MOORESTOWN TOWNSHIP PUBLIC SCHOOLS
MOORESTOWN, NEW JERSEY

Upper Elementary School
Arts & Technology: Educational Technology

Technology Grade 4

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Course Description and Fundamental Concepts

This Educational Technology course is intended to help students develop and reinforce the skills necessary to use technology in their daily lives. They will learn basic file management and system operations as well as the ethical use of technology. Through the use of word processing, spreadsheets, and presentations, students will develop ideas and begin to organize their ideas in a way that will support critical thinking and problem solving skills. Learning to develop, organize, summarize and synthesize information through the use of technology will inherently support learning in all curriculum areas. Students will explore the concepts of Engineering Design, a systematic approach to creating solutions to technological problems, and coding skills, allowing for the effective and efficient development of products and systems.

Throughout the year, this class is intended to meet once in an eight-day cycle for fifty-four minutes a class. (approximately 22 classes) Units will cover the following topics:

- Technology Literacy
- Internet and Digital Citizenship
- Word Processing
- Creating and Using Spreadsheets
- Creating Presentations/Visual Communication
- Design Thinking & Engineering
- Creativity & Innovation/Media Literacy
- Coding/Robotics

New Jersey Student Learning Standards (NJSLS)

Computer Science & Design Thinking (NJSLS 8)

8.1 Computer Science by the End of Grade 5

Computing Systems

Core Idea	Standard #	Standard Description
Computing devices may be connected to other devices to form a system as a way to extend their capabilities.	8.1.5.CS.1	Model how computing devices connect to other components to form a system
Software and hardware work together as a system to accomplish tasks (e.g., sending, receiving, processing, and storing units of information).	8.1.5.CS.2	Model how computer software and hardware work together as a system to accomplish tasks.
Shared features allow for common troubleshooting strategies that can be effective for many systems.	8.1.5.CS.3	Identify potential solutions for simple hardware and software problems using common troubleshooting strategies.

Networks and the Internet

Core Idea	Standard #	Standard Description
Information needs a physical or wireless path to travel to be sent and received.	8.1.5.NI.1	Develop models that successfully transmit and receive information using both wired and wireless methods.
Distinguishing between public and private information is important for safe and secure online interactions. Information can be protected using various security measures (i.e., physical and digital).	8.1.5.NI.2:	Describe physical and digital security measures for protecting sensitive personal information.

Impacts of Computing

Core Idea	Standard #	Standard Description
The development and modification of computing technology is driven by an individual's needs and wants and can affect individuals differently.	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.

Data & Analysis

Core Idea	Standard #	Standard Description
Data can be organized, displayed, and presented to highlight relationships.	8.1.5.DA.1	Organize and display data in order to highlight relationships or support a claim
The type of data being stored affects the storage requirements.	8.1.5.DA.2	Compare the amount of storage space required for different types of data

Individuals can select, organize, and transform data into different visual representations and communicate insights gained from the data.	8.1.5.DA.3	Organize and present collected data visually to highlight relationships or support claims.
	8.1.5.DA.4	Organize and present climate change data visually to highlight relationships or support a claim.
Many factors influence the accuracy of inferences and predictions.	8.1.5.DA.5	Propose cause and effect relationships, predict outcomes, or communicate ideas using data
Algorithms & Programming		
Different algorithms can achieve the same result. Some algorithms are more appropriate for a specific use than others.	8.1.5.AP.1	Compare and refine multiple algorithms for the same task and determine which is the most appropriate.
Programming languages provide variables, which are used to store and modify data.	8.1.5.AP.2	Create programs that use clearly named variables to store and modify data.
A variety of control structures are used to change the flow of program execution (e.g., sequences, events, loops, conditionals).	8.1.5.AP.3	Create programs that include sequences, events, loops, and conditionals.
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.	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.
Individuals develop programs using an iterative process involving design, implementation, testing, and review.	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 Design Thinking by the End of Grade 5

Core Ideas	Standard #	Standard Description
Engineering Design		
Engineering design is a systematic and creative process of communicating and collaborating to meet a design challenge. Often, several design solutions exist, each better in some way than the others.	8.2.5.ED.1	Explain the functions of a system and its subsystems.
	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
	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.
Engineering design requirements include desired features and limitations that need to be considered.	8.2.5.ED.4	Explain factors that influence the development and function of products and systems (e.g., resources, criteria, desired features, constraints).

