



TECHNOLOGY GRADE 6 CURRICULUM

Board of Education Approval: August 18, 2016

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Middle School Technology Curriculum Work Committee

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Introduction

This document serves to meet all requirements for curriculum as per the Middle Township Board of Education and the New Jersey Department of Education and will serve as a guide for lesson planning. New Jersey citizens are part of a dynamic, interconnected, and technologically driven global society centered on the creation and communication of knowledge and ideas across geographical, cultural, and linguistic borders. Students in today's schools need to need exposure to technology in order to be high functioning and contributing members, capable of effective communication and possessing advanced technological skills, of today's global society.

Course Description

Middle School Introduction to Technology familiarizes the students with the resources of technology, technology systems and the evolution of technology. Students will be taught the design process and use it to explore the concept of design. They will be introduced to common materials and processes as they challenge themselves to solve innovative problems. Each grade level will receive approximately 45 days of technology instruction.

Technology Standards Information

New Jersey's Technology Standards consist of 8.1 Educational Technology and 8.2 Technology, Engineering, Design and Computational Thinking, which work symbiotically to provide students with the necessary skills for college and career readiness.

"Advances in technology have drastically changed the way we interact with the world and each other. The digital age requires that we understand and are able to harness the power of technology to live and learn". - International Society for Technology in Education

In this ever-changing digital world where citizenship is being re-imagined, our students must be able to harness the power of technology to live, solve problems and learn in college, on the job and throughout their lives. Enabled with digital and civic citizenship skills, students are empowered to be responsible members of today's diverse global society.

Readiness in this century demands that students actively engage in critical thinking, communication, collaboration, and creativity. Technology empowers students with real-world data, tools, experts and global outreach to actively engage in solving meaningful problems in all areas of their lives. The power of technology discretely supports all curricular areas and multiple levels of mastery for all students.

"A major consequence of accelerating technological change is a difference in levels of technological ability and understanding. The workforce of the future must have the ability to use, manage, and understand technology." – International Technology and Engineering Educators Association

The design process builds in our students the recognition that success is not merely identifying a problem but working through a process and that failure is not an end but rather a point for reevaluation. Whether applied as a skill in product development, in the learning environment, in daily life, in a local or more global arena, the design process supports students in their paths to becoming responsible, effective citizens in college, careers and life.

Computational thinking provides an organizational means of approaching life and its tasks. It develops an understanding of technologies and their operations and provides students with the abilities to build and create knowledge and new technologies. Not all students will be programmers, but they should have an understanding of how computational thinking can build knowledge and control technology.

6th Grade Pacing Guide

<u>UNIT TITLE</u>	<u>ENDURING UNDERSTANDINGS</u>	<u>NJSLS</u>	<u>TIMEFRAME</u>
Databases	Databases are used to hold information and report it in specific manners. Misunderstandings ~ Databases have to be created in specific “database” software programs.	8.1.8.A.1 8.1.8.A.5	<u>5-7 days</u>
Digital Citizenship	Technology use can have positive or negative impact on both users and those affected by their use.	8.1.8.D.1 8.1.8.D.3 8.1.8.D.4 8.1.8.D.5	<u>6 days</u>
Word Processing	Word processing programs are used to create professional documents.	8.1.8.A.1 8.1.8.A.2	<u>2-3 days</u>

Content Area:	Technology	Grade(s) 6
Unit Plan Title:	Databases	
Standard		
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.		
Overview/Rationale		
In today's educational system, students need to understand and use technology systems and select and use applications effectively and productively. Students should demonstrate appropriate and effective use of technology both personally and professionally to research, communicate, create and store information.		
Strand(s)		
8.1.A. Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations.		
Technology Standard(s) (Established Goals)		
8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools.		
8.1.8.A.5 Create a database query, sort and create a report and describe the process, and explain the report results.		
Interdisciplinary Standard(s)		
English Language Arts		
CCRA.W.2 Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.		
NPH-H.9-12.2 Health Information, Products and Services		
NPH-H.9-12.3 Reducing Health Risks		
NPH-H.9-12.4 Health Influences		
NPH-H.9-12.5 Using Communication Skills to Promote Health		
Enduring Understandings: (What are the big ideas? What specific understandings about them are desired? What misunderstandings are predictable?)		
Students will understand that...		
Databases are used to hold information and report it in specific manners.		
Misunderstandings ~ Databases have to be created in specific “database” software programs.		

Essential Question(s) : (What provocative questions will foster inquiry, understanding, and transfer of learning?)			
In this unit plan, the following 21 st Century themes and skills are addressed:			
Check all that apply.		Indicate whether these skills are E-Encouraged , T-Taught , or A-Assessed in this unit by marking E , T , A on the line before the appropriate skill.	
21 st Century Themes		21 st Century Skills	
	Global Awareness	E, T	Critical Thinking & Problem Solving
	Environmental Literacy	E, T, A	Creativity and Innovation
X	Health Literacy		Collaboration, Teamwork and Leadership
	Civic Literacy		Cross-Cultural and Interpersonal Communication
X	Financial, Economic, Business and Entrepreneurial Literacy		Communication and Media Fluency
			Accountability, Productivity and Ethics
In this unit plan, the following Career Ready Practices are addressed:			
Indicate whether these skills are E-Encouraged , T-Taught , or A-Assessed in this unit by marking E , T , A on the line before the appropriate skill.			
E	CRP1. Act as a responsible and contributing citizen and employee		
E, T, A	CRP2. Apply appropriate academic and technical skills		
E	CRP3. Attend to personal health and financial well-being		
E	CRP4. Communicate clearly and effectively with reason		
	CRP5. Consider the environmental, social and economic impacts of decisions		
E	CRP6. Demonstrate creativity and innovation		
	CRP7. Employ valid and reliable research strategies		

