Stafford Township School District

Computer Science & Design Thinking
Grade 3 & 4

2020 New Jersey Student Learning Standards – Computer Science & Design Thinking

https://www.nj.gov/education/standards/compsci/Docs/2020%20NJSLS-CSDT.pdf

Original Adoption: September 12, 2022

Philosophy

The goal of Stafford Township School District's Technology curriculum is technological literacy for all students. The curriculum is designed to help students develop solutions to real-world problems and design and build products that address human needs and desires. Our technology program facilitates a vital link to the math/science/technology triangle and assists with understanding living and working in our advanced technology-driven Information Age. The activities and projects require students to use invention, innovations and other creative, engineering- like activities for producing physical objects and performing various engineering testing through the application of organized knowledge and problem solving techniques. Technology Education, as applied in this curriculum, focuses on a systems approach to develop innovation, creativity, critical thinking and technological literacy.

Each student is actively involved in activities that develop knowledge, skills and attitudes regarding industry and technology. Emphasis is given to nurturing leadership, communication, social interaction, problem-solving and manipulative skills. Personal and social growth is fostered through interaction with other students in the technology laboratory. The technological method of problem solving is experienced by identifying a problem, collecting and analyzing data, generating alternatives, synthesizing a design or plan, developing a proposed product or service, and evaluating the process and results. Throughout this educational process, students are taught to explore their options and to make decisions about exactly how they are going to design, build and test a certain project.

Curriculum Units/Pacing Guide	
Unit # / Title	**Number of Weeks**
Unit 1: Computing Systems/Data Analysis/Technology Literacy	5 Weeks
Unit 2: Networks & The Internet/ Impacts of Computing/ Information & Media Literacy	5 Weeks
Unit 3: Engineering, Design/ Algorithms & Programming/ Critical Thinking & Problem Solving	16 Weeks
Unit 4: Interaction of Technology & Humans/ Nature of Technology/Digital Citizenship	5 Weeks
Unit 5: Effects of Technology on the Natural World/ Ethics & Culture/ Global & Cultural Awareness	5 Weeks

Overview	Standards	Unit Skills Focus	Content-Specific Practices (when applicable)
Unit 1 Computing Systems/ Data Analysis/Technology Literacy	8.1.5.CS.3: Identify potential solutions for simple hardware and software problems using common troubleshooting strategies. 8.1.2.CS.2: Explain the functions of common software and hardware components of computing systems. 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. 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. 9.4.5.TL.2: Sort and filter data in a spreadsheet to analyze findings.	Demonstrate responsible behavior when safely operating technology equipment. Understand terms and concepts related with applications Identify and use application, documents and downloads folder, hard drive, networked folder icons, and trash icons. Open and use multiple programs, windows, and/or browser tabs simultaneously. Use concepts and skills from basic software and apply them to more advanced software. Organize, calculate, and graph data using a spreadsheet.	Essential Question: How is technology useful? How can word processing software be used for a range of purposes? (i.e. Research Projects, Visual Aids, and Web Pages) How can software be used to show data? How can software be used for presentations?

	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.		
Suggested Resources	Google Apps, YouTube, BrainPop, NewsELA, Flocabulary		

Assessment Plan			
Formative Assessments	**Summative Assessments**	**Benchmark Assessment**	**Alternative Assessments**
typing.com WPM tests Nearpod responses Teacher observations Class discussions Questioning Tests and Quizzes Presentation Peer editing Self-evaluation Portfolios Performance tasks and projects	PBL Student Self-Evaluation Typing Tests	Student Technology Project with Teacher Scoring Rubric	Student self-reflection about creation or discussion while planning project Conversation/presentation rubric to score student work and presentation of final creation Teacher Checklist to record student understanding of skills based on participation and performance of skills

Accommodations and Modifications			
English Language Learners	**Students with IEPs**	**Economically Disadvantaged**	**Gifted and Talented**
Use of visuals Introduce key vocabulary before lesson Teacher reads aloud Verbal prompting Modeling Work in small group Peer tutoring	Provide students with additional time to complete projects Provide options, alternatives and choices to differentiate and broaden the curriculum Model for the student before independent practice to help student better understand the	Pre-Teach vocabulary and help students to preview lesson to build background knowledge and help students make connections with their experiences to achieve lesson and unit goals Provide student with materials and supplies to support lesson and	After completing a learning experience via the same content or process, the student may have a choice of products to show what has been learned. Provide students with opportunities to enrich and explore the tools and materials they use

