

Branchburg Township Public Schools

Office of Curriculum and Instruction

Grade 5 Technology Curriculum



Adopted by the Board of Education October 2022

This curriculum is aligned with the 2020 New Jersey Student Learning Standards – Computer Science and Design Thinking

TECHNOLOGY Curriculum Scope and Sequence

Content Area	TECHNOLOGY	Course Title/Grade Level:	5TH GRADE
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	Topic/Unit Name	Suggested Pacing (Days/Weeks)
<u>Topic/Unit #1</u>	Digital Citizenship and Social Media	5 cycles
<u>Topic/Unit #2</u>	Data/Research Integration w/ Google Sheets and Artificial Intelligence	10 cycles
<u>Topic/Unit #3</u>	Innovation Lab and Collaborative Coding	5 cycles
<u>Topic/Unit #4</u>	Coding/Programming with Tynker	10 cycles

Topic/Unit 1 Title	Digital Citizenship and Social Media	Approximate Pacing	5 cycles
STANDARDS			
NJSLS Technology			
<p style="text-align: center;">8.1.5.CS.1: Model how computing devices connect to other components to form a system.</p> <p style="text-align: center;">8.1.5.NI.2: Describe physical and digital security measures for protecting sensitive personal information.</p> <p>8.1.5.IC.1: Identify computing technologies that have impacted how individuals live and work and describe the factors that influenced the changes.</p> <p style="text-align: center;">8.1.5.DA.3: Organize and present collected data visually to communicate insights gained from different views of the data.</p> <p style="text-align: center;">8.2.5.ITH.2: Evaluate how well a new tool has met its intended purpose and identify any shortcomings it might have.</p> <p>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.</p> <p style="text-align: center;">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.</p> <p style="text-align: center;">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.</p>			
Interdisciplinary Connections:		21st Century Skills:	
<p>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.</p> <p>Example-students will utilize computer shortcuts to quickly find pertinent information when using digital resources and exploring sources.</p>		<p>9.1.5. EG.5: Identify sources of consumer protection and assistance.</p> <p>Example-students will identify how they can use social media respectfully and responsibly.</p>	

<p>NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.</p> <p>Example-students will utilize the Google Classroom platform to interact and engage with one another in an online community safely.</p>	<p>9.1.5.FI.1: Identify various types of financial institutions and the services they offer including banks, credit unions, and credit card companies.</p> <p>Example-students will understand the importance of important information and data that is housed online such as banking information and why that information should be kept secure like private information.</p> <p>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.</p> <p>Example-students will understand how social media has the power to influence others and to question information they find online.</p>										
<p>Technology Standards:</p>	<p>Career Ready Practices:</p>										
<p>2020 Standard Disciplinary Concepts (See Standards Above):</p> <table border="1" data-bbox="142 932 1054 1367"> <tr> <td data-bbox="142 932 562 997">Computing Systems (CS)</td> <td data-bbox="562 932 1054 997">Engineering Design (ED)</td> </tr> <tr> <td data-bbox="142 997 562 1101">Networks & the Internet (NI)</td> <td data-bbox="562 997 1054 1101">Interaction of Technology and Humans (ITH)</td> </tr> <tr> <td data-bbox="142 1101 562 1166">Impacts of Computing (IC)</td> <td data-bbox="562 1101 1054 1166">Nature of Technology (NT)</td> </tr> <tr> <td data-bbox="142 1166 562 1269">Data & Analysis (DA)</td> <td data-bbox="562 1166 1054 1269">Effects of Tech on the Natural World (ETW)</td> </tr> <tr> <td data-bbox="142 1269 562 1367">Algorithm & Programming (AP)</td> <td data-bbox="562 1269 1054 1367">Ethics & Culture (EC)</td> </tr> </table>	Computing Systems (CS)	Engineering Design (ED)	Networks & the Internet (NI)	Interaction of Technology and Humans (ITH)	Impacts of Computing (IC)	Nature of Technology (NT)	Data & Analysis (DA)	Effects of Tech on the Natural World (ETW)	Algorithm & Programming (AP)	Ethics & Culture (EC)	<p>9.4.5.DC.2: Provide attribution according to intellectual property rights guidelines using public domain or creative commons media.</p> <p>Example-students will consider that the work others create or they create may be protected by intellectual property rights.</p> <p>9.4.5.DC.3: Distinguish between digital images that can be reused freely and those that have copyright restrictions.</p> <p>Example-students will be introduced to what websites have free and appropriate use photos to use in their work.</p> <p>9.4.5.DC.5: Identify the characteristics of a positive and negative online identity and the lasting implications of online activity.</p>
Computing Systems (CS)	Engineering Design (ED)										
Networks & the Internet (NI)	Interaction of Technology and Humans (ITH)										
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Example-students will consider, evaluate, and see examples of their own digital footprint.

