Lavallette Elementary School	Technology
Content Area: Technology **Course Title:** Technology	**Grade Level:** K-2
Unit Plan 1 Basic Operations & Network Skills Keyboarding Word Processing Acceptable Use/Copyright/Plagiarism Digital Citizenship	Marking Period 1 September - November
Unit Plan 2 Keyboarding Word Processing Communication & Collaboration PARCC	Marking Period 2 November - January
Unit Plan 3 Keyboarding Spreadsheets Multimedia/Presentation Tools	Marking Period 3 January - April
Unit Plan 4 Keyboarding Research & Gathering Information Communication & Collaboration	Marking Period 4 May - June
Updated: August 2018 by Sharon Carroll	Board Approved: 10/16/18

Lavallette Elementary School
Technology Curriculum
Unit Overview

Content Area: Technology

Standard: 8.1 Educational Technology
Standard: 8.2 Technology Education, Engineering, Design, and Computational Thinking, Programming

Strand 8.1

- ✓ Technology Operations and Concepts
- ✓ Creativity and Innovation
- ✓ Communication and Collaboration
- ✓ Digital Citizenship
- ✓ Research and Information Fluency
- ✓ Critical Thinking, Problem Solving, and Decision Making

Summary 8.1

- All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaboratively and to create and communicate knowledge.

Strand 8.2

- ✓ The Nature of Technology: Creativity and Innovation
- ✓ Technology and Society
- ✓ Design
- ✓ Abilities for a Technological World
- ✓ Computational Thinking: Programming

Summary 8.2

- All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Primary Interdisciplinary Connections: Mathematics, Language Arts Literacy, Science, Social Studies. All of the NJ State Standards may be found on the New Jersey state website.

Learning Targets

Content Standards 8.1

Students will:

- Understand and use technology systems.
- Select and use applications effectively and productively.
- Apply existing knowledge to generate new ideas, products, or processes.
- Create original works as a means of personal or group expression.
- Collaborate and publish with peers, experts, or others by using a variety of digital media.
- Communicate information and ideas to multiple audiences using a variety of media and formats.
- Develop cultural understanding and global awareness by engaging with learners of other cultures.
- Contribute to project teams to produce original works or solve problems.
- Advocate and practice safe, legal, and responsible use of information and technology.
- Plan strategies to guide inquiry.
- Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media.
- Evaluate and select information sources and digital tools based on the appropriateness for specific tasks.
- Identify and define authentic problems and significant questions for investigation.
- Plan and manage activities to develop a solution or complete a project.
- To collect and analyze data to identify solutions and/or make informed decisions.
- Use multiple processes and diverse perspectives to explore alternative solutions.

Number	Standard for Mastery
8.1.2.A.1	Identify the basic features of a digital device and explain its purpose.
8.1.2.A.2	Create a document using a word processing application.
8.1.2.A.3	Compare the common uses of at least two different digital applications and identify the advantages and disadvantages of using each.

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.A.5	Enter information into a spreadsheet and sort the information.
8.1.2.A.6	Identify the structure and components of a database.
8.1.2.A.7	Enter information into a database or spreadsheet and filter the information.
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.
8.1.2.C.1	Engage in a variety of developmentally appropriate learning activities with students in other classes, schools, or countries using various media formats such as online collaborative tools, and social media.
8.1.2.D.1	Develop an understanding of ownership of print and nonprint information.
8.1.2.E.1	Use digital tools and online resources to explore a problem or issue.
8.1.2.F.1	Use geographic mapping tools to plan and solve problems.

Unit Essential Questions	**Unit Enduring Understandings** *Students will understand that….*
● What skills do I need to learn to be a 21st century student? ● How do I choose the right digital tools and when do I use them? ● How can I use my digital tools and skills in new situations?	● Technology is always changing and we need to be lifelong learners ● We should use technology based on our personal and/or career needs ● A tool is only as good as the person using it ● Digital tools allow for communication and collaboration anytime/anyplace worldwide

Unit Objectives *Students will know…*	**Unit Objectives** *Students will be able to…*
● The use of technology and digital	● Identify the basic features of a

tools requires knowledge and appropriate use of operations and related applications. ● Digital tools and environments support the learning process and foster collaboration in solving local or global issues and problems. ● Technology products and systems impact every aspect of the world in which we live. ● Collect and post the results of a digital classroom survey about a problem or issue and use data to suggest solutions. ● Digital tools facilitate local and global communication and collaboration in designing products and systems. ● Technological products and systems are created through the application and appropriate use of technological resources.	digital device and explain its purpose. ● Create a document using a word processing application. ● Compare the common uses of at least two different digital applications and identify the advantages and disadvantages of using each. ● Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums) ● Enter information into a spreadsheet and sort the information. ● Identify the structure and components of a database. ● Enter information into a database or spreadsheet and filter the information. ● Illustrate and communicate original ideas and stories using multiple digital tools and resources. ● Engage in a variety of developmentally appropriate learning activities with students in other classes, schools, or countries using various media formats such as online collaborative tools, and social media. ● Develop an understanding of ownership of print and nonprint information. ● Use digital tools and online resources to explore a problem or issue. ● Use geographic mapping tools to plan and solve problems.

