

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: 6th Grade Technology

Content Area: Technology

Grade Level(s): 6

Course Description: 6th Grade Technology

Curriculum Writer(s): Dina LoPiccolo

Date Created: 7/20/2015

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Pacing Guide

Unit 1 Title: Safe, Responsible, and Ethical Use of Technology

Unit 2 Title: Digital Tools, Globalization, and the Designed World

Unit 3 Title: Digital Tools for Communication, Collaboration, and Problem Solving in a Global Society

Unit 4 Title: The Design Process: Solving Problems Systematically and Creatively

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Unit 1 - Safe, Responsible, and Ethical Use of Technology

Unit Summary: In this unit, students will understand and use technology systems. They will demonstrate personal responsibility for lifelong learning by selecting and using applications effectively and productively in a safe, legal, and responsible manner.

Interdisciplinary Connections/Content Area Integrations Including Technology: Utilizing interdisciplinary activities that emphasize the use of technology skills to become lifelong learners.

- Critical Thinking
- Problem Solving
- English Language Arts
- Communications Skills
- Health
- Science
- Social Studies
- Mathematics
- 21st Century Life and Careers

CCSS/[NJCCCS](#) Number

2014 CCSS/[NJCCCS](#) Content

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8.1 Educational Technology:	<p>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> <ul style="list-style-type: none">● Strand A. Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts.● Strand D: Digital Citizenship: Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.
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Summative Assessments:

May include but not limited to: Prezi, Google Documents, Google Slides, Google Spreadsheet, Google Forms

Students will be able to answer the enduring questions for the unit and demonstrate their understanding on the formative assessment.



Formative Assessments:

Students will be able to answer the enduring questions for the unit and demonstrate their understanding on the formative assessment. May include but not limited to: Prezi, Google Documents, Google Slides, Google Spreadsheet, Google Forms



Enduring Understandings:

- Technology is constantly changing and requires continuous learning of new skills.
- Selection of technology should be based upon personal needs and/or the requirements of the task.

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- A tool is only as good as the operator utilizing the tool; knowing how to use the tool is paramount.
- Technology is a tool that can be used for collecting, organizing, creating, and presenting information.



Essential Questions:

- In a world that is constantly changing, what skills do we need to master?
- How do I choose which technological tools to use and when it is appropriate to use them?
- What is the impact of technology on research and communication?
- What are the benefits and limitations of using technology?



Instructional Outcomes:

8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools.

8.1.8.A.2 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.

8.1.8.A.3 Use and/or develop a simulation that provides an environment to solve a real world problem or theory.

8.1.8.A.4 Graph and calculate data within a spreadsheet and present a summary of the results.

8.1.8.D.1 Understand and model appropriate online behaviors related to cybersafety, cyber bullying, cyber security, and cyber ethics including appropriate use of social media. Demonstrate personal responsibility for lifelong learning.

8.1.8.D.2 Demonstrate the application of appropriate citations to digital content.

8.1.8.D.3 Demonstrate an understanding of fair use and Creative Commons to intellectual property. Exhibit leadership for digital citizenship.

8.1.8.D.4 Assess the credibility and accuracy of digital content.

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Suggested Learning Activities:

8.1.8.D.1 Understand and model appropriate online behaviors related to cybersafety, cyber bullying, cyber security, and cyber ethics including appropriate use of social media. Demonstrate personal responsibility for lifelong learning.

Grade 6:

- Determine how to maintain cyber security and cyber ethics using appropriate online behaviors.
- Introduce cybersafety with the video links below:
 - http://mediasmarts.ca/sites/mediasmarts/files/games/privacy_playground/flash/privacy_playground_en/start.html
- Discuss content of videos with students.
- Present scenarios to students and discuss appropriate ways to maintain cyber security and appropriate online behaviors.
- Create a comic illustrating two or three of the rules regarding Internet etiquette.
- Introduce concepts related to appropriate behaviors with regard to cybersafety with the video links and games below:
 - <http://www.netsmartz.org/RealLifeStories/YourPhotoFate>
 - https://learninglab.org/life_skills/online_safety/try_movie.swf
- Review Netiquette on the link below with students; class discussion
 - <http://networketiquette.net/netiquette/student-netiquette/>
 - <http://www.netsmartz.org/resources/activitycards>
- Have students take the online safety quiz found on the link below:
 - <https://www.getsafeonline.org/quiz/>