E, T, A	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them
E	CRP9. Model integrity, ethical leadership and effective management
	CRP10. Plan education and career paths aligned to personal goals
E, T, A	CRP11. Use technology to enhance productivity
	CRP12. Work productively in teams while using cultural global competence
Student Learning Goals/Objectives: (What key knowledge and skills will students acquire as a result of this unit? What should they eventually be able to do as a result of such knowledge and skill?)	
Students will know.... The importance of limiting fats (especially saturated) and "empty" calories in their diets. How to compare various food items in terms of fat and caloric content. How to synthesize what they've learned	Students will be able to (do)... Create a database Critically Analyze data Write an explanatory text Develop a PSA
Assessment Evidence:	
Performance Tasks Each student will look up five foods he or she might eat as an entree or main dish at each of five different fast-food restaurants. Students then will use a spreadsheet to compare the fat and caloric content of these choices. They will then do a similar analysis on a complete meal (dessert, side items, and a main item) they may eat at one fast-food restaurant. Finally, they will then try to create a healthful and hopefully tasty menu for a full day of eating at fast-food restaurants.	Other Assessment Measures: <ul style="list-style-type: none"> • understanding of the impact fat and calories have on health. • comprehension of nutritional facts on food items consumed at fast food restaurants. • synthesis of nutritional facts as shown by the daily menus they create. • time management and basic computer skills.
Teaching and Learning Actions: (What learning experiences and instruction will enable students to achieve the desired results?)	
<i>Instructional Strategies and Activities</i>	Consider how will the design will: W = Help the students know Where the unit is going and What is expected? Help the teacher know Where the students are coming from (prior knowledge and interests)? H = Hook all students and Hold their interest? E = Equip students, help the Experience the key ideas and Explore the issue? R =Provide opportunities to Rethink and Revise their understandings and work? E =Allow students to Evaluate their work and its implications?

T=be Tailored (personalized to the different needs, interests and abilities of learners?)
O=be Organized to maximize initial and sustained engagement as well as effective learning?

Have students -- working individually or in small groups -- complete the following steps:

1. Go to Wake Forest University Baptist Medical Center's Drive-Thru Diet.
2. At the top of the page, click the logo of one fast food restaurant. (Pick a restaurant you like to eat at.)
3. Find one main item (hamburger, taco, etc.) at that restaurant and click the item's name. Notice that a small window opens showing nutritional information for that item.
4. Open Excel (or another spreadsheet program). In cell A2, type the name of the restaurant and the menu item (such as, Wendy's: Jr. Cheeseburger). In cell B1, type the words "Fat grams." In cell B2, type the actual fat grams in that item. In cell C1, type the words "Total Calories." In cell C2, type the actual calories in that item. In cell D1, type the words "RDA" (Recommended Daily Allowance). Look at the 2,000-calorie allowance percentages. In cell D2, type the percentage of recommended daily fat contained in that item.
5. Repeat steps 3 and 4 for four different main items sold by four different restaurants. Enter that information in rows 3, 4, 5, and 6 of your spreadsheet.
6. Choose your favorite restaurant from among those listed and select a complete meal from the menu. Include all main items side items, and desserts that you might eat at one sitting.
7. Click cell A9 of the spreadsheet (skipping several rows!) and type the words "My Typical Meal." In cells A10, A11, A12, type the menu items. In cells B10, C10, and so on, enter fat content, calories, and recommended daily allowance of fat.
8. Compare the fat and calorie information for your favorite meal items in steps 1-5 with your favorite meal from steps 6-7. Are you eating a healthful diet?
9. Save and print this worksheet.
10. Open a new spreadsheet. Using the information at Wake Forest University Baptist Medical Center's Drive-Thru Diet, create a healthful menu for breakfast, lunch, and dinner at the restaurants listed. The food should be items you'll eat, but the total should not exceed 2,000 calories or the daily recommended allowance for fat. Be sure to list any nutritional information that you think proves you've made healthful choices. Save and print your spreadsheet. (Note: This step might be a good enrichment, homework, or extension activity.)
11. Write an explanatory text to support the development of a public service document conveying ideas and concepts.
(3 – 4 class periods for research and data input)
12. Create PSA (2 – 3 days for PSA completion)

Sample Activity

Create a collaborative database with classmates who each enter their data for a survey completed on a relevant content area topic that addresses a problem and increases community awareness. Critically analyze the data by querying, sorting, and developing a graphical display. Use the analysis to validate any conclusions or hypothesis to persevere in solving

	the problems. Write an explanatory text to support the development of a public service document conveying ideas and concepts.
Resources	
<ul style="list-style-type: none"> • Drive-Thru Nutrition: http://www.educationworld.com/a_tech/techlp/techlp029.shtml • Rock Your World Initial PSA Ideas: http://www.rock-your-world.org/brainstorming-initial-psa-ideas-reviewing-project-requirements-planning-out-individual-psa-concepts <p>Technology Options</p> <ul style="list-style-type: none"> • Audacity: Create audio files to share online http://sourceforge.net/projects/audacity/ • Create a Graph: visualizing data http://nces.ed.gov/nceskids/createagraph/ • CutePDF: to increase compatibility http://www.cutepdf.com/ • Google Forms: Can be used to develop surveys, text or with pictures, collect data and sort for analysis https://support.google.com/docs/answer/87809?hl=en <p>Tech Tip: Not all files can be opened in all programs, they are not compatible. Use .pdf file format which has greater compatibility. The author must open the file and “save as” a .pdf file format.</p>	
Suggested Time Frame:	5 -7 days

D – Indicates differentiation at the Lesson Level (Identify Modifications for ELL, Gifted and Talented, Title 1, Special Education)

Content Area:	Technology	Grade(s) 6
Unit Plan Title:	Digital Citizenship	
Standard		
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.		
Overview/Rationale		
Students must practice digital citizenship which includes taking responsibility for their online activities and understanding the impacts of their actions.		
Strand(s)		
8.1.D. Digital Citizenship: Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.		
Technology Standard(s) (Established Goals)		
8.1.8.D.1 Understand and model appropriate online behaviors related to cyber safety, cyber bullying, cyber security, and cyber ethics including appropriate use of social media.		
8.1.8.D.3 Demonstrate an understanding of fair use and Creative Commons to intellectual property.		
8.1.8.D.4 Assess the credibility and accuracy of digital content.		
8.1.8.D.5 Understand appropriate uses for social media and the negative consequences of misuse.		
Interdisciplinary Standard(s)		
English Language Arts		
CCRA.W.2 Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.		
Enduring Understandings: (What are the big ideas? What specific understandings about them are desired? What misunderstandings are predictable?)		
Students will understand that...		
Technology use can have positive or negative impact on both users and those affected by their use.		