Content Standards 8.2

Students will be able to/or understand:

- The characteristics and scope of technology.
- The core concepts of technology.
- The relationships among technologies and the connections between technology and other fields of study.
- The cultural, social, economic, and political effects of technology.
- The effects of technology on the environment.
- The role of society in the development and use of technology.
- The influence of technology on history.
- The attributes of design.
- The application of engineering design.
- The role of troubleshooting, research/development, invention/innovation, and experimentation in problem solving.
- Apply the design process.
- Use and maintain technological products and systems.
- Assess the impact of products and systems.
- Computational thinking and computer programming as tools used in design and engineering.

Number	Standard for Mastery
8.2.2.A.1	Define products produced as a result of technology or of nature.
8.2.2.A.2	Describe how designed products and systems are useful at school, home and work.
8.2.2.A.3	Identify a system and the components that work together to accomplish its purpose.
8.2.2.A.4	Choose a product to make and plan the tools and materials needed.
8.2.2.A.5	Collaborate to design a solution to a problem affecting the community.
8.2.2.B.1	Identify how technology impacts or improves life.
8.2.2.B.2	Demonstrate how reusing a product affects the local and global environment.
8.2.2.B.3	Identify products or systems that are designed to meet human needs.

8.2.2.B.4	Identify how the ways people live and work has changed because of technology.
8.2.2.C.1	Brainstorm ideas on how to solve a problem or build a product.
8.2.2.C.2	Create a drawing of a product or device that communicates its function to peers and discuss.
8.2.2.C.3	Explain why we need to make new products.
8.2.2.C.4	Identify designed products and brainstorm how to improve one used in the classroom.
8.2.2.C.5	Describe how the parts of a common toy or tool interact and work as part of a system.
8.2.2.C.6	Investigate a product that has stopped working and brainstorm ideas to correct the problem.
8.2.2.D.1	Collaborate and apply a design process to solve a simple problem from everyday experiences.
8.2.2.D.2	Discover how a product works by taking it apart, sketching how parts fit, and putting it back together.

8.2.2.D.3	Identify the strengths and weaknesses in a product or system.
8.2.2.D.4	Identify the resources needed to create technological products or systems.
8.2.2.D.5	Identify how using a tool (such as a bucket or wagon) aids in reducing work.
8.2.2.E.1	List and demonstrate the steps to an everyday task.
8.2.2.E.2	Demonstrate an understanding of how a computer takes input through a series of written commands and then interprets and displays information as output.
8.2.2.E.3	Create algorithms (a set of instructions) using a predefined set of commands (e.g. to move a student or a character through a maze).

8.2.2.E.4	Debug an algorithm (i.e. correct an error).
8.2.2.E.5	Use appropriate terms in conversation (e.g. basic vocabulary words: input, output, the operating system, debug, and algorithm).

Unit Essential Questions	**Unit Enduring Understandings**
● How does a broken part affect the use of a toy or tool? ● How does technology affect my life and others? ● What does it mean to be a safe and responsible 21st century learner?	*Students will understand that...* ● Technology highly influences individuals, family, community, and the environment. ● Individual parts make up a system and rely on each other to work properly.

Unit Objectives *Students will know…*	**Unit Objectives** *Students will be able to…*
● The use of technology and digital tools requires knowledge and appropriate use of operations and related applications. ● Collect and post the results of a digital classroom survey about a problem or issue and use data to suggest solutions. ● Digital tools facilitate local and global communication and collaboration in designing products and systems. ● Technological products and systems are created through the application and appropriate use of technological resources. ● The design process is a systematic approach to solving problems.	● Define products produced as a result of technology or of nature. ● Describe how designed products and systems are useful at school, home and work. ● Identify a system and the components that work together to accomplish its purpose. ● Choose a product to make and plan the tools and materials needed. ● Collaborate to design a solution to a problem affecting the community. ● Identify how technology impacts or improves life.

	● Demonstrate how reusing a product affects the local and global environment. ● Identify products or systems that are designed to meet human needs. ● Identify how the ways people live and work has changed because of technology. ● Brainstorm ideas on how to solve a problem or build a product. ● Create a drawing of a product or device that communicates its function to peers and discuss. ● Explain why we need to make new products. ● Identify designed products and brainstorm how to improve one used in the classroom. ● Describe how the parts of a common toy or tool interact and work as part of a system. ● Investigate a product that has stopped working and brainstorm ideas to correct the problem. ● Collaborate and apply a design process to solve a simple problem from everyday experiences. ● Discover how a product works by taking it apart, sketching how parts fit, and putting it back together. ● Identify the strengths and weaknesses in a product or system. ● Identify the resources needed to create technological products or systems. ● Identify how using a tool (such as a bucket or wagon) aids in reducing work. ● List and demonstrate the steps to an everyday task.

	● Demonstrate an understanding of how a computer takes input through a series of written commands and then interprets and displays information as output. ● Create algorithms (a set of instructions) using a predefined set of commands (e.g. to move a student or a character through a maze). ● Debug an algorithm (i.e. correct an error). ● Use appropriate terms in conversation (e.g. basic vocabulary words: input, output, the operating system, debug, and algorithm).

Lavallette Elementary School	Technology
Content Area: Technology **Course Title:** Technology	**Grade Level:** 3-5
Unit Plan 1 Basic Operations & Network Skills Keyboarding Word Processing Acceptable Use/Copyright/Plagiarism Digital Citizenship	Marking Period 1 September - November
Unit Plan 2 Keyboarding Word Processing Communication & Collaboration PARCC	Marking Period 2 November - January
Unit Plan 3 Keyboarding Spreadsheets Multimedia/Presentation Tools	Marking Period 3 January - April
Unit Plan 4 Keyboarding Research & Gathering Information Communication & Collaboration	Marking Period 4 May - June

Lavallette Elementary School
Technology Curriculum
Unit Overview

Content Area: Technology

Standard: 8.1 Educational Technology
Standard: 8.2 Technology Education, Engineering, Design, and Computational Thinking, Programming

Strand 8.1

- ✓ Technology Operations and Concepts
- ✓ Creativity and Innovation
- ✓ Communication and Collaboration
- ✓ Digital Citizenship
- ✓ Research and Information Fluency
- ✓ Critical Thinking, Problem Solving, and Decision Making

Summary 8.1

- All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaboratively and to create and communicate knowledge.