	8.2.5.ED.5	Describe how specifications and limitations impact the engineering design process
	8.2.5.ED.6	Evaluate and test alternative solutions to a problem using the constraints and trade-offs identified in the design process.

Interaction of Technology and Humans		
Societal needs and wants determine which new tools are developed to address real-world problems.	8.2.5.ITH.1	Explain how societal needs and wants influence the development and function of a product and a system.
A new tool may have favorable or unfavorable results as well as both positive and negative effects on society. Technology spurs new businesses and careers.	8.2.5.ITH.2	Evaluate how well a new tool has met its intended purpose and identify any shortcomings it might have
	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
	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.

Nature of Technology		
Technology innovation and improvement may be influenced by a variety of factors. Engineers create and modify technologies to meet people's needs and wants	8.2.5.NT.1	Troubleshoot a product that has stopped working and brainstorm ideas to correct the problem.
	8.2.5.NT.2	Identify new 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
	8.2.5.NT.4	Identify how improvement in the understanding of materials science impacts technologies.

Effect of Technology on the Natural World		
The technology developed for the human designed world can have unintended consequences for the environment. Technology must be continually developed and made more efficient to reduce the need for nonrenewable resources.	8.2.5.ETW.1	Describe how resources such as material, energy, information, time, tools, people, and capital are used in products or systems.
	8.2.5.ETW.2	Describe ways that various technologies are used to reduce improper use of resources.
	8.2.5.ETW.3	Explain why human-designed systems, products, and environments need to be constantly monitored, maintained, and improved.
	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

Ethics and Culture		
Technological choices and opportunities vary due to factors such as differences in economic resources, location, and cultural values.	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.

Career Awareness, Exploration, Preparation, and Training (Standard 9.2)

By Grade 5

Unit Addressed	Core Idea	Standard / Description
6, 7	An individual's passions, aptitude and skills can affect his/her employment and earning potential.	*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.*
7	Income and benefits can vary depending on the employer and type of job or career.	*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.*
6, 7	There are a variety of factors to consider before starting a business.	*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.*
2	Individuals can choose to accept inevitable risk or take steps to protect themselves by avoiding or reducing risk.	*9.2.5.CAP.8: Identify risks that individuals and households face.* *9.2.5.CAP.9: Justify reasons to have insurance.*

Life Literacies and Key Skills (Standard 9.4)

By Grade 5

Unit Addressed	Core Idea	Standard / Description
2 5 6 7	Collaboration with individuals with diverse perspectives can result in new ways of thinking and/or innovative solutions.	*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).* *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).*

1-7	**Creativity and Innovation**: Curiosity and a willingness to try new ideas (intellectual risk-taking) contributes to the development of creativity and innovation skills.	*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).* *9.4.5.CI.4: Research the development process of a product and identify the role of failure as a part of the creative process*
1-7	**Critical Thinking and Problem-solving:** The ability to solve problems effectively begins with gathering data, seeking resources, and applying critical thinking skills.	*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).*
1-7	**Digital Citizenship:** 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.	*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 media.* *9.4.5.DC.3: Distinguish between digital images that can be reused freely and those that have copyright restrictions.*
1-7	**Digital Citizenship:** 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.	*9.4.5.DC.4: Model safe, legal, and ethical behavior when using online or offline technology (e.g., 8.1.5.NI.2).*
1-7	**Digital Citizenship:** Digital identities must be managed in order to create a positive digital footprint.	*9.4.5.DC.5: Identify the characteristics of a positive and negative online identity and the lasting implications of online activity*
2	**Digital Citizenship:** Digital tools have positively and negatively changed the way people interact socially.	*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.*
2 7	**Digital Citizenship:** Digital engagement can improve the planning and delivery of climate change actions.	*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).*
5 7	**Global and Cultural Awareness:** Culture and geography can shape an individual's experiences and perspectives.	*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).*

