

SHORE REGIONAL HIGH SCHOOL DISTRICT
A Regional Collaborative of the Communities Served by the Monmouth Beach, Oceanport, Shore Regional, and West Long Branch School Districts

Aligned to Common Core State Standards/New Jersey Core Curriculum Content Standards as Applicable

Course Title: Grade 3 Technology
Content Area: Technology
Grade Level(s): 3
Course Description: Computers and Technology
Curriculum Writer(s): Angel Somers
Date Created: July 2015
Date Approved by Board of Education: October of 2015

Pacing Guide

Unit 1 Title: Digital Citizenship and Cybersafety
Unit 2 Title: Selecting Digital Tools

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Unit 3 Title: Using Digital Tools and Technology
Unit 4 Title: Problem Solving

Unit 1 Digital Citizenship and Cybersafety

Unit Summary: Students will practice safe and responsible use of digital technology.

Interdisciplinary Connections/Content Area Integrations Including Technology: Critical Thinking, Problem Solving, English Language Arts, Communications Skills, Health, Science, Social Studies, Mathematics, 21st Century Life and Careers

NJCCCS Number	NJCCCS Content
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<p>8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.</p>	<p>A. Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems, and operations.</p> <ul style="list-style-type: none"> ● 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. <p>B. Creativity and Innovation: <i>Students demonstrate creative thinking, construct knowledge and develop innovative products, and process using technology.</i></p> <ul style="list-style-type: none"> ● 8.1.2.B.1 <i>Illustrate and communicate original ideas and stories using multiple digital tools and resources.</i> <p>D. Digital Citizenship: <i>Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.</i></p> <ul style="list-style-type: none"> ● 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.
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Summative Assessments:

May include but are not limited to: PowerPoint presentation, Google Slide Presentation, bookmarks, and/or comic strip posters.



Formative Assessments:

May include but is not limited to: Teacher Observation, Oral Questioning, Class Discussion, Homework, Quizzes, Exit Tickets, Graphic Organizers, Independent and Cooperative Activities/Assignments/Projects, Tests.



Enduring Understandings:

- Technology use can have positive or negative impact on both users and those affected by their use.
- Advocate and practice safe, legal, and responsible use of information and technology.
- Skills learned and mastered at school can be used at home.
- Information is spread worldwide within seconds due to technological advancements and has an immediate impact.

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Essential Questions:

- How do you create a positive online community?
- How do I choose which technological tools to use and when it is appropriate to use them?
- How can I transfer what I know to new technological situations/experiences?
- What are an individual's responsibilities for using technology?
- What constitutes misuse, and how can it best be prevented?
- What is responsible online behavior?



Instructional Outcomes:

Students will:

- Students will establish group norms to create a positive online community that promotes responsible and respectful digital behavior within their classroom.
- Describe the problems and consequences when technology and information are used inappropriately.

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- Use computer programs and input/output devices with respect.
- Students will engage in a class discussion/participation and create a document and/or slideshow that explains the importance of cyber safety, cyber security, and cyber ethics.
- Students will use a word processing program.



Suggested Learning Activities:

D. Digital Citizenship: *Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.*

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.

- Practice cyber safety by completing grade specific lessons from sites such as:

www.commonsense.org

<https://kids.usa.gov/teachers/lesson-plans/online-safety/index.shtml>

<http://www.netsmartz.org/Educators>

<http://www.digizen.org/>

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- Students will collaborate in creating a digital citizenship pledge outlining their collective social norms for exploring in and interacting with the digital world.
- Have students fill out Common Sense Media’s Family Media Agreement with a parent or family member (www.commonsensemedia.org/educators/parent-media-education/family-media-a...). Families can make revisions to the document as they see fit. If all family members agree on the terms outlined in the document, they can sign it to make it official. Family media agreements can help ensure that all members of a family are on the same page about their expectations and values regarding media and technology use.
- Show students the Internet safety video such as the one available on *BrainPOP Jr.* Have students take a quiz individually, or complete a quiz as a class. Read a cyber bullying story/situation to the students. Halfway through, stop and ask each group of students to write the ending of the story. Once groups have shared their endings, read the real ending. As a class, come up with a list of steps explaining how to deal with cyberbullying and post it in the classroom.
- Have students create bookmarks that list their top ten tips for behaving safely, responsibly, and respectfully online. These bookmarks can be formatted using Word or Google Docs.