Strand 8.2

- ✓ The Nature of Technology: Creativity and Innovation
- ✓ Technology and Society
- ✓ Design
- ✓ Abilities for a Technological World
- ✓ Computational Thinking: Programming

Summary 8.2

- All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Content Area: 21st Century Life and Careers

Career Ready Practices

Strand CRP:
CRP2: Apply appropriate academic and technical skills. CRP11: Use technology to enhance productivity

Summary CRP:
These practices outline the skills that all individuals need to have to truly be adaptable, reflective, and proactive in life and careers. These are researched practices that are essential to career readiness.

Primary Interdisciplinary Connections: Mathematics, Language Arts Literacy, Science, Social Studies. All of the NJ State Standards may be found on the New Jersey state website.

Learning Targets

Content Standards 8.1

Students will:

- Understand and use technology systems.
- Select and use applications effectively and productively.
- Apply existing knowledge to generate new ideas, products, or processes.
- Create original works as a means of personal or group expression.
- Interact, collaborate, and publish with peers, experts, or others by employing a variety of digital environments and media.
- Communicate information and ideas to multiple audiences using a variety of media and formats.
- Develop cultural understanding and global awareness by engaging with learners of other cultures.
- Contribute to project teams to produce original works or solve problems.
- Advocate and practice safe, legal, and responsible use of information and technology.
- Demonstrate personal responsibility for lifelong learning.
- Exhibit leadership for digital citizenship.
- Plan strategies to guide inquiry.
- Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media.
- Evaluate and select information sources and digital tools based on the appropriateness for specific tasks.
- Identify and define authentic problems and significant questions for investigation.
- Plan and manage activities to develop a solution or complete a project.
- Collect and analyze data to identify solutions and/or make informed decisions.
- Use multiple processes and diverse perspectives to explore alternative solutions.

Number	Standard for Mastery
8.1.5.A.1	Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.
8.1.5.A.2	Format a document using a word processing application to enhance text and include graphics, symbols and/ or pictures.
8.1.5.A.3	Use a graphic organizer to organize information about problem or issue.
8.1.5.A.4	Graph data using a spreadsheet, analyze and produce a report that explains the analysis of the data.
8.1.5.A.5	Create and use a database to answer basic questions.
8.1.5.A.6	Export data from a database into a spreadsheet; analyze and produce a report that explains the analysis of the data.
8.1.5.B.1	Collaborative to produce a digital story about a significant local event or issue based on first person interviews.
8.1.5.C.1	Engage in online discussions with learners of other cultures to investigate a worldwide issue from multiple perspectives and sources, evaluate findings and present possible solutions, using digital tools and online resources for all steps.
8.1.5.D.1	Understand the need for and use of copyrights.
8.1.5.D.2	Analyze the resource citations in online materials for proper use.
8.1.5.D.3	Demonstrate an understanding of the need to practice cyber safety, cyber security, and cyber ethics when using technologies and social media.
8.1.5.D.4	Understand digital citizenship and demonstrate an understanding of the personal consequences of inappropriate use of technology and social media.
8.1.5.E.1	Use digital tools to research and evaluate the accuracy of, relevance to, and appropriateness of using print and nonprint electronic information sources to complete a variety of tasks.
8.1.5.F.1	Apply digital tools to collect, organize, and analyze data that support a scientific finding.

Unit Essential Questions	**Unit Enduring Understandings**
● What skills do I need to learn to be a 21st century learner/student? ● How do I pick the right digital tools and when do I use them? ● How can I use my digital tools and skills in new situations? ● How do I choose which technological tools to use and when it is appropriate to use them?	*Students will understand that…* ● Technology is always changing and we need to be lifelong learners. ● We should use technology based on our ● personal and /or career needs. ● A tool is only as good as the person using it. ● Digital tools allow for communication and collaboration anytime/anyplace worldwide. ● Selection of technology should be based on personal and /or career needs assessment.

Unit Objectives	**Unit Objectives**
Students will know… ● The use of technology and digital tools requires knowledge and appropriate use of operations and related applications.	*Students will be able to…* ● Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems. ● Format a document using a word processing application to enhance text and include graphics, symbols and/ or pictures. ● Use a graphic organizer to organize information about problem or issue. ● Graph data using a spreadsheet, analyze and produce a report that explains the analysis of the data. ● Create and use a database to answer basic questions. ● Export data from a database into a spreadsheet; analyze and produce a report that explains the analysis

	of the data. ● Collaborative to produce a digital story about a significant local event or issue based on first person interviews. ● Engage in online discussions with learners of other cultures to investigate a worldwide issue from multiple perspectives and sources, evaluate findings and present possible solutions, using digital tools and online resources for all steps. ● Understand the need for and use of copyrights. ● Analyze the resource citations in online materials for proper use. ● Demonstrate an understanding of the need to practice cyber safety, cyber security, and cyber ethics when using technologies and social media. ● Understand digital citizenship and demonstrate an understanding of the personal consequences of inappropriate use of technology and social media. ● Use digital tools to research and evaluate the accuracy of, relevance to, and appropriateness of using print and nonprint electronic information sources to complete a variety of tasks. ● Apply digital tools to collect, organize, and analyze data that support a scientific finding.

