GRADES 3-5
TECHNOLOGY
CURRICULUM

Middle Township Public Schools
216 S. Maun Street
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Board of Education Approval: August 2022

Grades 3, 4, 5 Technology Curriculum Work Committee

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Introduction

This document serves to meet all requirements for curriculum as per the Middle Township Board of Education and the New Jersey Department of Education and will serve as a guide for lesson planning. Students will meet for their technology approximately 25 days for each grade level.

Course Description

Introduction to Technology familiarizes the students with the resources of technology, technology systems and the evolution of technology. Students will be taught the design process and use it to explore the concept of design. They will be introduced to common materials and processes as they challenge themselves to solve innovative problem

Technology Standards

Computer Science and Design Thinking

New approaches necessary for solving the critical challenges that we face as a society will require harnessing the power of technology and computing. Rapidly changing technologies and the proliferation of digital information have permeated and radically transformed learning, working, and everyday life. To be well-educated, global-minded individuals in a computing-intensive world, students must have a clear understanding of the concepts and practices of computer science. As education systems adapt to a vision of students who are not just computer users but also computationally literate creators who are proficient in the concepts and practices of computer science and design thinking, engaging students in computational thinking and human-centered approaches to design through the study of computer science and technology serves to prepare students to ethically produce and critically consume technology.

Mission

Computer science and design thinking education prepares students to succeed in today's knowledge-based economy by providing equitable and expanded access to high-quality, standards-based computer science and technological design education.

Vision

All students have equitable access to a rigorous computer science and design thinking education. Students will benefit from opportunities to engage in high-quality technology programs that foster their ability to:

• develop and apply computational and design thinking to address real-world problems and design creative solutions;

• engage as collaborators, innovators, and entrepreneurs on a clear pathway to success through postsecondary education and careers;

• navigate the dynamic digital landscape to become healthy, productive, 21st century global-minded individuals; and

• participate in an inclusive and diverse computing culture that appreciates and incorporates perspectives from people of different genders, ethnicities, and abilities.

Intent and Spirit of the Computer Science and Design Thinking Standards

All students receive computer science and design thinking instruction from Kindergarten through grade 12. The study of these disciplines focuses on deep understanding of concepts that enable students to think critically and systematically about leveraging technology to solve local and global issues. Authentic learning experiences that enable students to apply content knowledge, integrate concepts across disciplines, develop computational thinking skills, acquire and incorporate varied perspectives, and communicate with diverse audiences about the use and effects of computing prepares New Jersey students for college and careers.

Revised Standards

Framework for NJ Designed Standards New to this version of the NJSLS-CS&DT are the following:

• Standard 8.1 Computer Science o Computer Science, previously a strand entitled ‘Computational Thinking: Programming’ in standard 8.2 of the 2014 NJSLS Technology, outlines a comprehensive set of concepts and skills, such as data and analysis, algorithms and programming, and computing systems.

• Standard 8.2 Design Thinking This standard, previously standard 8.2 Technology Education of the 2014 NJSLS – Technology, outlines the technological design concepts and skills essential for technological and engineering literacy. The new framework design, detailed previously, includes Engineering Design, Ethics and Culture, and the Effects of Technology on the Natural world among the disciplinary concepts.

* Please note that the concepts and skills previously included in 8.1 Educational Technology of the 2014 NJSLS – Technology have been expanded and integrated across multiple disciplinary concepts in the 2020 NJSLS – Career Readiness, Life Literacies, and Key Skills standard 9.4. Given the ubiquity of technology, our students will continue to be required to demonstrate increasing levels of proficiency to access, manage, evaluate, and synthesize information in their personal, academic, and professional lives. Therefore, the standards that were housed in one discipline have been enhanced and restructured to reflect the continued need for student learning in technology literacy, digital citizenship, and information and media literacy.

The design of this version of the NJSLS – Computer Science and Design Thinking (NJSLS-CS&DT) is intended to:

• promote the development of curricula and learning experiences that reflect the vision and mission of computer science and design thinking as stated in the beginning of this document;

• foster greater coherence and appropriate progressions across grade bands;

• prioritize the important ideas and core processes that are central to computing and have lasting value beyond the classroom; and

• reflect the habits of mind central to technology that lead to post-secondary success.

Pacing Guide

UNIT TITLE	ENDURING UNDERSTANDINGS	NJSLS	TIMEFRAME
Keyboarding	• Students will demonstrate the skills that make up proper ergonomic techniques to promote a healthy lifestyle while using the computer. • A tool is only as good as the person using it. • Technology is constantly changing and requires continuous learning of new skills. • Accurate documents reflect one's image.	**9.4.2.TL.1** **9.4.2.TL.2** **9.4.2.TL.6** **9.4.5.TL3**	**September-ongoing**
Digital Citizenship	• **Privacy and Security -** Students learn strategies for managing their online information and keeping it secure from online risks such as identity thieves and phishing. They learn how to create strong passwords, avoid scams and schemes, and analyze privacy policies. • **Digital Footprint and Reputation -** Students learn to protect their own privacy and respect others' privacy. Our digital world is permanent, and with each post, students are building a digital footprint. By encouraging students to self-reflect before they self-reveal, they will consider how what they share online can impact themselves and others. • **Self-Image and Identity -** Students explore their own digital lives, focusing on their online versus their offline identity. • **Creative Credit and Copyright -** Living in a "copy/paste" culture, students need to reflect on their responsibilities and rights as creators in the online spaces where they consume, create, and share information. • **Information Literacy -** Information literacy includes the ability to identify, find, evaluate, and use information effectively. From effective search strategies to evaluation techniques, students learn how to evaluate the quality, credibility, and validity of websites, and give proper credit.	**8.1.2NI.3** **8.1.2.NI.4** **9.4.2.DC.1** **9.4.2.DC.2** **9.4.2.DC.3** **9.4.2.DC.4** **9.4.2.DC.5** **9.4.2.DC.6** **9.4.2.DC.7** **9.4.2.DC.8**	**October-ongoing**

