

**Lower Township School District  
Cape May, NJ**

<b>Unit Overview</b>	
<b>Content Area: Computer Science and Design Thinking</b>	
<b>Unit Title: 8.1- Computer Science</b>	
<b>Grade Level: 1 and 2</b>	<b>Timeline: 24 weeks</b>
<b>Disciplinary Concepts:</b> <ul style="list-style-type: none"> <li>● Computing Systems</li> <li>● Networks and the Internet</li> <li>● Impacts of Computing</li> <li>● Data and Analysis</li> <li>● Algorithms and Programming</li> </ul>	
<b>Core Ideas/Performance Expectations</b>	
<b>Core Ideas</b>	<b>Performance Expectations</b>
Individuals use computing devices to perform a variety of tasks accurately and quickly. Computing devices interpret and follow the instructions they are given literally.	<ul style="list-style-type: none"> <li>● 8.1.2.CS.1: Select and operate computing devices that perform a variety of tasks accurately and quickly based on user needs and preferences.</li> </ul>
A computing system is composed of software and hardware.	<ul style="list-style-type: none"> <li>● 8.1.2.CS.2: Explain the functions of common software and hardware components of computing systems.</li> </ul>
Describing a problem is the first step toward finding a solution when computing systems do not work as expected.	<ul style="list-style-type: none"> <li>● 8.1.2.CS.3: Describe basic hardware and software problems using accurate terminology.</li> </ul>
Computer networks can be used to connect individuals to other individuals, places, information, and ideas. The Internet enables individuals to connect with others worldwide.	<ul style="list-style-type: none"> <li>● 8.1.2.NI.1: Model and describe how individuals use computers to connect to other individuals, places, information, and ideas through a network.</li> <li>● 8.1.2.NI.2: Describe how the Internet enables individuals to connect with others worldwide.</li> </ul>
Connecting devices to a network or the Internet provides great benefits, but care must be taken to use authentication measures, such as strong passwords, to protect devices and information from unauthorized access.	<ul style="list-style-type: none"> <li>● 8.1.2.NI.3: Create a password that secures access to a device. Explain why it is important to create unique passwords that are not shared with others.</li> <li>● 8.1.2.NI.4: Explain why access to devices need to be secured.</li> </ul>

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<p>Computing technology has positively and negatively changed the way individuals live and work (e.g., entertainment, communication, productivity tools).</p>	<ul style="list-style-type: none"> <li>● 8.1.2.IC.1: Compare how individuals live and work before and after the implementation of new computing technology.</li> </ul>
<p>Individuals collect, use, and display data about individuals and the world around them.</p>	<ul style="list-style-type: none"> <li>● 8.1.2.DA.1: Collect and present data, including climate change data, in various visual formats.</li> </ul>
<p>Computers store data that can be retrieved later. Data can be copied, stored in multiple locations, and retrieved.</p>	<ul style="list-style-type: none"> <li>● 8.1.2.DA.2: Store, copy, search, retrieve, modify, and delete data using a computing device.</li> </ul>
<p>Data can be used to make predictions about the world.</p>	<ul style="list-style-type: none"> <li>● 8.1.2.DA.3: Identify and describe patterns in data visualizations.</li> <li>● 8.1.2.DA.4: Make predictions based on data using charts or graphs.</li> </ul>
<p>Individuals develop and follow directions as part of daily life.</p> <p>A sequence of steps can be expressed as an algorithm that a computer can process.</p>	<ul style="list-style-type: none"> <li>● 8.1.2.AP.1: Model daily processes by creating and following algorithms to complete tasks.</li> </ul>
<p>Real world information can be stored and manipulated in programs as data (e.g., numbers, words, colors, images).</p>	<ul style="list-style-type: none"> <li>● 8.1.2.AP.2: Model the way programs store and manipulate data by using numbers or other symbols to represent information</li> </ul>
<ul style="list-style-type: none"> <li>• Computers follow precise sequences of steps that automate tasks.</li> </ul>	<ul style="list-style-type: none"> <li>● 8.1.2.AP.3: Create programs with sequences and simple loops to accomplish tasks.</li> </ul>
<p>Complex tasks can be broken down into simpler instructions, some of which can be broken down even further.</p>	<ul style="list-style-type: none"> <li>● 8.1.2.AP.4: Break down a task into a sequence of steps</li> </ul>
<p>People work together to develop programs for a purpose, such as expressing ideas or addressing problems.</p> <p>The development of a program involves identifying a sequence of events, goals, and expected</p>	<ul style="list-style-type: none"> <li>● 8.1.2.AP.5: Describe a program's sequence of events, goals, and expected outcomes.</li> <li>● 8.1.2.AP.6: Debug errors in an algorithm or program that includes sequences and simple loops</li> </ul>

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outcomes, and addressing errors (when necessary).	