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

What is the place of digital media in our lives?
 What steps can help you find what you're looking for when you search online?
 What is identity theft, and how can you protect yourself from it?
 How do you judge the intentions and impact of people's words and actions online?
 What rights do you have as a creator?

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

<i>Check all that apply.</i>		<i>Indicate whether these skills are E-Encouraged, T-Taught, or A-Assessed in this unit by marking E, T, A on the line before the appropriate skill.</i>	
21st Century Themes		21st Century Skills	
X	Global Awareness	E	Critical Thinking & Problem Solving
	Environmental Literacy	E	Creativity and Innovation
	Health Literacy	E	Collaboration, Teamwork and Leadership
X	Civic Literacy	E	Cross-Cultural and Interpersonal Communication
	Financial, Economic, Business and Entrepreneurial Literacy	E, T, A	Communication and Media Fluency
		E, T, A	Accountability, Productivity and Ethics

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

Indicate whether these skills are E-Encouraged, T-Taught, or A-Assessed in this unit by marking E, T, A on the line before the appropriate skill.

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

E, T, A	CRP7. Employ valid and reliable research strategies
E, T, A	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them
E, T, A	CRP9. Model integrity, ethical leadership and effective management
	CRP10. Plan education and career paths aligned to personal goals
E, T, A	CRP11. Use technology to enhance productivity
E, T, A	CRP12. Work productively in teams while using cultural global competence
Student Learning Goals/Objectives: (What key knowledge and skills will students acquire as a result of this unit? What should they eventually be able to do as a result of such knowledge and skill?)	
<i>Students will know....</i> <ul style="list-style-type: none"> • about the 24/7, social nature of digital media • Learn that it is important to act responsibly when carrying out relationships over digital media. • understand the importance of using a variety of search strategies • what identity theft is and why it's important to guard against it • how to recognize strategies that scam artists use to access private information • how to guard against phishing and identity theft • what it means to be brave and stand up for others offline and online • the difference between empathy and sympathy • that copyright is a legal system that provides their rights to creative work 	<i>Students will be able to (do)...</i> <ul style="list-style-type: none"> • Explore their digital lives • Create a simile • master new strategies for effective and efficient online searches • create and execute a five-step plan for conducting an online search • show empathy for those who have been cyberbullied. • generate multiple solutions for helping others when cyberbullying occurs. • compare different ways people license their copyrighted work
Assessment Evidence:	
<i>Performance Tasks</i> Participate in class discussions, group activities	<i>Other Assessment Measures:</i> Similes Learning Log entry - What are digital media? What are two important characteristics of digital media? KWL chart

	<p>Ticket out the door - 3 MC questions and recall the 5 steps of SEARCH</p> <p>3Q Multiple choice for lesson plus - 3 things identity thieves look for 2 ways you can avoid falling for scams 1 important word with definition you learned today.</p> <p>3 question "quiz"</p> <p>Ticket out the door - 3 cyberbullying behaviors, 2 bystander behaviors, 1 up stander behaviors.</p> <p>Video discussion questions, worksheet</p> <p>Learning Log - 3 ways copyright gives you rights at the creator</p>
<p><i>Teaching and Learning Actions: (What learning experiences and instruction will enable students to achieve the desired results?)</i></p>	
<p><i>Instructional Strategies and Activities</i></p>	<p>Consider how will the design will:</p> <p>W = Help the students know Where the unit is going and What is expected? Help the teacher know Where the students are coming from (prior knowledge and interests)?</p> <p>H= Hook all students and Hold their interest?</p> <p>E= Equip students, help the Experience the key ideas and Explore the issue?</p> <p>R=Provide opportunities to Rethink and Revise their understandings and work?</p> <p>E=Allow students to Evaluate their work and its implications?</p> <p>T=be Tailored (personalized to the different needs, interests and abilities of learners?</p> <p>O=be Organized to maximize initial and sustained engagement as well as effective learning?</p> <p>Activities to include:</p> <p>Review Key Vocabulary</p> <p>Class discussion - What is the difference between media and digital media?</p> <p>Watch the "digital life 101" video to learn about the 24/7, social nature of digital media</p> <p>Explore their digital lives through a concept map that contains actions and feelings about their use of DM.</p> <p>Create a simile that showcases how it is important to act responsibly when carrying out relationships over digital media.</p> <p>Lead discussion -</p> <p>How do you find something online? What kinds of things do you search for?</p> <p>Discuss examples given, be sure to make sure that they realize the time and purpose for searches.</p>

Key vocab - effective, efficient, strategy

KWL - about strategic searching

Using "Tips for Strategic Searching Handout," discuss different strategies and then demonstrate some examples of searching on SMART board.

Discuss pros/cons of types.

Ask - Why do you think it might be important to have a plan when you search online? Display SEARCH mnemonic and explain and discuss each step. Divide students into groups; have them conduct a search using SEARCH criteria.

Key vocab - scam - brainstorm what it means

Lead discussion - Do you know anyone who has been scammed? What happened? What is the purpose of a scam? What tricks do people use to carry out a scam? Can people get scammed on the internet? How?

Define identity theft; discuss items that are used in identity theft.

Define vulnerable, explain who is vulnerable and why

Discuss "How do you think identity thieves might try to get your information?" Define phishing.

Complete and review "Spotting Scams" hand out

Review "rules" to protect yourself, have students create examples of scams

Lead discussion - *What does it mean to be brave? How can you show bravery if someone is being cyberbullied and you are a witness?*

Key Vocabulary terms **bystander**, **up stander**, and **empathize**.

