

05-Coding

Content Area: **Library/Media**
Course(s):
Time Period: **Marking Period**
Length: **5 weeks**
Status: **Published**

General Overview, Course Description or Course Philosophy

Students in grades 3-5 will develop information literacy skills including appreciation for diverse literature, information/nonfiction texts, and digital literacy skills. Students learn how to use the library, its resources, and to develop the aptitude necessary to conduct research. They develop and build competencies in using print and digital resources empowering them to become life-long readers, critical thinkers, and effective users of ideas and information. The Stonybrook Library Media Center provides the opportunity for students to make informed decisions that prepare them to engage as active citizens in a dynamic global society and to successfully meet the challenges and opportunities of the 21st century global workplace.

OBJECTIVES, ESSENTIAL QUESTIONS, ENDURING UNDERSTANDINGS

Enduring Understandings:

- Coding is the language of computers
- There are many forms of coding, such as python, html, java, etc.
- An algorithm is a list of steps to complete a task
- A program is an algorithm that has been coded into something that can be run by a machine

Essential Questions:

- What is an algorithm?
- What is a program?
- What is a loop?
- What is a conditional?
- What is a variable?

CONTENT AREA STANDARDS

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| TECH.K-12.1.5.d | understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions. |
| CS.3-5.8.1.5.AP.1 | Compare and refine multiple algorithms for the same task and determine which is the most appropriate. |
| CS.3-5.8.1.5.AP.2 | Create programs that use clearly named variables to store and modify data. |
| CS.3-5.8.1.5.AP.3 | Create programs that include sequences, events, loops, and conditionals. |
| CS.3-5.8.1.5.AP.4 | Break down problems into smaller, manageable sub-problems to facilitate program |

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| | development. |
| CS.3-5.8.1.5.AP.5 | Modify, remix, or incorporate pieces of existing programs into one's own work to add additional features or create a new program. |
| CS.3-5.8.1.5.AP.6 | Develop programs using an iterative process, implement the program design, and test the program to ensure it works as intended. |
| CS.3-5.8.2.5.ED.3 | Follow step by step directions to assemble a product or solve a problem, using appropriate tools to accomplish the task. |
| CS.3-5.8.2.5.NT.1 | Troubleshoot a product that has stopped working and brainstorm ideas to correct the problem. |
| TECH.9.4.5.CT.3 | <p>Describe how digital tools and technology may be used to solve problems.</p> <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> <p>Collaboration with individuals with diverse perspectives can result in new ways of thinking and/or innovative solutions.</p> <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> <p>Different algorithms can achieve the same result. Some algorithms are more appropriate for a specific use than others.</p> <p>The development and modification of computing technology is driven by individual's needs and wants and can affect individuals differently.</p> <p>Individuals develop programs using an iterative process involving design, implementation, testing, and review.</p> <p>Programming languages provide variables, which are used to store and modify data.</p> <p>Computing devices may be connected to other devices to form a system as a way to extend their capabilities.</p> <p>Shared features allow for common troubleshooting strategies that can be effective for many systems.</p> <p>Software and hardware work together as a system to accomplish tasks (e.g., sending, receiving, processing, and storing units of information).</p> <p>A variety of control structures are used to change the flow of program execution (e.g., sequences, events, loops, conditionals).</p> |

RELATED STANDARDS (Technology, 21st Century Life & Careers, ELA Companion Standards are Required)

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| LA.K-12.NJSLSA.R1 | Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. |
| LA.K-12.NJSLSA.R2 | Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas. |
| LA.K-12.NJSLSA.R4 | Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone. |
| LA.K-12.NJSLSA.W6 | Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others. |

STUDENT LEARNING TARGETS

Refer to the 'Declarative Knowledge' and 'Procedural Knowledge' sections.

Declarative Knowledge

Students will understand that:

- Software and hardware work together to accomplish tasks
- Technology can help make the world a better place
- Individuals develop programs for technology. These programs must be developed, tested and reviewed.
- Different algorithms can achieve the same result.
- Tools such as loops and conditionals can be used to short-cut the program writing

Procedural Knowledge

Students will be able to:

- create simple programs
- debug/modify existing programs
- create a loop
- create a conditional
- identify/list an algorithm
- interpret existing program (predict program's outcome)
- describe how digital tools and technology solve problems

EVIDENCE OF LEARNING

Refer to the 'Formative Assessments' and 'Summative Assessments' sections.

Formative Assessments

exit tickets

participation and observation

peer discussions

Summative Assessments

quizzes

posters

presentations

Code.org assessments

RESOURCES (Instructional, Supplemental, Intervention Materials)

[Code.org](https://code.org)

Follow the Algorithm [slide show](#)

Graph Paper Coding [slide show](#)

Move it, Move it [slide show](#)

[Lightbot.com](https://lightbot.com)

INTERDISCIPLINARY CONNECTIONS

English/Language Arts:

- Language Acquisition
- Grace Hopper: Queen of computer code by Laurie Wallmark
- Ada Bryon Lovelace and the thinking machine by Laurie Wallmark

Technology/Multimedia:

- Audio/Visual media analysis
- Media Literacy
- Educational tech applications

Visual Performing Arts:

- Electronic media

Career Readiness:

- Employ valid and reliable research strategies
- Use technology to enhance productivity
- Utilize critical thinking to make sense of problems and persevere in solving them.
- Applicable career options are discussed as they arise throughout the course; career options include but are not limited to business, journalism, education, psychology, social work, politics, research and art.

Science:

- Engineering

ACCOMMODATIONS & MODIFICATIONS FOR SUBGROUPS

See link to Accommodations & Modifications document in course folder.

Other examples include:

- written directions
- wait time
- additional time for tasks
- verbal responses
- illustrations