2 5 7	**Information and Media Literacy:** Digital tools and media resources provide access to vast stores of information, but the information can be biased or inaccurate.	*9.4.5.IML.1: Evaluate digital sources for accuracy, perspective, credibility and relevance (e.g., Social Studies Practice - Gathering and Evaluating Sources).*
3 4 5 7	**Information and Media Literacy:** Digital tools can be used to modify and display data in various ways that can be organized to communicate ideas.	*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.*
2 5 7	**Information and Media Literacy:** Accurate and comprehensive information comes in a variety of platforms and formats and is the basis for effective decision-making.	*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.*
2-7	**Information and Media Literacy:** Specific situations require the use of relevant sources of information.	*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.*
3-7	**Technology Literacy:** Different digital tools have different purposes.	*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.* *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.*
4-7	**Technology Literacy:** Collaborating digitally as a team can often develop a better artifact than an individual working alone.	*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 (2020 NJSLS)

Visual & Performing Arts Integration (Standard 1)

Unit Addressed	Artistic Process	Anchor Standard
2-7	**Creating**	*Anchor Standard 1: Generating and conceptualizing ideas.* *Anchor Standard 2: Organizing and developing ideas.* *Anchor Standard 3: Refining and completing products.*
2-7	**Connecting**	*Anchor Standard 10: Synthesizing and relating knowledge and personal experiences to create products.* *Anchor Standard 11: Relating artistic ideas and works within societal, cultural, and historical contexts to deepen understanding.*
3-7	**Performing/Presenting/Producing**	*Anchor Standard 4: Selecting, analyzing, and interpreting work.* *Anchor Standard 5: Developing and refining techniques and models or steps needed to create products.* *Anchor Standard 6: Conveying meaning through art.*
4,5,6,7	**Responding**	*Anchor Standard 7: Perceiving and analyzing products.* *Anchor Standard 8: Applying criteria to evaluate products.* *Anchor Standard 9: Interpreting intent and meaning.*

Pacing Guide (All Dates are approximate based on the school calendar)

Unit/ Topic	Month (w/Approx number of Teaching Days)
Technology Literacy (Spiraled throughout all units)	**September** (2 days)
Internet and Digital Citizenship (Spiraled throughout all units)	**October** (2-3 days)
Word Processing (Spiraled throughout all units)	**November** (2 days)
Coding/Robotics	**December** (2 days)
Coding/Robotics	**January** (2-3 days)
Design Thinking & Engineering	**February** (2 days)
Design Thinking & Engineering Creating & Using Spreadsheets	**March** (3 days)
Creating Presentations/Visual Communication	**April** (2 days)
Creating Presentations/Visual Communication	**May** (2 days)
Coding/Robotics Design Thinking & Engineering	**June** (2 days)

Unit 1: TECHNOLOGY LITERACY

Learning Goals: What do I want my students to learn?

Standards

NJSLS - Computer Science 8.1.5.CS.1; 8.1.5.CS.2; 8.1.5.CS.3; 8.1.5.NI.1; 8.1.5.DA.2; 8.1.5.IC.2; 8.1.5.IC.1; 8.1.5.DA.2
NJSLS -Design Thinking 8.2.5.ED.1; 8.2.5.ED.2;
NJSLS - Career Awareness, Exploration, Preparation, and Training
NJSLS - Life Literacies and Key Skills See Chart
NJSLS - Interdisciplinary Standards

Fundamental Concepts / Big Ideas

- Computing devices may be connected to other devices to form a system as a way to extend their capabilities.
- 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 needs a physical or wireless path to travel to be sent and received.
- The development and modification of computing technology is driven by an individual's needs and wants and can affect individuals differently.
- The type of data being stored affects the storage requirements
- Navigating and working within an operating system can accomplish digital tasks.
- Specific digital tool functionality and determining the appropriate digital tool to use to complete specific tasks.
- Methods for saving work and storage options.
- File organization and management are important to maintaining an efficient digital work space.
- Sometimes there is a need to troubleshoot issues with hardware or software. What are the options?

