

## General Brown Central School District Curriculum Map

Course Title: Computer Science I	Prepared By: D. Newvine
Time Frame: 3 Weeks	Unit/Theme Networks & Systems Design: Hardware and Software
<p>Essential Questions:</p> <p>What are the individual parts of a computer?</p> <p>How does a computer take in, process, and put out information?</p> <p>What is an operating system?</p> <p>What is binary?</p> <p>What is Boolean Logic?</p>	
<p>NYS Standards:</p> <p>9-12.NSD.1 Design a solution to a problem that utilizes embedded systems.</p> <p>9-12.NSD.2 Explain the levels of interaction existing between the application software, system software, and hardware of a computing system.</p> <p>9-12.NSD.3 Develop and communicate multistep troubleshooting strategies others can use to identify and fix problems with computing devices and their components.</p>	<p>Vocabulary:</p> <p>Abstraction</p> <p>Application</p> <p>ASCII</p> <p>Binary</p> <p>BIOS</p> <p>Bit</p> <p>Boolean Logic</p> <p>Byte</p> <p>Central Processing Unit (CPU)</p> <p>Computer</p> <p>Hardware</p> <p>Software</p>
<p>Student Objectives (The student will...):</p> <p>TSW be able to identify all the different pieces of a computer.</p> <p>TSW understand binary language and how it is used by computers.</p> <p>TSW be able to convert using hexadecimal and binary languages.</p> <p>TSW be able to understand boolean logic gates.</p>	
<p>Assessment:</p> <p>Worksheets, Class Discussions, Homework, Quiz #1</p>	
<p>Recommended Texts:</p> <p>Computer Science Principles: The Foundational Concepts of Computer Science</p>	<p>Resources:</p> <p>Google Slides: Notes</p> <p>iPads</p>

## General Brown Central School District Curriculum Map

Course Title: Computer Science I	Prepared By: D. Newvine
Time Frame: 2 Weeks	Unit/Theme Networks and System Design: Networks and the Internet
<p>Essential Questions:</p> <p>What is the Internet?</p> <p>How are different networks able to communicate with each other?</p> <p>How can new technologies impact those networks in terms of security or reliability?</p>	
<p>NYS Standards:</p> <p>9-12.NSD.4 Describe the design characteristics that allow data and information to be moved, stored and referenced over the Internet.</p> <p>9-12.NSD.5 Describe how emerging technologies are impacting networks and how they are used.</p>	<p>Vocabulary:</p> <p>Internet Hexadecimal Motherboard Random Access Memory Power Supply Operating System (OS)</p>
<p>Student Objectives (The student will...):</p> <p>TSW understand how the internet was formed and what its purpose is in today's society.</p> <p>TSW identify different networks and their ability to transfer information.</p> <p>TSW understand how networks are able to secure information through encryption means.</p>	
<p>Assessment:</p> <p>Worksheets, Class Discussions, Homework, Test #1</p>	
<p>Recommended Texts:</p> <p>Computer Science Principles: The Foundational Concepts of Computer Science</p>	<p>Resources:</p> <p>Google Slides: Notes iPads</p>

## General Brown Central School District Curriculum Map

Course Title: Computer Science I	Prepared By: D. Newvine
Time Frame: 1 Week	Unit/Theme Computational Thinking: Modeling and Simulation
<p>Essential Questions:</p> <p>How can we better understand a system?</p> <p>How can we produce data that simulates real-world situations?</p> <p>What types of predictions can be made from models?</p>	
<p>NYS Standards:</p> <p>9-12.CT.1 Create a simple digital model that makes predictions of outcomes.</p>	<p>Vocabulary:</p> <p>Binary Tree Bit Rate Dictionary</p>
<p>Student Objectives (The student will...):</p> <p>TSW build a model that can be used to study different phenomena.</p> <p>TSW analyse data from models</p>	
<p>Assessment:</p> <p>Project #1</p>	
<p>Recommended Texts:</p> <p>Computer Science Principles: The Foundational Concepts of Computer Science</p>	<p>Resources:</p> <p>Google Slides: Notes iPads</p>