	• **Cyberbullying -** Students learn what to do if they are involved in a cyberbullying situation. They explore the roles people play and how individual actions both negative and positive can impact their friends and broader communities. • **Internet Safety -** Students explore how the Internet offers an amazing way to collaborate with others world-wide, while staying safe through employing strategies such as distinguishing between inappropriate contact and positive connections.		
Algorithms and Programming	• Designing a program requires algorithms and abstraction just as in general problem solving. • Proper program design requires several steps, and often requires the developer to go back and redesign the program several times. • Programming is a collaborative endeavor, as many are often modified by others to improve upon or use for another purpose. • Identify web programming languages. • Identify the types of applications that can be made through the use of a computer program. • Identify situations where the use of looping is appropriate. • Explain the difficulty of translating real problems into programs. • Demonstrate that ideas may feel clear and yet still be misinterpreted by a computer.	**8.1.5.E.1** **8.1.5.F.1** **8.1.5.A.2** **8.1.5.A.3**	**Full Year**
Computing Systems	• . Individuals use computing devices to perform a variety of tasks accurately and quickly. • Computing devices interpret and follow the instructions they are given literally. • A computing system is composed of software and hardware. • Describing a problem is the first step toward finding a solution when computing systems do not work as expected. • 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).	**8.1.2CS.1** **8.1.2.CS.2** **8.1.2.CS.3** **8.1.5..CS.1** **8.1.5..CS.2** **8.1.5.CS.3**	**4 weeks**

	• Shared features allow for common troubleshooting strategies that can be effective for many systems.		
Impacts of Computing	Computing technology has positively and negatively changed the way individuals live and work (e.g., entertainment, communication, productivity tools). In the past, if students wanted to read about a topic, they needed access to a library to find a book about it. Today, students can view and read information on the Internet about a topic or they can download e-books about it directly to a device. Such information may be available in more than one language and could be read to a student, allowing for great accessibility. The development and modification of computing technology is driven by people's needs and wants and can affect individuals differently. New computing technology is created and existing technologies are modified for many reasons, including to increase their benefits, decrease their risks, and meet societal needs.	**8.1.2.IC.1** **8.1.5.IC.1** **8.1.5.IC.2** **9.4.5.DC.6**	**4 weeks**
Networks and the Internet	Computer networks can be used to connect individuals to other individuals, places, information, and ideas. The Internet enables individuals to connect with others worldwide. Connecting devices to a network or the Internet provides great benefits, but care must be taken to use authentication measures, such as strong passwords, to protect devices and information from unauthorized access. Information needs a physical or wireless path to travel to be sent and received. Distinguishing between public and private information is important for safe and secure online interactions. Information can be protected using various security measures (cybersecurity i.e., physical and digital).	**8.1.2.NI.1** **8.1.2.NI.2** **8.1.2.NI.3** **8.1.2.NI4** **8.1.5.NI1** **8.1.5.NI.2**	**4 weeks**

Multimedia Presentations	Multimedia presentations allow presenters to display information visually which makes the delivery of the content more efficient and the information more memorable Multimedia presentations can display images, graphs, charts, video, audio, and other components that make the content more interesting and easier to understand	**8.1.5.AP.6** **8.1.2.DA.1** **8.1.5.DA.1** **8.1.5.DA.3** **8.1.5.DA.4** **9.4.2.IML.2** **9.4.2.IML.3** **9.4.2.TL.6** **9.4.2.TL.7** **9.4.5.IML.2** **9.4.5.TL.3**	**6 weeks**
Data and Analysis	Individuals collect, use, and display data about individuals and the world around them. Computers store data that can be retrieved later. Data can be copied, stored in multiple locations, and retrieved. Data can be used to make predictions about the world. Data can be organized, displayed, and presented to highlight relationships. The type of data being stored affects the storage requirements. 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.	**8.1.2.DA.1** **8.1.2.DA.2** **8.1.2.DA.3** **8.1.2.DA.4** **8.1.5.DA.1** **8.1.5.DA.2** **8.1.5.DA.3** **8.1.5.DA.4** **8.1.5.DA.5** **9.4.2.TL.3**	**6 weeks**

Pacing Guide

Content Area:	Technology	Grade(s) 3-5
Unit Plan Title:	Keyboarding	

Overview/Rationale

Computers are integrated into every aspect of our lives. Changes in technology take place every day. Activities and typing instruction need to keep pace with technological changes. Students will learn the most recent methods of keyboard familiarization.

Keyboard instruction will teach students to type quickly and accurately with the correct technique. Keyboarding skills will be introduced in the early grades and follow up instruction will be provided throughout the grade levels.

Technology Standard(s) (Established Goals)

9.4.2.TL.1: Identify the basic features of a digital tool and explain the purpose of the tool.
9.4.2.TL.2: Create a document using a word processing application.
9.4.2.TL.6: Illustrate and communicate ideas and stories using multiple digital tools.
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.

Interdisciplinary Standard(s)

NJSLS - ELA Standards

NJSLSA.W.5. With some guidance and support from adults and peers, use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of two pages in a single sitting.

NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

NJSLSA.RI.3.5. Use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information relevant to a given topic efficiently.

NJSLSA.SL5. Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations

Enduring Understandings:

- Students will demonstrate the skills that make up proper ergonomic techniques to promote a healthy lifestyle while using the computer.
- A tool is only as good as the person using it.
- Technology is constantly changing and requires continuous learning of new skills.
- Accurate documents reflect one's image.

Essential Question(s)

* How does good posture help to promote good health?
- How does an accurate document promote a positive image?
- How does speed influence one's image?

In this unit plan, the following 21st Century themes and skills are addressed:

21st Century Themes		21st Century Skills	
X	Global Awareness	T	Critical Thinking & Problem Solving
X	Environmental Literacy		Creativity and Innovation
X	Health Literacy	T	Collaboration, Teamwork and Leadership
X	Civic Literacy		Cross-Cultural and Interpersonal Communication
X	Financial, Economic, Business and Entrepreneurial Literacy		Communication and Media Fluency
			Accountability, Productivity and Ethics

In this unit plan, the following Career Ready Practices are addressed:

E-Encouraged, T-Taught, or A-Assessed

E	CRP1. Act as a responsible and contributing citizen and employee CRP2.
T	Apply appropriate academic and technical skills
E	CRP3. Attend to personal health and financial well-being CRP4.
T	Communicate clearly and effectively with reason
	CRP5. Consider the environmental, social and economic impacts of decisions CRP6.
T	

	Demonstrate creativity and innovation
A	**CRP7. Employ valid and reliable research strategies**
E	**CRP8. Utilize critical thinking to make sense of problems and persevere in solving them CRP9.**
T	**Model integrity, ethical leadership and effective management**
T	**CRP10. Plan education and career paths aligned to personal goals**
T	**CRP11. Use technology to enhance productivity**
	CRP12. Work productively in teams while using cultural global competence

Student Learning Goals/Objectives:	
Demonstrate proper keyboarding techniques. ***Proper ergonomic posture, proper seating and hand and feet placement.*** ***Familiarization of touchpad.***	
Assessment Evidence:	
Online assessments for speed and accuracy. ***Teacher observation of proper techniques.***	**Other Assessment Measures:** *Students will graph 5 minute typing test*
Teaching and Learning Actions:	
Instructional Strategies and Activities	***Students will graph their results on their daily typing quiz.***
Resources	
Computers and Internet Identify any sources used here – websites, etc.	
Suggested Time Frame:	September-ongoing

Content Area:	Technology	Grade(s) 3-5
Unit Plan Title:	Digital Citizenship	

Overview/Rationale

Students use digital media to explore, connect, create, and learn in ways never before imagined. With this power, young people have extraordinary opportunities yet face potential pitfalls. Schools are dealing with the associated ramifications like cyberbullying, digital cheating, and safety and security concerns. These issues underscore the need for students to learn and for teachers to teach digital literacy and citizenship skills.