Content Standards 8.2

Students will be able to/or understand:

- The characteristics and scope of technology.
- The core concepts of technology.
- The relationships among technologies and the connections between technology and other fields of study.
- The cultural, social, economic, and political effects of technology.
- The effects of technology on the environment.
- The role of society in the development and use of technology.
- The influence of technology on history.
- The attributes of design.
- The application of engineering design.
- The role of troubleshooting, research/development, invention/innovation, and experimentation in problem solving.
- Apply the design process.
- Use and maintain technological products and systems.
- Assess the impact of products and systems.
- Computational thinking and computer programming as tools used in design and engineering.

Number	Standard for Mastery
8.2.2.A.1	Define products produced as a result of technology or of nature.
8.2.2.A.2	Describe how designed products and systems are useful at school, home and work.
8.2.2.A.3	Identify a system and the components that work together to accomplish its purpose.
8.2.2.A.4	Choose a product to make and plan the tools and materials needed.
8.2.2.A.5	Collaborate to design a solution to a problem affecting the community.
8.2.2.B.1	Identify how technology impacts or improves life.
8.2.2.B.2	Demonstrate how reusing a product affects the local and global environment.
8.2.2.B.3	Identify products or systems that are designed to meet human needs.

8.2.2.B.4	Identify how the ways people live and work has changed because of technology.
8.2.5.B.5	Explain the purpose of intellectual property law.
8.2.5.B.6	Compare and discuss how technologies have influenced history in the past century.
8.2.2.C.1	Brainstorm ideas on how to solve a problem or build a product.
8.2.2.C.2	Create a drawing of a product or device that communicates its function to peers and discuss.
8.2.2.C.3	Explain why we need to make new products.
8.2.2.C.4	Identify designed products and brainstorm how to improve one used in the classroom.
8.2.2.C.5	Describe how the parts of a common toy or tool interact and work as part of a system.
8.2.2.C.6	Investigate a product that has stopped working and brainstorm ideas to correct the problem.
8.2.5.C.7	Work with peers to redesign an existing product for a different purpose.
8.2.2.D.1	Collaborate and apply a design process to solve a simple problem from everyday experiences.
8.2.2.D.2	Discover how a product works by taking it apart, sketching how parts fit, and putting it back together.

8.2.2.D.3	Identify the strengths and weaknesses in a product or system.
8.2.2.D.4	Identify the resources needed to create technological products or systems.
8.2.2.D.5	Identify how using a tool (such as a bucket or wagon) aids in reducing work.

8.2.5.D.6	Explain the positive and negative effect of products and systems on humans, other species and the environment, and when the product or system should be used.
8.2.5.D.7	Explain the impact that resources such as energy and materials used in a process to produce products or system have on the environment
8.2.2.E.1	List and demonstrate the steps to an everyday task.
8.2.2.E.2	Demonstrate an understanding of how a computer takes input through a series of written commands and then interprets and displays information as output.
8.2.2.E.3	Create algorithms (a set of instructions) using a predefined set of commands (e.g. to move a student or a character through a maze).
8.2.2.E.4	Debug an algorithm (i.e. correct an error).

Unit Essential Questions	**Unit Enduring Understandings**
● What skills do I need to learn to be a 21st century learner/student? ● How do I pick the right digital tools and when do I use them? ● How can I use my digital tools and skills in new situations? ● How does a broken part affect the use of a toy or tool?	*Students will understand that...* ● Technology is always changing and we need to be lifelong learners. ● We should choose technology based on our personal and/or career needs. ● A tool is only as good as the person using it. ● Individual parts make up a system and rely on each other to work properly. ● Technology products and systems are made up of resources. ● The design process is fundamental to technology and engineering.

Unit Objectives *Students will know…* ● The use of technology and digital tools requires knowledge and appropriate use of operations and related applications ● The design process is a systematic approach to solving problems.	**Unit Objectives** *Students will be able to…* ● Compare and contrast how products made in nature differ from products that are human made in how they are produced and used. ● Investigate and present factors that influence the development and function of a product and a system. ● Investigate and present factors that influence the development and function of products and systems (e.g. resources, criteria, and constraints). ● Compare and contrast how technologies have changed over time due to human needs and economic, political, and/or cultural influences. ● Identify how improvement in the understanding of materials science impacts technologies. ● Examine ethical considerations in the development and production of a product through its life cycle. ● Examine systems used for recycling and recommend simplification of the systems and share with product developers. ● Investigate ways that various technologies are being developed and used to reduce improper use of resources. 8.2.5.B.4 Research technologies that have changed due to society's changing needs and wants. ● Explain the purpose of intellectual property law. ● Compare and discuss how technologies have influenced history in the past century. ● Collaborate with peers to illustrate components of a designed system.