## General Brown Central School District Curriculum Map

Course Title: Computer Science I	Prepared By: D. Newvine
Time Frame: 2 Weeks	Unit/Theme Computational Thinking: Data Analysis and Visualization
<p>Essential Questions:</p> <p>How can we better analyse data?</p> <p>How can data affect downloading speeds?</p> <p>How can we compress data?</p> <p>What are dictionaries?</p> <p>How can we construct relationships from data sets?</p> <p>How can we showcase data for the general public to understand?</p>	
<p>NYS Standards:</p> <p>9-12.CT.2 Collect data from multiple sources for use in a computational artifact.</p> <p>9-12.CT.3 Refine and visualize a large data set using an appropriate tool in order to persuade an audience.</p>	<p>Vocabulary:</p> <p>Google Sheets</p> <p>Excell</p> <p>Codec</p> <p>Run-Length Encoding</p> <p>Sample Rate</p> <p>Metadata</p> <p>Uncompressed</p> <p>Variable Length Code</p>
<p>Student Objectives (The student will...):</p> <p>TSW be able to use different tools to analyze data.</p> <p>TSW be able to make sound conclusions/relationships from the data.</p> <p>TSW understand patterns that are present in data sets. .</p> <p>TSW understand differences between a string, integer, or float value.</p>	
<p>Assessment:</p> <p>Project #1</p>	
<p>Recommended Texts:</p> <p>Computer Science Principles: The Foundational Concepts of Computer Science</p>	<p>Resources:</p> <p>iPads</p> <p>Databases</p> <p>Python Programming</p>

## General Brown Central School District Curriculum Map

Course Title: Computer Science I	Prepared By: D. Newvine
Time Frame: 2 Weeks	Unit/Theme Computational Thinking: Abstraction and Decomposition
<p>Essential Questions:</p> <p>When creating a program, what is the overall goal? What do we want the program to do?</p> <p>What are the individual pieces of information that are necessary for the program to process?</p> <p>How does this program similar to other programs that have been made/used in society?</p>	
<p>NYS Standards:</p> <p>9-12.CT.4 Decompose a program into parts in order to understand how the program should be organized and written.</p> <p>9-12.CT.5 Create or remix one or more abstraction(s) utilizing multiple existing abstractions</p>	<p>Vocabulary:</p> <p>Big Data Consistency Fault Tolerance Keys Abstraction HTTP Java Script CSS Python</p>
<p>Student Objectives (The student will...):</p> <p>TSW determine what the overall goal of a program is.</p> <p>TSW create a list of necessary features for a program to run efficiently.</p> <p>TSW compare other programs to see patterns or better methods for their program.</p>	
<p>Assessment:</p> <p>Notes, Homework, Worksheets, and Python Programing Tasks</p>	
<p>Recommended Texts:</p> <p>Computer Science Principles: The Foundational Concepts of Computer Science</p>	<p>Resources:</p> <p>Google Slides: Notes iPads Python Programming</p>

## General Brown Central School District Curriculum Map

Course Title: Computer Science I	Prepared By: D. Newvine
Time Frame: 2 Weeks	Unit/Theme Computational Thinking: Algorithms
<p>Essential Questions:</p> <p>What is an algorithm?</p> <p>How can an algorithm become more efficient?</p> <p>What are the necessary pieces of information when creating an algorithm?</p> <p>What are modules?</p>	
<p>NYS Standards:</p> <p>9-12.CT.6 Demonstrate how at least two classic algorithms work.</p> <p>9-12.CT.7 Analyze trade-offs related to two or more algorithms for completing the same task.</p> <p>9-12.CT.8 Identify a relevant module, library, or API and use it in a computer program to add a feature or functionality.</p>	<p>Vocabulary:</p> <p>Algorithm</p> <p>Modules</p> <p>Debugging</p> <p>Functions</p> <p>Import</p> <p>Syntax</p>
<p>Student Objectives (The student will...):</p> <p>TSW understand how to create successful algorithms for different programs.</p> <p>TSW understand the use of modules in programming languages.</p> <p>TSW implement different algorithms to perform different tasks.</p>	
<p>Assessment:</p> <p>Notes, Homework, Worksheets, Python Programming Tasks, and Quiz #2</p>	
<p>Recommended Texts:</p> <p>Computer Science Principles: The Foundational Concepts of Computer Science</p>	<p>Resources:</p> <p>Google Slides: Notes</p> <p>iPads</p> <p>Python Programming</p>

