display data in various ways that can be organized to communicate ideas.	<ul style="list-style-type: none"> <li>9.4.5.IML.2: Create a visual representation to organize information about a problem or issue (e.g., 4.MD.B.4, 8.1.5.DA.3).</li> <li>9.4.5.IML.3: Represent the same data in multiple visual formats in order to tell a story about the data.</li> </ul>
Accurate and comprehensive information comes in a variety of platforms and formats and is the basis for effective decision-making.	<ul style="list-style-type: none"> <li>9.4.5.IML.4: Determine the impact of implicit and explicit media messages on individuals, groups, and society as a whole.</li> <li>9.4.5.IML.5: Distinguish how media are used by individuals, groups, and organizations for varying purposes. (e.g., 1.3A.5.R1a).</li> </ul>
Specific situations require the use of relevant sources of information.	<ul style="list-style-type: none"> <li>9.4.5.IML.6: Use appropriate sources of information from diverse sources, contexts, disciplines, and cultures to answer questions (e.g., RI.5.7, 6.1.5.HistoryCC.7, 7.1.NM.IPRET.5).</li> <li>9.4.5.IML.7: Evaluate the degree to which information meets a need including social emotional learning, academic, and social (e.g., 2.2.5. PF.5).</li> </ul>

<p>Different digital tools have different purposes.</p>	<ul style="list-style-type: none"> <li>● 9.4.5.TL.1: Compare the common uses of at least two different digital tools and identify the advantages and disadvantages of using each.</li> <li>● 9.4.5.TL.2: Sort and filter data in a spreadsheet to analyze findings.</li> <li>● 9.4.5.TL.3: Format a document using a word processing application to enhance text, change page formatting, and include appropriate images graphics, or symbols.</li> </ul>
<p>Collaborating digitally as a team can often develop a better artifact than an individual working alone.</p>	<ul style="list-style-type: none"> <li>● 9.4.5.TL.4: Compare and contrast artifacts produced individually to those developed collaboratively (e.g., 1.5.5.CR3a).</li> <li>● 9.4.5.TL.5: Collaborate digitally to produce an artifact (e.g., 1.2.5CR1d).</li> </ul>

**NJ: 2016 SLS: English Language Arts**

- RI.3.1. Ask and answer questions, and make relevant connections to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.
- RI.3.2. Determine the main idea of a text; recount the key details and explain how they support the main idea.
- RI.3.5. Use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information relevant to a given topic efficiently. Idea.
- W.3.2. Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
- W.3.4. With guidance and support from adults, produce writing in which the development and organization are appropriate to task and purpose.
- W.3.6. With guidance and support from adults, use technology to produce and publish writing as well as to interact and collaborate with others.
- W.3.10. Write routinely over extended time frames (time for research, reflection, metacognition/self-correction and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline- specific tasks, purposes, and audiences.
- SL.3.3. Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.
- SL.3.4. Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.
- L.3.6. Acquire and use accurately grade-appropriate conversational, general academic, and domain-specific words and phrases, including those that signal spatial and temporal relationships (e.g., After dinner that night we went looking for them).

- RI.4.1. Refer to details and examples in a text and make relevant connections when explaining what the text says explicitly and when drawing inferences from the text.
- RI.4.2. Determine the main idea of a text and explain how it is supported by key details; summarize the text.
- W.4.2. Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
- W.4.4. Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience.
- W.4.6. With some guidance and support from adults, use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of one page in a single sitting.
- RI.4.10. By the end of year, read and comprehend literary nonfiction (see Appendix A) at grade level text-complexity (see Appendix A) or above, with scaffolding as needed.
- W.4.7. Conduct short research projects that build knowledge through investigation of different aspects of a topic.
- W.4.10. Write routinely over extended time frames (time for research, reflection, metacognition/self-correction and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline- specific tasks, purposes, and audiences.
- SL.4.4. Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.
- L.4.6. Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including those that signal precise actions, emotions, or states of being (e.g., quizzed, whined, stammered) and that are basic to a particular topic (e.g., wildlife, conservation, and endangered when discussing animal preservation).
- RI.5.1. Quote accurately from a text and make relevant connections when explaining what the text says explicitly and when drawing inferences from the text.
- RI.5.4. Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 5 topic or subject area.
- RI.5.7. Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.
- W.5.2. Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
- W.5.4. Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience
- W.5.6. With some guidance and support from adults and peers, use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of two pages in a single sitting.

- W.5.7. Conduct short research projects that use several sources to build knowledge through investigation of different perspectives of a topic.
- W.5.10. Write routinely over extended time frames (time for research, reflection, metacognition/self-correction and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline- specific tasks, purposes, and audiences.
- SL.5.3. Summarize the points a speaker makes and explain how each claim is supported by reasons and evidence.
- SL.5.5. Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes.
- SL.5.6. Adapt speech to a variety of contexts and tasks, using formal English when appropriate to task and situation.
- L.5.6. Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including those that signal contrast, addition, and other logical relationships (e.g., however, although, nevertheless, similarly, moreover, in addition).

### Interdisciplinary Connections

#### Mathematics

- 3.MD.B.4. Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.
- 4.MD.A.1. Know relative sizes of measurement units within one system of units including km, m, cm. mm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two column table.
- 4.MD.C 6. Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.
- 4.G.A.1. Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.
- 5.MD.A.1. Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.
- 5.MD.C.4. Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and non-standard units.
- 5.MD.C.5.b. Apply the formulas  $V = l \times w \times h$  and  $V = B \times h$  for rectangular prisms to find volumes of right rectangular prisms with whole number edge lengths in the context of solving real world and mathematical problems.