	● Explain how specifications and limitations can be used to direct a product's development. ● Research how design modifications have lead to new products. ● Collaborate and brainstorm with peers to solve a problem evaluating all solutions to provide the best results with supporting sketches or models. ● Explain the functions of a system and subsystems. ● Examine a malfunctioning tool and identify the process to troubleshoot and present options to repair the tool. ● Work with peers to redesign an existing product for a different purpose. ● Identify and collect information about a problem that can be solved by technology, generate ideas to solve the problem, and identify constraints and tradeoffs to be considered ● Evaluate and test alternative solutions to a problem using the constraints and tradeoffs identified in the design process to evaluate potential solutions. ● Follow step by step directions to assemble a product or solve a problem. ● Explain why human designed systems, products, and environments need to be constantly monitored, maintained, and improved. ● Describe how resources such as material, energy, information, time, tools, people and capital are used in products or systems. ● Explain the positive and negative effect of products and systems on humans, other species and the environment, and when the product or system should be used.

	● Explain the impact that resources such as energy and materials used in a process to produce products or system have on the environment ● Identify how computer programming impacts our everyday lives. ● Demonstrate an understanding of how a computer takes input of data, processes and stores the data through a series of commands, and outputs information. ● Using a simple, visual programming language, create a program using loops, events and procedures to generate specific output. ● Use appropriate terms in conversation (e.g., algorithm, program, debug, loop, events, procedures, memory, storage, processing, software, coding, procedure, and data).

Content Standard: Career Readiness Practice

Students will be able to/or understand:

- Career ready individuals readily access and use the knowledge and skills acquired through experience and education to be more productive. They make connections between abstract concepts with real world applications, and they make correct insights about when it is appropriate to apply the use of an academic skill in a workplace situation
- Career ready individuals find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems. They are flexible and adaptive in acquiring new technology. They are proficient with ubiquitous technology applications. They understand the inherent risks personal and organizational of technology applications, and they take actions to prevent or mitigate these risks.

Number	Standard for Mastery
CRP2	Apply appropriate academic and technical skills.
CRP11	Use technology to enhance productivity.

Unit Essential Questions	**Unit Enduring Understandings**
● What skills do I need to become an effective researcher? ● What skills do I need to be a responsible citizen of the global community?	● Planning the nature of researching pertinent information, evaluating sources critically and creating a product that accomplishes a specific purpose are necessary skills to develop in order to function in an ever changing job market. ● An awareness of the world, a sense of personal responsibility, and the taking action to make one's community a better place are all necessary attributes of a productive member of society.

Unit Objectives *Students will know…*	**Unit Objectives** *Students will be able to…*
● How to make decisions and critically solve problems, and to be reflective about thinking and learning in order to become a lifelong learner and contribute to an ever changing global society	● Apply appropriate academic and technical skills. ● Use technology to enhance productivity.

Lavallette Elementary School	Technology
Content Area: Technology **Course Title:** Technology	**Grade Level:** 6-8
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Summary 8.1

- All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaboratively and to create and communicate knowledge.

Strand 8.2

- ✓ The Nature of Technology: Creativity and Innovation
- ✓ Technology and Society
- ✓ Design
- ✓ Abilities for a Technological World
- ✓ Computational Thinking: Programming

Summary 8.2

- All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Content Area: 21st Century Life and Careers

Career Ready Practices

Strand CRP:
CRP2: Apply appropriate academic and technical skills. CRP11: Use technology to enhance productivity

Summary CRP:
These practices outline the skills that all individuals need to have to truly be adaptable, reflective, and proactive in life and careers. These are researched practices that are essential to career readiness.

Standard: 9.2 Career Awareness, Exploration, and Preparation
Strand 9.2: **B.** Career Exploration
Summary 9.2: ● This standard outlines the importance of being knowledgeable about one's interests and talents, and being well informed about postsecondary and career options, career planning, and career requirements.
Primary Interdisciplinary Connections: Mathematics, Language Arts Literacy, Science, Social Studies. All of the NJ State Standards may be found on the New Jersey state website.

Learning Targets

Content Standards 8.1

Students will:

- Understand and use technology systems.
- Select and use applications effectively and productively.
- Apply existing knowledge to generate new ideas, products, or processes.
- Create original works as a means of personal or group expression.
- Interact, collaborate, and publish with peers, experts, or others by employing a variety of digital environments and media.
- Communicate information and ideas to multiple audiences using a variety of media and formats.
- Develop cultural understanding and global awareness by engaging with learners of other cultures.
- Contribute to project teams to produce original works or solve problems.
- Advocate and practice safe, legal, and responsible use of information and technology.
- Demonstrate personal responsibility for lifelong learning.
- Exhibit leadership for digital citizenship.
- Plan strategies to guide inquiry.
- Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media.
- Evaluate and select information sources and digital tools based on the appropriateness for specific tasks.
- Identify and define authentic problems and significant questions for investigation.
- Plan and manage activities to develop a solution or complete a project.
- Collect and analyze data to identify solutions and/or make informed decisions.
- Use multiple processes and diverse perspectives to explore alternative solutions.

Number	Standard for Mastery
8.1.8.A.1	Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.
8.1.8.A.2	Format a document using a word processing application to enhance text and include graphics, symbols and/ or pictures.

8.1.8.A.3	Use a graphic organizer to organize information about problem or issue.
8.1.8.A.4	Graph data using a spreadsheet, analyze and produce a report that explains the analysis of the data.
8.1.8.A.5	Create and use a database to answer basic questions.
8.1.8.B.1	Collaborative to produce a digital story about a significant local event or issue based on first person interviews.
8.1.8.C.1	Engage in online discussions with learners of other cultures to investigate a worldwide issue from multiple perspectives and sources, evaluate findings and present possible solutions, using digital tools and online resources for all steps.