## General Brown Central School District Curriculum Map

Course Title: Computer Science I	Prepared By: D. Newvine
Time Frame: 2 Weeks	Unit/Theme Computational Thinking: Programming
<p>Essential Questions:</p> <p>What are variables?</p> <p>What is the format of a program?</p> <p>How can functions make a program more efficient?</p> <p>How can we give a user information from a program?</p>	
<p>NYS Standards:</p> <p>9-12.CT.9 Design or remix a program that utilizes data structures to store and modify a set of related data.</p> <p>9-12.CT.10 Develop a program that effectively uses control structures in order to create a computer program for practical intent, personal expression, or to address a societal issue.</p>	<p>Vocabulary:</p> <p>Strings</p> <p>Integers</p> <p>Floats</p> <p>Object-Oriented Scripts</p> <p>Variables</p> <p>Assignment Operator</p> <p>Calls</p>
<p>Student Objectives (The student will...):</p> <p>TSW make programs to solve practical problems.</p> <p>TSW understand the use of variables and and inputs in a program.</p> <p>TSW be able to output information to users using print statements.</p>	
<p>Assessment:</p> <p>Homework, Notes, Worksheets, Practice Programs.</p> <p>Test #2</p>	
<p>Recommended Texts:</p> <p>Computer Science Principles: The Foundational Concepts of Computer Science</p>	<p>Resources:</p> <p>Google Slides: Notes</p> <p>iPads</p> <p>Python Programming</p>

## General Brown Central School District Curriculum Map

Course Title: Computer Science I	Prepared By: D. Newvine
Time Frame: 1 Week	Unit/Theme Computational Thinking: Programming
<p>Essential Questions:</p> <p>What are bugs?</p> <p>How can we identify bugs in a program?</p> <p>What kinds of programs would a user want?</p> <p>How can we collaborate when developing a program?</p>	
<p>NYS Standards:</p> <p>9-12.CT.11 Systematically test and refine programs using a range of test cases, based on anticipating common errors and user behavior.</p> <p>9-12.CT.12 Collaboratively design and develop a program or computational artifact for a specific audience and create documentation outlining implementation features to inform collaborators and users</p>	<p>Vocabulary:</p> <p>Bugs Console Data Print</p>
<p>Student Objectives (The student will...):</p> <p>TSW understand what bugs are and be able to effectively fix them in programs.</p> <p>TSW determine programs that users demand, therefore, developing them for their use.</p> <p>TSW work together to build, implement, and fix a program for users to use.</p>	
<p>Assessment:</p> <p>Project #2</p>	
<p>Recommended Texts:</p> <p>Computer Science Principles: The Foundational Concepts of Computer Science</p>	<p>Resources:</p> <p>Google Slides: Notes iPads Python Programming</p>



## General Brown Central School District Curriculum Map

Course Title: Computer Science I	Prepared By: D. Newvine
Time Frame: 3 Weeks	Unit/Theme Computational Thinking: Programming
<p>Essential Questions:</p> <p>What are loops?</p> <p>What are if statements?</p> <p>What does random code do?</p> <p>What are lists?</p>	
<p>NYS Standards:</p> <p>9-12.CT.11 Systematically test and refine programs using a range of test cases, based on anticipating common errors and user behavior.</p> <p>9-12.CT.12 Collaboratively design and develop a program or computational artifact for a specific audience and create documentation outlining implementation features to inform collaborators and users</p>	<p>Vocabulary:</p> <p>While Loops</p> <p>For Loops</p> <p>If Statements</p> <p>Else Statements</p> <p>True</p> <p>False</p> <p>Discionaries</p> <p>Lists</p>
<p>Student Objectives (The student will...):</p> <p>TSW understand different types of loops and use them for specific types of programs.</p> <p>TSW use if and else statements in order to meet specific conditions in their programs.</p> <p>TSW use random code to create programs that are based on chance or have multiple outputs.</p>	
<p>Assessment:</p> <p>Notes, Homework, Worksheets, Practice Programs.</p> <p>CSI Final Exam</p>	
<p>Recommended Texts:</p> <p>Computer Science Principles: The Foundational Concepts of Computer Science</p>	<p>Resources:</p> <p>Google Slides: Notes</p> <p>iPads</p>