9.4.5.DC.7: Explain how posting and commenting in social spaces can have positive or negative consequences.

Example-students will consider how the actions they may online can have repercussions through infographics or skits.

UNIT/TOPIC ESSENTIAL QUESTIONS AND ENDURING OBJECTIVES/UNDERSTANDINGS

ENDURING OBJECTIVES/UNDERSTANDINGS

1. Uses and treats equipment with respect
2. Acts appropriately and respectfully in the real and digital world
3. Uses appropriate technology/digital citizenship vocabulary
4. Can access, use, and select digital applications for a specific purpose or job
5. Uses the internet to explore and investigate safely while assessing credibility
6. Uses research skills to solve problems or further understanding
7. Creates and shares original work
8. Credits resources appropriately

ESSENTIAL QUESTIONS

1. How does a computer/application work?
2. What is a digital citizen/What is digital etiquette?
3. What is social media and how does it have an impact on us positively and negatively?
4. How can we stay safe interacting with others online?
5. Can this program/application help me accomplish my learning goal?
6. Can I use digital applications to demonstrate my learning?
7. Can I use my research skills to bring awareness to a topic?
8. How does sharing resources online create a community of learners?
9. Why is it important to understand ownership rights in a digital environment?

STUDENT LEARNING OBJECTIVES

Key Knowledge

Process/Skills/Procedures/Application of Key Knowledge

<p>Students will know:</p> <ul style="list-style-type: none"> • What being a contributing, digital citizen looks like online. • How to build/monitor their digital footprint and identify how to interact responsible and safely online. • Types of social media, how it is used, and the positives and negatives factors in utilizing social media. • Understand the need for copyright, trademarks, and citing resources. • Their interactions and photos posted online leave a mark and make an impression on them 	<p>Students will be able to:</p> <ul style="list-style-type: none"> • Identify what a good digital citizen is and identify their own digital footprint. • Be a part of a successful, education, and informative online community via Google Classroom. • Act out a skit, share a positive message about being a good digital citizen, or identify challenging situations that can occur via social media. • Utilize free use photos for a purpose to improve their digital work
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ASSESSMENT OF LEARNING

<p>Summative Assessment (Assessment at the end of the learning period)</p>	<p>Portfolios Rubrics/Checklists Notes</p> <p>Culminating Activity: students create a positive message to share with others about being a good digital citizen and/or research their own digital footprint. Students will also explore scenarios where they learn to be a digital citizen on Digital Compass for tricky situations.</p>
<p>Formative Assessments (Ongoing assessments during the learning period to inform instruction)</p>	<p>Discussion questions via Google Classroom, teacher observation and notes</p>
<p>Alternative Assessments (Any learning activity or assessment that asks students to <i>perform</i> to demonstrate their knowledge, understanding and proficiency)</p>	<p>Student research or an individual assignment based on student needs</p>
<p>Benchmark Assessments (used to establish baseline achievement data and</p>	<p>Students will discuss their knowledge of digital citizenship first through discussion questions and class discussion. Then, they will take a quiz about digital etiquette and/or social media on BrainPop.</p>

measure progress towards grade level standards; given 2-3 X per year)

RESOURCES

Core instructional materials:

- [Unit 2 Student Presentation/Passport](#)
- [Common Sense Education](#)
- [Google's Be Internet Awesome](#)
- [Brainpop Digital Etiquette](#)
- [Digital Compass Digital Citizenship](#)

Supplemental materials:

- [3 Lessons about Copyright for students](#)
- [Edutopia Digital Citizenship Website](#)

Modifications for Learners

See [appendix](#)