Technology Standard(s) (Established Goals)

8.1.2.NI.3: Create a password that secures access to a device. Explain why it is important to create unique passwords that are not shared with others.

8.1.2.NI.4: Explain why access to devices need to be secured.

9.4.2.DC.1: Explain differences between ownership and sharing of information.

9.4.2.DC.2: Explain the importance of respecting the digital content of others.

9.4.2.DC.3: Explain how to be safe online and follow safe practices when using the internet

9.4.2.DC.4: Compare information that should be kept private to information that might be made public.

9.4.2.DC.5: Explain what a digital footprint is and how it is created.

9.4.2.DC.6: Identify respectful and responsible ways to communicate in digital environments.

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.

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.

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

Interdisciplinary Standard(s)

NJSLS - ELA Standards

NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

NJSLSA.RI.3.5. Use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information relevant to a given topic efficiently.

NJSLSA.RI.3.7. Use information gained from text features (e.g., illustrations, maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).

NJSLSA.RI.5.4 Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 5 topic or subject area.

NJSLSA.SL1. Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

NJSLSA.SL2. Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

NJSLSA.SL4. Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

NJSLSA.SL5. Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations

Enduring Understandings:

- **Privacy and Security** - Students learn strategies for managing their online information and keeping it secure from online risks such as identity thieves and phishing. They learn how to create strong passwords, avoid scams and schemes, and analyze privacy policies.
- **Digital Footprint and Reputation -** Students learn to protect their own privacy and respect others' privacy. Our digital world is permanent, and with each post, students are building a digital footprint. By encouraging students to self-reflect before they self-reveal, they will consider how what they share online can impact themselves and others.
- **Self-Image and Identity -** Students explore their own digital lives, focusing on their online versus their offline identity.

- **Creative Credit and Copyright -** Living in a "copy/paste" culture, students need to reflect on their responsibilities and rights as creators in the online spaces where they consume, create, and share information.
- **Information Literacy -** Information literacy includes the ability to identify, find, evaluate, and use information effectively. From effective search strategies to evaluation techniques, students learn how to evaluate the quality, credibility, and validity of websites, and give proper credit.
- **Cyberbullying -** Students learn what to do if they are involved in a cyberbullying situation. They explore the roles people play and how individual actions both negative and positive can impact their friends and broader communities.
- **Internet Safety -** Students explore how the Internet offers an amazing way to collaborate with others world-wide, while staying safe through employing strategies such as distinguishing between inappropriate contact and positive connections.

Essential Question(s) : (What provocative questions will foster inquiry, understanding, and transfer of learning?)

- What information can you share online? What information should you not share online?
- What personal information should always remain private?
- What should you do to protect you and your friends from cyberbullies?
- How is cyberbullying different from in-person bullying? How should you handle it?
- What is an upstander? How can you be an upstander?
- Why do you need a password to get onto the computer or different websites?
- How do you search on the Internet for best results?
- Which websites are a good source of information? Which websites will not provide you with reliable/trusted information?
- What is an advertisement and what is an authentic informative Website?
- How can you communicate with people online? What different methods of communication are there?
- When is it okay to talk to a stranger online?
- How can you protect yourself from identity theft?
- How can you prove that you created something and take credit for what you created?
- What is plagiarism? When is it okay to use the work of others?
- When is it okay to alter photos digitally? How should it be done to protect the owner and subject?

In this unit plan, the following 21st Century themes and skills are addressed:

		***E**-Encouraged, **T**-Taught, or **A**-Assessed*			
21st Century Themes			**21st Century Skills**		
	X	**Global Awareness**		**T**	**Critical Thinking & Problem Solving**
	X	**Environmental Literacy**			**Creativity and Innovation**

X	Health Literacy	E	Collaboration, Teamwork and Leadership
X	Civic Literacy		Cross-Cultural and Interpersonal Communication
X	Financial, Economic, Business and Entrepreneurial Literacy		Communication and Media Fluency
			Accountability, Productivity and Ethics

In this unit plan, the following Career Ready Practices are addressed:

E-Encouraged, T-Taught, or A-Assessed

T	CRP1. Act as a responsible and contributing citizen and employee CRP2.
T	Apply appropriate academic and technical skills
E	CRP3. Attend to personal health and financial well-being CRP4.
E	Communicate clearly and effectively with reason
E	CRP5. Consider the environmental, social and economic impacts of decisions CRP6.
E	Demonstrate creativity and innovation
	CRP7. Employ valid and reliable research strategies
E	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them CRP9.
E	Model integrity, ethical leadership and effective management
E	CRP10. Plan education and career paths aligned to personal goals
T	CRP11. Use technology to enhance productivity
	CRP12. Work productively in teams while using cultural global competence

Student Learning Goals/Objectives:

• What information can you share online? What information should you not share online?	• What personal information should always remain private?

Assessment Evidence:	
• Online assessments • Teacher observation • Teacher created exit ticket	**Other Assessment Measures*:*** Journals and self-reflection
Teaching and Learning Actions:	
Instructional Strategies and Activities	• Google Be Internet Awesome • Commonsense.org • Brainpop • Code.org • Teacher created lessons and materials
Resources	
Computers and Internet Identify any sources used here – websites, etc.	
Suggested Time Frame:	October-ongoing

Content Area:	Technology	Grade(s) 3-5
Unit Plan Title:	Algorithms and Programming	

Overview/Rationale

- Individuals develop and follow directions as part of daily life. People work together to develop programs for a purpose, such as expressing ideas or addressing problems.
- An algorithm is a sequence of steps designed to accomplish a specific task. Algorithms are translated into programs, or code, to provide instructions for computing devices.
- Algorithms and programming control all computing systems, empowering people to communicate with the world in new ways and solve compelling problems.