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- Create a list of rules regarding Internet etiquette in a word processing document that outlines appropriate behaviors when online with regard to cybersafety.
- Create a comic illustrating two or three of the rules from the list of rules regarding Internet etiquette using Google Slides or the following links:
 - <http://www.readwritethink.org/files/resources/interactives/comic/>
 - <http://www.makebeliefscomix.com/>
- Introduce concept of cyber bullying with the video clips below:
 - <http://www.to14.com/games/game-1255516144.swf>
- Create a presentation that demonstrates appropriate behavior when faced with situations that deal with issues of cybersafety, cyber bullying, cyber security, and cyber ethics to share with younger students or parents.
- Explain the concept of copyright in students' own words.
- Students watch the video link below and review the lyrics to the "Copyright Song" and discuss the concept of copyright and its implications and connections to the First Amendment.
 - <http://mediaeducationlab.com/1-whats-copyright-music-video>

8.1.8.D.3 Demonstrate an understanding of fair use and Creative Commons to intellectual property. Exhibit leadership for digital citizenship.

Grade 6:

- Explain fair use policy after discussing article.
- Read and discuss one of the articles linked below and then have students create a chart after reading an article.
 - <http://www.nolo.com/legal-encyclopedia/fair-use-rule-copyright-material-30100.html>
 - <http://www.teachingcopyright.org/handout/fair-use-faq>
 - <http://copyright.lib.utexas.edu/copypol2.html>
 - <http://fairuse.stanford.edu/overview/fair-use/four-factors/>

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8.1.8.A.2 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.

8.1.8.D.1 Understand and model appropriate online behaviors related to cybersafety, cyber bullying, cyber security, and cyber ethics including appropriate use of social media. Demonstrate personal responsibility for lifelong learning.

8.1.8.D.2 Demonstrate the application of appropriate citations to digital content.

8.1.8.D.4 Assess the credibility and accuracy of digital content.

Grade 6

- Create a newsletter about a civil rights leader using advanced features of a word processing program.

Or

- Create a poster, advertisement, or a book cover related to a civil rights leader utilizing the advanced features of a word processing program.
- Employ a word processing program to insert and format digital pictures into the newsletter, poster, advertisement, or book cover.
- Have students select a civil rights leader and then research the civil rights leader to create a newsletter related to the activities of said leader using a word processing program. The newsletter must include appropriate graphics, margins, columns, etc.
- Create a Work Cited and/or Bibliography.
- Sample resources to select a civil rights leader:
 - <http://www.infoplease.com/spot/bhmheroes1.html>
 - <http://www.pbs.org/black-culture/explore/civil-rights-leaders/#.Va0pgvIVgSU>
 - <http://www.jfklibrary.org/Education/Students/Leaders-in-the-Struggle-for-Civil-Rights.aspx>
 - <http://www.georgiaencyclopedia.org/special-collections/black-leaders-civil-rights-movement>
- Evaluate resources using one of the following:
 - <http://www.schrockguide.net/uploads/3/9/2/2/392267/5ws.pdf>

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- http://www.readwritethink.org/files/resources/lesson_images/lesson328/evalform.pdf

8.1.8.A.2 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.

8.1.8.A.4 Graph and calculate data within a spreadsheet and present a summary of the results.

8.1.8.D.1 Understand and model appropriate online behaviors related to cybersafety, cyber bullying, cyber security, and cyber ethics including appropriate use of social media. Demonstrate personal responsibility for lifelong learning.

8.1.8.D.2 Demonstrate the application of appropriate citations to digital content.

8.1.8.D.4 Assess the credibility and accuracy of digital content.

Grade 6

- Sample resources for students who build a database of African American scientists, their country of origin, their inventions, any patents they may hold, and the impact of their inventions on the world we live in:

- <http://www.infoplease.com/spot/bhmScientists1.html>

- http://inventors.about.com/od/blackinventors/a/black_inventors.htm

- <https://webfiles.uci.edu/mcbrown/display/faces.html>

- <http://www.enchantedlearning.com/inventors/black.shtml>

- <http://kids.nationalgeographic.com/explore/science/black-inventors-and-pioneers-of-science/#black-scientist-jemison.jpg>

Or

- Students must use at least three resources, including their textbook, one of the sample resources from the list below, and one of their own choosing in order to build a database of volcanoes, location, number of times it has erupted, how it was formed, type of volcano, and interesting facts.