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- Students can create a comic strip either on paper or digitally using their own student designed Super Digital Citizen to demonstrate the cyber safety rules. (See this teacher video: <https://www.teachingchannel.org/videos/teaching-digital-citizenship>. This website/s online cyber safety game provides ideas for possible topics for their comics: <http://www.att.com/Common/images/safety/game.swf>.)

B. Creativity and Innovation: *Students demonstrate creative thinking, construct knowledge and develop innovative products, and process using technology.*

8.1.2.B.1 Illustrate and communicate original ideas and stories using multiple digital tools and [resources](#).

- Review with students how to create a document using word processing software. Review the different ways to input text such as the keyboard, speech-to-text software, etc. Demonstrate how to format text using the software program. Have students create a poster about themselves that includes text formatting and graphics. Student can then present to the class to get to know one another.



Suggested Differentiation:

Visual and verbal instructions, choice activities, chunking information, video and written tutorials, assistive technology



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Curriculum Development Resources:

Roselle Public Schools Technology Curriculum Grades 3-4 2013 <http://goo.gl/9JZeOs>

Brainpop Jr. (www.brainpopjr.com)

Commonsense Media (www.common sense media.org)

<https://www.teachingchannel.org/videos/teaching-digital-citizenship>

<http://www.loc.gov/teachers/copyrightmystery/?#>

<http://www.att.com/Common/images/safety/game.swf>

<http://www.cyberspacers.com/>



Notes/Comments:

Vocabulary: Safety, cyber safety, cyber ethics, digital citizenship

Unit 2 Selecting Digital Tools

Unit Summary: Students will evaluate and select appropriate digital tools and resources to accomplish a variety of tasks.

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Interdisciplinary Connections/Content Area Integrations Including Technology: Critical Thinking, Problem Solving, English Language Arts, Communications Skills, Health, Science, Social Studies, Mathematics, 21st Century Life and Careers

NJCCCS Number	NJCCCS Content
<p>8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.</p>	<p>A. Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems, and operations.</p> <ul style="list-style-type: none"> ● 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.3 Use a graphic organizer to organize information about a problem or issue. <p>B. Creativity and Innovation: Students demonstrate creative thinking, construct knowledge and develop innovative products, and process using technology.</p> <ul style="list-style-type: none"> ● 8.1.5.B.1 Collaborate to produce a digital story about a significant local event or issue based on first-person interviews.

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	<p>F: Critical thinking, problem solving, and decision making: Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.</p> <ul style="list-style-type: none">• 8.1.5.F.1 Apply digital tools to collect, organize, and analyze data that support a scientific finding.
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Summative Assessments:

May include but is not limited to student created presentations using PowerPoint, Google slides, or other presentation programs, spreadsheets, digital stories, graphs, and/or charts.



Formative Assessments:

May include but is not limited to: Teacher Observation, Oral Questioning, Class Discussion, Homework, Quizzes, Exit Tickets, Graphic Organizers, Independent and Cooperative Activities/Assignments/Projects, Tests.



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Enduring Understandings:

- Digital tools allow for communication and collaboration anytime/anyplace worldwide.
- Selection of technology should be based on personal and/or career needs assessment.
- A tool is only as good as the person using it.
- Digital tools provide enhanced opportunities to design innovative solutions and express ideas creatively.



Essential Questions:

- How can digital tools be used for creating original and innovative works, ideas, and solutions?
- Why is the evaluation and appropriate use of accurate information more important than ever in the technological age?
- How has the use of digital tools improved opportunities for communication and collaboration?
- How do I choose which technological tools to use and when it is appropriate to use them?
- How can I transfer what I know to new technological situations/experiences?



Instructional Outcomes:

Students will:

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- Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.
- Use a graphic organizer to organize information about a problem or issue.
- Collaborate to produce a digital story about a significant local event or issue based on first-person interviews.
- Apply digital tools to collect, organize, and analyze data that support a scientific finding.

Suggested Learning Activities:

A. Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems, and operations.

8.1.5.A.1 Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.

- Have a class discussion about how we choose websites that provide accurate information and are appropriate to use. Create a list of qualities that make a website credible and a list of qualities that make a website untrustworthy. Also discuss when websites are appropriate to use as a source of information and when interviewing an expert might be better. Divide students into small groups and assign each group a local issue to research. Have the students create a list of credible websites about the issue and create a report about how technology was or was not successful in helping to address the issue. Reports can be published and shared to a class digital or electronic journal.

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- Introduce presentation software such as PowerPoint or Google Slides to the students. Show them a completed presentation that contains special effects and features. Have students create a presentation about three of their personality traits. As the students are working, you can continue to demonstrate how to incorporate the special features. Be sure to include inserting graphics and review the different slide formats.

A. Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems, and operations.

8.1.5.A.3 Use a graphic organizer to organize information about a problem or issue.

- Introduce spreadsheets to students by conducting a class survey about a topic such as favorite foods. Enter the data collected into a spreadsheet. Students can follow along on their own computers or follow along by watching the teacher up front. As an assignment, have students look up the price of one back to school item at various stores. They should create a spreadsheet to organize the prices. In their spreadsheet, they should also add a column to show the price at each store if five of the items were purchased or if 10 of the items were purchased.

B. Creativity and Innovation: Students demonstrate creative thinking, construct knowledge and develop innovative products, and process using technology.

8.1.5.B.1 Collaborate to produce a digital story about a significant local event or issue based on first-person interviews.

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- Have students work in groups to perform research on a relevant topic. The students can interview teachers, students, and parents about the issue they chose and create a digital story to present their findings and suggest possible solutions to the issue.

F: Critical thinking, problem solving, and decision making: Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.

8.1.5.F.1 Apply digital tools to collect, organize, and analyze data that support a scientific finding.

- Collaborating with the students' science teacher to create a lesson that correlates to a unit in their science curriculum. Students will participate in a science experiment and then collect and organize data using a spreadsheet such as Excel or Google Spreadsheets. Students will create a variety of different types of graphs to analyze the outcomes of the experiments.

Suggested Differentiation:

Visual and verbal instructions, choice activities, chunking information, video and written tutorials, assistive technology



Curriculum Development Resources:

Roselle Public Schools Technology Curriculum Grades 3-4 2013 <http://goo.gl/9JZeOs>

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<http://www.schrockguide.net/digital-storytelling.html>
http://www.educationworld.com/a_tech/techlp/techlp004.shtml
<http://faculty.kutztown.edu/schaeffe/Excel/Excel.html>



Notes/Comments:

Vocabulary: evaluation, credible, spreadsheet, graph, digital story, data, Excel

Unit 3 Using Digital Tools and Technology

Unit Summary: In this unit, students will use digital tools to collect, analyze, synthesize, and publish information about a local or global issue or event on a collaborative, web-based service. They will create STEM projects that demonstrate and document understanding of the design process and explain how resources and processes in the production of technological products impact the environment, which is why they need to be monitored and modified if necessary in order to have a more positive impact on the environment.

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<p>8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.</p>	<p>E: Research and Information Fluency: Students apply digital tools to gather, evaluate, and use information.</p> <ul style="list-style-type: none"> ● 8.1.5.E.1 Use digital tools to research and evaluate the accuracy of, relevance to, and appropriateness of using print and non-print electronic information sources to complete a variety of tasks.
<p>8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming:</p>	<p>B. Technology and Society: <i>Knowledge and understanding of human, cultural, and societal values are fundamental when designing technology systems and products in the global society.</i></p> <ul style="list-style-type: none"> ● 8.2.5.B.1 Examine ethical considerations in the development and production of a product through its life cycle.

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<p>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.</p>	<ul style="list-style-type: none"> ● 8.2.5.B.2 Examine systems used for recycling and recommend simplification of the systems and share with product developers. ● 8.2.5.B.3 Investigate ways that various technologies are being developed and used to reduce improper use of resources. <p>D. Abilities for a Technological World: The designed world is the product of a design process that provides the means to convert resources into products and systems.</p> <ul style="list-style-type: none"> ● 8.2.5.D.1 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. ● 8.2.5.D.2 Evaluate and test alternative solutions to a problem using the constraints and tradeoffs identified in the design process to evaluate potential solutions. ● 8.2.5.D.3 Follow step by step directions to assemble a product or solve a problem. ● 8.2.5.D.5 Describe how resources such as material, energy, information, time, tools, people, and capital are used in products or systems. ● 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.
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Summative Assessments:

May include but are not limited to: Class discussions, student journals, timelines, and lunch box designs.



Formative Assessments:

May include but is not limited to: Teacher Observation, Oral Questioning, Class Discussion, Homework, Quizzes, Exit Tickets, Graphic Organizers, Independent and Cooperative Activities/Assignments/Projects, Tests.



Enduring Understandings:

- A system has interrelated components designed to collectively achieve a desired goal.
- All technological activities use resources that include tools/machines, materials, information, energy, capital, time, and people.



Essential Questions:

- How do I choose which technological tools to use and when it is appropriate to use them?