Technology Standard(s) (Established Goals)

8.1.2.AP.1: Model daily processes by creating and following algorithms to complete tasks.

8.1.2.AP.2: Model the way programs store and manipulate data by using numbers or other symbols to represent information.

8.1.2.AP.3: Create programs with sequences and simple loops to accomplish tasks.

8.1.2.AP.4: Break down a task into a sequence of steps.

8.1.2.AP.5: Describe a program's sequence of events, goals, and expected outcomes.

8.1.2.AP.6: Debug errors in an algorithm or program that includes sequences and simple loops.

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.

Interdisciplinary Standard(s)
NJSLS - ELA Standards **NJSLSA.W2.** Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content. **NJSLSA.W5.** Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach. **NJSLSA.W6**. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others. **NJSLSA.RI.3.5**. Use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information relevant to a given topic efficiently. **NJSLSA.RI.3.7**. Use information gained from text features (e.g., illustrations, maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur). **NJSLSA.RI.5.4** Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 5 topic or subject area. **NJSLSA.SL1**. Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively. **NJSLSA.SL3.** Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric. **NJSLSA.SL4.** Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience. **NJSLSA.SL5.** Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations. **NJSLS - Math Standards** **NJSLS.2**.NBT.B Measuring Length **NJSLS.3.G.A** Spatial Reasoning and Fluency with Operations **NJSLS.3.NF.A** Introductory Fraction Concepts

NJSLS.4.G.A Geometry and Measurement

NJSLS.4.MD.C Geometry and Measurement

NJSLS.5.G.A The Coordinate System and Classifying Two-Dimensional Figures

Enduring Understandings:

- Designing a program requires algorithms and abstraction just as in general problem solving.
- Proper program design requires several steps, and often requires the developer to go back and redesign the program several times.
- Programming is a collaborative endeavor, as many are often modified by others to improve upon or use for another purpose.
- Identify web programming languages.
- Identify the types of applications that can be made through the use of a computer program.
- Identify situations where the use of looping is appropriate.
- Explain the difficulty of translating real problems into programs.
- Demonstrate that ideas may feel clear and yet still be misinterpreted by a computer

Essential Question(s) :

- How can we get computers to do what we want them to do?
- What is an algorithm?
- How can you break down a task into a sequence of steps?
- How can writing out an algorithm before programming be helpful when coding (pseudocode)?
- How does debugging allow us to find errors in a program?
- How do loops improve our programs (code efficiency)?
- How can we control our sprites' movements (events)?
- How can we animate our sprites (behaviors)?
- How do we use conditionals to help a computer make decisions?
- What is a variable and how do you clearly name variables to store and modify data?
- When is it okay to modify, remix, or incorporate pieces of existing programs into one's own work to add additional features or create a new program?
- When should you test your program to ensure it works as intended?

In this unit plan, the following 21st Century themes and skills are addressed:					
			E-Encouraged, T-Taught, or A-Assessed		
21st Century Themes			**21st Century Skills**		
	X	**Global Awareness**		X	**Critical Thinking & Problem Solving**
	X	**Environmental Literacy**			**Creativity and Innovation**
	X	**Health Literacy**		X	**Collaboration, Teamwork and Leadership**
	X	**Civic Literacy**			**Cross-Cultural and Interpersonal Communication**
	X	**Financial, Economic, Business and Entrepreneurial Literacy**			**Communication and Media Fluency**
					Accountability, Productivity and Ethics

In this unit plan, the following Career Ready Practices are addressed:	
E-Encouraged, T-Taught, or A-Assessed	
E	**CRP1. Act as a responsible and contributing citizen and employee CRP2.**
T	**Apply appropriate academic and technical skills**
	CRP3. Attend to personal health and financial well-being CRP4.
T	**Communicate clearly and effectively with reason**
E	**CRP5. Consider the environmental, social and economic impacts of decisions CRP6.**
T	**Demonstrate creativity and innovation**
	CRP7. Employ valid and reliable research strategies
E	**CRP8. Utilize critical thinking to make sense of problems and persevere in solving them CRP9.**
T	**Model integrity, ethical leadership and effective management**
E	**CRP10. Plan education and career paths aligned to personal goals**
T	**CRP11. Use technology to enhance productivity**
T	**CRP12. Work productively in teams while using cultural global competence**

Student Learning Goals/Objectives:	
Students will understand how : Unplugged activities and Online activities are used for various programming applications	
Assessment Evidence:	
Completed programs, mini-projects, end of course projects Teacher created exit tickets Journals and self-reflection	**Other Assessment Measures*:*** Teacher observation
Teaching and Learning Actions:	
Instructional Strategies and Activities	• Design a program to accomplish a task. • Break down a task into a sequence of steps. • Describe a program's sequence of events, goals, and expected outcomes. • Model the way programs store and manipulate data by using numbers or other symbols to represent information. • Explain the importance of pseudocode (why is it important to write out an algorithm before coding?) • Describe how we can get computers to do what we want them to do. • Create a program to control a sprites' movements. • Analyze your code for bugs and explain how debugging allows us to improve our projects. • Design an algorithm that uses loops to improve code efficiency. • Develop a program that will animate our sprites. • How do we use conditionals to help a computer make decisions? • 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. • 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.

Resources	
• Chromebook or other digital device, Internet • Online coding websites • Unplugged activities (CS Unplugged, Code.org, Barefoot Computing and others)	
Suggested Time Frame:	FULL YEAR

Content Area:	Technology	Grade(s) 3-5
Unit Plan Title:	Computing Systems	

Overview/Rationale

People interact with a wide variety of computing devices that collect, store, analyze, and act upon information in ways that can affect human capabilities both positively and negatively. The physical components (hardware) and instructions (software) that make up a computing system communicate and process information in digital form. Because computing devices are composed of an interconnected system of hardware and software, troubleshooting strategies may need to address both.

Technology Standard(s) (Established Goals)

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.

8.1.2.CS.2: Explain the functions of common software and hardware components of computing systems.

8.1.2.CS.3: Describe basic hardware and software problems using accurate terminology.

8.1.5.CS.1: Model how computing devices connect to other components to form a system.

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

Interdisciplinary Standard(s)

NJSLS - ELA Standards

NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

NJSLSA.RI.3.5. Use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information relevant to a given topic efficiently.