- <http://www.factmonster.com/ipka/A0001746.html>

- <http://www.infoplease.com/ipa/A0001439.html>

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- <http://www.volcanodiscovery.com/volcanoes.html>
- Evaluate resources using one of the following:
 - <http://www.schrockguide.net/uploads/3/9/2/2/392267/5ws.pdf>
 - http://www.readwritethink.org/files/resources/lesson_images/lesson328/evalform.pdf
- Create a Work Cited and/or Bibliography.
- Compare the volcanoes by creating a graph of the number of times each has erupted; find the Sum, Min., and Max.
- Create a poster using advanced features of a word processing program.

8.1.8.A.3 Create a multimedia presentation including sound and images.

Grade 6:

Students create animation of a science process (the growing of a plant, the rock cycle, or another concept covered in science class).

Or

Students create animation, iMovie, iPhoto slideshow, or Prezi of a fairytale they either learned about in English Language Arts class or have researched on the Internet.

Or

Students create an online reading recording and then self-evaluate their expressive reading skills through the podcast they have created; other students will also be asked to evaluate expressive reading of students (audio only or image enhanced podcast).

Multimedia presentation software: Garageband, Podcasts, iMovie, Voicethread Free Animation software, Animoto, iPhoto slideshow, Prezi, Glogster, Google Slides and/or Sites.

8.1.8.A.4 Graph and calculate data within a spreadsheet and present a summary of the results.

Grade 6:

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- Have students compare the nutritional values (fat and calorie content) of McDonalds, Burger King, Wendy’s, Sonic, and White Castle (and any others you would like to add to the list) by creating an Excel or Google spreadsheet with fields of information comparing the fat and calorie content of five different “foods” at each of the restaurants listed above using the links found below:
 - <http://www.infoplease.com/ipa/A0934642.html>
 - <http://www.acaloriecounter.com/fast-food.php>

8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools.

8.1.8.D.4 Assess the credibility and accuracy of digital content.

Grade 6:

- Provide students with different websites for them to evaluate the credibility of the sites.
 - Present different scenarios to students and have them select the most appropriate tool to utilize to accomplish the task and explain their reasoning.
 - Evaluate digital resources and tools to accomplish tasks or solve problems.
 - Using the link below, have students peruse the document prior to evaluating the list of resources provided for assessment and credibility: <http://library.albany.edu/usered/webeval/au/au2.html>
 - Use the link below for hoax sites for student evaluation:
 - http://www.shsu.edu/~lis_mah/documents/TCEA/hoaxtable.html
- Or
- Evaluate information on a controversial issue for bias.
 - Research the uprising in Syria or Greece (or any current event of the time) and the government’s control of media/Internet during the aftermath of a domestic or international incident and evaluate whether or not the information being provided by said country’s government was biased by reviewing the information provided by the United States with regard to the same incident.

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- Complete a Venn diagram comparing and contrasting the information presented by both countries and evaluate whether or not there was bias demonstrated by one or both countries.



Suggested Differentiation:

Tier 1 Learners - Work individually, allow student choice to experiment with various resources.

Tier 2 Learners - Work with a partner, chunk information into smaller parts, provide written notes and/or resources for the student to utilize, student choice from a limited amount of resources.

Tier 3 Learners - Video or written tutorials, work with a partner, chunk information into smaller parts, provide written notes and/or resources for the student to utilize, provide graphic organizers and a list of resources, allow extra time to complete assignments.

Curriculum Development Resources: Roselle Public Schools Technology Curriculum Grades 5-6



Notes/Comments:

- For Assessment and Rubric Resources see:
 - <http://www.schrockguide.net/assessment-and-rubrics.html>

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Unit 2 - Digital Tools, Globalization, and the Designed World

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.

Interdisciplinary Connections/Content Area Integrations Including Technology: Utilizing interdisciplinary activities that emphasize the use of technology skills to become lifelong learners.

- Science
- Mathematics
- Critical Thinking
- Problem Solving
- English Language Arts
- Communications Skills
- 21st Century Life and Careers

CCSS/NJCCCS Number	2014 CCSS/NJCCCS Content
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.