Topic/Unit 2 Title	Data/Research Integration w/ Google Sheets and Artificial Intelligence	Approximate Pacing	10 cycles
STANDARDS			
NJSLS Technology			
<p data-bbox="191 380 1927 412">8.1.5.CS.3: Identify potential solutions for simple hardware and software problems using common troubleshooting strategies.</p> <p data-bbox="216 451 1902 516">8.1.5.IC.1: Identify computing technologies that have impacted how individuals live and work and describe the factors that influenced the changes.</p> <p data-bbox="149 558 1969 623">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.</p> <p data-bbox="373 662 1749 695">8.1.5.DA.1: Collect, organize, and display data in order to highlight relationships or support a claim.</p> <p data-bbox="222 737 1896 769">8.1.5.DA.3: Organize and present collected data visually to communicate insights gained from different views of the data.</p> <p data-bbox="317 808 1801 841">8.1.5.DA.4: Organize and present climate change data visually to highlight relationships or support a claim.</p> <p data-bbox="338 883 1780 915">8.1.5.DA.5: Propose cause and effect relationships, predict outcomes, or communicate ideas using data.</p> <p data-bbox="163 954 1959 1019">8.2.5.ED.4: Explain factors that influence the development and function of products and systems (e.g., resources, criteria, desired features, constraints).</p> <p data-bbox="354 1062 1766 1094">8.2.5.NT.4: Identify how improvement in the understanding of materials science impacts technologies.</p> <p data-bbox="233 1136 1871 1201">8.2.5.ETW.4: Explain the impact that resources, such as energy and materials used to develop technology, have on the environment.</p> <p data-bbox="212 1260 1892 1325">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.</p>			

Interdisciplinary Connections:	21st Century Skills:				
<p>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.</p> <p>Example-students will utilize an important topic such as global warming and utilize multiple resources to come to their own conclusions using specific textual evidence.</p> <p>NJSLSA.R2. Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.</p> <p>Example-students will come to their own conclusions based on texts regarding technology.</p> <p>NJSLSA.R7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.</p> <p>Example-students will evaluate data organized in a multitude of ways from online resources to draw their own conclusions.</p>	<p>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).</p> <p>Example-students collect information based on climate change to determine their own opinions and consider the ways they can have a positive impact</p>				
Technology Standards:	Career Ready Practices:				
<p>2020 Standard Disciplinary Concepts (See Standards Above):</p> <table border="1" data-bbox="149 1256 1052 1421"> <tbody> <tr> <td data-bbox="149 1256 562 1321">Computing Systems (CS)</td> <td data-bbox="562 1256 1052 1321">Engineering Design (ED)</td> </tr> <tr> <td data-bbox="149 1321 562 1421">Networks & the Internet (NI)</td> <td data-bbox="562 1321 1052 1421">Interaction of Technology and Humans (ITH)</td> </tr> </tbody> </table>	Computing Systems (CS)	Engineering Design (ED)	Networks & the Internet (NI)	Interaction of Technology and Humans (ITH)	<p>9.4.5.IML.1: Evaluate digital sources for accuracy, perspective, credibility and relevance (e.g., Social Studies Practice - Gathering and Evaluating Sources).</p> <p>Example-students will have to disseminate, organize, and evaluate sources when researching and utilizing online resources.</p>
Computing Systems (CS)	Engineering Design (ED)				
Networks & the Internet (NI)	Interaction of Technology and Humans (ITH)				

Impacts of Computing (IC)	Nature of Technology (NT)	
Data & Analysis (DA)	Effects of Tech on the Natural World (ETW)	
Algorithm & Programming (AP)	Ethics & Culture (EC)	
UNIT/TOPIC ESSENTIAL QUESTIONS AND ENDURING OBJECTIVES/UNDERSTANDINGS		
<u>ENDURING OBJECTIVES/UNDERSTANDINGS</u>		
<ol style="list-style-type: none"> 1.) Identify how computers have evolved and changed over time emphasizing input and output. 2.) Computers and technology are capable of impacting our environment. 3.) Consider machine learning and how artificial intelligence are capable of learning 4.) Enhance student understanding of Google Sheets and graphing data. 5.) Understand that data can be represented in multiple ways in print and digitally. 6.) Determine if resources found are reliable and credible. 		
<u>ESSENTIAL QUESTIONS</u>		
<ol style="list-style-type: none"> 1.) What is Wikipedia? Is it a source? How can we utilize it to start researching? 2.) How can one use the internet to find important data about important topics such as global warming? 3.) What is a spreadsheet and how can they be used to organize information? 4.) How can my learning help those around me (locally or globally) enhance their knowledge on a topic? 5.) How can I use a variety of digital tools to find accurate information? 		
STUDENT LEARNING OBJECTIVES		
Key Knowledge	Process/Skills/Procedures/Application of Key Knowledge	
<i>Students will know:</i> <ul style="list-style-type: none"> • What problems in today’s world might be solved with technology (climate change, pollution, poverty, etc.) 	<i>Students will be able to:</i> <ul style="list-style-type: none"> • Utilize the internet to research challenging topics (global warming) 	