NJSLSA.RI.3.7. Use information gained from text features (e.g., illustrations, maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).

NJSLSA.RI.5.4 Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 5 topic or subject area.

NJSLSA.SL1. Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

NJSLSA.SL4. Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

NJSLSA.SL5. Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations

Enduring Understandings:

- Individuals use computing devices to perform a variety of tasks accurately and quickly.
- Computing devices interpret and follow the instructions they are given literally.
- A computing system is composed of software and hardware.
- Describing a problem is the first step toward finding a solution when computing systems do not work as expected.
- 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

Essential Question(s) :

- What is the difference between hardware and software?
- What are the images or actual components of hardware or software?
- Describe the relationship between hardware and software. How does one require the other?
- What are the different parts of the computer?
- Which component is the brain of the computer?
- What are the different peripheral devices available for different types of computers?
- How does input-output-processing work?
- How can some parts be both input and output devices?
- How do computers and/or software impact your family and community?
- What are common problems that arise in computer hardware/software?
- What are some troubleshooting strategies that you can use to repair a computer problem?

In this unit plan, the following 21st Century themes and skills are addressed:

E-Encouraged, T-Taught, or A-Assessed

	21st Century Themes			21st Century Skills
X	Global Awareness		T	Critical Thinking & Problem Solving
X	Environmental Literacy		T	Creativity and Innovation
X	Health Literacy		T	Collaboration, Teamwork and Leadership
X	Civic Literacy		E	Cross-Cultural and Interpersonal Communication
X	Financial, Economic, Business and Entrepreneurial Literacy		E	Communication and Media Fluency
			T	Accountability, Productivity and Ethics

In this unit plan, the following Career Ready Practices are addressed:

E-Encouraged, T-Taught, or A-Assessed

E	CRP1. Act as a responsible and contributing citizen and employee
E	CRP2. Apply appropriate academic and technical skills
	CRP3. Attend to personal health and financial well-being
E	CRP4.Communicate clearly and effectively with reason
E	CRP5. Consider the environmental, social and economic impacts of decisions
T	CRP6.Demonstrate creativity and innovation
	CRP7. Employ valid and reliable research strategies
T	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them
T	CRP9Model integrity, ethical leadership and effective management
T	CRP10. Plan education and career paths aligned to personal goals
T	CRP11. Use technology to enhance productivity
E	CRP12. Work productively in teams while using cultural global competence

Student Learning Goals/Objectives:	
The students will understand how to use: • Hardware • Software • Input-output-processing • When to choose a particular device over another. • Troubleshooting	
Assessment Evidence:	
Completed projects Teacher created exit tickets Journals and self-reflection	**Other Assessment Measures*:*** Teacher observation
Teaching and Learning Actions:	
Instructional Strategies and Activities	• Videos on computer components. • See and touch the inside of various types of computers. • Build your own paper computer. • Research the different parts of the computer and define what they do. • Use physical devices to explain input-output-processing. • Use a journal to reflect on the lesson. • Discuss with a partner, group, or whole class.
Resources	
Computers and Internet Identify any sources used here – websites, etc.	
Suggested Time Frame:	4 weeks

Content Area:	Technology	Grade(s) 3-5
Unit Plan Title:	**Impacts of Computing**	

Overview/Rationale

Computing affects many aspects of the world in both positive and negative ways at local, national, and global levels. Individuals and communities influence computing through their behaviors and cultural and social interactions, and, in turn, computing influences new cultural practices.

Technology Standard(s) (Established Goals)

8.1.2.IC.1: Compare how individuals live and work before and after the implementation of new computing technology.

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.

9.4.5.DC.6: Compare and contrast how digital tools have changed social interactions.

Interdisciplinary Standard(s)

NJSLS - ELA Standards

NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

NJSLSA.RI.3.5. Use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information relevant to a given topic efficiently.

NJSLSA.RI.3.7. Use information gained from text features (e.g., illustrations, maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).

NJSLSA.RI.5.4 Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 5 topic or subject area.

NJSLSA.SL1. Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

NJSLSA.SL4. Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

NJSLSA.SL5. Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

Enduring Understandings:

Computing technology has positively and negatively changed the way individuals live and work (e.g., entertainment, communication, productivity tools). In the past, if students wanted to read about a topic, they needed access to a library to find a book about it. Today, students can view and read information on the Internet about a topic or they can download e-books about it directly to a device. Such information may be available in more than one language and could be read to a student, allowing for great accessibility.The development and modification of computing technology is driven by people's needs and wants and can affect individuals differently. New computing technology is created and existing technologies are modified for many reasons, including to increase their benefits, decrease their risks, and meet societal needs.

Essential Question(s) :

- How do computers help us? How would you get certain jobs done without a computer?
- What were the first computers like?
- Reflect and discuss how computers have changed over time. How have some of these computers changed from what they used to look like and what we use them for?
- What futurist's predictions do you think will come to fruition? What predictions have already been realized?
- What technology available might help someone with a disability?
- What could you design to help someone that is not already available?

In this unit plan, the following 21st Century themes and skills are addressed:

		***E**-Encouraged, **T**-Taught, or **A**-Assessed*			
21st Century Themes			**21st Century Skills**		
	X	**Global Awareness**		**T**	**Critical Thinking & Problem Solving**
	X	**Environmental Literacy**		**T**	**Creativity and Innovation**
	X	**Health Literacy**		**T**	**Collaboration, Teamwork and Leadership**
	X	**Civic Literacy**			**Cross-Cultural and Interpersonal Communication**

X	Financial, Economic, Business and Entrepreneurial Literacy	E	Communication and Media Fluency	
			Accountability, Productivity and Ethics	

In this unit plan, the following Career Ready Practices are addressed:

***E**-Encouraged, **T**-Taught, or **A**-Assessed*

E	**CRP1. Act as a responsible and contributing citizen and employee.**
T	**CRP2 Apply appropriate academic and technical skills**
E	**CRP3. Attend to personal health and financial well-being.**
	CPR4Communicate clearly and effectively with reason
T	**CRP5. Consider the environmental, social and economic impacts of decisions.**
T	**CRP6 Demonstrate creativity and innovation**
	CRP7. Employ valid and reliable research strategies
E	**CRP8. Utilize critical thinking to make sense of problems and persevere in solving them .**
T	**CRP9 Model integrity, ethical leadership and effective management**
T	**CRP10. Plan education and career paths aligned to personal goals**
T	**CRP11. Use technology to enhance productivity**
	CRP12. Work productively in teams while using cultural global competence