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	<ul style="list-style-type: none">● Strand B. Creativity and Innovation: Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.● Strand 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.
8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming	<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">● Strand C. Design: The design process is a systematic approach to solving problems.● Strand 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.

Summative Assessments:

Students will be able to answer the enduring questions for the unit and demonstrate their understanding on the formative assessment. May include but not limited to: Prezi, Google Documents, Google Slides, Google Spreadsheet, Google Forms.



Formative Assessments:

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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:

- Digital tools provide opportunities for people to have new experiences, recognize problems, design solutions, and express their ideas.
- Information is spread worldwide within seconds due to technological advancements and has an immediate impact.
- Collaboration is an essential part in industry.
- Data collected from testing models are analyzed and applied.



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 do I collect data? How should I select which data are important? How do I analyze data and apply it to improve technology?
- Why do companies collect data from testing their products?



Instructional Outcomes:

- 8.1.8.B.1** Synthesize and publish information about a local or global issue or event on a collaborative, web-based service.
- 8.1.8.F.1** Explore a local issue by using digital tools to collect and analyze data to identify a solution and make an informed decision.
- 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.

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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.D.1 Design and create a product that addresses a real world problem using a design process under specific constraints.

8.2.8.D.3 Build a prototype that meets a STEM-based 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.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.



Suggested Learning Activities:

8.1.8.B.1 Synthesize and publish information about a local or global issue or event on a collaborative, web-based service.

Grade 6:

- Investigate the most important and relevant issues in an upcoming campaign and create a virtual discussion board in which students can “discuss” the issues and share information and opinions related to the campaign.

8.1.8.F.1 Explore a local issue by using digital tools to collect and analyze data to identify a solution and make an informed decision.

Grade 6:

- Analyze the data to create a possible solution to decrease the number of injuries and/or deaths due to tornadoes in the United States using the following link:
 - <http://www.ncdc.noaa.gov/climate-information/extreme-events/us-tornado-climatology#deadly>

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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.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.D.1 Design and create a product that addresses a real world problem using a design process under specific constraints.

8.2.8.D.3 Build a prototype that meets a STEM-based design challenge using science, engineering, and math principles that validate a solution.

Grade 6:

- Using the links below, have students research the needs of a person with kidney disease and have students design a product to assist in the management of the disease (can be as simple as a log recording system to track dialysis and reactions to treatment, etc.).
 - <https://www.kidney.org/kidneydisease/aboutckd>
 - <http://www.webmd.com/a-to-z-guides/understanding-kidney-disease-basic-information>
 - <http://www.webmd.com/a-to-z-guides/chronic-kidney-disease-treatment-overview>
 - <http://www.nlm.nih.gov/medlineplus/magazine/issues/winter08/articles/winter08pg9-10.html>
- Have students work in small groups to create an accurate representation of the product using every day, household items (cardboard, paper, pipe cleaners, etc.) and then create a three-dimensional sketch of the product using a CAD program such as:
 - <http://www.sketchup.com/>
 - <http://www.123dapp.com/design>
- Create a digital log using Google Docs, a wiki, or a blog to record the developmental cycle of the product, including the sketches on the recording.

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.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.

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Grade 6:

- Identify the components of an iPhone (or another type of cellular phone) that draw power from the phone's battery (apps that draw more power and drain the battery) and the function these components serve in the overall function of the phone.
- Explain how to monitor and maintain the components to preserve the phone's battery.
- Research the life span of an iPhone's battery and how to preserve the life of the battery to lessen the impact upon the environment.

8.2.8.C.5 Explain the interdependence of a subsystem that operates as part of a system.

Grade 6:

- Using the links below, have students examine the interdependence of a subsystem (engine of a car) that operates as part of a system (the vehicle) in order to create a flowchart using Inspiration software that demonstrates what happens when one part of the systems fails to work or does not work to the full potential.
 - <http://www.howacarworks.com/>
 - <http://auto.howstuffworks.com/engine.htm>
 - <http://jalopnik.com/ten-gifs-that-explain-how-a-car-works-495996770>
 - <http://www.howacarworks.com/>
 - <https://www.youtube.com/user/EngineeringExplained>

Suggested Differentiation:

Tier 1 Learners - Work individually, allow student choice to experiment with various resources.