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- Why is the evaluation and appropriate use of accurate information more important than ever in the technological age?
- Can a system continue to operate with a missing or malfunctioning component?
- Is it always beneficial to use the most economical material/materials for production of a technological product?



Instructional Outcomes:

- Use digital tools to research and evaluate the accuracy of, relevance to, and appropriateness of using print and non-print electronic information sources to complete a variety of tasks.
- 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.
- Identify and collect information about a problem that can be solved by technology, generate ideas to solve the problem, and identify constraints and trade-offs 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.

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- Follow step by step directions to assemble a product or solve a problem.
- 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.

Suggested Learning Activities:

E: Research and Information Fluency: Students apply digital tools to gather, evaluate, and use information.

8.1.5.E.1 Use digital tools to research and evaluate the accuracy of, relevance to, and appropriateness of using print and non-print electronic information sources to complete a variety of tasks.

- Present the class with a relevant problem or community issue that could be solved using more than one digital tool (for ideas, ask Science and Social Studies teachers what the kids are working on). Have groups of students select different digital tools to solve the problem. When completed, the class should discuss all the solutions and the different tools used. The advantages and disadvantages of each tool should be discussed using Venn diagrams or other organizational charts. Students can post findings to a digital or electronic journal.

B. Technology and Society: *Knowledge and understanding of human, cultural, and societal values are fundamental when designing technology systems and products in the global society.*

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8.2.5.B.1 Examine ethical considerations in the development and production of a product through its life cycle.

8.2.5.B.2 Examine systems used for recycling and recommend simplification of the systems and share with product developers.

8.2.5.B.3 Investigate ways that various technologies are being developed and used to reduce improper use of resources.

- Hold up a Chromebook and ask the students to call out factors that need to be considered when creating the device. If they say materials, ask what materials are used. If they are having trouble, ask questions such as: How much do you think it costs to buy this? How much do you think it costs to make this? etc., until they figure out that cost is a factor. Make a list of factors on the board or on large poster paper. Have students, working in small groups, select another device such as a Smartphone, Smartwatch, tablet, etc., and apply the same discussion questions. They will report their discussion results to the class.

D. Abilities for a Technological World: The designed world is the product of a design process that provides the means to convert resources into products and systems.

8.2.5.D.5 Describe how resources such as material, energy, information, time, tools, people, and capital are used in products or systems.

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.

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- Have students work in groups to create presentations on how an invention such as a camera or TV or phone has changed over time. They can create a timeline that includes at least five different versions of the device throughout the years. Their timeline should include pictures as well as details of how the device has changed.

D. Abilities for a Technological World: The designed world is the product of a design process that provides the means to convert resources into products and systems.

8.2.5.D.1 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.

8.2.5.D.2 Evaluate and test alternative solutions to a problem using the constraints and tradeoffs identified in the design process to evaluate potential solutions.

8.2.5.D.3 Follow step by step directions to assemble a product or solve a problem.

- Introduce the design process by having students watch the following video: <http://www.youtube.com/watch?v=Ev2sHur84sl> . After the video, distribute or display the design process steps. Have the students identify the steps of the design process in the video. Also discuss what is done with leftover materials. Explain to students that they will be designing a new lunch box for students. They should consider the shape and appearance of the lunch box and materials necessary to create the box. They should also think about how the extra materials will be disposed of.

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- Bring in a product from home that all of the students can test or try out in class. Then administer a customer satisfaction survey to collect reviews on the item from the students. Display the results of the survey for the class and ask the students to form groups of 3-4. Each group should brainstorm ideas on how to modify the product based on the survey results. They can present their final ideas to the class. There can be a discussion on how similar and/or different each group's suggested modifications were.



Suggested Differentiation:

Visual and verbal instructions, choice activities, chunking information , video and written tutorials, assistive technology



Curriculum Development Resources:

Roselle Public Schools Technology Curriculum Grades 3-4 2013 <http://goo.gl/9JZeOs>
<http://www.youtube.com/watch?v=Ev2sHur84sl>



Notes/Comments:

Vocabulary: survey, resources, recycling, cost factors, design process

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Unit 4 Problem Solving

Unit Summary: In this unit, students will use the design process and digital tools to solve real world problems. They will understand that computers are a product of design and engineering. They will employ computational thinking and programming languages to solve math and science problems or to create interactive apps, games, and experiences.

Interdisciplinary Connections/Content Area Integrations Including Technology: Critical Thinking, Problem Solving, English Language Arts, Communications Skills, Health, Science, Social Studies, Mathematics, 21st Century Life and Careers

NJCCCS Number	NJCCCS Content
8.1 Educational Technology: All students will use digital tools to access, manage,	C. Communication and Collaboration: Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.