Learning Objectives

Students will be able to…
- Model how computing devices connect to other components to form a system.
- Model how computer software and hardware work together as a system to accomplish tasks.
- Identify potential solutions for simple hardware and software problems using common troubleshooting strategies.
- Develop models that successfully transmit and receive information using both wired and wireless methods.
- Identify computing technologies that have impacted how individuals live and work and describe the factors that influenced the changes.
- Identify possible ways to improve the accessibility and usability of computing technologies to address the diverse needs and wants of users.
- Explain the need for the Acceptable Use Policy and articulate the consequences of misusing district technology.
- Turn on the CPU and monitor or the laptop/Chromebook.
- Use Control (Ctrl,), Alt, and Delete (Del) keys to access the login screen.
- Log on to the MTPS and cloud-based networks using their personal login and password
- Use Start Menu and taskbars.
- Open menus and submenus, and choose items on those menus.
- Use right-click to open context menus or shortcut menus.
- Identify icons for word processing, spreadsheet, presentation, publication, and Internet applications.
- Use desktop icons to open applications.
- Use keyboard shortcuts to perform various tasks
- Understand the difference between Save and Save As, and save files using both.
- Save to the Cloud, personal device, and to a flash drive.
- Compare the amount of storage space required for different types of data
- Organize files by creating and saving to folders.

- Open files and folders via "This PC" and within a software application (i.e., Microsoft Word, Docs).
- Understand how to open and switch between three open documents.
- Resize open windows and move them on the screen.
- Close windows.
- Use vertical and horizontal scrollbars to view full documents.
- Use Cut, Copy, and Paste functions to move text and/or images from one document to another.
- Use dialog boxes.
- Use arrow icons to open the drop-down menu within a dialog box.
- Choose a printer and print a document.
- Use the help menu in an application to find information.

Unit 2: INTERNET & DIGITAL CITIZENSHIP

Learning Goals: What do I want my students to learn?

Standards

NJSLS - Computer Science 8.1.5.NI.1; 8.1.5.NI.2;
NJSLS -Design Thinking 8.2.5.ITH.4
NJSLS - Career Awareness, Exploration, Preparation, and Training
NJSLS - Life Literacies and Key Skills See Chart
NJSLS - Interdisciplinary Standards

Fundamental Concepts/Big Ideas

- How can students learn the importance of proper digital behavior?
- What fundamentals of digital citizenship can students learn?
- What do students need to understand about using technology safely?
- What should students learn about ownership of work?
- What should students learn with regards to Internet browsing and research?
- Distinguishing between public and private information is important for safe and secure online interactions.
- Information can be protected using various security measures (i.e., physical and digital).
- 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.
- 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.

Learning Objectives

Students will be able to…
- Access online resources in a safe manner.
- Understand how to maintain privacy and personal security while online.
- Understand proper internet netiquette.
- Understand what cyberbullying means and what to do if it is encountered at school or elsewhere.
- Understand the consequences of misusing online resources (i.e., plagiarism).
- Use web browsers, search engines, and directories to obtain information.
- Describe physical and digital security measures for protecting sensitive personal information.
- Identify the characteristics of a positive and negative online identity and the lasting implications of online activity
- Compare and contrast how digital tools have changed social interactions
- Explain how posting and commenting in social spaces can have positive or negative consequences.
- Explain the need for and use of copyrights.
- Provide attribution according to intellectual property rights guidelines using public domain or creative media.
- Distinguish between digital images that can be reused freely and those that have copyright restrictions.
- Model safe, legal, and ethical behavior when using online or offline technology

Unit 3: WORD PROCESSING

Learning Goals: What do I want my students to learn?