Tier 2 Learners - Work with a partner, chunk information into smaller parts, provide written notes and/or resources for the student to utilize, student choice from a limited amount of resources.

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Tier 3 Learners - Video or written tutorials, work with a partner, chunk information into smaller parts, provide written notes and/or resources for the student to utilize, provide graphic organizers and a list of resources, allow extra time to complete assignments.



Curriculum Development Resources: Roselle Public Schools Technology Curriculum Grades 5-6



Notes/Comments:

- **For Assessment and Rubric Resources see:**
 - <http://www.schrockguide.net/assessment-and-rubrics.html>

Unit 3 - Digital Tools for Communication, Collaboration, and Problem Solving in a Global Society

Unit Summary: In this unit, students will utilize online learning communities to participate with students in other countries to discuss individual perspectives on a global problem or issue and to propose possible solutions to the issue or problem. They will determine the impact globalization has on services and goods. They will be able to explain how products and new technologies are a result of the demands, values, and interests of individuals, businesses, industries, and societies. They will be able to compare and contrast the different types of intellectual property including copyrights, patents, and trademarks and explain how many forms of intellectual property can exist in one device or product.

Interdisciplinary Connections/Content Area Integrations Including Technology:

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<p>Utilizing interdisciplinary activities that emphasize the use of technology skills to become lifelong learners.</p> <ul style="list-style-type: none"> ● Science ● Mathematics ● Critical Thinking ● Problem Solving ● English Language Arts ● Communications Skills ● 21st Century Life and Careers

CCSS/NJCCCS Number	2014 CCSS/NJCCCS Content
8.1 Educational Technology	<p>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> <ul style="list-style-type: none"> ● Strand A. Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts. ● Strand C. Communication and Collaboration
8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming	<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"> ● Strand B. Technology and Society: Knowledge and understanding of human, cultural, and society values are fundamental when designing technology systems and products in the global society.

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| | <ul style="list-style-type: none">• Strand 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. |
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Summative Assessments:

Students will be able to answer the enduring questions for the unit and demonstrate their understanding on the formative assessment. May include but not limited to: Prezi, Google Documents, Google Slides, Google Spreadsheet, Google Forms.



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:

- 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.
- Technology evolves at an ever-accelerating 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.

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- All technological activities use resources that include tools/machines, materials, information, energy, capital, time, and people.



Essential Questions:

- 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?
- Can we control the pace at which technology is created? Should we, even if we can?
- 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:

- 8.1.8.A.1** Demonstrate knowledge of a real world problem using digital tools.
- 8.1.8.C.1** Collaborate to develop and publish work that provides perspectives on a global problem for discussions with learners from other countries.
- 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.



Suggested Learning Activities:

- 8.1.8.A.1** Demonstrate knowledge of a real world problem using digital tools.
- 8.1.8.C.1** Collaborate to develop and publish work that provides perspectives on a global problem for discussions with learners from other countries.

Grade 6:

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- Utilize online learning communities to participate with students in other countries to discuss individual perspectives on a global problem or issue and to propose possible solutions to the issue or problem.
- Using the links below, have students select a global issue and discuss the issue utilizing an online learning community to attain outside perspectives of other students in different countries with regard to the global issue selected:
 - <http://www.globalissues.org/issue/178/climate-change-and-global-warming>
 - <http://www.globalissues.org/issue/168/environmental-issues>
 - <http://www.globalissues.org/article/165/racism>
- Evaluate and summarize the perspectives of other cultures about a current event or contemporary figure by using an electronic authoring tool to collaborate with students in other countries.
- Have students use an electronic authoring tool to collaborate with students from other countries discussing and determining their perspectives on a current event and then compare and contrast their perspectives with your own perspective in a podcast, Voicethread, or Google Slides presentation to share with your classmates.
 - Use the links below to locate participants from other countries:
 - <http://www.epals.com/#!/main>

8.2.8.B.5 Identify new technologies resulting from the demands, values, and interests of individuals, businesses, industries, and societies.

Grade 6:

- Have students explain what globalization is; elicit responses from students; clarify responses to solidify definition of globalization for students.
- Have students research the production of Northface™ products or Timberline™ boots to determine the impact globalization has upon the products they selected and how the impact has changed over time.

8.2.8.B.6 Compare and contrast the different types of intellectual property including copyrights, patents, and trademarks.