<ul style="list-style-type: none"> • That they can build upon their knowledge of Google Sheets to graph and represent more advanced data. • Wikipedia is not a resource but can be utilized to find resources and introduce them to complex topics. • Google Sheets terminology including: spreadsheet, cell, active cell, row, column, x axis, y axis, entry bar, and formula. • That data represented online must be analyzed carefully to determine accuracy. • Different types of graphs can represent different data. • Artificial intelligence is a type of machine learning. • Data can be represented in with more than numbers and can include pictures, colors, shapes, and locations. 	<ul style="list-style-type: none"> • Decipher if information is of quality and accurate by analyzing online sources. • Utilize Google Sheets to graph data that they have found to represent it visually. • Control various aspects of a visual chart in Google Sheets including axis titles, chart colors, and types of charts. • Create their own AI model to clean an Ocean. • Define important machine learning terms such as classify, bias, algorithm, data, and AI.
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ASSESSMENT OF LEARNING

<p>Summative Assessment (Assessment at the end of the learning period)</p>	<p>Portfolios Rubrics/Checklists Notes</p> <p>Culminating Activity: Students will program their own artificial intelligence models on Code.org about cleaning up the Oceans. Then students will build a visual chart/graph with appropriate titles and data to represent data they have analyzed and collected about global warming via multiple resources.</p>
<p>Formative Assessments (Ongoing assessments during the learning period to inform instruction)</p>	<p>Discussion questions via Google Classroom, teacher observation and notes</p>
<p>Alternative Assessments (Any learning activity or assessment that asks students to <i>perform</i> to demonstrate their knowledge, understanding and proficiency)</p>	<p>Student research or an individual assignment based on student needs</p>
<p>Benchmark Assessments (used to establish baseline achievement data and</p>	<p>Students will complete a Google Sheets SGO Assessment by following the directions of the document and building a graph in Google Sheets.</p>

measure progress towards grade level standards; given 2-3 X per year)	
RESOURCES	
<p>Core instructional materials: Code.org AI Assignment Google Sheets Teacher Demos/Worksheets NASA Climate Change Website Rutgers Climate Lab Website</p>	
<p>Supplemental materials: Boyan Slat and Ocean Cleanup Gapminder (Climate Change) Book-Step-by-Step Spreadsheet Activities for Microsoft Excel</p>	
Modifications for Learners	
See appendix	

Topic/Unit 3 Title	Innovation Lab and Collaborative Coding	Approximate Pacing	5 cycles
STANDARDS			
NJSLS Technology			
<p data-bbox="338 350 1785 380" style="text-align: center;">8.1.5.CS.2: Model how computer software and hardware work together as a system to accomplish tasks.</p> <p data-bbox="212 420 1911 488" style="text-align: center;">8.1.5.IC.1: Identify computing technologies that have impacted how individuals live and work and describe the factors that influenced the changes.</p> <p data-bbox="264 529 1856 558" style="text-align: center;">8.1.5.AP.1: Compare and refine multiple algorithms for the same task and determine which is the most appropriate.</p> <p data-bbox="470 599 1650 628" style="text-align: center;">8.1.5.AP.3: Create programs that include sequences, events, loops, and conditionals.</p> <p data-bbox="149 669 1971 737" style="text-align: center;">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.</p> <p data-bbox="403 777 1755 846" style="text-align: center;">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.</p> <p data-bbox="268 886 1852 915" style="text-align: center;">8.2.2.ED.2: Collaborate to solve a simple problem, or to illustrate how to build a product using the design process.</p> <p data-bbox="346 956 1774 985" style="text-align: center;">8.2.2.ED.3: Select and use appropriate tools and materials to build a product using the design process.</p> <p data-bbox="237 1026 1822 1094" style="text-align: center;">8.2.5.NT.2: Identify new technologies resulting from the demands, values, and interests of individuals, businesses, industries, and societies.</p>			
Interdisciplinary Connections:		21st Century Skills:	
<p data-bbox="142 1219 1056 1320">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.</p> <p data-bbox="142 1360 1024 1429">Example-students will consider the domain specific vocabulary in researching tech careers they are interested in.</p>		<p data-bbox="1083 1230 1955 1331">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.</p>	