8.1.8.D.1	Understand the need for and use of copyrights.
8.1.8.D.2	Analyze the resource citations in online materials for proper use.
8.1.8.D.3	Demonstrate an understanding of the need to practice cyber safety, cyber security, and cyber ethics when using technologies and social media.
8.1.8.D.4	Understand digital citizenship and demonstrate an understanding of the personal consequences of inappropriate use of technology and social media.
8.1.8.D.5	Understand appropriate uses for social media and the negative consequences of misuse.
8.1.8.E.1	Use digital tools to research and evaluate the accuracy of, relevance to, and appropriateness of using print and nonprint electronic information sources to complete a variety of tasks.
8.1.8.F.1	Apply digital tools to collect, organize, and analyze data that support a scientific finding.

Unit Essential Questions	**Unit Enduring Understandings**
● What skills do I need to learn to be a 21st century learner/student? ● How can I transfer what I know to new	*Students will understand that…* ● Selection of technology should be based on personal and/or career

technological situations/experiences?	needs assessment. ● The use of technology and digital tools requires knowledge and appropriate use of operations and related applications.

Unit Objectives *Students will know…* ● The use of technology and digital tools requires knowledge and appropriate use of operations and related applications. ● Digital tools and environments support the learning process and foster collaboration in solving local or global issues and problems. ● Technology products and systems impact every aspect of the world in which we live. ● Digital tools facilitate local and global communication and collaboration in designing products and systems.	**Unit Objectives** *Students will be able to…* ● Demonstrate knowledge of a real world problem using digital tools. ● Create a document (e.g. newsletter, reports, personalized learning plan, business letters or flyers) using one or more digital applications to be critiqued by professionals for usability. ● Use and/or develop a simulation that provides an environment to solve a real world problem or theory. ● Graph and calculate data within a spreadsheet and present a summary of the results ● Create a database query, sort and create a report and describe the process, and explain the report results. ● Synthesize and publish information about a local or global issue or event (ex. telecollaborative project, blog, school web). ● Collaborate to develop and publish work that provides perspectives on a global problem for discussions with learners from other countries. ● Understand and model appropriate online behaviors related to cyber safety, cyber bullying, cyber security, and cyber ethics including appropriate use of social media. ● Demonstrate the application of appropriate citations to digital

	content. ● Demonstrate an understanding of fair use and Creative Commons to intellectual property. ● Assess the credibility and accuracy of digital content. ● Understand appropriate uses for social media and the negative consequences of misuse. ● Effectively use a variety of search tools and filters in professional public databases to find information to solve a real world problem. ● Explore a local issue, by using digital tools to collect and analyze data to identify a solution and make an informed decision.

Content Standards 8.2

Students will be able to/or understand:

- The characteristics and scope of technology.
- The core concepts of technology.
- The relationships among technologies and the connections between technology and other fields of study.
- The cultural, social, economic, and political effects of technology.
- The effects of technology on the environment.
- The role of society in the development and use of technology.
- The influence of technology on history.
- The attributes of design.
- The application of engineering design.
- The role of troubleshooting, research development, invention and innovation, and experimentation in problem solving.
- Apply the design process.
- Use and maintain technological products and systems.
- Assess the impact of products and systems.
- Computational thinking and computer programming as tools used in design and engineering.

Number	Standard for Mastery
8.2.8.A.1	Research a product that was designed for a specific demand and identify how the product has changed to meet new demands (i.e. telephone for communication smartphone for mobility needs).
8.2.8.A.2	Examine a system, consider how each part relates to other parts, and discuss a part to redesign to improve the system.
8.2.8.A.3	Investigate a malfunction in any part of a system and identify its impacts.
8.2.8.A.4	Redesign an existing product that impacts the environment to lessen its impact(s) on the environment.
8.2.8.A.5	Describe how resources such as material, energy, information, time, tools, people, and capital contribute to a technological product or system.
8.2.8.B.1	Evaluate the history and impact of sustainability on the development of a designed product or system over time and present results to peers.
8.2.8.B.2	Identify the desired and undesired consequences from the use of a product or system.
8.2.8.B.3	Research and analyze the ethical issues of a product or system on the environment and report findings for review by peers and /or experts.
8.2.8.B.4	Research examples of how humans can devise technologies to reduce the negative consequences of other technologies and present your findings.
8.2.8.B.5	Identify new technologies resulting from the demands, values, and interests of individuals, businesses, industries and societies.
8.2.8.B.6	Compare and contrast the different types of intellectual property including copyrights, patents and trademarks.
8.2.8.B.7	Analyze the historical impact of waste and demonstrate how a product is upcycled, reused or remanufactured into a new product.

8.2.8.C.1	Explain how different teams/groups can contribute to the overall design of a product.
8.2.8.C.2	Explain the need for optimization in a design process.
8.2.8.C.3	Evaluate the function, value, and aesthetics of a technological product or system, from the perspective of the user and the producer.

8.2.8.C.4	Identify the steps in the design process that would be used to solve a designated problem.
8.2.8.C.5	Explain the interdependence of a subsystem that operates as part of a system.
8.2.8.C.6	Collaborate to examine a malfunctioning system and identify the stepbystep process used to troubleshoot, evaluate and test options to repair the product, presenting the better solution.
8.2.8.C.7	Collaborate with peers and experts in the field to research and develop a product using the design process, data analysis and trends, and maintain a design log with annotated sketches to record the developmental cycle.
8.2.8.C.8	Develop a proposal for a chosen solution that include models (physical, graphical or mathematical) to communicate the solution to peers.
8.2.8.D.1	Design and create a product that addresses a real world problem using a design process under specific constraints.
8.2.8.D.2	Identify the design constraints and tradeoffs involved in designing a prototype (e.g., how the prototype might fail and how it might be improved) by completing a design problem and reporting results in a multimedia presentation, design portfolio or engineering notebook.
8.2.8.D.3	Build a prototype that meets a STEMbased design challenge using science, engineering, and math principles that validate a solution.
8.2.8.D.4	Research and publish the steps for using and maintaining a product or system and incorporate diagrams or images throughout to enhance user comprehension.
8.2.8.D.5	Explain the impact of resource selection and the production process in the development of a common or technological product or system.