Grade 6:

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- Ask what is intellectual property?
- Review the concept of patenting with students and elicit responses as to how patents protect inventors.
- Review the concept of trademarks and ask students to weigh in on the importance of a logo or brand.
- Review the concepts of copyright, copy left, and Creative Commons. Ask students how the Internet affects copyrights.
- Have students work in groups to explain how many forms of intellectual property can exist in one device (for example electronic devices including Smartphone, computer, and television.) The shape may be protected by a registered design; a part or mechanism may be protected by patents; the name of the device may be registered as a trademark; and of course, the advertising materials for it may be protected by copyright.
- Have students create a multimedia presentation, Podcast, or a Voicethread comparing and contrasting the different types of intellectual property including all of the above.
 - Resources
 - http://inventors.about.com/cs/lessonplans/a/student_primer.htm
 - http://www.tkkfoundation.org.sg/foundation/young/hb_teacher.pdf



Suggested Differentiation:

Tier 1 Learners - Work individually, allow student choice to experiment with various resources.

Tier 2 Learners - Work with a partner, chunk information into smaller parts, provide written notes and/or resources for the student to utilize, student choice from a limited amount of resources.

Tier 3 Learners - Video or written tutorials, work with a partner, chunk information into smaller parts, provide written notes and/or resources for the student to utilize, provide graphic organizers and a list of resources, allow extra time to complete assignments.



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Curriculum Development Resources: Roselle Public Schools Technology Curriculum Grades 5-6



Notes/Comments:

- For Assessment and Rubric Resources see:
 - <http://www.schrockguide.net/assessment-and-rubrics.html>

Unit 4 - The Design Process: Solving Problems Systematically and Creatively

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:

Utilizing interdisciplinary activities that emphasize the use of technology skills to become lifelong learners.

- Science
- Mathematics
- Critical Thinking
- Problem Solving
- English Language Arts
- Communications Skills

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- **21st Century Life and Careers**

CCSS/NJCCCS Number	CCSS/NJCCCS Content
8.1 Educational Technology:	<p>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> <ul style="list-style-type: none">● Strand A. Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts.
8.2 Technology Education, Engineering, Design, and Computational Thinking – Programming	<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">● Strand B. Technology and Society: Knowledge and understanding of human, cultural, and society values are fundamental when designing technology systems and products in the global society.● Strand 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.● Strand E. Computational Thinking: Programming: Computational thinking builds and enhances problem solving, allowing students to move beyond using knowledge to creating knowledge.

Summative Assessments:

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Students will be able to answer the enduring questions for the unit and demonstrate their understanding on the formative assessment. May include but not limited to: Prezi, Google Documents, Google Slides, Google Spreadsheet, Google Forms.



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:

- Technological outcomes have potential for anticipated and unanticipated positive and negative results.
- The design process is fundamental to technology and engineering.
- Common themes guide the design process across many different contexts.
- We use computers to achieve goals, like being able to type, using a spreadsheet program, editing video, etc.
- Computers are programmed using one of the many programming languages in the world, either to solve math and science problems or to create interactive apps, games, and experiences.
- Computers systems are a product of science and engineering, both on the hardware side (electrical engineering) and the software (algorithms).



Essential Questions:

- How does technology extend human capabilities?
- What are the positive and negative consequences of technology?

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- Should technologies that produce negative impact be used?
- When are the most sophisticated tools required, and when are the simplest tools best?
- What are the fundamentals of computer programming?
- How do you create a program?
- How are algorithms used in coding?
- How can you use computer programming to complete a task?
- How is computer programming useful in real life?
- How might you use computer programming in your future career?



Instructional Outcomes:

8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools. Select and use applications effectively and productively.

8.2.8.B.2 Identify the desired and undesired consequences from the use of a product or system.

8.2.8.D.1 Design and create a product that addresses a real world problem using the design process and working with specific criteria and 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.

8.2.8.D.3 Build a prototype that meets a STEM-based design challenge using science, engineering, and math principles that validate a solution.

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.3 Develop an algorithm to solve an assigned problem using a specified set of commands, and use peer review to critique the solution.

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8.2.8.E.4 Use appropriate terms in conversation (e.g., programming, language, data, RAM, ROM, Boolean logic terms).



Suggested Learning Activities:

8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools.