<p>NJSLSA.W7. Conduct short as well as more sustained research projects, utilizing an inquiry-based research process, based on focused questions, demonstrating understanding of the subject under investigation.</p> <p>Example-students will research a specific tech career of interest to learn more about it or will further build upon knowledge of video game careers.</p>	<p>Example-students will select a Google Suite application to meet requirements of a design project.</p> <p>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.</p> <p>Example-students will consider how changing the format of a document can enhance it.</p>										
<p>Technology Standards:</p>	<p>Career Ready Practices:</p>										
<p>2020 Standard Disciplinary Concepts (See Standards Above):</p> <table border="1" data-bbox="142 688 1054 1127"> <tr> <td data-bbox="142 688 562 753">Computing Systems (CS)</td> <td data-bbox="562 688 1054 753">Engineering Design (ED)</td> </tr> <tr> <td data-bbox="142 753 562 857">Networks & the Internet (NI)</td> <td data-bbox="562 753 1054 857">Interaction of Technology and Humans (ITH)</td> </tr> <tr> <td data-bbox="142 857 562 928">Impacts of Computing (IC)</td> <td data-bbox="562 857 1054 928">Nature of Technology (NT)</td> </tr> <tr> <td data-bbox="142 928 562 1026">Data & Analysis (DA)</td> <td data-bbox="562 928 1054 1026">Effects of Tech on the Natural World (ETW)</td> </tr> <tr> <td data-bbox="142 1026 562 1127">Algorithm & Programming (AP)</td> <td data-bbox="562 1026 1054 1127">Ethics & Culture (EC)</td> </tr> </table>	Computing Systems (CS)	Engineering Design (ED)	Networks & the Internet (NI)	Interaction of Technology and Humans (ITH)	Impacts of Computing (IC)	Nature of Technology (NT)	Data & Analysis (DA)	Effects of Tech on the Natural World (ETW)	Algorithm & Programming (AP)	Ethics & Culture (EC)	<p>9.4.5.CT.3: Describe how digital tools and technology may be used to solve problems.</p> <p>Example-with future careers students will have the choice on how to tackle problems by selecting digital tools and technology to help.</p> <p>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).</p> <p>Example-students will understand how culture, society, and community influence the direction of technology and future careers based on needs, interests, and vision.</p>
Computing Systems (CS)	Engineering Design (ED)										
Networks & the Internet (NI)	Interaction of Technology and Humans (ITH)										
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<p>UNIT/TOPIC ESSENTIAL QUESTIONS AND ENDURING OBJECTIVES/UNDERSTANDINGS</p>											
<p>ENDURING OBJECTIVES/UNDERSTANDINGS</p> <p>1.) The jobs of the future are ever-changing and are often led with technology innovations. These should be celebrated during Computer Science Week in December of every year.</p> <p>2.) Many of the jobs today might be replaced with automation in the future.</p>											

- 3.) Tech tools such as building a website, Google Slides, Adobe Spark, and Prezi can be utilized to share information with others.
- 4.) Collaboration is a necessary skill to persevere, problem solve, and enhance learning.
- 5.) Reinforce directional awareness with x and y manipulations to move a character/sprite in a digital environment.

ESSENTIAL QUESTIONS

- 1.) How has technology changed the jobs of the future? What are some jobs you are interested in and what knowledge of technology will be required to be successful in them?
- 2.) What type of personal skills/characteristics are needed to be a responsible worker?
- 3.) Why is mindset important when learning new technologies? How can this be applied to jobs in the future?
- 4.) How can one debug and problem solve to meet an outlined objective?