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<p>evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.</p>	<ul style="list-style-type: none">● 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.
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<p>8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming: 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.</p>	<p>C. Design: The design process is a systematic approach to solving problems.</p> <ul style="list-style-type: none">● 8.2.5.C.1 Collaborate with peers to illustrate components of a design system.● 8.2.5.C.2 Explain how specifications and limitations can be used to direct a product’s development.● 8.2.5.C.4 Collaborate and brainstorm with peers to solve a problem evaluating all solutions to provide the best results with supporting sketches or models.● 8.2.5.C.6 Examine a malfunctioning tool and identify the process to troubleshoot and present options to repair the tool.● 8.2.5.C.7 Work with peers to redesign an existing product for a different purpose. <p>E. Computational Thinking: Programming: Computational thinking builds and enhances problem solving, allowing students to move beyond using knowledge to creating knowledge.</p> <ul style="list-style-type: none">● 8.2.5.E.1 Identify how computer programming affects everyday lives.● 8.2.5.E.2 Demonstrate an understanding of how a computer takes input of data, processes, and stores the data through a series of commands, and outputs information.● 8.2.5.E.3 Using a simple visual programming language create a program using loops, events, and procedures to generate a specific output.
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	<ul style="list-style-type: none">● 8.2.5.E.4 Use appropriate terms in conversation (e.g., algorithm, program, debug, loop, events, procedures, memory, storage, processing software, coding, procedure, and data).
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Summative Assessments:

May include but are not limited to:

Rubrics will be developed to assess student progress on design challenges and project based learning activities:

<http://rubistar.4teachers.org/index.php?screen=NewRubric&module=Rubistar&>

<http://www.dailyteachingtools.com/cooperative-learning-evaluate.html>

<http://www.getworksheets.com/samples/rubrics/elementary.html>

http://bie.org/object/document/3_5_creativity_innovation_rubric_ccss_aligned

Rubrics will be developed to assess the student progress in coding activities.



Formative Assessments:

May include but is not limited to: Teacher Observation, Oral Questioning, Class Discussion, Homework, Quizzes, Exit Tickets, Graphic Organizers, Independent and Cooperative Activities/Assignments/Projects, Tests.

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Enduring Understandings:

- Digital tools can and provide a means to solve problems and communicate understandings in a global community.
- A system has interrelated components designed to collectively achieve a desired goal.
- All technological activities use resources that include tools/machines, materials, information, energy, capital, time, and people.



Essential Questions:

- How can we use digital tools to collaborate with others in a global community?
- What are the essential components of a design system?
- What language does a computer use, and how does it communicate?
- Is it always beneficial to use the most economical material/materials for production of a technological product?
- What is coding, and what is it used for?



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Instructional Outcomes:

- 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.
- Collaborate with peers to illustrate components of a design system.
- Explain how specifications and limitations can be used to direct a product's development.
- Collaborate and brainstorm with peers to solve a problem evaluating all solutions to provide the best results with supporting sketches or models.
- 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 how computer programming affects 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 a specific output.
- Use appropriate terms in conversation (e.g., algorithm, program, debug, loop, events, procedures, memory, storage, processing software, coding, procedure, and data).



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Suggested Learning Activities:

C. Communication and Collaboration: Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.

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.

- Have students collaborate with students from another state or country to discuss a current event or topic by comparing and contrasting their different perspectives using an online authoring tool or by communicating digitally through SKYPE. For example, students might complete an author study and then connect with another class in a different country or state that is also studying the same author to share reading responses and book reviews.

- <http://www.ePals.com>

C. Design: The design process is a systematic approach to solving problems.

8.2.5.C.1 Collaborate with peers to illustrate components of a design system.

8.2.5.C.2 Explain how specifications and limitations can be used to direct a product's development.

8.2.5.C.4 Collaborate and brainstorm with peers to solve a problem evaluating all solutions to provide the best results with supporting sketches or models.

8.2.5.C.6 Examine a malfunctioning tool and identify the process to troubleshoot and present options to repair the tool.

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8.2.5.C.7 Work with peers to redesign an existing product for a different purpose.