Discuss qualities of being upstanding

Read case study and map out scenario, decide who plays which roles and who did the right thing

Create solutions for the outlined problems, explain why they think it would work.

Review Key Vocabulary

Class discussion - What is something you've made that you're proud of? Can you think of a time when you used someone else's work

Watch a video that explains that copyright is a legal system that provides their rights to creative work

Review definitions and look at examples that compare different ways people license their copyrighted work

Discuss the song "happy birthday" and its copyright information create an original song

For various differentiation ideas:

Multiple Means of Actions and Expressions: Vary the methods for response and navigation -

<http://www.udlcenter.org/aboutudl/udlguidelines/principle2>

	<p>Sample Activity Research and discuss cyber safety, security and ethics when using technology and social media. If a friend at work or school asked for inappropriate pictures for use, what would be the consequences for both people involved from both perspectives. Use relevant, well-chosen facts; identify appropriate behaviors, details, and examples of how to increase safety and security online. Present your claims and findings to peers clearly and accurately with effective selection, organization and analysis of this issue.</p>
	<p>Flipped Classroom: https://net.educause.edu/ir/library/pdf/ELI7081.pdf The flipped classroom pedagogical model can be used where presentations are observed outside of the classroom; and students prepare questions for the group. Classroom time is used for questions and answers to increase understanding. This benefits students and provides time for review as needed.</p>
Resources	
<p>Technology Options</p> <ul style="list-style-type: none"> • AndroVid: Video editor for Android devices. https://play.google.com/store/apps/details?id=com.androvid • Audacity: An audio editor to create “radio” presentations. http://audacity.sourceforge.net/ • Google Slides: Create a presentation using this Google product to reduce the need for data storage and enable sharing and editing by individual users or groups. http://www.google.com/slides/about/ • Visme: Create interactive online presentations. http://www.visme.co/ • Mind mapping: Graphic organizer • Common Sense Media: https://www.commonsensemedia.org/educators/curriculum <p>Tech Tip: It is easy to copy and paste images and content into the presentation. Copyright and Creative Commons video clips may be used free for educational purposes to discover how to avoid copyright issues. https://www.commoncraft.com/video/copyright-and-creative-commons</p> <p>Copyright Law: From Digital reprints to downloads: http://www.readwritethink.org/classroom-resources/lesson-plans/copyright-from-digital-reprints-1067.html</p> <p>Using TED to Develop Presentation Skills: http://www.thetechclassroom.com/home/usingtedtodeveloppresentationskills</p>	
Suggested Time Frame:	6 days (5 class periods for lessons, 1 for unit assessment)

Content Area:	Technology	Grade(s) 6
Unit Plan Title:	Word Processing	
Standard		
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.		
Overview/Rationale		
Students should demonstrate appropriate and effective use of technology both personally and professionally to research, communicate, create and store information.		
Strand(s)		
8.1.A. Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations.		
Technology Standard(s) (Established Goals)		
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.		
Interdisciplinary Standard(s)		
English Language Arts		
CCRA.W.2 Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.		
WHST.6-8.10. Write routinely over extended time frames (time for research, reflection, metacognition/self-correction, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.		
Enduring Understandings: (What are the big ideas? What specific understandings about them are desired? What misunderstandings are predictable?)		
Students will understand that...		
Word processing programs are used to create professional documents.		

Essential Question(s) : (What provocative questions will foster inquiry, understanding, and transfer of learning?)			
How can we use the advanced features of a word processing program to create professional documents?			
In this unit plan, the following 21st Century themes and skills are addressed:			
<i>Check all that apply.</i>		<i>Indicate whether these skills are E-Encouraged, T-Taught, or A-Assessed in this unit by marking E, T, A on the line before the appropriate skill.</i>	
21st Century Themes		21st Century Skills	
	Global Awareness	E	Critical Thinking & Problem Solving
	Environmental Literacy	T, A	Creativity and Innovation
	Health Literacy		Collaboration, Teamwork and Leadership
	Civic Literacy	E	Cross-Cultural and Interpersonal Communication
	Financial, Economic, Business and Entrepreneurial Literacy		Communication and Media Fluency
			Accountability, Productivity and Ethics
In this unit plan, the following Career Ready Practices are addressed:			
<i>Indicate whether these skills are E-Encouraged, T-Taught, or A-Assessed in this unit by marking E, T, A on the line before the appropriate skill.</i>			
	CRP1. Act as a responsible and contributing citizen and employee		
T, A	CRP2. Apply appropriate academic and technical skills		
	CRP3. Attend to personal health and financial well-being		
T, A	CRP4. Communicate clearly and effectively with reason		
T, A	CRP5. Consider the environmental, social and economic impacts of decisions		
	CRP6. Demonstrate creativity and innovation		
	CRP7. Employ valid and reliable research strategies		

	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them		
	CRP9. Model integrity, ethical leadership and effective management		
	CRP10. Plan education and career paths aligned to personal goals		
E	CRP11. Use technology to enhance productivity		
	CRP12. Work productively in teams while using cultural global competence		
Student Learning Goals/Objectives: (What key knowledge and skills will students acquire as a result of this unit? What should they eventually be able to do as a result of such knowledge and skill?)			
<table> <tr> <td> Students will know.... The concepts of visual design. The mechanics of an Acrostic Poem. </td><td> Students will be able to (do)... Create a new word document Write an Acrostic Poem Make the document visually appealing </td></tr> </table>		Students will know.... The concepts of visual design. The mechanics of an Acrostic Poem.	Students will be able to (do)... Create a new word document Write an Acrostic Poem Make the document visually appealing
Students will know.... The concepts of visual design. The mechanics of an Acrostic Poem.	Students will be able to (do)... Create a new word document Write an Acrostic Poem Make the document visually appealing		
Assessment Evidence:			
Performance Tasks Students will create an Acrostic poem using their first name; they will be scored based upon a rubric.	Other Assessment Measures:		
<i>Teaching and Learning Actions: (What learning experiences and instruction will enable students to achieve the desired results?)</i>			