## General Brown Central School District Curriculum Map

Course Title: Computer Science II	Prepared By: D. Newvine
Time Frame: 1 Week	Unit/Theme Cybersecurity: Risks
<p>Essential Questions:</p> <p>What is a hacker?</p> <p>How can a hacker break into someone's computer / iPhone ?</p> <p>What devices should be protected?</p>	
<p>NYS Standards:</p> <p>9-12.CY.1 Determine the types of personal and organizational information and digital resources that an individual may have access to that needs to be protected</p>	<p>Vocabulary:</p> <p>Digital Footprint Cloud Hacker Wifi</p>
<p>Student Objectives (The student will...):</p> <p>TSW understand what hackers want and how they can get information from someone's device.</p> <p>TSW determine their own viewpoint of what their digital footprint is.</p>	
<p>Assessment:</p> <p>Notes, Homework, Class Discussions, Worksheets</p>	
<p>Recommended Texts:</p> <p>Computer Science Principles: The Foundational Concepts of Computer Science</p>	<p>Resources:</p> <p>Google Slides: Notes iPads</p>

## General Brown Central School District Curriculum Map

Course Title: Computer Science II	Prepared By: D. Newvine
Time Frame: 2 Weeks	Unit/Theme Cybersecurity: Safeguards
<p>Essential Questions:</p> <p>What are some methods that can be used to protect our information?</p> <p>What is encryption?</p> <p>What are the positive / negative effects of using security recommendations?</p>	
<p>NYS Standards:</p> <p>9-12.CY.2 Describe physical, digital, and behavioral safeguards that can be employed to protect the confidentiality, integrity, and accessibility of information</p> <p>9-12.CY.3 Explain specific trade-offs when selecting and implementing security recommendations.</p> <p>9-12.CY.4 Evaluate applications of cryptographic methods.</p>	<p>Vocabulary:</p> <p>Copyright Digital Divide Blockers Encryption Keys</p>
<p>Student Objectives (The student will...):</p> <p>TSW learn about different encryption methods that can protect people's personal information.</p> <p>TSW understand which methods are more efficient than others in protecting information.</p> <p>TSW determine their own digital footprint in society.</p>	
<p>Assessment:</p> <p>Notes, Quiz #3, Homework, Worksheets, Class Discussions</p>	
<p>Recommended Texts:</p> <p>Computer Science Principles: The Foundational Concepts of Computer Science</p>	<p>Resources:</p> <p>Google Slides: Notes iPads</p>

## General Brown Central School District Curriculum Map

Course Title: Computer Science II	Prepared By: D. Newvine
Time Frame: 1 Week	Unit/Theme Cybersecurity: Response
Essential Questions:  How can we respond when someone steals our information?  What insurance companies offer cyber security protection?  What are the negative consequences if someone steals valuable information? (Identity Theft)	
NYS Standards:  9-12.CY.5 Recommend multiple potential actions to take in response to various types of digital security breaches.	Vocabulary:  Ethics Privacy Security
Student Objectives (The student will...): TSW research different companies and how they are able to settle issues of identity theft. TSW determine the importance of having cyber security protection.	
Assessment: Notes, Class Discussions, Research Project #2	
Recommended Texts: Computer Science Principles: The Foundational Concepts of Computer Science	Resources: Google Slides: Notes iPads

## General Brown Central School District Curriculum Map

Course Title: Computer Science II	Prepared By: D. Newvine
Time Frame: 3 Weeks	Unit/Theme Impacts of Computing: Society
<p>Essential Questions:</p> <p>How has technology positively affected society?</p> <p>How has technology negatively affected society?</p> <p>What types of regulations has the U.S. government put on technology that directly affects citizens?</p>	
<p>NYS Standards:</p> <p>9-12.IC.1 Evaluate the impact of computing technologies on equity, access, and influence in a global society.</p> <p>9-12.IC.2 Debate laws and regulations that impact the development and use of computing technologies and digital information.</p>	<p>Vocabulary:</p> <p>HTTP Laws</p> <p>Data Protection Laws</p> <p>EULA</p> <p>Ethical Computing</p>
<p>Student Objectives (The student will...):</p> <p>TSW research different effects of technology in society.</p> <p>TSW determine their own viewpoints of technology in society.</p> <p>TSW debate with peers about the effect of technology in society.</p>	
<p>Assessment:</p> <p>Homework, Notes, Worksheets, Class Discussions</p> <p>Quiz #1</p> <p>Debate Project #1</p>	
<p>Recommended Texts:</p> <p>Computer Science Principles: The Foundational Concepts of Computer Science</p>	<p>Resources:</p> <p>Google Slides: Notes</p> <p>iPads</p>