- Students will participate in a variety of STEM design challenges. During each of these challenges, students define a simple design problem including specified criteria and constraints. Then they generate and compare multiple possible solutions. Students are asked to develop a solution to a problem based on how well each is likely to meet the criteria and constraints of the problem and construct a prototype. Students plan and carry out fair tests in which variables are controlled. Students consider failure points of data collected to identify aspects of the design solution that can be improved. Students communicate their design solution including specific suggestions for improvement. Possible design challenges or projects can include but are not limited to the following:
 - Read a children’s fairy tale and present the class with a STEAM problem to solve related to the tale. For example, read *The Gingerbread Man* and then have the students design and create a different method for the gingerbread man to cross the stream so that he does not need to jump on the fox’s nose or have them design and build a better house for the three little pigs. The students will collaborate and brainstorm with peers to sketch and build their designs.
 - Give students a mystery bag challenge. In the bag are the components for a machine. They need to figure out how to put the components together to make the machine work. For instance, they might need to build a catapult using plastic spoons, rubber bands, and tongue depressors. Students would work in teams to plan, sketch, build, and then test their device.

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- Students will collaborate to plan, draw, and label a Rube Goldberg machine. See resources below for websites that demonstrate how a Rube Goldberg machine works, models, and games relating to the use of simple machines to create these devices.
 - <http://pbskids.org/zoom/games/goldburgertogo/rubegame.html>
 - <https://www.rubegoldberg.com/education/teaching-resources/>
 - <http://coolmaterial.com/roundup/rube-goldberg-machines/>
 - <https://www.rubegoldberg.com/education/rube-works-game/>
 - <http://www.engineering.com/GamesPuzzles/DynamicSystems.aspx>
 - <http://www.crackingideas.com/exhibition/game/>

- For lessons in observing and identifying how simple machines relate to and affect one another to better understand how machines work, the following websites can be used:
 - <http://legacy.mos.org/sIn/Leonardo/SketchGadgetAnatomy.html>
 - <http://legacy.mos.org/sIn/Leonardo/BeInventive.html> and
 - <http://legacy.mos.org/sIn/Leonardo/BeInventiveChallenges.html>

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- Assign each student group a product that is popular amongst 3rd graders. It can be a toy or tool that they are familiar with. Ask them to come up with two alternative uses for the product and to create a commercial to sell the product that shows both alternative ways to use the product. They can record their commercial and edit it using movie software.

E. Computational Thinking: Programming: Computational thinking builds and enhances problem solving, allowing students to move beyond using knowledge to creating knowledge.

8.2.5.E.1 Identify how computer programming affects everyday lives.

8.2.5.E.2 Demonstrate an understanding of how a computer takes input of data, processes, and stores the data through a series of commands, and outputs information.

8.2.5.E.3 Using a simple visual programming language, create a program using loops, events, and procedures to generate a specific output.

8.2.5.E.4 Use appropriate terms in conversation (e.g., algorithm, program, debug, loop, events, procedures, memory, storage, processing software, coding, procedure, and data).

- Participate in grade appropriate lessons in coding and computational thinking by using websites such as:
 - <http://www.code.org>
 - <http://tynker.com>

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- <https://scratch.mit.edu/>



Suggested Differentiation:

Visual and verbal instructions, choice activities, chunking information, video and written tutorials, assistive technology



Curriculum Development Resources:

Roselle Public Schools Technology Curriculum Grades 3-4 2013 <http://goo.gl/9JZeOs>

Websites:

- <http://legacy.mos.org/sln/Leonardo/SketchGadgetAnatomy.html>
- <http://legacy.mos.org/sln/Leonardo/BeInventive.html> and
- <http://legacy.mos.org/sln/Leonardo/BeInventiveChallenges.html>
- <http://www.code.org>
- <http://tynker.com>

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- <https://scratch.mit.edu/>
- <http://pbskids.org/zoom/games/goldburgertogo/rubegame.html>
- <https://www.rubegoldberg.com/education/teaching-resources/>
- <http://coolmaterial.com/roundup/rube-goldberg-machines/>
- <https://www.rubegoldberg.com/education/rube-works-game/>
- <http://www.engineering.com/GamesPuzzles/DynamicSystems.aspx>
- <http://www.crackingideas.com/exhibition/game/>
- <http://www.epals.com>
- <http://rubistar.4teachers.org/index.php?screen=NewRubric&module=Rubistar&>
- <http://www.dailyteachingtools.com/cooperative-learning-evaluate.html>
- <http://www.getworksheets.com/samples/rubrics/elementary.html>
- http://bie.org/object/document/3_5_creativity_innovation_rubric_ccss_aligned



Notes/Comments: Vocabulary - algorithm, program, debug, loop, events, procedures, memory, storage, processing software, coding, procedure, and data

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