STUDENT LEARNING OBJECTIVES

Key Knowledge	Process/Skills/Procedures/Application of Key Knowledge
<p><i>Students will know:</i></p> <ul style="list-style-type: none"> ● Almost every job relies on multiple types of technology or software platforms one must become familiar with ● Many jobs in the future have not been created yet ● The job responsibilities of specific careers and jobs of interest. ● Even jobs that may not rely on a lot of technology are evolving rapidly. ● Collaboration and debugging as two skills needed to be successful in our computer learning environment. 	<p><i>Students will be able to:</i></p> <ul style="list-style-type: none"> ● Consider types of future careers a student might be interested in. ● Consider the types of skills they possess that might make them successful in specific careers ● Research a potential future career of interest to consider the skills (personal and technological) they might need. ● Use a coding platform to create and make an animated scene from a video game after collaborating and brainstorming with a group ● Customize an existing video game to make it unique ● Manipulate the x and y axis to control a character or sprite.

ASSESSMENT OF LEARNING

<p>Summative Assessment (Assessment at the end of the learning period)</p>	<p>Portfolios Rubrics/Checklists Notes</p> <p>Culminating Activity: students will create their very own assignment.</p>
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	<p>Culminating Activity-Students will create their own video game idea with a group, animate a scene from it with pixel art, research jobs in the video game industry, modernize the video game Tetris, and code Lunar Test Drive Expedition utilizing Tynker’s Hour of Code via Tynker on their “Computer Sciene Passport.”</p>
<p>Formative Assessments (Ongoing assessments during the learning period to inform instruction)</p>	<p>Discussion questions via Google Classroom, teacher observation and notes</p>
<p>Alternative Assessments (Any learning activity or assessment that asks students to <i>perform</i> to demonstrate their knowledge, understanding and proficiency)</p>	<p>Student research or an individual assignment based on student needs</p>
<p>Benchmark Assessments (used to establish baseline achievement data and measure progress towards grade level standards; given 2-3 X per year)</p>	<p>Students will be assessed at the beginning of the section on familiarity with programs and will be able to progress further based on progress for the final coding/programming unit with Tynker. Students will have choice in how they will learn in the final unit but the CS Passport serves as a benchmark assessment in student placement.</p>
RESOURCES	
<p>Core instructional materials: CS Science Week Passport (4th and 5th Grade) Computer Science Week Website Tynker Lunar Test Drive STEM Brainpop</p>	
<p>Supplemental materials: Wired Jobs of the Future Resource Jobs of the Future Digital Marketing Institute Jobs of the Future Resource Ball Pop Tynker Independent Assignment (Challenging)</p>	
Modifications for Learners	
<p>See appendix</p>	

Topic/Unit 4 Title	Coding/Programming with Tynker	Approximate Pacing	10 cycles
STANDARDS			
NJSLS Technology			
<p>8.1.5.CS.3: Identify potential solutions for simple hardware and software problems using common troubleshooting strategies.</p> <p style="padding-left: 40px;">8.1.5.AP.1: Compare and refine multiple algorithms for the same task and determine which is the most appropriate.</p> <p style="padding-left: 80px;">8.1.5.AP.2: Create programs that use clearly named variables to store and modify data.</p> <p style="padding-left: 80px;">8.1.5.AP.3: Create programs that include sequences, events, loops, and conditionals.</p> <p style="padding-left: 40px;">8.1.5.AP.4: Break down problems into smaller, manageable sub-problems to facilitate program development.</p> <p>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.</p> <p>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.</p> <p>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.</p>			
Interdisciplinary Connections:		21st Century Skills:	
<p>RI.5.5. Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 5 topic or subject area.</p> <p>Example-students will use domain specific language when talking about their code or explaining the logic behind it.</p>		<p>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).</p> <p>Example-students consider how to utilize a coding platform to engage themselves to become curious about a topic.</p>	