<p><i>Instructional Strategies and Activities</i></p>	<p>Consider how will the design will:</p> <p>W = Help the students know Where the unit is going and What is expected? Help the teacher know Where the students are coming from (prior knowledge and interests)?</p> <p>H= Hook all students and Hold their interest?</p> <p>E= Equip students, help the Experience the key ideas and Explore the issue?</p> <p>R=Provide opportunities to Rethink and Revise their understandings and work?</p> <p>E=Allow students to Evaluate their work and its implications?</p> <p>T=be Tailored (personalized to the different needs, interests and abilities of learners?</p> <p>O=be Organized to maximize initial and sustained engagement as well as effective learning?</p> <p>Activities include:</p> <p>Lead class discussion on Visual Design</p> <p>What would it be like to go to the movies with a blindfold on?</p> <p>What would it be like if your math teacher read you all of the information, but you didn't have a textbook and weren't allowed to write anything down when solving problems?</p> <p>When we look at posters, signs, etc... what characteristics make us want to continue to investigate what it's for?</p> <p>How would you describe yourself and explain the things that you like to someone who can't hear?</p> <p>Ask students to create a new word document, look to see who cannot get started, Model creating a Word document if needed</p> <p>Explain what an Acrostic Poem is, Model on overhead</p> <p>Use examples from discussion and online advertising as examples of "visually appealing" provide student rubric for required elements</p>
Resources	
Suggested Time Frame:	2 – 3 class periods

D – Indicates differentiation at the Lesson Level (Identify Modifications for ELL, Gifted and Talented, Title 1, Special Education)

Grades 6-8 Technology Curriculum Map

6 th through 8 th Grade		6 th Grade	7 th Grade	8 th Grade
Technology Curriculum				
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.				
A. Students demonstrate a sound understanding of technology concepts, systems and operations.				
Understand and use technology systems.				
8.1.8.A.1	Demonstrate knowledge of a real world problem using digital tools.	✓	✓	✓
Select and use applications effectively and productively.				
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.A.5	Create a database query, sort and create a report and describe the process, and explain the report results.	✓		
B. Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.				
Create original works as a means of personal or group expression.				
8.1.8.B.1	Synthesize and publish information about a local or global issue or event (ex. Tele-collaborative project, blog, school web).			✓
C. 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.				
8.1.8.C.1	Collaborate to develop and publish work that provides perspectives on a global problem for discussions with learners from other countries. <ul style="list-style-type: none"> a) Interact, collaborate, and publish with peers, experts, or others by employing a variety of digital environments and media. b) Communicate information and ideas to multiple audiences using a variety of media and formats. c) Develop cultural understanding and global awareness by 			

	engaging with learners of other cultures. d) Contribute to project teams to produce original works or solve problems.			
D. Digital Citizenship: Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.				
Advocate and practice safe, legal, and responsible use of information and technology.				
8.1.8.D.1	Understand and model appropriate online behaviors related to cyber safety, 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.	✓	✓	✓
8.1.8.D.5	Understand appropriate uses for social media and the negative consequences of misuse.	✓	✓	✓
E. Research and Information Fluency: Students apply digital tools to gather, evaluate, and use information.				
8.1.8.E.1	Effectively use a variety of search tools and filters in professional public databases to find information to solve a real world problem. a) Plan strategies to guide inquiry. b) Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media. c) Evaluate and select information sources and digital tools based on the appropriateness for specific tasks. d) Process data and report results.		✓	✓
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.				
8.1.8.F.1	Explore a local issue, by using digital tools to collect and analyze data to identify a solution and make an informed decision. a) Identify and define authentic problems and significant questions for investigation. b) Plan and manage activities to develop a solution or complete a project. c) Collect and analyze data to identify solutions &/or make informed decisions.			✓

	d) Use multiple processes and diverse perspectives to explore alternative solutions			
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.				
A. The Nature of Technology: Creativity and Innovation Technology systems impact every aspect of the world in which we live.				
The characteristics and scope of technology.				
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 - smart phone for mobility needs).			
The core concepts of technology.				
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.			
The relationships among technologies and the connections between technology and other fields of study.				
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.			
B. Technology and Society: Knowledge and understanding of human, cultural and societal values are fundamental when designing technological systems and products in the global society.				
The cultural, social, economic and political effects of technology.				
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.			
The effects of technology on the environment.				
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.			
The role of society in the development and use of technology.				
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.			
The influence of technology on history				
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.			
C. Design: The design process is a systematic approach to solving problems.				
The attributes of design				
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.			
The application of engineering design.				
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.5a	Create a technical sketch of a product with materials and measurements labeled.			
The role of troubleshooting, research and development, invention and innovation and experimentation in problem solving.				
8.2.8.C.6	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.			
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 w/annotated sketches to record 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.			
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.				
Apply the design process.				

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 trade-offs 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 STEM-based design challenge using science, engineering, and math principles that validate a solution.			
Use and maintain technological products and systems.				
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.			
Assess the impact of products and systems.				
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.			
Assess the impact of products and 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.			
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.			
E. Computational Thinking: Programming: Computational thinking builds and enhances problem solving, allowing students to move beyond using knowledge to creating knowledge.				
Computational thinking and computer programming as tools used in design and engineering.				
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).		✓	



TECHNOLOGY GRADE 7 CURRICULUM

Middle Township Public Schools
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Cape May Court House NJ, 08210

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Middle School Technology Curriculum Work Committee

Melanie Lisitski

Introduction

This document serves to meet all requirements for curriculum as per the Middle Township Board of Education and the New Jersey Department of Education and will serve as a guide for lesson planning. New Jersey citizens are part of a dynamic, interconnected, and technologically driven global society centered on the creation and communication of knowledge and ideas across geographical, cultural, and linguistic borders. Students in today's schools need to need exposure to technology in order to be high functioning and contributing members, capable of effective communication and possessing advanced technological skills, of today's global society.