Standards

NJSLS - Computer Science 8.1.5.DA.1; 8.1.5.DA.3
NJSLS -Design Thinking
NJSLS - Career Awareness, Exploration, Preparation, and Training
NJSLS - Life Literacies and Key Skills See Chart
NJSLS - Interdisciplinary Standards

Fundamental Concepts / Big Ideas

- What should students learn in order to determine the appropriate digital tool for a specific task?
- What should students learn in order to effectively use word processing digital tools?
- What features of word processing should students learn?
- What skills should students learn in order to enhance documents created with word processing tools?
- What should students learn with regards to word processing digital workspace?
- What should students learn in order to output a document?
- What should students learn in order to properly save a document?
- Different digital tools have different purposes.
- Data can be organized, displayed, and presented to highlight relationships

Learning Objectives

Students will be able to…
- Define the use of a word processing program.
- Copy and move text without retyping.
- Use the spell check feature.
- Format text and images.
- Select and replace text.
- Highlight/select, move, and copy text.
- Change font and font size.
- Change paragraph alignment.
- Change justification and margins.
- Change line spacing.
- Create bulleted and numbered lists.
- Apply borders and shading.
- Insert images and word art to enhance a document.
- Enhance the appearance of a document using images, lines, and shapes.
- Insert a header and footer with automatic page numbering.
- Change the program window from normal to print layout view.
- Use scroll bars to view different parts of a document.
- Save a document to a network drive, device, or flash drive
- Review the document in the print preview mode.
- Indicate what pages of a document to print.
- Format a document using a word processing application to enhance text, change page formatting, and include appropriate images, graphics, or symbols.
- Collect, organize, and display data in order to highlight relationships or support a claim

Unit 4: CREATING AND USING SPREADSHEETS

Learning Goals: What do I want my students to learn?

Standards

NJSLS - Computer Science 8.1.5.DA.1; 8.1.5.DA.3; 8.1.5.DA.4; 8.1.5.CS.2;
NJSLS -Design Thinking 8.2.5.ED.2; 8.2.5.ED.3
NJSLS - Career Awareness, Exploration, Preparation, and Training
NJSLS - Life Literacies and Key Skills See Chart
NJSLS - Interdisciplinary Standards

Fundamental Concepts / Big Ideas

- What should students learn in order to effectively use a spreadsheet digital tool?
- What features of spreadsheet software and data collection should students learn?
- What skills should students learn in order to convert data into visual representation?
- What should students learn with regards to setting up a spreadsheet digital workspace?
- Data can be organized, displayed, and presented to highlight relationships.
- Different digital tools have different purposes
- Individuals can select, organize, and transform data into different visual representations and communicate insights gained from the data.
- Digital tools can be used to modify and display data in various ways that can be organized to communicate ideas.

Learning Objectives

Students will be able to…
- Create a spreadsheet using spreadsheet software and save it to the network and to a flash drive/USB.
- Set up a page using orientation, scaling, margins, header, footer, and other options.
- Edit the spreadsheet using cut, copy, and paste.
- Fill, clear, and delete cell contents.
- View and select toolbars.
- Insert rows, columns, and worksheets.
- Insert images and symbols.
- Insert a chart.
- Format the chart.
- Format cells (number, alignment, font, border, patterns).
- Create and use a graphic organizer to collect and organize data.
- Compare the common uses of at least two different digital tools and identify the advantages and disadvantages of using each.
- Create a visual representation to organize information about a problem or issue
- Represent the same data in multiple visual formats in order to tell a story about the data
- Sort and filter data in a spreadsheet to analyze findings
- Collect, organize, and display data in order to highlight relationships or support a claim
- Organize and present collected data visually to communicate insights gained from different views of the data

Unit 5: CREATING PRESENTATIONS

Learning Goals: What do I want my students to learn?