Student Learning Goals/Objectives:

The students will have;

Student discussion on topics that relate to the history of technology and the changes in the world due to technology. Topics could include robotics, wearable computing, artificial intelligence, cybersecurity, or current news content

Assessment Evidence:	
Completed projects Teacher created exit tickets Journals and self-reflection	**Other Assessment Measures*:*** Teacher observation
Teaching and Learning Actions:	
Instructional Strategies and Activities	• Teacher created slide presentations. • Videos on the history of computers. • Use a journal to reflect on the lesson. • Discuss with a partner, group, or whole class. • Research and design something that might help someone with a diverse need or want. • Use physical devices to build something that might help someone with a diverse need or want.
Resources	
• Chromebook or other digital device, Internet • Books on famous figures in computer science • BrainPop • Physical device; littleBits, micro:bit, Makey Makey	
Suggested Time Frame:	4 weeks

Content Area:	Technology	Grade(s) 3-5
Unit Plan Title:	**Networks and the Internet**	

Overview/Rationale

Computing devices typically do not operate in isolation. Networks connect computing devices to share information and resources and are an increasingly integral part of computing. Networks and communication systems provide greater connectivity in the computing world.

Technology Standard(s) (Established Goals)

8.1.2.NI.1: Model and describe how individuals use computers to connect to other individuals, places, information, and ideas through a network.

8.1.2.NI.2: Describe how the Internet enables individuals to connect with others worldwide.

8.1.2.NI.3: Create a password that secures access to a device. Explain why it is important to create unique passwords that are not shared with others.

8.1.2.NI.4: Explain why access to devices need to be secured.

8.1.5.NI.1: Develop models that successfully transmit and receive information using both wired and wireless methods.

8.1.5.NI.2: Describe physical and digital security measures for protecting sensitive personal information.

9.4.2.DC.3: Explain how to be safe online and follow safe practices when using the internet

9.4.2.DC.4: Compare information that should be kept private to information that might be made public.

9.4.2.DC.5: Explain what a digital footprint is and how it is created.

9.4.2.DC.6: Identify respectful and responsible ways to communicate in digital environments.

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.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.

Interdisciplinary Standard(s)

NJSLS - ELA Standards

NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

NJSLSA.RI.3.5. Use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information relevant to a given topic efficiently.

NJSLSA.RI.3.7. Use information gained from text features (e.g., illustrations, maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).

NJSLSA.RI.5.4 Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 5 topic or subject area.

NJSLSA.SL1. Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

NJSLSA.SL4. Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

NJSLSA.SL5. Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations

Enduring Understandings:

- Computer networks can be used to connect individuals to other individuals, places, information, and ideas.
- The Internet enables individuals to connect with others worldwide.
- Connecting devices to a network or the Internet provides great benefits, but care must be taken to use authentication measures, such as strong passwords, to protect devices and information from unauthorized access.
- Information needs a physical or wireless path to travel to be sent and received.
- Distinguishing between public and private information is important for safe and secure online interactions.
- Information can be protected using various security measures (cybersecurity i.e., physical and digital).

Essential Question(s) :

- What is the Internet?
- What is the World Wide Web?

- What is the difference between the Internet and the World Wide Web?
- What types of information might you find on the Internet? Where else can you find the same information?
- How do you communicate with others on the Internet?
- How are devices connected to the Internet? Explain the difference between wired and wireless connections.
- Why is it important to keep your information private?
- How do you protect yourself from hackers?
- How do you keep your information safe?

In this unit plan, the following 21st Century themes and skills are addressed:

E-Encouraged, T-Taught, or A-Assessed

	21st Century Themes			21st Century Skills
X	Global Awareness		E	Critical Thinking & Problem Solving
X	Environmental Literacy		E	Creativity and Innovation
X	Health Literacy			Collaboration, Teamwork and Leadership
X	Civic Literacy			Cross-Cultural and Interpersonal Communication
X	Financial, Economic, Business and Entrepreneurial Literacy			Communication and Media Fluency
				Accountability, Productivity and Ethics

In this unit plan, the following Career Ready Practices are addressed:

E-Encouraged, T-Taught, or A-Assessed

E	CRP1. Act as a responsible and contributing citizen and employee.
T	CRP2 Apply appropriate academic and technical skills
	CRP3. Attend to personal health and financial well-being.
E	CPR4Communicate clearly and effectively with reason
E	CRP5. Consider the environmental, social and economic impacts of decisions.
T	CRP6 Demonstrate creativity and innovation
	CRP7. Employ valid and reliable research strategies

	E	**CRP8. Utilize critical thinking to make sense of problems and persevere in solving them .**
	T	**CRP9 Model integrity, ethical leadership and effective management**
	E	**CRP10. Plan education and career paths aligned to personal goals**
	T	**CRP11. Use technology to enhance productivity**
	T	**CRP12. Work productively in teams while using cultural global competence**

Student Learning Goals/Objectives:

The students will:

- Explain what we use the Internet for.
- Explain what a network is.
- Demonstrate how information is transmitted over the Internet.
- Use the internet to connect with other classes or with information

Assessment Evidence:

Completed projects Teacher created exit tickets Journals and self-reflection	**Other Assessment Measures** Teacher observation

Teaching and Learning Actions:

Instructional Strategies and Activities	• Teacher created slide presentations. • Videos on the networks and the internet. • Use a journal to reflect on the lesson. • Discuss with a partner, group, or whole class. • Use physical devices to replicate how networks work.

Resources	
• Chromebook or other digital device, Internet • BrainPop • Physical device; littleBits, micro:bit, Makey Makey	
Suggested Time Frame:	4 weeks

Content Area:	**Technology**	**Grade(s) 3-5**
Unit Plan Title:	**Multimedia Presentations**	

Overview/Rationale

Multimedia presentations are a graphic means of presenting information to enhance a message.

Technology Standard(s) (Established Goals)

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.

8.1.2.DA.1: Collect and present data, including climate change data, in various visual formats.

8.1.5.DA.1: Collect, organize, and display data in order to highlight relationships or support a claim.

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.4: Organize and present climate change data visually to highlight relationships or support a claim.

9.4.2.IML.2: Represent data in a visual format to tell a story about the data

9.4.2.IML.3: Use a variety of sources including multimedia sources to find information about topics such as climate change, with guidance and support from adults.

9.4.2.TL.6: Illustrate and communicate ideas and stories using multiple digital tools.

9.4.2.TL.7: Describe the benefits of collaborating with others to complete digital tasks or develop digital artifacts.