## General Brown Central School District Curriculum Map

Course Title: Computer Science II	Prepared By: D. Newvine
Time Frame: 3 Weeks	Unit/Theme Impacts of Computing: Ethics & Accessibility
<p>Essential Questions:</p> <p>What is encryption?</p> <p>What is the CISA?</p> <p>What kinds of data are not protected?</p> <p>What are the risks associated with social media?</p>	
<p>NYS Standards:</p> <p>9-12.IC.3 Debate issues of ethics related to real world computing technologies.</p> <p>9-12.IC.4 Assess personal and societal trade-offs related to computing technologies and privacy.</p> <p>9-12.IC.5 Describe ways that complex computer systems can be designed for inclusivity and to mitigate unintended consequences.</p> <p>9-12.IC.6 Create accessible computational artifacts that meet standard compliance requirements or otherwise meet the needs of users with disabilities.</p>	<p>Vocabulary:</p> <p>Routers</p> <p>Network Systems</p> <p>Servers</p> <p>VPN</p> <p>Trademarks</p>
<p>Student Objectives (The student will...):</p> <p>TSW research different encryption methods.</p> <p>TSW determine their own viewpoint of how protected our online information is in today's society.</p> <p>TSW debate matters that pertain to the CISA.</p>	
<p>Assessment:</p> <p>Homework, Worksheets, Class Discussions, Notes, Quiz #2</p> <p>Debate Project #2</p> <p>Test #1</p>	
<p>Recommended Texts:</p> <p>Computer Science Principles: The Foundational Concepts of Computer Science</p>	<p>Resources:</p> <p>Google Slides: Notes</p> <p>iPads</p>

## General Brown Central School District Curriculum Map

Course Title: Computer Science II	Prepared By: D. Newvine
Time Frame: 1 Week	Unit/Theme Impacts of Computing: Career Paths
Essential Questions:  What types of jobs require a computer science degree?  What are the average salaries of computer science professionals?  In what sectors of the job market are computer science jobs created/available?	
NYS Standards:  9-12.IC.7 Investigate the use of computer science in multiple fields	Vocabulary:  Multiple Careers that use CS
Student Objectives (The student will...): TSW investigate different jobs that require knowledge in computer science. TSW understand where computer scientists are needed. TSW determine what is necessary in order to obtain a computer science degree.	
Assessment: Research Paper, Class Discussions	
Recommended Texts: Computer Science Principles: The Foundational Concepts of Computer Science	Resources: Google Slides: Notes iPads

## General Brown Central School District Curriculum Map

Course Title: Computer Science II	Prepared By: D. Newvine
Time Frame: 6 Weeks	Unit/Theme Digital Literacy
Essential Questions: How can we teach the general public about the use of computer science knowledge?	
<p>NYS Standards:</p> <p>9-12.DL.1 Type proficiently on a keyboard.</p> <p>9-12.DL.2 Communicate and work collaboratively with others using digital tools to support individual learning and contribute to the learning of others.</p> <p>9-12.DL.4a Independently select advanced digital tools and resources to create, revise, and publish complex digital artifacts or collections of artifacts.</p> <p>9-12.DL.4b Transfer knowledge of technology operations in order to use new and emerging technologies on multiple platforms.</p> <p>9-12.DL.5 Actively manage digital presence and footprint to reflect an understanding of the permanence and potential consequences of actions in online spaces.</p> <p>9-12.DL.6 Design and implement strategies that support safety and security of digital information, personal identity, property, and physical and mental health when operating in the digital world.</p>	<p>Vocabulary:</p> <p>Digital Footprint Platforms Keywords Digital Consequences Support Systems</p>
Student Objectives (The student will...): TSW present their overall understanding of computer science to the class.	
Assessment: Project #3 CSII Final Exam	
Recommended Texts: Computer Science Principles: The Foundational Concepts of Computer Science	Resources: Google Slides: Notes iPads