

MILLSTONE TOWNSHIP SCHOOL DISTRICT
Computers
Grade 4

Unit of Study: Computers 4th Grade	
Unit Overview: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.	
Pacing	
Once a week throughout the school year	
Enduring Understandings:	Essential Questions:
<ul style="list-style-type: none"> ● Software and hardware work together as a system to accomplish tasks (e.g., sending, receiving, processing, and storing units of information). ● Shared features allow for common troubleshooting strategies that can be effective for many systems. ● Information and devices can be protected using various security measures (i.e., physical and digital). ● Data is collected and stored so that it can be analyzed to better understand the world, make better predictions, and support claims. ● The amount of digital data generated in the world is rapidly expanding. ● Algorithms are translated into programs, or code, to provide instructions for computing devices. ● There are multiple ways to write and troubleshoot programs to accomplish a specific task. ● Individuals develop programs using an iterative process involving design, implementation, testing, and review. ● A new tool may have favorable or unfavorable results as well as both positive and negative effects on society. ● Money management includes examining various aspects of budgeting, building and maintaining a credit profile, loan and debt planning, identifying and managing 	<ul style="list-style-type: none"> ● How do hardware and software that make up a computing system communicate and process information in digital form? ● How can we troubleshoot familiar and unfamiliar problems? ● How can we protect ourselves and our devices when online? ● How can we collect, store, organize, analyze, and report understandings of various types and amounts of data? ● What makes one algorithm more appropriate for accomplishing a task than another? ● How do we use variables, sequences, events, loops, and conditionals to accomplish a task? ● How does an iterative process help us create a program? ● What are positives and negatives with using virtual reality? ● What options do we have with our money? ● How can we turn our passions into a career? ● What other factors should be considered when thinking about future careers? ● Why should we have insurance? ● How do we give credit to our sources?

<p>potential risks and investments, and understanding various insurance options.</p> <ul style="list-style-type: none"> ● An individual's passions, aptitude and skills can affect his/her employment and earning potential. ● Income and benefits can vary depending on the employer, type of job, or if self-employed. ● Individuals can choose to accept inevitable risk or take steps to protect themselves by avoiding or reducing risk. ● We need to give credit to our sources when we use someone else's work to help us with our own. ● We must consider copyright, fair use, and the public domain when selecting images to use in our work. ● We protect ourselves by practicing cyber safety, cyber security, and cyber ethics when online. ● Digital tools and media resources provide access to vast stores of information, but the information can be biased or inaccurate. ● Digital tools can be used to modify and display data in various ways that can be organized to communicate ideas. ● Collaborating digitally as a team can often develop a better artifact than an individual working alone. ● Improving speed and accuracy in keyboarding is a necessary life skill. 	<ul style="list-style-type: none"> ● What is the difference between content that is copyrighted, fair use, and part of the public domain? ● How do we behave appropriately when using technology? ● How can we determine whether we should use a source? ● How can we display and redisplay data visually? ● How can we effectively collaborate when using technology? ● What are some keyboard shortcuts that help us work more efficiently?
<p>Objectives/Teaching Points:</p>	<p>2020 NJSL: Computer Science & Design Thinking:</p>
<ul style="list-style-type: none"> ● Diagram how hardware and software work together to accomplish tasks. ● Develop a bank of troubleshooting strategies for familiar and unfamiliar problems. ● Discriminate between what is safe and unsafe to click and download. ● Collect, organize, display, transform, analyze, interpret, and report 	<ul style="list-style-type: none"> ● 8.1.5.CS.2: Model how computer software and hardware work together as a system to accomplish tasks ● 8.1.5.CS.3: Identify potential solutions for simple hardware and software problems using common troubleshooting strategies.