Use of additional resources utilizing the student's native language	project or assignment Provide differentiated instruction as needed Follow all IEP modifications Provide manipulatives or the opportunity to draw solution strategies	help student achieve lesson and unit goals	with the unit to help students build upon their skills Use higher order thinking questions and expose students to higher level vocabulary
Basic Skills Students	**Students with 504 Plan**	**Students at Risk for Failure**	
- Preview lessons - Preview vocabulary wordsSummarize as you go	Provide students with additional time to complete projects Provide options, alternatives and choices to differentiate and broaden the curriculum Model for the student before independent practice to help student better understand the project or assignment Provide differentiated instruction as needed Follow all 504 plan modifications Provide manipulatives or the opportunity to draw solution strategies	- Small group instruction - Frequent breaks - Model how assignments should look - Incorporate social/emotional discussions - Encourage and monitor positive peer collaboration - Provide academic resources for both home and school use - Provide incentives to increase motivation and collaboration	
Unit 1 Connections			
NJSLS - Computer Science and Design Thinking When possible, provide links to specific samples/ documents/ assignments/etc. Refer to the Computer Science and Design Thinking	**Career Readiness, Life Literacies and Key Skills** When possible, provide links to specific samples/ documents/ assignments/etc. Refer to Career Readiness, Life Literacies and Key Skills Practices	***9.1 Personal Financial Literacy*** When possible, provide links to specific samples/ documents/ assignments/etc. Refer to the Personal Financial Literacy	***Interdisciplinary Connections*** When possible, provide links to specific ELA/Math/Sci/SS standards as well as samples/ documents/ assignments/etc. Refer to the NJ Student Learning Standards

	Act as a responsible and contributing community members and employee Attend to financial well-being Consider the environmental, social and economic impacts of decisions Utilize critical thinking to make sense of problems and persevere in solving them Model integrity, ethical leadership and effective management Plan education and career paths aligned to personal goals Use technology to enhance productivity increase collaboration and communicate effectively Work productively in teams while using cultural/global competence	9.1.5.CR.1: Compare various ways to give back and relate them to your strengths, interests, and other personal factors. 9.1.5.PB.1: Develop a personal budget and explain how it reflects spending, saving, and charitable contributions. 9.1.5.FP.1:Illustrate the impact of financial traits on financial decisions 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	5.OA.A.1 5.OA.A.2 R.F.5.4 A,B,C 6.1.A (SS) W.5.7 L.5.6 R.I.5.5

Overview	Standards	Unit Skills Focus	Content-Specific Practices (when applicable)
Unit 2 **Networks & The Internet/ Impacts of Computing/ Information & Media Literacy**	8.1.5.NI.2: Describe physical and digital security measures for protecting sensitive personal information. 8.1.5.NI.1: Develop models that successfully transmit and receive information using both wired and wireless methods. 8.1.5.IC.1: Identify computing	Identify ways to be safe on the internet. How to safely send an email Use software properly for video clips, and animation in presentations. Using search engines, etc., search for images, cut/paste them in a	Essential Questions: What are the basic rules of using the internet? How can the internet be used to find useful information? How can the internet be used for different purposes?

	technologies that have impacted how individuals live and work and describe the factors that influenced the changes. 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. 9.4.5.IML.1: Evaluate digital sources for accuracy, perspective, credibility and relevance. 9.4.5.IML.4: Determine the impact of implicit and explicit media messages on individuals, groups, and society as a whole. 9.4.5.IML.6: Use appropriate sources of information from diverse sources, contexts, disciplines, and cultures to answer questions.	Google document, and then find information on the topic and cut/paste the information below the picture.	What is the appropriate behavior to use online?
Suggested Resources	code.org, scratch, NewsELA, YouTube, Email, Google Apps		