8.2.8.D.6	Identify and explain how the resources and processes used in the production of a current technological product can be modified to have a more positive impact on the environment.
8.2.8.E.1	Identify ways computers are used that have had an impact across the range of human activity and within different careers where they are used.
8.2.8.E.2	Demonstrate an understanding of the relationship between hardware and software.
8.2.8.E.3	Develop an algorithm to solve an assigned problem using a specified set of commands and use peer review to critique the solution.
8.2.8.E.4	Use appropriate terms in conversation (e.g., programming, language, data, RAM, ROM, Boolean logic terms).

Unit Essential Questions	**Unit Enduring Understandings**
● Why is following the design process an essential part of solving a problem? ● How can following the design process ● help you solve a problem? ● How can digital tools be used to bring the people together to solve local/global issues? ● How does technology impact society? ● What are the positive and negative consequences of technology? ● Should technologies that produce negative impact continue to be used? ● Is it always beneficial to use the most economical material(s) for production of a technological product?	● The design process is an efficient way to solve a problem. ● Digital tools play an essential role in helping to solve local and global problems. ● Technology evolves at a rapid pace based on the needs/wants of society and is influenced by cultural, political and environmental values and constraints. ● A system has interrelated components designed to collectively achieve a desired goal. ● All technological use requires resources that include tools/machines, materials, information, energy, capital, time and people.

Unit Objectives

Students will know…

- The use of technology and digital tools requires knowledge and appropriate use of operations and related applications.
- The design process is a systematic approach to solving problems.
- The use of digital tools and mediarich resources enhances creativity and the construction of knowledge.
- Digital tools and environments support the learning process and foster collaboration in solving local or global issues and problems.
- Digital tools facilitate local and global communication and collaboration in designing products and systems.
- The use of technology and digital tools requires knowledge and appropriate use of operations and related applications
- Technology products and systems impact every aspect of the world in which we live.
- Knowledge and understanding of human, cultural, and societal values are fundamental when designing technology systems and products in the global society.
- Information literacy skills, research, data analysis, and prediction provide the basis for the effective design of technology systems.
- Technological products and systems are created through the application and appropriate use of technological resources.
- The designed world is the product of a design process that provides the means to convert resources into products and systems

Unit Objectives

Students will be able to…

- Research a product that was designed for a specific demand and identify how the product has changed to meet new demands (i.e. telephone for communication smart phone for mobility needs).
- Examine a system, consider how each part relates to other parts, and discuss a part to redesign to improve the system.
- Investigate a malfunction in any part of a system and identify its impacts.
- Redesign an existing
- product that impacts the environment to lessen its impact(s) on the environment.
- Describe how resources such as material, energy, information, time, tools, people, and capital contribute to a technological product or system.
- Evaluate the history and impact of sustainability on the development of a designed product or system over time and present results to peers.
- Identify the desired and undesired consequences from the use of a product or system.
- Research and analyze the ethical issues of a product or system on the environment and report findings for review by peers and /or experts.
- Research examples of how humans can devise technologies to reduce the negative consequences of other technologies and

	present your findings. ● Identify new technologies resulting from the demands, values, and interests of individuals, businesses, industries and societies. ● Compare and contrast the different types of intellectual property including copyrights, patents and trademarks. ● Analyze the historical impact of waste and demonstrate how a product is upcycled, reused or remanufactured into a new product. ● Explain how different teams/groups can contribute to the overall design of a product. ● Explain the need for optimization in a design process. ● Evaluate the function, value, and aesthetics of a technological product or system, from the perspective of the user and the producer. ● Identify the steps in the design process that would be used to solve a designated problem. ● Explain the interdependence of a subsystem that operates as part of a system. Create a technical sketch of a product with materials and measurements labeled. ● Collaborate to examine a malfunctioning system and identify the step-by-step process used to troubleshoot, evaluate and test options to repair the product, presenting the better solution. ● Collaborate with peers and experts in the field to research

	and develop a product using the design process, data analysis and trends, and maintain a design log with annotated sketches to record the developmental cycle. ● Develop a proposal for a chosen solution that include models (physical, graphical or mathematical) to communicate the solution to peers. ● Design and create a product that addresses a real world problem using a design process under specific constraints. ● Identify the design constraints and tradeoffs involved in designing a prototype (e.g., how the prototype might fail and how it might be improved) by completing a design problem and reporting results in a multimedia presentation, design portfolio or engineering notebook. ● Build a prototype that meets a STEMbased design challenge using science, engineering, and math principles that will validate a solution. ● Research and publish the steps for using and maintaining a product or system and incorporate diagrams or images throughout to enhance user comprehension. ● Explain the impact of resource selection and the production process in the development of a common or technological product or system. ● Identify and explain how the resources and processes used in the production of a current technological product can be

	modified to have a more positive impact on the environment. ● Identify ways computers are used that have had an impact across the range of human activity and within different careers where they are used. ● Demonstrate an understanding of the relationship between hardware and software. ● Develop an algorithm to solve an assigned problem using a specified set of commands and use peer review to critique the solution. ● Use appropriate terms in conversation (e.g. programming, data, RAM, ROM, Boolean logic terms).