<p>understandings of various amounts of data.</p> <ul style="list-style-type: none"> ● Create 2 different algorithms to meet the same goal and determine which might be more appropriate to use. ● Create a program incorporating variables, sequences, events, loops, and conditionals. ● Conceptualize a program, write its code, test the program, and make adjustments as needed. ● Analyze how effective learning is through the use of virtual reality. ● Create a mock budget based on a potential future career. ● Consider personal interests and potential careers that engage those interests. ● Research a variety of characteristics of potential careers such as salary, education required, benefits, etc. ● Select and justify why a career might be a good fit. ● Distinguish between copyright, fair use, and public domain and what responsibilities someone has before using each type of content found online. ● Safely and responsibly navigate the Internet. ● Evaluate whether a source should be used based on its accuracy, potential bias, credibility and relevance. ● Create a visual representation of world population data. ● Collaborate with peers to create a skit that will teach about potential future careers. ● Utilize two hands and proper posture when typing. ● Build stamina for remaining on task while using technology. 	<ul style="list-style-type: none"> ● 8.1.5.NI.2: Describe physical and digital security measures for protecting sensitive personal information. ● 8.1.5.DA.1: Collect, organize, and display data in order to highlight relationships or support a claim. ● 8.1.5.DA.2: Compare the amount of storage space required for different types of data. ● 8.1.5.DA.3: Organize and present collected data visually to communicate insights gained from different views of the data. ● 8.1.5.DA.5: Propose cause and effect relationships, predict outcomes, or communicate ideas using data. ● 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.2: Create programs that use clearly named variables to store and modify data. ● 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.6: Develop programs using an iterative process, implement the program design, and test the program to ensure it works as intended. ● 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.
2020 NJSLs Career Readiness, Life Literacies & Key Skills	
<p>CRP2- Apply appropriate academic and technical skills. CRP3- Attend to personal health and financial well-being. CRP4- Communicate clearly and effectively and with reason. CRP6- Demonstrate creativity and innovation.</p>	

CRP7- Employ valid and reliable research strategies.

CRP8- Utilize critical thinking to make sense of problems and persevere in solving them.

CRP11- Use technology to enhance productivity.

- 9.1.5.PB.1: Develop a personal budget and explain how it reflects spending, saving, and charitable contributions.
- 9.1.5.PB.2: Describe choices consumers have with money (e.g., save, spend, donate).
- 9.2.5.CAP.1: Evaluate personal likes and dislikes and identify careers that might be suited to personal likes.
- 9.2.5.CAP.2: Identify how you might like to earn an income.
- 9.2.5.CAP.3: Identify qualifications needed to pursue traditional and non-traditional careers and occupations.
- 9.2.5.CAP.4: Explain the reasons why some jobs and careers require specific training, skills, and certification (e.g., life guards, child care, medicine, education) and examples of these requirements.
- 9.2.5.CAP.5: Identify various employee benefits, including income, medical, vacation time, and lifestyle benefits provided by different types of jobs and careers.
- 9.2.5.CAP.6: Compare the characteristics of a successful entrepreneur with the traits of successful employees.
- 9.2.5.CAP.7: Identify factors to consider before starting a business.
- 9.2.5.CAP.8: Identify risks that individuals and households face.
- 9.2.5.CAP.9: Justify reasons to have insurance.
- 9.4.5.DC.1: Explain the need for and use of copyrights.
- 9.4.5.DC.2: Provide attribution according to intellectual property rights guidelines using public domain or creative commons media.
- 9.4.5.DC.3: Distinguish between digital images that can be reused freely and those that have copyright restrictions.
- 9.4.5.IML.1: Evaluate digital sources for accuracy, perspective, credibility and relevance (e.g., Social Studies Practice - Gathering and Evaluating Sources).
- 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).
- 9.4.5.IML.3: Represent the same data in multiple visual formats in order to tell a story about the data.
- 9.4.5.IML.7: Evaluate the degree to which information meets a need including social emotional learning, academic, and social (e.g., 2.2.5. PF.5).
- 9.4.5.TL.4: Compare and contrast artifacts produced individually to those developed collaboratively (e.g., 1.5.5.CR3a).
- 9.4.5.TL.5: Collaborate digitally to produce an artifact (e.g., 1.2.5CR1d).