Assessment Plan			
Formative Assessments	**Summative Assessments**	**Benchmark Assessment**	**Alternative Assessments**
Teacher observations Class discussions Questioning Tests and Quizzes Presentation Peer editing Self-evaluation Portfolios	PBL Student Self-Evaluation	Student Technology Project with Teacher Scoring Rubric	Student self-reflection about creation or discussion while planning project Conversation/presentation rubric to score student work and presentation of final creation Teacher Checklist to record

			student understanding of skills based on participation and performance of skills

Accommodations and Modifications			
English Language Learners	**Students with IEPs**	**Economically Disadvantaged**	**Gifted and Talented**
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Basic Skills Students	**Students with 504 Plan**	**Students at Risk for Failure**	
• Preview lessons • Preview vocabulary wordsSummarize as you go	Provide students with additional time to complete projects Provide options, alternatives and choices to differentiate and broaden the curriculum Model for the student before independent practice to help student better understand the project or assignment Provide differentiated instruction as needed Follow all 504 plan modifications	• Small group instruction • Frequent breaks • Model how assignments should look • Incorporate social/emotional discussions • Encourage and monitor positive peer collaboration • Provide academic resources for both home and school use	

	Provide manipulatives or the opportunity to draw solution strategies	● Provide incentives to increase motivation and collaboration	
Unit 2 Connections			
NJSLS - Computer Science and Design Thinking When possible, provide links to specific samples/ documents/ assignments/etc. Refer to the [Computer Science and Design Thinking](#)	**Career Readiness, Life Literacies and Key Skills** When possible, provide links to specific samples/ documents/ assignments/etc. [Refer to Career Readiness, Life Literacies and Key Skills Practices](#)	*9.1 Personal Financial Literacy* When possible, provide links to specific samples/ documents/ assignments/etc. Refer to the Personal [Financial Literacy](#)	*Interdisciplinary Connections* When possible, provide links to specific ELA/Math/Sci/SS standards as well as samples/ documents/ assignments/etc. Refer to the [NJ Student Learning Standards](#)
	Act as a responsible and contributing community members and employee Attend to financial well-being Consider the environmental, social and economic impacts of decisions Utilize critical thinking to make sense of problems and persevere in solving them Model integrity, ethical leadership and effective management Plan education and career paths aligned to personal goals Use technology to enhance productivity increase collaboration and communicate effectively Work productively in teams while using cultural/global competence	9.1.5.CR.1: Compare various ways to give back and relate them to your strengths, interests, and other personal factors. 9.1.5.PB.1: Develop a personal budget and explain how it reflects spending, saving, and charitable contributions. 9.1.5.FP.1:Illustrate the impact of financial traits on financial decisions 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	4.MD.A.3 5.MD.C.3 R.F.5.4 A,B,C 6.1.A (SS) W.5.7 L.5.6 R.I.5.5

Overview	Standards	Unit Skills Focus	Content-Specific Practices (when applicable)
Unit 3 Engineering, Design/ Algorithms & Programming/ Critical Thinking & Problem solving	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. 8.1.5.AP.3: Create programs that include sequences, events, loops, and conditionals. 8.1.5.AP.4: Break down problems into smaller, manageable sub-problems to facilitate program development. 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. 8.1.5.AP.1: Compare and refine multiple algorithms for the same task and determine which is the most appropriate. 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. 8.1.5.AP.2: Create programs that use clearly named variables to store and modify data.	By using code.org and https://scratch.mit.edu/ and having students code their own interactive stories, animations and games. By using Scratch they will think creatively, reason systematically, and work collaboratively while sharing their projects and ideas with others online. Students will complete interactive puzzles using Prodigy & Code.org Students will explore the creation of repetitive designs using variables in the Artist environment. Students will learn how variables make code easier to write and easier to read.	Essential Questions: For each app or game you see, what choice do you think the app maker is giving the user? How can Debugging help you? How does breaking up a bigger problem into smaller pieces help to figure out a solution? How are functions helpful in coding? How do various coding functions help create and solve activities?

| | 9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process

9.4.5.CT.3: Describe how digital tools and technology may be used to solve problems.

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 | | |
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Suggested Resources	code.org, Scratch, CS First

Assessment Plan

Formative Assessments	**Summative Assessments**	**Benchmark Assessment**	**Alternative Assessments**
Teacher observations
Class discussions
Questioning
Tests and Quizzes
Presentation
Peer editing
Self-evaluation
Portfolios
Performance tasks and projects	PBL
Student Self-Evaluation	Student Technology Project with Teacher Scoring
Rubric	Student self-reflection about creation or discussion while planning project
Conversation/presentation rubric to score student
work and presentation of final creation
Teacher Checklist to record student understanding
of skills based on participation and performance of
skills

Accommodations and Modifications

English Language Learners	**Students with IEPs**	**Economically Disadvantaged**	**Gifted and Talented**