<b>Interdisciplinary Connections with art</b>
<p>1.2.2.Cr1a: Discover, share and express ideas for media artworks through experimentation, sketching and modeling.</p> <ul style="list-style-type: none"> <li>● 1.2.2.Cr1b: Brainstorm and improvise multiple ideas using a variety of tools, methods and materials.</li> <li>● 1.2.2.Cr1c: Explore form ideas for media art production with support.</li> <li>● 1.2.2.Cr1d: Connect and apply ideas for media art production.</li> <li>● 1.2.2.Cr1e: Choose ideas to create plans for media art production.</li> </ul>
<ul style="list-style-type: none"> <li>● 1.2.2.Cr2a: Explore form ideas for media art production with support.</li> <li>● 1.2.2.Cr2b: Connect and apply ideas for media art production.</li> <li>● 1.2.2.Cr2c: Choose ideas to create plans for media art production.</li> </ul>
<ul style="list-style-type: none"> <li>● 1.2.2.Cr3a: Create and assemble content for media arts productions, identifying basic principles (e.g., pattern, positioning, attention, and repetition.)</li> <li>● 1.2.2.Cr3b: Identify and describe the effects of altering, refining and completing media artworks.</li> </ul>
<p>1.2.2.Pr4a: With guidance and moving towards independence, combine art forms and media content into media artworks such as an illustrated story or narrated animation.</p> <ul style="list-style-type: none"> <li>● 1.2.2.Pr4b: Practice combining varied academic, arts and media content to form media artworks.</li> </ul>
<ul style="list-style-type: none"> <li>● 1.2.2.Pr5a: Identify and enact basic skills such as handling tools, making choices, and soft skills for planning and creating media artworks.</li> <li>● 1.2.2.Pr5b: Identify, describe and demonstrate basic creative skills such as trial-and-error and playful practice, within media arts production.</li> <li>● 1.2.2.Pr5c: Discover, experiment with and demonstrate creative skills for media artworks.</li> </ul>
<p>1.2.2.Pr6a: With guidance and moving towards independence, identify, share and discuss reactions to and experiences of the presentation of media artworks.</p>
<p>1.2.2.Re7a: Identify, share and describe the components and messages in media artwork.</p> <ul style="list-style-type: none"> <li>● 1.2.2.Re7b: Identify, share and describe a variety of media artworks created from different experiences in response to global issues including climate change.</li> </ul>
<p>1.2.2.Re8a: Share observations, identify the meanings, and determine the purposes of media artworks, considering personal and cultural context.</p>
<p>1.2.2.Re9a: Share appealing qualities, identify the effective parts, and discuss improvements for media artworks, considering their context.</p>

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- 1.2.2.Cn10a: Use personal experiences, interests, information and models in creating media artworks.
- 1.2.2.Cn10b: Share and discuss experiences of media artworks, describing their meaning and purpose.

- 1.2.2.Cn11a: Discuss and demonstrate how media artworks, messages environments and ideas relate to everyday and cultural life, such as daily activities, popular media, connections with family and friends.
- 1.2.2.Cn11b: Interact appropriately with media arts tools and environments considering safety, rules and fairness.

<b>Accommodations and Modifications</b>	
Special Education	Students level changed when working in code.org., Students working in groups, Extra time given when needed, Jobs given when working in the group, Priority seating,
English Language Learners	Vocabulary words explained with more than one definition, Students working in groups, Extra time given when needed, Jobs given when working in the group,
Students At-Risk of School Failure	Students level changed when working in code.org., Students working in groups, Extra time given when needed, Jobs given when working in the group,
Advanced Skills	Students level changed when working in code.org., Students working in groups, Jobs given when working in the group, alternative projects
Students with 504 Plans	Vocabulary words explained with more than one definition, Directions given in short steps, Priority seating, Students working in groups, Extra time given when needed, Jobs given when working in the group,

<b>Assessments</b>	
Formative	Students come to first grade with no formal computer class. When students start they can be moved within the program to higher levels. Second grade students are based on their performance in first grade.
Summative	Participation in discussion, score on rubrics, students' self-assessment and progression through programs
Benchmark	score on rubrics, progression through programs
Alternative	Alternative projects

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<b>Interdisciplinary Connections</b>
Math, reading, language, science