Standards

NJSLS - Computer Science 8.1.5.DA.1; 8.1.5.DA.3; 8.1.5.DA.4
NJSLS -Design Thinking 8.2.5.EC.1; 8.2.5.ED.2; 8.2.5.ED.3;
NJSLS - Career Awareness, Exploration, Preparation, and Training
NJSLS - Life Literacies and Key Skills See Chart
NJSLS - Interdisciplinary Standards

Fundamental Concepts/Big Ideas

- What should students learn in order to determine the appropriate digital tool for a specific task?
- What should students learn in order to effectively use a presentation digital tool?
- What features of presentation software should students learn?
- What skills should students learn in order to enhance and improve their presentation?
- What should students learn with regards to setting up a presentation digital workspace?
- What should students learn in order to produce a presentation?
- What skills should students learn in order to be an effective presenter?
- Data can be organized, displayed, and presented to highlight relationships.
- 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.
- 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

Learning Objectives

Students will be able to…
- Create and save a slide presentation using presentation software, such as Microsoft PowerPoint or Google Slides.
- Use the slide layout feature.
- Change the design template and color scheme of the entire presentation and of individual slides.
- Add text and images to each slide.
- Edit font type, style, and size.
- Animate text and images and add transitions between slides.
- Add sound to the presentation.
- Print the presentation as handouts.
- Share the presentation with the class
- Collect, organize, and display data in order to highlight relationships or support a claim.
- Evaluate digital sources for accuracy, perspective, credibility and relevance (e.g., Social Studies Practice - Gathering and Evaluating Sources).
- Create a visual representation to organize information about a problem or issue
- Determine the impact of implicit and explicit media messages on individuals, groups, and society as a whole.
- Distinguish how media are used by individuals, groups, and organizations for varying purposes.
- Use sources of information from diverse sources, contexts, disciplines, and cultures to answer questions
- Evaluate the degree to which information meets a need including social emotional learning, academic, and social.

Unit 6: CODING/ROBOTICS

Learning Goals: What do I want my students to learn?

Standards

NJSLS - Computer Science 8.1.5.CS.1; 8.1.5.CS.2; 8.1.5.AP.1; 8.1.5.AP.2; 8.1.5.AP.3; 8.1.5.AP.4; 8.1.5.AP.5;8.1.5.AP.6;
NJSLS -Design Thinking 8.2.5.ITH.1; 8.2.5.ITH.2; 8.2.5.ITH.3; 8.2.5.ITH.4; 8.2.5.NT.1; 8.2.5.NT.2; 8.2.5.EC.1
NJSLS - Career Awareness, Exploration, Preparation, and Training
NJSLS - Life Literacies and Key Skills   See Chart
NJSLS - Interdisciplinary Standards

Fundamental Concepts Big Ideas

- Computing devices may be connected to other devices to form a system as a way to extend their capabilities.
- Software and hardware work together as a system to accomplish tasks
- Different algorithms can achieve the same result. Some algorithms are more appropriate for a specific use than others.
- Programming languages provide variables, which are used to store and modify data
- A variety of control structures are used to change the flow of program execution (e.g., sequences, events, loops, conditionals)
- 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.
- Societal needs and wants determine which new tools are developed to address real-world problems.
- A new tool may have favorable or unfavorable results as well as both positive and negative effects on society.
- Technology spurs new businesses and careers.
- Technology innovation and improvement may be influenced by a variety of factors.
- Engineers create and modify technologies to meet people's needs and wants.
- Technological choices and opportunities vary due to factors such as differences in economic resources, location, and cultural values.

Learning Objectives

Students will be able to…
- Model how computing devices connect to other components to form a system
- Model how computer software and hardware work together as a system to accomplish tasks.
- Compare and refine multiple algorithms for the same task and determine which is the most appropriate.
- Create programs that use clearly named variables to store and modify data.
- Create programs that include sequences, events, loops, and conditionals.
- Create programs that include variables.
- Create programs that include functions.
- Break down problems into smaller, manageable sub-problems to facilitate program development
- Modify, remix, or incorporate pieces of existing programs into one's own work to add additional features or create a new program.
- Develop programs using an iterative process, implement the program design, and test the program to ensure it works as intended.
- Explain how societal needs and wants influence the development and function of a product and a system.
- Evaluate how well a new tool has met its intended purpose and identify any shortcomings it might have
- Analyze the effectiveness of a new product or system and identify the positive and/or negative consequences resulting from its use
- Describe a technology/tool that has made the way people live easier or has led to a new business or career.
- Troubleshoot a product that has stopped working and brainstorm ideas to correct the problem.
- Identify new technologies resulting from the demands, values, and interests of individuals, businesses, industries, and societies

- Analyze how technology has contributed to or reduced inequities in local and global communities and determine its short- and long-term effects.