	<ul style="list-style-type: none"> <li>• 5.G.A. 2. Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.</li> </ul>
Science	<ul style="list-style-type: none"> <li>• 3-5-ETS1-1 Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.</li> <li>• 3-5-ETS1-2 Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.</li> <li>• 3-5-ETS1-3 Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.</li> </ul>
Connection and Skills	<ul style="list-style-type: none"> <li>• Critical thinking &amp; Problem Solving</li> <li>• Digital Citizenship</li> <li>• Collaboration and Teamwork</li> <li>• Global and Cultural Awareness</li> <li>• Creativity and Innovation</li> <li>• Technology Literacy</li> <li>• Information and Media Literacy</li> </ul>

### Accommodations & Modifications

**Special Education Students, 504 students, English Language Learners, Students at-Risk Based on Students' Individual Needs**

Time/General	Processing	Comprehension
<ul style="list-style-type: none"> <li>• Allow extra time</li> <li>• Repeat and clarify directions</li> <li>• Provide breaks in between tasks</li> <li>• Have student verbalize directions</li> <li>• Provide timelines/due dates for reports and projects</li> </ul>	<ul style="list-style-type: none"> <li>• Provide extra response time</li> <li>• Have student verbalize steps</li> <li>• Repeat directions</li> <li>• Provide small group instruction</li> <li>• Include partner work</li> </ul>	<ul style="list-style-type: none"> <li>• Provide reading material on student's level</li> <li>• Have student underline important points</li> <li>• Assist student on how to use context clues to identify words/phrases</li> <li>• Ensure short manageable tasks</li> </ul>

<b>Tests/Quizzes/Grading</b>	<b>Behavior/Attention</b>	<b>Organization</b>
<ul style="list-style-type: none"> <li>• Provide extended time</li> <li>• Provide study guides</li> <li>• Limit number of responses</li> </ul>	<ul style="list-style-type: none"> <li>• Establish classroom rules</li> <li>• Write a contract with the student specifying expected behaviors</li> <li>• Provide preferential seating</li> <li>• Re-focus student as needed</li> <li>• Reinforce student for staying on task</li> </ul>	<ul style="list-style-type: none"> <li>• Monitor the student and provide reinforcement of directions</li> <li>• Verify the accurateness of homework assignments</li> <li>• Display a written agenda</li> </ul>

**ELL, Enrichment, Gifted & Talented Strategies**

Accommodations Based on Students' Individual Needs

ELL Strategies

- Provide explicit, systematic instruction in vocabulary.
- Ensure that ELLs have ample opportunities to talk with both adults and peers and provide ongoing feedback and encouragement.
- Expose ELLs to rich language input.
- Scaffolding for ELLs language learning.
- Encourage continued L1 language development.
- Alphabet knowledge
- Phonological awareness
- Print awareness
- Design instruction that focuses on all of the foundational literacy skills.
- Recognize that many literacy skills can transfer across languages.
- English literacy development by helping ELLs make the connection between what they know in their first language and what they need to know in English.
- Graphic organizers
- Modified texts
- Modified assessments

- Written/audio instruction
- Shorter paragraph/essay length
- Homogeneously grouped by level

#### Accommodations Based on Students' Individual Needs:

#### Enrichment Strategies

- Evaluate vocabulary
- Elevate Text Complexity
- Incorporate inquiry based assignments and projects
- Extend curriculum
- Balance individual, small group and whole group instruction
- Provide tiered/multi-level activities
- Include purposeful learning centers
- Provide open-ended activities and projects
- Offer opportunities for heterogeneous grouping to work with age and social peers as well as homogeneous grouping to provide time to work with individual peers
- Provide pupils with experiences outside the 'regular' curriculum
- Alter the pace the student uses to cover regular curriculum in order to explore topics of interest in greater depth/breadth within their own grade level
- Require a higher quality of work than the norm for the given age group
- Promote higher level of thinking and making connections.
- Focus on process learning skills such as brainstorming, decision making and social skills
- Use supplementary materials in addition to the normal range of resources.
- Encourage peer to peer mentoring
- Integrate cross-curricular lessons
- Incorporate real-world problem solving activities
- Facilitate student-led questioning and discussions



## Gifted & Talented Strategies

- More elaborate, complex, and in-depth study of major ideas, problems, and themes that integrate knowledge within and across systems of thought.
- Development and application of productive thinking skills to enable students to reconceptualize existing knowledge and/or generate new knowledge.
- Explore constantly changing knowledge and information and develop the attitude that knowledge is worth pursuing in an open world.
- Encourage exposure to, selection, and use of appropriate and specialized resources.
- Promote self-initiated and self-directed learning and growth.
- Provide for the development of self-understanding and the understanding of one's relationship to persons, societal institutions, nature, and culture.
- Flexible pacing
- Use of more advanced or complex concepts, abstractions, and materials
- Encourage students to move through content areas at their own pace. If they master a particular unit, they need to be provided with more advanced learning activities, not more of the same activity.
- Questions that require a higher level of response and/or open-ended questions that stimulate inquiry, active exploration, and discovery.
- Encourage students to think about subjects in more abstract and complex ways
- Activity selection based on student interests, that encourage self-directed learning
- Group interaction and simulations
- Guided self-management
- Encourage students to demonstrate what they have learned in a wide variety of forms that reflect both knowledge and the ability to manipulate ideas.
- Engage students in active problem-finding and problem-solving activities and research.
- Provide students opportunities for making connections within and across systems of knowledge by focusing on issues, themes, and ideas.

