

MILLSTONE TOWNSHIP SCHOOL DISTRICT
Computers
Grade 5

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| Unit of Study: Computers 5th 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"> ● Shared features allow for common troubleshooting strategies that can be effective for many systems. ● Information can be protected using various security measures (i.e., physical and digital). ● The development and modification of computing technology is driven by individual's needs and wants and can affect individuals differently. ● Data can be organized, displayed, presented to highlight relationships, transformed into different visual representations, and used for making inferences and predictions. ● Some algorithms are more appropriate for a specific use than others. ● Programs can be broken down into smaller parts to facilitate their design, implementation, and review. Programs can also be created by incorporating smaller portions of programs that already exist. ● Individuals develop programs using an iterative process involving design, implementation, testing, and review. ● Engineering design is a systematic and creative process of communicating and collaborating to meet a design challenge. ● Technology spurs new businesses and careers. | <ul style="list-style-type: none"> ● How do we troubleshoot familiar and unfamiliar problems? ● How can we protect our information when online? ● How has technology changed to meet individual needs? ● How can we collect, store, organize, analyze, and report understandings of various types of data? ● What makes an algorithm appropriate for a program? ● How do we effectively remix projects? ● How does an iterative process help us create a program? ● How can we effectively collaborate with peers to develop multiple solutions to a problem? ● How has virtual reality created new businesses or made life easier? ● How can we work together to attempt to solve big problems? ● How can we effectively solve problems? ● Why should we protect and respect intellectual property? ● How can we be safe, legal and ethical online? ● How and why should we manage our digital footprints? ● How does technology affect us socially? |

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| <ul style="list-style-type: none"> • Collaboration with individuals with diverse perspectives can result in new ways of thinking and/or innovative solutions. • The ability to solve problems effectively begins with gathering data, seeking resources, and applying critical thinking skills. • Intellectual property rights exist to protect the original works of individuals. It is allowable to use other people's ideas in one's own work provided that proper credit is given to the original source. • Sending and receiving copies of media on the internet creates the opportunity for unauthorized use of data, such as personally owned video, photos, and music. • Digital identities must be managed in order to create a positive digital footprint. • Digital tools have positively and negatively changed the way people interact socially. • Digital engagement can improve the planning and delivery of climate change actions. • Culture and geography can shape an individual's experiences and perspectives. • Accurate and comprehensive information comes in a variety of platforms and formats and is the basis for effective decision-making. • Specific situations require the use of relevant sources of information. • 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"> • How can we use technology to spread an understanding of climate change? • How do culture and geography shape experiences and perspectives? • How do we gather relevant information to assist in effective decision making? • How can we effectively collaborate when using technology? • Why is it important to use proper keyboarding techniques? • What are some keyboard shortcuts that help us work more efficiently? |
| <p>Objectives/Teaching Points:</p> | <p>2020 NJSLs: Computer Science & Design Thinking:</p> |
| <ul style="list-style-type: none"> • Develop a bank of troubleshooting strategies for familiar and unfamiliar problems. | <ul style="list-style-type: none"> • 8.1.5.CS.3: Identify potential solutions for simple hardware and software problems using common troubleshooting strategies. |

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| <ul style="list-style-type: none">• Discern between what is safe or unsafe to click, download, or share online.• Describe a technology that impacts people and suggest how it could become more accessible or user friendly.• Collect, organize, and display climate change data to support a claim.• Create 2 different algorithms to meet the same goal and determine which might be more appropriate to use.• Remix a program, incorporate some of its existing code, and expand on what already existed to create something new.• Conceptualize a program, write its code, test the program, and make adjustments as needed.• Collaborate with peers to research, plan, and teach a gym class game.• Describe how virtual reality has impacted existing businesses or created new ones.• Investigate various perspectives about the global clean water crisis and formulate a plan for how to handle it.• As a team, evaluate options and develop a plan for how to teach material to the class. Use technology and problem-solving strategies when problems arise.• Determine when it is necessary to give credit to a source and then provide proper credit.• Safely, responsibly, and ethically navigate the internet, collect information or content, and interact with others.• Determine how online activities could have an impact positively or negatively in the future.• Describe ways technology and social media affect our social interactions both positively and negatively.• Evaluate collected climate change data, make and support a claim about it, and propose a plan for how to use technology to spread the message and claim.• Research various viewpoints about the global clean water crisis and suggest why perspectives might be different in different parts of the world. | <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.IC.1: Identify computing 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.• 8.1.5.DA.1: Collect, organize, and display data in order to highlight relationships or support a claim.• 8.1.5.DA.4: Organize and present climate change data visually to highlight relationships or support a claim.• 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.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.6: Develop programs using an iterative process, implement the program design, and test the program to ensure it works as intended.• 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. |
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| <ul style="list-style-type: none"> ● Gather information from different sources and platforms, compare the messages presented, and form an opinion/make a decision. ● Determine the reliability, credibility, and relevance of various sources. ● Collaborate with peers to research, select, plan, and teach a game from around the world in gym class. ● Utilize two hands and proper posture when typing. ● Build stamina for remaining on task while using technology. | <ul style="list-style-type: none"> ● 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. |
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2020 NJSL Career Readiness, Life Literacies & Key Skills

CRP1- Act as a responsible and contributing citizen and employee.