Use of visuals Introduce key vocabulary before lesson Teacher reads aloud Verbal prompting Modeling Work in small group Peer tutoring Use of additional resources utilizing the student's native language	Provide students with additional time to complete projects Provide options, alternatives and choices to differentiate and broaden the curriculum Model for the student before independent practice to help student better understand the project or assignment Provide differentiated instruction as needed Follow all IEP modifications Provide manipulatives or the opportunity to draw solution strategies	Pre-Teach vocabulary and help students to preview lesson to build background knowledge and help students make connections with their experiences to achieve lesson and unit goals Provide student with materials and supplies to support lesson and help student achieve lesson and unit goals	After completing a learning experience via the same content or process, the student may have a choice of products to show what has been learned. Provide students with opportunities to enrich and explore the tools and materials they use with the unit to help students build upon their skills Use higher order thinking questions and expose students to higher level vocabulary
Basic Skills Students	**Students with 504 Plan**	**Students at Risk for Failure**	
- Preview lessons - Preview vocabulary wordsSummarize as you go	Provide students with additional time to complete projects Provide options, alternatives and choices to differentiate and broaden the curriculum Model for the student before independent practice to help student better understand the project or assignment Provide differentiated instruction as needed Follow all 504 plan modifications Provide manipulatives or the opportunity to draw solution strategies	- Small group instruction - Frequent breaks - Model how assignments should look - Incorporate social/emotional discussions - Encourage and monitor positive peer collaboration - Provide academic resources for both home and school use - Provide incentives to increase motivation and collaboration	
Unit 3 Connections			
NJSLS - Computer Science and Design Thinking When possible, provide links to	*Career Readiness, Life Literacies and Key Skills* When possible, provide links to specific samples/ documents/	*9.1 Personal Financial Literacy & 9.2 Career Awareness, Exploration, Preparation & Training*	*Interdisciplinary Connections* When possible, provide links to specific ELA/Math/Sci/SS

specific samples/ documents/ assignments/etc. Refer to the [Computer Science and Design Thinking](#)	assignments/etc. [Refer to Career Readiness, Life Literacies and Key Skills Practices](#)	When possible, provide links to specific samples/ documents/ assignments/etc. Refer to the [Financial Literacy](#)	standards as well as samples/ documents/ assignments/etc. Refer to the [NJ Student Learning Standards](#)
	Act as a responsible and contributing community members and employee

Attend to financial well-being

Consider the environmental, social and economic impacts of decisions

Utilize critical thinking to make sense of problems and persevere in solving them

Model integrity, ethical leadership and effective management

Plan education and career paths aligned to personal goals

Use technology to enhance productivity increase collaboration and communicate effectively

Work productively in teams while using cultural/global competence | 9.2.5.CAP.6: Compare the characteristics of a successful entrepreneur with the traits of successful employees.
9.1.5.CR.1: Compare various ways to give back and relate them to your strengths, interests, and other personal factors.
9.1.5.PB.1: Develop a personal budget and explain how it reflects spending, saving, and charitable contributions.
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4.NF.C.5 4.
NF.A.1
R.F.5.4 A,B,C
6.1.A (SS)
W.5.7
L.5.6 R.I.5.5 |
| | | | |

Overview	Standards	Unit Skills Focus	Content-Specific Practices (when applicable)
Unit 4 Interaction of Technology & Humans/ Nature of Technology/ Digital Citizenship	8.2.5.ITH.1: Explain how societal needs and wants influence the development and function of a product and a system.

8.2.5.NT.2: Identify new | Identify how technology innovation and improvement may be influenced by a variety of factors.

Technology innovation and improvement may be influenced | Essential Questions:

How does technology impact our lives?

How do engineers modify their |

	technologies resulting from the demands, values, and interests of individuals, businesses, industries, and societies. 8.2.5.NT.3: Redesign an existing product for a different purpose in a collaborative team. 9.4.5.DC.4: Model safe, legal, and ethical behavior when using online or offline technology. 9.4.5.DC.5: Identify the characteristics of a positive and negative online identity and the lasting implications of online activity.	by a variety of factors. Engineers create and modify technologies to meet people's needs and wants; scientists ask questions about the natural world. Work collaboratively to create a business that improves upon a previous invention/material. Digital Citizenship overview.	designs & use the engineering process? How does society influence the development and functions of products? What does it mean to be a good digital citizen?