	<p>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).</p> <p>Example-students will use their computer code to showcase how they solved a problem by describing the steps of their code.</p>
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Technology Standards:	Career Ready Practices:
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<p>2020 Standard Disciplinary Concepts (See Standards Above):</p> <table border="1" style="width: 100%;"> <tr> <td style="width: 50%;">Computing Systems (CS)</td> <td style="width: 50%;">Engineering Design (ED)</td> </tr> <tr> <td>Networks & the Internet (NI)</td> <td>Interaction of Technology and Humans (ITH)</td> </tr> <tr> <td>Impacts of Computing (IC)</td> <td>Nature of Technology (NT)</td> </tr> <tr> <td>Data & Analysis (DA)</td> <td>Effects of Tech on the Natural World (ETW)</td> </tr> <tr> <td>Algorithm & Programming (AP)</td> <td>Ethics & Culture (EC)</td> </tr> </table>	Computing Systems (CS)	Engineering Design (ED)	Networks & the Internet (NI)	Interaction of Technology and Humans (ITH)	Impacts of Computing (IC)	Nature of Technology (NT)	Data & Analysis (DA)	Effects of Tech on the Natural World (ETW)	Algorithm & Programming (AP)	Ethics & Culture (EC)	<p>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).</p> <p>Example-students consider what problem solving skills to tackle programming and coding challenges.</p>
Computing Systems (CS)	Engineering Design (ED)										
Networks & the Internet (NI)	Interaction of Technology and Humans (ITH)										
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UNIT/TOPIC ESSENTIAL QUESTIONS AND ENDURING OBJECTIVES/UNDERSTANDINGS
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| <p>ENDURING OBJECTIVES/UNDERSTANDINGS</p> <ol style="list-style-type: none"> 1.) Demonstrate novice/intermediate to advanced coding and logic principles 2.) Uses research skills/coding strategies to solve problems or further understanding 3.) Automation is changing how individuals work and future jobs are created 4.) Robots and automation are replacing popular jobs. |
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ESSENTIAL QUESTIONS

- 1.) What is an app and why do we use them?
- 2.) Why are “mobile” applications so popular?
- 3.) Did I learn from my mistakes and keep persevering?
- 4.) What is the correct way to debug when you have errors in your code?
- 5.) How can we work collaboratively to find mistakes in our code?
- 6.) How can a student take responsibility for learning at their own pace when it comes to computer science?

STUDENT LEARNING OBJECTIVES

Key Knowledge	Process/Skills/Procedures/Application of Key Knowledge
<p><i>Students will know:</i></p> <ul style="list-style-type: none"> ● There are many different coding platforms such as Code.org and Tynker that can teach you computer science independently. ● Coding terminology from Tynker including coding/program, sequence, costume, command, coordinates, state, animation, algorithm, coordinate plane, x and y coordinate values. ● Apps have become one of the most popular types of programs and now are more than mobile applications. 	<p><i>Students will be able to:</i></p> <ul style="list-style-type: none"> ● Animate their own cartoon in Tynker ● Consider what jobs in the future might be replaced by automation and robots. ● Work on a coding course individually to <ul style="list-style-type: none"> ○ Use visual block codes to create a program ○ Sequence steps in order ○ Use loops and conditional statements to control events ○ Break down a problem and create an algorithm to solve it ○ Broadcasting messages ○ Loops/repition ○ Navigation ○ Animations ○ Problem solve and debugging

ASSESSMENT OF LEARNING

<p>Summative Assessment (Assessment at the end of the learning period)</p>	<p>Portfolios Rubrics/Checklists Notes</p>
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	<p>Assessment of a student’s progress in a coding course will be followed and monitored on the Tynker Teacher Dashboard. Students will learn and progress at their own pace. Students can also build a concept map of important coding terms they have learned and mastered in the specific coding platform they work on. Advanced students may be placed in a more rigorous curriculum if they show content understanding, have a collaborative mindset, and can follow classroom procedures on their own.</p> <p>Students will code their very own Alien Space Shooter on Tynker by the EOY to emphasize concepts such as random locations of x and y, motion, conditional logic, and animations.</p>
<p>Formative Assessments (Ongoing assessments during the learning period to inform instruction)</p>	<p>Discussion questions via Google Classroom, teacher observation and notes</p>
<p>Alternative Assessments (Any learning activity or assessment that asks students to <i>perform</i> to demonstrate their knowledge, understanding and proficiency)</p>	<p>Student research or an individual assignment based on student needs</p>
<p>Benchmark Assessments (used to establish baseline achievement data and measure progress towards grade level standards; given 2-3 X per year)</p>	<p>tudents will be assessed throughout the year on their familiarity with programs, and will be able to progress further based on progress. Their progress is monitored through the Tynker platform. Students have quizzes and badges to earn as they progress through their Tynker Unit.</p>
RESOURCES	
<p>Core instructional materials: Tynker Student Handout/Presentation 5th Grade Code.org Debugging Guide/Resource Tynker Programming 201 Curriculum Tynker Programming 202 Curriculum (Advanced) Assistive handouts/anchor charts to help students</p>	

Supplemental materials:

[Code.org CS Fundamentals Course E Curriculum](#)

[Code.org App Lab](#)

[Khan Academy Computer Science Resources](#)

Modifications for Learners

See [appendix](#)