<b>Integration of 21st Century Skills- NJSL 9</b>	
There are ways to keep the things we value safely at home and other places.	<ul style="list-style-type: none"> <li>● 9.1.2.RM.1: Describe how valuable items might be damaged or lost and ways to protect them.</li> </ul>
Different types of jobs require different knowledge and skills.	<ul style="list-style-type: none"> <li>● 9.1.2.CAP.1: Make a list of different types of jobs and describe the skills associated with each job.</li> </ul>
Income is received from work in different ways including regular payments, tips, commissions, and benefits.	<ul style="list-style-type: none"> <li>● 9.1.2.CAP.2: Explain why employers are willing to pay individuals to work.</li> </ul>
Critical thinkers must first identify a problem then develop a plan to address it in order to effectively solve a problem.	<ul style="list-style-type: none"> <li>● 9.4.2.CT.1: Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2).</li> <li>● 9.4.2.CT.2: Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3).</li> <li>● 9.4.2.CT.3: Use a variety of types of thinking to solve problems (e.g., inductive, deductive).</li> </ul>
Digital tools and media resources provide access to vast stores of information that can be searched.	<ul style="list-style-type: none"> <li>● 9.4.2.IML.1: Identify a simple search term to find information in a search engine or digital resource.</li> </ul>
Digital tools can be used to display data in various ways.	<ul style="list-style-type: none"> <li>● 9.4.2.IML.2: Represent data in a visual format to tell a story about the data (e.g., 2.MD.D.10).</li> </ul>
A variety of diverse sources, contexts, disciplines and cultures provide valuable and necessary information that can be used for different purposes. Information is shared or conveyed in a variety of formats and sources.	<ul style="list-style-type: none"> <li>● 9.4.2.IML.3: Use a variety of sources including multimedia sources to find information about topics such as climate change, with guidance and support from adults (e.g., 6.3.2.GeoGI.2, 6.1.2.HistorySE.3, W.2.6, 1-LSI-2).</li> </ul>
Information is shared or conveyed in a variety of formats and sources.	<ul style="list-style-type: none"> <li>● 9.4.2.IML.4: Compare and contrast the way information is shared in a variety of contexts (e.g., social,</li> </ul>

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	academic, athletic) (e.g., 2.2.2.MSC.5, RL.2.9).
Digital tools have a purpose.	<ul style="list-style-type: none"> <li>● 9.4.2.TL.1: Identify the basic features of a digital tool and explain the purpose of the tool (e.g., 8.2.2.ED.1).</li> <li>● 9.4.2.TL.2: Create a document using a word processing application.</li> <li>● 9.4.2.TL.3: Enter information into a spreadsheet and sort the information.</li> <li>● 9.4.2.TL.4: Navigate a virtual space to build context and describe the visual content.</li> <li>● 9.4.2.TL.5: Describe the difference between real and virtual experiences.</li> <li>● 9.4.2.TL.6: Illustrate and communicate ideas and stories using multiple digital tools (e.g., SL.2.5.).</li> </ul>

**Career Readiness, Life Literacies, and Key Skills Practices**

Career Readiness, Life Literacies, and Key Skills Practices describe the habits of the mind that all educators in all content areas should seek to develop in their students. They are practices that have been linked to increase college, career, and life success. These practices should be taught and reinforced in all content areas with increasingly higher levels of complexity and expectation as a student advances through a program of study.

1. Act as a responsible and contributing community member and employee.
2. Attend to financial well-being.
3. Consider the environmental, social and economic impacts of decisions.
4. Demonstrate creativity and innovation.
5. Utilize critical thinking to make sense of problems and persevere in solving them.
6. Model integrity, ethical leadership and effective management.
7. Plan education and career paths aligned to personal goals.
8. Use technology to enhance productivity, increase collaboration and communicate effectively.
9. Work productively in teams while using cultural/global competence.

**Integration of Technology Resources**

Whiteboard and projector, Tablets, Chromebooks, Various programmable robots and accessories, Internet connection, <https://code.org>, <https://codespark.com>, <https://www.kodable.com>, <https://www.teachyourmonstertoread.com>, <https://www.abcya.com>, Google Suite, <http://Youtube.com>, Google Suite, <https://makecode.microbit.org/>

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<b>Materials</b>	
Various programmable robots and accessories	How to Code a Sandcastle
Chromebooks	Whiteboard and projector
Tablets	micro:bits

<b>Instructional Activities</b>
<ul style="list-style-type: none"><li>● Kodable</li><li>● Program the teacher</li><li>● Code.org,</li><li>● Program various robots</li><li>● Code Spark</li><li>● Scratch Jr</li><li>● Unplugged coding</li><li>● Program a micro:bit to count steps</li><li>● Binary bracelets- 1st grade</li></ul>