Suggested Resources	Google Apps, CS First, NewsELA, BrainPop, YouTube

Assessment Plan

Formative Assessments	Summative Assessments	Benchmark Assessment	Alternative Assessments
Teacher observations Class discussions Questioning Tests and Quizzes Presentation Peer editing Self-evaluation Portfolios Performance tasks and projects	PBL Student Self-Evaluation	Student Technology Project with Teacher Scoring Rubric	Student self-reflection about creation or discussion while planning project Conversation/presentation rubric to score student work and presentation of final creation Teacher Checklist to record student understanding of skills based on participation and performance of skills

Accommodations and Modifications

English Language Learners	Students with IEPs	Economically Disadvantaged	Gifted and Talented
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Basic Skills Students	**Students with 504 Plan**	**Students at Risk for Failure**	
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Unit 4 Connections			
NJSLS - Computer Science and Design Thinking	**Career Readiness, Life Literacies and Key Skills**	*9.1 Personal Financial Literacy & 9.2 Career Awareness,*	*Interdisciplinary Connections*

When possible, provide links to specific samples/ documents/ assignments/etc. Refer to the [Computer Science and Design Thinking](#)	When possible, provide links to specific samples/ documents/ assignments/etc. [Refer to Career Readiness, Life Literacies and Key Skills Practices](#)	*Exploration, Preparation & Training* When possible, provide links to specific samples/ documents/ assignments/etc. Refer to the [Financial Literacy](#)	When possible, provide links to specific ELA/Math/Sci/SS standards as well as samples/ documents/ assignments/etc. Refer to the [NJ Student Learning Standards](#)
	Act as a responsible and contributing community members and employee	9.2.5.CAP.6: Compare the characteristics of a successful entrepreneur with the traits of successful employees.	4.NF.B.3 4.NF.C.5 4. NF.A.1 R.F.5.4 A,B,C 6.1.A (SS) W.5.7 L.5.6 R.I.5.5
	Attend to financial well-being	9.1.5.CR.1: Compare various ways to give back and relate them to your strengths, interests, and other personal factors.	
	Consider the environmental, social and economic impacts of decisions	9.1.5.PB.1: Develop a personal budget and explain how it reflects spending, saving, and charitable contributions.	
	Utilize critical thinking to make sense of problems and persevere in solving them	9.1.5.FP.1:Illustrate the impact of financial traits on financial decisions	
	Model integrity, ethical leadership and effective management	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	
	Plan education and career paths aligned to personal goals		
	Use technology to enhance productivity increase collaboration and communicate effectively		
	Work productively in teams while using cultural/global competence		

Overview	Standards	Unit Skills Focus	Content-Specific Practices (when applicable)
Unit 5 Effects of Technology on the Natural World/ Ethics & Culture/ Global & Cultural	8.2.5.ETW.2: Describe ways that various technologies are used to reduce improper use of resources.	The technology developed for the human designed world can have unintended consequences for the environment.	Essential Questions: What are some unintended consequences that technology has

Awareness	8.2.5.ETW.4: Explain the impact that resources, such as energy and materials used to develop technology, have on the environment. 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. 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. 9.4.5.GCA.1: Analyze how culture shapes individual and community perspectives and points of view.	Technology must be continually developed and made more efficient to reduce the need for non-renewable resources. Technological choices and opportunities vary due to factors such as differences in economic resources, location, and cultural values.	on the environment? What are some ways technology can help the environment in regards to renewable energy and waste reduction? How does access to technology impact education?
Suggested Resources	NewsELA, Brainpop, Google Apps, YouTube		

Assessment Plan			
Formative Assessments	**Summative Assessments**	**Benchmark Assessment**	**Alternative Assessments**
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Unit 5 Connections			

| NJSLS - Computer Science and Design Thinking

When possible, provide links to specific samples/ documents/ assignments/etc.
Refer to the Computer Science and Design Thinking | Career Readiness, Life Literacies and Key Skills

When possible, provide links to specific samples/ documents/ assignments/etc.
Refer to Career Readiness, Life Literacies and Key Skills Practices | 9.1 Personal Financial Literacy & 9.2 Career Awareness, Exploration, Preparation & Training

When possible, provide links to specific samples/ documents/ assignments/etc.
Refer to the Financial Literacy | Interdisciplinary Connections

When possible, provide links to specific ELA/Math/Sci/SS standards as well as samples/ documents/ assignments/etc.
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| | Act as a responsible and contributing community members and employee

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L.5.6 R.I.5.5 |