Unit 7: DESIGN THINKING & ENGINEERING

Learning Goals: What do I want my students to learn?

Standards

NJSLS - Computer Science 8.1.5.DA.1; 8.1.5.DA.3; 8.1.5.DA.4; 8.1.5.DA.5
NJSLS -Design Thinking 8.2.5.ED.1; 8.2.5.ED.2; 8.2.5.ED.3; 8.2.5.ED.4; 8.2.5.ED.5; 8.2.5.ED.6; 8.2.5.ITH.1; 8.2.5.ITH.2; 8.2.5.ITH.3; 8.2.5.ITH.4; 8.2.5.NT.1; 8.2.5.NT.2; 8.2.5.NT.3; 8.2.5.NT.4; 8.2.5.ETW.1.; 8.2.5.ETW.2; 8.2.5.ETW.3; 8.2.5.ETW.4;8.2.5.ETW.5; 8.2.5.EC.1
NJSLS - Career Awareness, Exploration, Preparation, and Training
NJSLS - Life Literacies and Key Skills See Chart
NJSLS - Interdisciplinary Standards

Fundamental Concepts / Big Ideas

- Engineering design is a systematic and creative process of communicating and collaborating to meet a design challenge.
- Often, several design solutions exist, each better in some way than the others.
- Engineering design requirements include desired features and limitations that need to be considered
- Societal needs and wants determine which new tools are developed to address real-world problems.
- A new tool may have favorable or unfavorable results as well as both positive and negative effects on society.
- Technology spurs new businesses and careers.
- Technology innovation and improvement may be influenced by a variety of factors.
- Engineers create and modify technologies to meet people's needs and wants.
- Technological choices and opportunities vary due to factors such as differences in economic resources, location, and cultural values.
- The technology developed for the human designed world can have unintended consequences for the environment.
- Technology must be continually developed and made more efficient to reduce the need for nonrenewable resources.
- Individuals can select, organize, and transform data into different visual representations and communicate insights gained from the data
- Many factors influence the accuracy of inferences and predictions.

Learning Objectives

Students will be able to…
- Explain the functions of a system and its subsystems.
- 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
- Follow step by step directions to assemble a product or solve a problem, using appropriate tools to accomplish the task.
- Explain factors that influence the development and function of products and systems (e.g., resources, criteria, desired features, constraints).
- Describe how specifications and limitations impact the engineering design process
- Evaluate and test alternative solutions to a problem using the constraints and trade-offs identified in the design process.
- Explain how societal needs and wants influence the development and function of a product and a system.
- Evaluate how well a new tool has met its intended purpose and identify any shortcomings it might have
- Analyze the effectiveness of a new product or system and identify the positive and/or negative consequences resulting from its use
- Describe a technology/tool that has made the way people live easier or has led to a new business or career.
- Troubleshoot a product that has stopped working and brainstorm ideas to correct the problem.
- Identify new technologies resulting from the demands, values, and interests of individuals, businesses, industries, and societies

- Analyze how technology has contributed to or reduced inequities in local and global communities and determine its short- and long-term effects.
- Redesign an existing product for a different purpose in a collaborative team
- Identify how improvement in the understanding of materials science impacts technologies.
- Describe how resources such as material, energy, information, time, tools, people, and capital are used in products or systems.
- Describe ways that various technologies are used to reduce improper use of resources.
- Explain why human-designed systems, products, and environments need to be constantly monitored, maintained, and improved.
- Explain the impact that resources, such as energy and materials used to develop technology, have on the environment.
- 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
- Organize and present collected data visually to highlight relationships or support claims
- Organize and present climate change data visually to highlight relationships or support a claim.
- Propose cause and effect relationships, predict outcomes, or communicate ideas using data

Please contact the content supervisor for any questions.