8.2.8.D.1 Design and create a product that addresses a real world problem using the design process and working with specific criteria and 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.

8.2.8.D.3 Build a prototype that meets a STEM-based design challenge using science, engineering, and math principles that validate a solution.

Grade 6:

- Review the design process with students.
- Students will work collaboratively in small groups or pairs to create a sketch of a better lunch box to keep ice pops cold and frozen until lunch time (using design software such as Sketchup).
- Students will have to work within the constraints provided by the teacher (cannot be more than 8 inches by 6 inches and must utilize common household products in the design).
- Students will create multiple designs within the group and evaluate which design best meets the needs of the product prototype and report their results on the online discussion board.
- Use the following links for reference:
 - <http://pbskids.org/designsquad/project/75630/>
 - <http://pbskids.org/designsquad/parentseducators/workshop/process.html>
 - Workshop Notepad PDF (204KB)
 - Workshop Notepad PDF for screen readers(208KB)

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- [The Design Process in Action PDF \(3.4MB\)](#)
- [The Design Process in Action PDF for screen readers \(3.4MB\)](#)
- [The Design Process Poster PDF \(2.5MB\)](#)
- [The Design Process Poster PDF for screen readers \(2.5MB\)](#)
- <https://www.youtube.com/watch?v=6PJTlzY0Aak>

8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools. Select and use applications effectively and productively.

8.2.8.D.3 Build a prototype that meets a STEM-based design challenge using science, engineering, and math principles that validate a solution.

Grade 6:

- Have students use the links below to create a prototype of ways to keep pets safe during evacuations due to hurricanes, tornadoes, or flooding or other natural disasters.
 - <http://www.neok12.com/php/watch.php?v=zX53677b4056657c51006d02&t=Natural-Disasters>
 - <http://environment.nationalgeographic.com/environment/natural-disasters/floods-profile>
 - <http://environment.nationalgeographic.com/environment/natural-disasters/hurricane-profile/>
 - <http://environment.nationalgeographic.com/environment/natural-disasters/wildfires/>
- Students will present their design prototypes to the class in a media-rich presentation format. Bias??

8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools.

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.

Grade 6:

- Using the link below, have students develop a product to remove grease stains from different types of materials using natural resources:
 - <http://home.howstuffworks.com/howto-remove-cooking-grease-and-autogrease-stains1.htm>
- Create a multimedia presentation that explains the impact of using the natural resource in removing grease stains from different types of materials.

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8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools.

8.2.8.B.2 Identify the desired and undesired consequences from the use of a product or system.

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.

Grade 6:

- Using the links below, have students explain the positive and negative impacts of plastic water bottles and the impact they have had on the environment:
 - <http://kids.nationalgeographic.com/kids/stories/spacescience/water-bottle-pollution/>
 - <http://www.fastcoexist.com/1682236/why-use-a-plastic-water-bottle-when-you-could-drink-from-something-much-more-classy>
 - <http://recyclenation.com/2015/03/what-you-need-to-know-about-reusable-water-bottles>
 - <http://recyclenation.com/2014/02/recycle-bottles>

Grade: 6

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).

- Ask what are the various forms of communication? Review the concept of code.
- Ask what is computational thinking?
- Ask how does this relate to the designed world?
- Using one or more of the links below, students work at their own pace using JavaScript, HTML and CSS, or SQL to create drawings and animations, webpages, or to organize, query, and manipulate data:
 - www.khanacademy.org
 - https://scratch.mit.edu/projects/editor/?tip_bar=home

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Suggested Differentiation:

Tier 1 Learners - Work individually, allow student choice to experiment with various resources.

Tier 2 Learners - Work with a partner, chunk information into smaller parts, provide written notes and/or resources for the student to utilize, student choice from a limited amount of resources.

Tier 3 Learners - Video or written tutorials, work with a partner, chunk information into smaller parts, provide written notes and/or resources for the student to utilize, provide graphic organizers and a list of resources, allow extra time to complete assignments.



Curriculum Development Resources: Roselle Public Schools Technology Curriculum Grades 5-6, Khan Academy: www.khanacademy.org, Scratch: <https://scratch.mit.edu/>



Notes/Comments:

- For Assessment and Rubric Resources see:
 - <http://www.schrockguide.net/assessment-and-rubrics.html>