Course Description

Introduction to Technology familiarizes the students with the resources of technology, technology systems and the evolution of technology. Students will be taught the design process and use it to explore the concept of design. They will be introduced to common materials and processes as they challenge themselves to solve innovative problems. They will learn the many different areas within the realm of Digital Citizenship and think critically about their own behavior and that of others; realizing the legal and ethical issues that are involved. Each grade level will receive approximately 45 days of technology instruction.

Technology Standards Information

New Jersey's Technology Standards consist of 8.1 Educational Technology and 8.2 Technology, Engineering, Design and Computational Thinking, which work symbiotically to provide students with the necessary skills for college and career readiness.

"Advances in technology have drastically changed the way we interact with the world and each other. The digital age requires that we understand and are able to harness the power of technology to live and learn". - International Society for Technology in Education

In this ever-changing digital world where citizenship is being re-imagined, our students must be able to harness the power of technology to live, solve problems and learn in college, on the job and throughout their lives. Enabled with digital and civic citizenship skills, students are empowered to be responsible members of today's diverse global society.

Readiness in this century demands that students actively engage in critical thinking, communication, collaboration, and creativity. Technology empowers students with real-world data, tools, experts and global outreach to actively engage in solving meaningful problems in all areas of their lives. The power of technology discretely supports all curricular areas and multiple levels of mastery for all students.

"A major consequence of accelerating technological change is a difference in levels of technological ability and understanding. The workforce of the future must have the ability to use, manage, and understand technology." – International Technology and Engineering Educators Association

The design process builds in our students the recognition that success is not merely identifying a problem but working through a process and that failure is not an end but rather a point for reevaluation. Whether applied as a skill in product development, in the learning environment, in daily life, in a local or more global arena, the design process supports students in their paths to becoming responsible, effective citizens in college, careers and life.

Computational thinking provides an organizational means of approaching life and its tasks. It develops an understanding of technologies and their operations and provides students with the abilities to build and create knowledge and new technologies. Not all students will be programmers, but they should have an understanding of how computational thinking can build knowledge and control technology.

Pacing Guide

<u>UNIT TITLE</u>	<u>ENDURING UNDERSTANDINGS</u>	<u>NJSLS</u>	<u>TIMEFRAME</u>
Digital Citizenship	Technology use can have positive or negative impact on both users and those affected by their use.	<i>8.1.8.D.1</i> <i>8.1.8.D.3</i> <i>8.1.8.D.5</i>	<u>6 days</u>
Computer Science and Programming	Computational thinking and computer programming are the main tools used in design and engineering.	<i>8.2.8.E.1</i> <i>8.2.8.E.2</i> <i>8.2.8.E.3</i> <i>8.2.8.E.4</i>	<u>20 days</u>
Million Dollar Project	Practice digital citizenship which includes taking responsibility for their online activities and understanding the impacts of their actions.	<i>8.1.8.A.1</i> <i>8.1.8.A.2</i> <i>8.1.8.A.3</i> <i>8.1.8.A.4</i> <i>8.1.8.D.2</i> <i>8.1.8.D.4</i> <i>8.1.8.E.1</i>	<u>10 days</u>

Content Area:	Technology	Grade(s) 7
Unit Plan Title:	Digital Citizenship	
Standard		
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.		
Overview/Rationale		
Students must practice digital citizenship which includes taking responsibility for their online activities and understanding the impacts of their actions.		
Strand(s)		
8.1.D. Digital Citizenship: <i>Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.</i>		
Technology Standard(s) (Established Goals)		
8.1.8.D.1 Understand and model appropriate online behaviors related to cyber safety, cyber bullying, cyber security, and cyber ethics including appropriate use of social media. 8.1.8.D.3 Demonstrate an understanding of fair use and Creative Commons to intellectual property. 8.1.8.D.5 Understand appropriate uses for social media and the negative consequences of misuse.		
Interdisciplinary Standard(s)		
English Language Arts		
CCRA.W.2 Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.		

Enduring Understandings: (What are the big ideas? What specific understandings about them are desired? What misunderstandings are predictable?)

Students will understand that...

Technology use can have positive or negative impact on both users and those affected by their use.

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

What are your personal media habits, and how much time do you spend with different types of media?

What responsibilities do you have to respect others' creative work?

How should you handle inappropriate talk online?

What are the benefits and risks of presenting yourself in different ways online?

What are gender stereotypes and how can they shape our experiences online?

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

Check all that apply.		Indicate whether these skills are E-Encouraged, T-Taught, or A-Assessed in this unit by marking E, T, A on the line before the appropriate skill.	
21 st Century Themes		21 st Century Skills	
X	Global Awareness	E	Critical Thinking & Problem Solving
	Environmental Literacy	E	Creativity and Innovation
	Health Literacy	E	Collaboration, Teamwork and Leadership
X	Civic Literacy	E	Cross-Cultural and Interpersonal Communication
	Financial, Economic, Business and Entrepreneurial Literacy	E, T, A	Communication and Media Fluency
		E, T, A	Accountability, Productivity and Ethics

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

Indicate whether these skills are E-Encouraged, T-Taught, or A-Assessed in this unit by marking E, T, A on the line before the appropriate skill.

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

Student Learning Goals/Objectives: (What key knowledge and skills will students acquire as a result of this unit? What should they eventually be able to do as a result of such knowledge and skill?)

Students will know....

how much time they spend with media activities

that piracy and plagiarism are irresponsible and disrespectful behaviors that have ethical and legal implications

positive and negative aspects of online talking and messaging
rules for safe online messaging

benefits and risks of presenting their identities in different ways online

definitions of stereo type and gender
characteristics of gender stereotypes

Students will be able to (do)...