Content Standard: Career Readiness Practice

Students will be able to/or understand:

- Careerready individuals readily access and use the knowledge and skills acquired through experience and education to be more productive. They make connections between abstract concepts with real world applications, and they make correct insights about when it is appropriate to apply the use of an academic skill in a workplace situation.
- Careerready individuals find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems. They are flexible and adaptive in acquiring new technology. They are proficient with ubiquitous technology applications. They understand the inherent risks personal and organizational of technology applications, and they take actions to prevent or mitigate these risks.

Number	Standard for Mastery
CRP2	Apply appropriate academic and technical skills.
CRP11	Use technology to enhance productivity.

Unit Essential Questions	**Unit Enduring Understandings**
● What skills are needed to become information literate, and subsequently an effective and efficient researcher? ● What skills are needed to become responsible citizens and globally –aware, active participants in a global community?	● Planning the nature of researching pertinent information, evaluating sources critically and creating a product that accomplishes a specific purpose are necessary skills to develop in order to function in an ever changing job market. ● An awareness of the world, a sense of personal responsibility, and the taking action to make one's community a better place are all necessary attributes of a productive member of society.

Unit Objectives *Students will know…*	**Unit Objectives** *Students will be able to…*
● Use entrepreneurial skills to enhance workplace productivity and career options. ● Society's impact on the natural world (e.g., population growth, population development, resource consumption rate, etc.	● Apply appropriate academic and technical skills. ● Use technology to enhance productivity

Content Standard 9.2

Students will understand:

● One's personal actions using social media can have a positive or negative effect in the workplace.

Number	**Standard for Mastery**
9.2.8.B.7	Evaluate the impact of online activities and social media on employer decisions.

Unit Essential Questions	**Unit Enduring Understandings**
● What effects can my actions online have on my occupation?	● When used appropriately, social media can help job seekers network with business contacts. ● When used inappropriately, employees can be terminated from positions or lose out on job opportunities

Unit Objectives *Students will know…*	**Unit Objectives** *Students will be able to…*
● The use of social media can have positive and negative effects on an individual in respect to the workplace.	● Evaluate comments to determine the potential effect it may have.

Evidence of Learning
Formative Assessments may include: ● Teacher observations ● Questioning ● Tests and Quizzes ● Presentation ● Portfolios ● Performance tasks and projects ● Selfevaluation ● Class Discussions
Summative Assessments may include: ● Showcase ● Any of the above formative assessment upon end of unit

Modifications (ELLs, Special Education, Gifted and Talented)

- More time
- Use of visuals
- Introduce key vocabulary prior lesson
- Teacher reads aloud
- Text to Speech
- Accessibility Settings (e.g. Enlarged font sizes, Invert Colors, Subtitles and Captioning)
- Verbal prompting
- Modeling
- Work in small group
- Peer tutoring
- Use of additional resources
- Provide options, alternatives and choices to differentiate and broaden the curriculum
- Provide enrichment exploration can settings be altered to more challenging levels (e.g. keyboarding practice)
- Follow all IEP modifications/504 plan
    - o Take all IEPs into consideration when incorporating modifications

Technology Integration Examples

English Language Arts:

- Students create or use a blog to hold discussions online
- Students can create graphic posters using drawing and camera software for practicing selection vocabulary
- Students can create "Choose your own Adventure" style stories using hyperlinks in presentation software

Math:

- Students can use cameras to take pictures for a "Shape Scavenger Hunt" around the school campus
- Students can use "M&M's" to sort by color, and graph using spreadsheet software
- Students can create multiplication flashcards using presentation software

Science: ● NASAs Astronomy Picture of the Day or Goddard Space Centers Earth Science Picture of the Day, both of which include a brief explanation of the days photo. ● Briefly discuss a scientist or a scientific event from Today in Science History.	**Social Studies:** ● Use Internet to locate archaeological artifacts on webquest ● Virtual field trips to various locations or museums ● GeoGuesser application for Geography where students use latitude/longitude to find locations using Google Earth
Performing Arts: ● Students can create movies using various movie making software ● Students can create podcasts on various topics ● JamStudio (online)With JamStudio, users can mix and create digital audio tracks to create their own music; the user interface is geared toward the rock and youth set. ● Rock Our World This online international project connects students from all over the globe to compose music, make movies and interact with each other in live video conferences.	**Visual Arts:** ● Doodlebuddy and Pottery students can create virtual artwork ● Destination Modern Art: From the Museum of Modern Art, this interactive online website speaks to students about art — literally reading out the instructions, a help for students who do not read well. Students of all abilities can explore and use this site to learn about different interpretive ideas, practice vocabulary, learn how art is created, and much more.

Comprehensive Health/Physical Education: ● Groups can research body systems and create multimedia presentations on topics. ● Students can use heart rate and pulse information to create graphs using spreadsheet software. ● Students can create instructional videos on physical skills (e.g. “How to Throw a Ball”)	**World Language:** ● Rosetta Stone students can learn various languages using this licensed software. ● Students can create movies using pictures and recorded audio for vocabulary words in various languages. ● Access online weather forecasts in French, German, or Spanish. Begin foreign language classes with a discussion of the day's weather.