Interdisciplinary Connections

Math & Language Arts- Research potential future careers. Use a spreadsheet to track money that could be made doing that career and money spent on expenses. Select and justify a possible career in a written report. *4.OA, W.4.1*

Visual & Performing Arts- Create a book cover in Google Drawings related to a piece of writing the student completed in Language Arts. *1.2.5.Cr1a, 1.2.5.Cr3b*

Learning Experiences:	Assessments:
<p>The following learning experiences will help students explore the big ideas and essential questions:</p> <p>Project Ideas:</p> <ul style="list-style-type: none"> ● Career Research Project- <i>Internet Research, Google Sheets, Google Docs</i> ● World Population Virtual Reality Bar Graph- <i>Research, CoSpaces</i> ● Career Skits- <i>Spheros</i> ● Book Cover Design- <i>Google Drawings</i> ● Computer Science ● Digital Citizenship ● Digital revising/editing skills- <i>all programs</i> ● Troubleshooting- <i>all programs</i> <p><u>Additional Ideas if Needed:</u></p> <ul style="list-style-type: none"> ● Native Americans or National Parks Research Project- <i>Research, Google Slides</i> ● Making Healthy Choices- <i>Google Sheet</i> 	<p>Assessment:</p> <p><u>Formative</u></p> <ul style="list-style-type: none"> ● Teacher observation ● Exit slips ● Checklists ● Student self-assessment <p><u>Summative</u></p> <ul style="list-style-type: none"> ● Rubrics <ul style="list-style-type: none"> ○ Career Research Project ○ Virtual Reality Project ○ Spheros Group Project ○ Book Cover Project ○ Native American Research Project ○ National Parks Project ○ Making Healthier Choices Project <p><u>Benchmark</u></p> <ul style="list-style-type: none"> ● Keyboarding Skills Assessment <p><u>Alternative</u></p> <ul style="list-style-type: none"> ● Follows directions, safety protocols, and classroom procedures ● Demonstrates creativity within project and software. ● Experiments with a variety of tools and techniques available in software. ● Seeks to explore options not required /demonstrated to enhance overall project. ● Uses troubleshooting techniques to help self and others ● Makes choices that enhance and not detract from messages ● Asks relevant questions ● Consults rubric for necessary requirements
Ideas for Differentiation:	
Based on the needs of the students, there may be a need for additional teaching points, extending beyond or substituting in for those outlined in the curriculum map.	

English Language Learners:

- Speak and display terminology and movement
- Teacher modeling
- Peer modeling
- Develop and post routines
- Word walls

IEP/504 Learners:

- Utilize modifications and accommodations delineated in the student's IEP
- Work with paraprofessional
- Use multi-sensory teaching approaches. Provide helpful visual, auditory, and tactile reinforcement of ideas.
- Work with a partner
- Provide concrete examples and relate all new strategies to previously learned strategies.
- Solidify and refine concepts through repetition.
- Change requirements to reduce activity time
- Chunk tasks into sections to assist with organization and work completion
- Provide graphic organizers and sentence starters as needed

Students at Risk of Failure:

- Using visual demonstrations, illustrations, and models
- Give directions/instructions verbally and in simple written format.
- Chunk tasks into sections to make workload less overwhelming
- Peer Support
- Increase one on one time
- Teachers may modify instructions by modeling what the student is expected to do
- Instructions left on the board/easel for the student to see during the time of the lesson.
- Review behavior expectations and make adjustments for personal space or other behaviors as needed.
- Oral prompts can be given

Gifted and Talented Learners:

- Curriculum compacting
- Inquiry-based instruction
- Independent study
- Higher order thinking skills
- Adjusting the pace of lessons
- Interest based content
- Real world scenarios
- Student Driven Instruction
- Student choice selecting application(s) needed to complete tasks

Suggested Resources:**Student Materials:****Technology:**

- Desktop computer
- Google Drive & Google Classroom
- Internet
- Typing.com
- CoSpaces
- Android phones
- Virtual reality headsets
- Spheros

Teaching Materials:

- Anchor charts
- Direction sheets
- Skill sheets

Teacher Resources:

- Common Sense Media
- Teacher-made screencasts
- Grade level general education and special education teachers