Record and compare the time they spend with different forms of digital media and in different activities

Formulate a view point on the role that digital media ply in their lives

consider ethical questions about real-life decisions young creators make in exercising their creative rights and responsibilities
brainstorm solutions to dilemmas creators might encounter

identify situations in which flirting and chatting become inappropriate and risky
feel empowered to deal with uncomfortable situations when communicating online

evaluate, from an ethical point of view, the feelings, motivations, contexts and possible outcomes associated with adopting different roles online
 Judge where certain ways people present themselves online are harmless or harmful

define gender stereotypes and their impact on peoples identities, both online and off

identify gender stereotypes in a virtual world for kids

analyze opportunities and limitations for gender expression in virtual worlds

Assessment Evidence:

Performance Tasks

Participate in class discussions, group activities

Other Assessment Measures:

Media logs, graphs, personal reflection,

Video discussion questions, worksheet

Learning Log - What is something new that you learned that helps you be responsible and respectful towards other people's creative works?

Name some opportunities and pitfalls of online communication

In what online situations do you need to follow your "gut feeling?"

What are some rules on safe online talking and messaging?

Ticket out the door - 1 each - Online "do" and "don't"

3 question "quiz"

Avatar creation with explanation

Worksheet answers

"Ticket out the door" - Definition of gender, look at two avatars, explain if you think a boy or girl created the first one, what stereotypes are shown in the 2nd one.

Teaching and Learning Actions: (What learning experiences and instruction will enable students to achieve the desired results?)

Instructional Strategies and Activities

Consider how will the design will:

W = Help the students know Where the unit is going and What is expected? Help the teacher know Where the students are coming from (prior knowledge and interests)?

H= Hook all students and Hold their interest?

E= Equip students, help the Experience the key ideas and Explore the issue?

R=Provide opportunities to Rethink and Revise their understandings and work?

E=Allow students to Evaluate their work and its implications?

T=be Tailored (personalized to the different needs, interests and abilities of learners?)

O=be Organized to maximize initial and sustained engagement as well as effective learning?

Activities will include:

Review Key Vocabulary (habit, log)

Class discussion - Take them on a "mental journey" to think about what type of digital media they use and how often they use it, Share what they discovered.

Complete and discuss media logs.

Create a bar graph of activities

Compare and contrast each other's use and formulate a view point on the role that digital media play in their lives

Review Key Vocabulary

Class discussion - Can you remember when you last copied, downloaded or shared some type of creative work? Can you think of a time when you used someone else's work in something you made?

Watch a video, discuss how was vocab used, what were the examples of creative works, what decisions did the people in the video have to make?

Review scenarios, discuss piracy and plagiarism and what the scenarios show us

Brainstorm solutions to dilemmas creators might encounter

Lead discussion - Have you ever heard the saying, "don't talk to strangers?"

How might this "rule" change when we communicate online?

Define opportunity, pitfall, inappropriate

Watch safety video, discuss 3 student perspectives from video, describe positive aspects of online talking and messaging

Define harass and risky, discuss difference in online vs. face to face communications, identify situations in which flirting and chatting become inappropriate and risky

Internet Traffic Light worksheet - review rules and discuss understanding of rules for safe online messaging, and feel empowered to deal with uncomfortable situations when communicating online

Lead discussion - What is identity? Do people ever express parts of their identities online that they might not express offline?

Watch video, discuss motives of student in video, consequences of actions

Work in groups to complete "Take a Stand" activity, examples of behaviors and ethical actions

Discuss motivation, actions and consequences

	<p>Discussion - If I was invited to a birthday party for 5 year-old twins, what are some gifts I could purchase for each of them?</p> <p>Put a Venn diagram on the SMART board; enter gift ideas into the diagram. Highlight the "stereotypical" gifts on each side. Discuss if they could be given to the other child. Why/Why not?</p> <p>Introduce vocab - gender, stereotype, feminine, masculine</p> <p>Explain gender stereotypes, have students name typical activities that teens pursue, place on board on "scale" from feminine to masculine. Discuss choices and if they fit a stereotype. Discuss how gender stereotypes create limits.</p> <p>Define Avatar. Discuss how the internet is a source of media. Have students create an avatar and complete the "Dress up your avatar" worksheet. Discuss avatars and the stereotypes that are showcased. Discuss how virtual worlds can allow you to challenge or break free from gender stereotypes.</p> <p>Discuss what gender stereotypes are and what they think about them. Discuss what role media plays in shaping those stereotypes. Discuss ways people can break free from gender stereotypes.</p>
Resources	
Common Sense Media: https://www.commonsensemedia.org/educators/digital-citizenship	
Suggested Time Frame:	6 days (5 class periods for lessons, 1 for unit assessment)

D – Indicates differentiation at the Lesson Level (Identify Modifications for ELL, Gifted and Talented, Title 1, Special Education)

Content Area:	Technology	Grade(s) 7
Unit Plan Title:	Computer Science and Programming	
Standard		
Standard 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.		
Overview/Rationale		
Computational thinking builds and enhances problem solving, allowing students to move beyond using knowledge to creating knowledge.		
Strand(s)		
8.2. E: Computational Thinking: Programming: <i>Computational thinking builds and enhances problem solving, allowing students to move beyond using knowledge to creating knowledge.</i>		
Technology Standard(s) (Established Goals)		
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).		
Interdisciplinary Standard(s)		
English Language Arts		
CCRA.SL.4 Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.		
Comprehensive Health and Physical Education		

2.1.8. A.3: Relate advances in technology to maintaining and improving personal health.

Enduring Understandings: (What are the big ideas? What specific understandings about them are desired? What misunderstandings are predictable?)

Students will understand that...

Computational thinking and computer programming are the main tools used in design and engineering.

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

What is computer science and how can it be helpful in your lives?

How can we use computational thinking as a way of preparing real-world problems for digital representation?

How does coding work?

How do we know the best way to accomplish a task?

What are conditionals and how do they pertain to loops and if statements?

How do we define and call functions?

How do we use abstraction in everyday life?

Why is it important to check your work and write programs in proper sequence?

How does the Internet work?

How can you be prepared to continue learning about computer science?