9.4.5.IML.2: Create a visual representation to organize information about a problem or issue.

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.

9.4.5.TL.5: Collaborate digitally to produce an artifact.

Interdisciplinary Standard(s)

NJSLS - ELA Standards

NJSLSA.W2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

NJSLSA.W5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

NJSLSA.RI.3.5. Use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information relevant to a given topic efficiently.

NJSLSA.RI.3.7. Use information gained from text features (e.g., illustrations, maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).

NJSLSA.RI.5.4 Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 5 topic or subject area.

NJSLSA.SL1. Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

NJSLSA.SL3. Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric.

NJSLSA.SL4. Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

NJSLSA.SL5. Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

Enduring Understandings:

Multimedia presentations allow presenters to display information visually which makes the delivery of the content more efficient and the information more memorable

Multimedia presentations can display images, graphs, charts, video, audio, and other components that make the content more interesting and easier to understand

Essential Question(s) :

- What are the characteristics of an exemplary multimedia presentation?
- How are multimedia presentations used in school? Outside of school?
- How can you make your presentation visually appealing?
- When should you use graphics? Video? Animations? Transitions?
- How do you change the font type, font styles, font color, etc.?
- How can you modify images to remove backgrounds, resize, crop, etc.?

In this unit plan, the following 21st Century themes and skills are addressed:

***E**-Encouraged, **T**-Taught, or **A**-Assessed*

	21st Century Themes			21st Century Skills
	X	Global Awareness	T	Critical Thinking & Problem Solving
		Environmental Literacy	E	Creativity and Innovation
	X	Health Literacy	E	Collaboration, Teamwork and Leadership
	X	Civic Literacy		Cross-Cultural and Interpersonal Communication
	X	Financial, Economic, Business and Entrepreneurial Literacy	T	Communication and Media Fluency
			T	Accountability, Productivity and Ethics

In this unit plan, the following Career Ready Practices are addressed:

***E**-Encouraged, **T**-Taught, or **A**-Assessed*

	T	CRP1. Act as a responsible and contributing citizen and employee.
	T	CRP2 Apply appropriate academic and technical skills

	T	**CRP3. Attend to personal health and financial well-being.**
	E	**CPR4Communicate clearly and effectively with reason**
	E	**CRP5. Consider the environmental, social and economic impacts of decisions.**
		CRP6 Demonstrate creativity and innovation
	T	**CRP7. Employ valid and reliable research strategies**
	T	**CRP8. Utilize critical thinking to make sense of problems and persevere in solving them .**
	T	**CRP9 Model integrity, ethical leadership and effective management**
	T	**CRP10. Plan education and career paths aligned to personal goals**
	E	**CRP11. Use technology to enhance productivity**
		CRP12. Work productively in teams while using cultural global competence

Student Learning Goals/Objectives:

Students will be able to communicate information and ideas to multiple audiences using a variety of media and formats.
Students will create projects using various media formats.

Assessment Evidence:

Completed multimedia presentation
Presentation Rubric

Teaching and Learning Actions:

Instructional Strategies and Activities	Possible activities may include and are not limited to, depending upon applications available: • Brochures • Slide presentations • Project created using a coding platform • Posters • Video • Audio • Physical computing

Resources	
• Chromebook or other digital device, Internet • Online coding websites • Google applications • Flipgrid or Seesaw • Other graphic applications depending upon applications available	
Suggested Time Frame:	6 weeks

Content Area:	Technology	Grade(s) 3-5
Unit Plan Title:	Data and Analysis	

Overview/Rationale

Computing systems exist to process data. The amount of digital data generated in the world is rapidly expanding, so the need to process data effectively is increasingly important. Data is collected and stored so that it can be analyzed to better understand the world and make more accurate predictions

Technology Standard(s) (Established Goals)

8.1.2.DA.1: Collect and present data, including climate change data, in various visual formats.

8.1.2.DA.2: Store, copy, search, retrieve, modify, and delete data using a computing device.

8.1.2.DA.3: Identify and describe patterns in data visualizations. 8.1.2.DA.4: Make predictions based on data using charts or graphs.

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.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.

9.4.2.TL.3: Enter information into a spreadsheet and sort the information.

Interdisciplinary Standard(s)

NJSLS - ELA Standards

NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

NJSLSA.RI.5.4 Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 5 topic or subject area.

NJSLSA.SL4. Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

NJSLSA.SL5. Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

NJSLS - Math Standards

NJSLS.2.MD.D.10 Measurement Data and Data Representations

NJSLS.3.MD.B.3 Spatial Reasoning and Fluency with Operations

Enduring Understandings:

- Individuals collect, use, and display data about individuals and the world around them.
- Computers store data that can be retrieved later. Data can be copied, stored in multiple locations, and retrieved.
- Data can be used to make predictions about the world.
- Data can be organized, displayed, and presented to highlight relationships.
- The type of data being stored affects the storage requirements.
- 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.

Essential Question(s) : (What provocative questions will foster inquiry, understanding, and transfer of learning?)

- How can you use data to predict an event?
- What are some ways you can use to collect data?
- What is a table?
- What is a graph?
- What are the common types of graphs (bar, column, pie, line)?
- How can you display data in a way that helps you make a decision?
- What inferences and/or predictions can you make about the data you collected?
- How can you store data?
- How can spreadsheets be used to efficiently manage data?
- How can you use multimedia presentations to create and share data with a purpose?

In this unit plan, the following 21st Century themes and skills are addressed:					
		E-Encouraged, T-Taught, or A-Assessed			
21st Century Themes			**21st Century Skills**		
	X	**Global Awareness**		T	**Critical Thinking & Problem Solving**
	X	**Environmental Literacy**		T	**Creativity and Innovation**
	X	**Health Literacy**		T	**Collaboration, Teamwork and Leadership**
	X	**Civic Literacy**			**Cross-Cultural and Interpersonal Communication**
	X	**Financial, Economic, Business and Entrepreneurial Literacy**		T	**Communication and Media Fluency**
				E	**Accountability, Productivity and Ethics**

In this unit plan, the following Career Ready Practices are addressed:		
E-Encouraged, T-Taught, or A-Assessed		
	A	**CRP1. Act as a responsible and contributing citizen and employee.**
	A	**CRP2 Apply appropriate academic and technical skills**
		CRP3. Attend to personal health and financial well-being.
	T	**CPR4Communicate clearly and effectively with reason**
		CRP5. Consider the environmental, social and economic impacts of decisions.
	T	**CRP6 Demonstrate creativity and innovation**
		CRP7. Employ valid and reliable research strategies
	T	**CRP8. Utilize critical thinking to make sense of problems and persevere in solving them .**
	E	**CRP9 Model integrity, ethical leadership and effective management**
	T	**CRP10. Plan education and career paths aligned to personal goals**
	E	

	E	**CRP11. Use technology to enhance productivity** **CRP12. Work productively in teams while using cultural global competence**

Student Learning Goals/Objectives:

- Students collect data on various subjects.
- Students record the data on a survey, paper tally sheet, or spreadsheet.
- Students analyze the data.
- Students present the data in a multimedia format.