CRP2- Apply appropriate academic and technical skills.

CRP4- Communicate clearly and effectively and with reason.

CRP5- Consider the environmental, social and economic impacts of decisions.

CRP6- Demonstrate creativity and innovation.

CRP7- Employ valid and reliable research strategies.

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

CRP9- Model integrity, ethical leadership and effective management.

CRP11- Use technology to enhance productivity.

CRP12- Work productively in teams while using cultural global competence.

- 9.4.5.CI.2: Investigate a persistent local or global issue, such as climate change, and collaborate with individuals with diverse perspectives to improve upon current actions designed to address the issue (e.g., 6.3.5.CivicsPD.3, W.5.7).
- 9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process (e.g., 2.1.5.EH.4, 4-ESS3-1, 6.3.5.CivicsPD.2).
- 9.4.5.CT.2: Identify a problem and list the types of individuals and resources (e.g., school, community agencies, governmental, online) that can aid in solving the problem (e.g., 2.1.5.CHSS.1, 4-ESS3-1).
- 9.4.5.CT.3: Describe how digital tools and technology may be used to solve problems.
- 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).
- 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.DC.4: Model safe, legal, and ethical behavior when using online or offline technology (e.g., 8.1.5.NI.2).
- 9.4.5.DC.5: Identify the characteristics of a positive and negative online identity and the lasting implications of online activity.

- 9.4.5.DC.6: Compare and contrast how digital tools have changed social interactions (e.g., 8.1.5.IC.1).
- 9.4.5.DC.7: Explain how posting and commenting in social spaces can have positive or negative consequences.
- 9.4.5.DC.8: Propose ways local and global communities can engage digitally to participate in and promote climate action (e.g., 6.3.5.GeoHE.1).
- 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).
- 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.4: Determine the impact of implicit and explicit media messages on individuals, groups, and society as a whole.
- 9.4.5.IML.5: Distinguish how media are used by individuals, groups, and organizations for varying purposes. (e.g., 1.3A.5.R1a).
- 9.4.5.IML.6: Use appropriate sources of information from diverse sources, contexts, disciplines, and cultures to answer questions (e.g., RI.5.7, 6.1.5.HistoryCC.7, 7.1.NM.IPRET.5).
- 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.5: Collaborate digitally to produce an artifact (e.g., 1.2.5CR1d).

Interdisciplinary Connections

Physical Education- Collaborate with a group to research a game played by kids in a different country. Teach and play that game in Phys. Ed. 2.2.5.MSC.5, 2.2.5.MSC.6, 2.2.5.MSC.7

Social Studies- Create a space in virtual reality that teaches about climate change. 6.3.5.CivicsPD.3, W.5.7

Learning Experiences:

The following learning experiences will help students explore the big ideas and essential questions:

Project Ideas:

- Digital Footprint & Digital Citizenship- *Spheros*
- Fitness Around the World- *Research, collaboration, Google Docs & student self-selected program*
- Climate Change Virtual Reality Graphic Design- *CoSpaces, Programming*

Assessments:

Assessment:

Formative

- Teacher observation
- Exit slips
- Checklists
- Student self-assessment

Summative

- Rubrics
 - Spheros Project
 - Fitness Around the World Project
 - Climate Change Virtual Reality Project
 - Global Clean Water Crisis Project

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| <ul style="list-style-type: none"> ● Investigate the Global Clean Water Crisis- <i>Research, Google Sheets & student self-selected program</i> ● Thank you, Millstone Elementary School- <i>Google Slides & Screencastify</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"> ● Book Blogs- <i>Google Docs & Google Classroom</i> | <ul style="list-style-type: none"> ○ Thank You, Millstone Elementary School Project <p><u>Benchmark</u></p> <ul style="list-style-type: none"> ● Typing skills monthly 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 ● Works productively as an individual and as a member of a group ● Draws connections between applications and the tools within them |
| <p>Ideas for Differentiation:</p> | |
| <p>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.</p> <p>English Language Learners:</p> <ul style="list-style-type: none"> ● Speak and display terminology and movement ● Teacher modeling ● Peer modeling ● Develop and post routines ● Word walls <p>IEP/504 Learners:</p> <ul style="list-style-type: none"> ● 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
- Screencastify
- CoSpaces
- Android phones
- Virtual reality headsets
- Sphero

Teaching Materials:

- Anchor charts
- Direction sheets

- Skill sheets

Teacher Resources:

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