Assessment Evidence:

Completed projects
Teacher created exit tickets
Journals and self-reflection
Teacher observation

Teaching and Learning Actions:

Instructional Strategies and Activities	• Teacher created activities to collect data, analyze, and display data. • Work with a partner, group, or whole class. • Use a journal to reflect on the lesson. • Class discussion on the findings.

Resources

Chromebook or other digital device, Internet

Suggested Time Frame:	4 weeks

Grades 3 -5 Technology Curriculum Map

3rd through 5th Grade		3rd Grade	4th Grade	5th Grade
Technology				
8.1 Computer Science				
Computer Systems				
8.1.2.CS.1 Model how computing devices connect to other components to form a system.	Computing devices may be connected to other devices to form a system as a way to extend their capabilities.	✔	✔	✔
8.1.2.CS2 Model how computer software and hardware work together as a system to accomplish tasks.	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.3 Identify potential solutions for simple hardware and software problems using common troubleshooting strategies.	Shared features allow for common troubleshooting strategies that can be effective for many systems.			✔
Networks and the Internet				
8.1.5.NI.1 Develop models that successfully transmit and receive information using both wired and wireless methods.	Information needs a physical or wireless path to travel to be sent and received.			✔
8.1.5.NI.2: Describe physical and digital security measures for protecting sensitive personal information.	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).	✔	✔	✔

Impacts of Computing				
● **8.1.5.IC.1:** Identify computing technologies that have impacted how individuals live and work and describe the factors that influenced the changes	The development and modification of computing technology is driven by individual's needs and wants and can affect individuals differently		✔	✔
● **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.	The development and modification of computing technology is driven by individual's needs and wants and can affect individuals differently.		✔	✔
Data & Analysis				
8.1.5.DA.1: Collect, organize, and display data in order to highlight relationships or support a claim.	Data can be organized, displayed, and presented to highlight relationships.	✔	✔	✔
8.1.5.DA.2: Compare the amount of storage space required for different types of data.	The type of data being stored affects the storage requirements.	✔	✔	✔
● **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.4:** Organize and present climate change data visually to highlight relationships or support a claim.	Individuals can select, organize, and transform data into different visual representations and communicate insights gained from the data.	✔	✔	✔
8.1.5.DA.5: Propose cause and effect relationships, predict outcomes, or communicate ideas using data	Many factors influence the accuracy of inferences and predictions.	✔	✔	✔
Algorithms & Programming				
8.1.5.AP.1: Compare and refine multiple algorithms for the same task and determine which is the most appropriate.	Different algorithms can achieve the same result. Some algorithms are more appropriate for a specific use than others.		✔	✔
8.1.5.AP.2: Create programs that use clearly named variables to store and modify data	Programming languages provide variables, which are used to store and modify data.			✔

8.1.5.AP.3: Create programs that include sequences, events, loops, and conditional	A variety of control structures are used to change the flow of program execution (e.g., sequences, events, loops, 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.	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.6: Develop programs using an iterative process, implement the program design, and test the program to ensure it works as intended.	Individuals develop programs using an iterative process involving design, implementation, testing, and review.	✔	✔	✔

Grades 3 -5 Technology Curriculum Map

3rd through 5th Grade		**3rd Grade**	**4th Grade**	**5th Grade**
Technology				
8.2Dessign by Thinking				
Engineering Design				
● **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.	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.3**: Follow step by step directions to assemble a product or solve a problem, using appropriate tools to accomplish the task.				
● **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 tradeoffs identified in the design process	Engineering design requirements include desired features and limitations that need to be considered.			✔
Interaction of Technology and Humans				
8.2.5.ITH.1: Explain how societal needs and wants influence the development and function of a product and a system.	Societal needs and wants determine which new tools are developed to address real-world problems.	✔	✔	
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.	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.	✔	✔	✔

Nature of Technology				
● **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.	Technology innovation and improvement may be influenced by a variety of factors. Engineers create and modify technologies to meet people's needs and wants; scientists ask questions about the natural world.		✔	✔
Effects of Technology on the Natural World				
● **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	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 non-renewable resources.	✔	✔	✔

increase positive effects and to reduce any negative effects, such as climate change.				
Ethics & Culture				
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.	Technological choices and opportunities vary due to factors such as differences in economic resources, location, and cultural values.	✔	✔	✔

Differentiation for Support (ELL, Special Education, Students at Risk)		
Students with 504 Plans, ELL, Special ED and At-Risk · Scaffolding assignments · Chunking of material · Allow for errors · Study Guides · Pre-teach material · Rephrase questions & directions · Oral and written assignments · Assessment review · Focus on essential vocabulary · Guided questioning and notetaking · Peer editing and review · Use of assisted technology · Visual learning · Small group jigsaw · Teacher modeling · Partner/group work · Notebook checks · Current events · Online videos	Differentiation for Enrichment · More complex tasks and projects · Higher level questioning and techniques · Peer mentoring · Independent extension of content based on interest · Supplemental reading · Independent study · Real world problems and scenarios · Student driven	Work to be posted via Google Classroom Allow students to preview work the week prior Extended time for classwork/Assignments Guided notes will be provided based upon IEP

Assessments

Suggested Formative/Summative Classroom Assessments

Summative Assessments	**Formative Assessments**
Multiple Choice Tests	· **Discussion**
Weekly Tests	· **Demonstration**
· Rubric	· **Reading**
· Teacher Conference	· **Individual/group projects**
· Journals/Writer's Notebook	· **Drawings**
· Portfolio	· **Posters**
Graphic Organizers	· **Collages**
Reading Responses	· **Work sheets**
Learning Response Log	· **Role play**
Exit Slips	
· Individual Whiteboards	
· Peer/Self Assessments	**Alternative Assessments**
· Think-Pair-Share	Collaborative testing.
Constructive Quizzes	Student portfolios
	Performance Tests
	Conferencing