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

<i>Check all that apply.</i> 21st Century Themes		<i>Indicate whether these skills are E-Encouraged, T-Taught, or A-Assessed in this unit by marking E, T, A on the line before the appropriate skill.</i> 21st Century Skills	
X	Global Awareness	E	Critical Thinking & Problem Solving
	Environmental Literacy	E	Creativity and Innovation
X	Health Literacy	E	Collaboration, Teamwork and Leadership
	Civic Literacy		Cross-Cultural and Interpersonal Communication
	Financial, Economic, Business and Entrepreneurial Literacy	E, T, A	Communication and Media Fluency
		E, T, A	Accountability, Productivity and Ethics

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

Indicate whether these skills are E-Encouraged, T-Taught, or A-Assessed in this unit by marking E, T, A on the line before the appropriate skill.

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

Student Learning Goals/Objectives: (What key knowledge and skills will students acquire as a result of this unit? What should they eventually be able to do as a result of such knowledge and skill?)

Students will know....

the difference between programming, computer science and computational thinking
that a computer is a tool and not an excuse to turn off your brain
to be responsible computer users
that computer science can change the world
the 4 steps of computational thinking

Students will be able to (do)...

solve complex problems
Express ideas clearly and logically in order to create programs.
Create programming structures such as loops and function
Practice creating algorithms that describe real world problems
Evaluate logical statements to determine which branch of program to

<p>the difficulty of translating real problems into programs that ideas may feel clear to them and still be misinterpreted by a computer the need for formal programming structures like loops and functions</p> <p>about solving a problem many different ways about creating more "efficient" solutions to problems</p> <p>how to determine if outcome (true or false) of conditionals</p> <p>about defining functions</p> <p>about the complexity of sending messages over the Internet</p>	<p>follow</p> <p>Practice calling functions See the practicality of passing variables as parameters</p> <p>Have the chance to internalize the idea of “abstraction” Combine writing and abstraction to test their own creativity Analyze their day to find differences that they can turn into similarities</p> <p>Practice imagining expected outcomes Practice completing “thinking tasks” Under pressure check their work as well as the work of others Think about sequence</p> <p>Translate web addresses into IP addresses Practice creative problem solving</p> <p>Recall events covered over the unit Reinvent concepts covered in the unit by creating new games Work in groups to blend seemingly unique subjects</p>
Assessment Evidence:	
<p>Performance Tasks</p> <p>Participate in class discussions, group activities, and online Code.org levels</p>	<p>Other Assessment Measures:</p> <p>Name 3 important things in your life that were probably created by computer scientists, 2 things computer scientists can do that are NOT related to programming that could help the world, and 1 thing you learned today that you didn't realize was important</p> <p>Reflections on activities.</p>
<i>Teaching and Learning Actions: (What learning experiences and instruction will enable students to achieve the desired results?)</i>	
<p><i>Instructional Strategies and Activities</i></p>	<p>Consider how will the design will:</p> <p>W = Help the students know Where the unit is going and What is expected? Help the teacher know Where the students are coming from (prior knowledge and interests)?</p>

	<p>H= Hook all students and Hold their interest? E= Equip students, help the Experience the key ideas and Explore the issue? R=Provide opportunities to Rethink and Revise their understandings and work? E=Allow students to Evaluate their work and its implications? T=be Tailored (personalized to the different needs, interests and abilities of learners? O=be Organized to maximize initial and sustained engagement as well as effective learning?</p> <p>Activities will include: Take the Accelerated Intro to CS Course at Code.org</p>
Resources	
<p>Accelerated Intro to CS Course: https://studio.code.org/s/20-hour</p> <ul style="list-style-type: none"> • Algorithms - Lesson 1 - Introduction to Algorithms: http://www.curriki.org/xwiki/bin/view/Coll_nishantgupta/Itroduction?bc • Search Engine Lessons: http://www.trycomputing.org/lesson-plans/search-engines-lesson • Solving a Simple Maze: http://tryengineering.org/lessons/simplemaze.pdf • Basic Search Tips and Advanced Boolean Operators: http://www.lib.berkeley.edu/TeachingLib/Guides/Internet/Boolean.pdf • Edublogs: An online journal where information can be posted and shared. Students can retrieve documents and interact. https://edublogs.org/why-edublogs/ • Draw.io: Web site that allows users to create flowcharts to organize thoughts, work independently, or collaborate online for group assignments. https://www.draw.io/ • Edublogs free course Blogging with Students: http://www.theedublogger.com/2015/02/03/2015-teacher-blogging-challenge/ • Quizlet: Students can create flash cards with commands (Boolean operators) on the front and functions on the back, which can be printed and/ or shared online. https://quizlet.com/teachers • Verizon Innovative APP Challenge: Challenge that increases relevancy to learning by developing an App to solve a real world problem in school or community. Enter for the opportunity to win recognition and a financial prize. http://appchallenge.tsaweb.org/ <p>Tech Tip: Blogs can be used to create a safe environment for sharing information, resources for teacher professional development, and student challenges.</p>	
Suggested Time Frame:	20 days

D – Indicates differentiation at the Lesson Level (Identify Modifications for ELL, Gifted and Talented, Title 1, Special Education)

Content Area:	Technology	Grade(s) 7
Unit Plan Title:	Million Dollar Project	
Standard		
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.		
Overview/Rationale		
Students must practice digital citizenship which includes taking responsibility for their online activities and understanding the impacts of their actions.		
Strand(s)		
8.1. A. Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations.		
8.1. D. Digital Citizenship: Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.		
8.1. E. Research and Information Fluency: Students apply digital tools to gather, evaluate, and use information.		
Technology Standard(s) (Established Goals)		
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.2 Demonstrate the application of appropriate citations to digital content.		
8.1.8. D.4 Assess the credibility and accuracy of digital content.		
8.1.8. E.1 Effectively use a variety of search tools and filters in professional public databases to find information to solve a real world problem.		
Interdisciplinary Standard(s)		
English Language Arts		
RST.6-8.3 Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.		
RST.6-8.7 Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).		
NJLSA.W2 Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective		

selection, organization, and analysis of content.

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

NJSLSA.W7 Conduct short as well as more sustained research projects, utilizing an inquiry-based research process, based on focused questions, demonstrating understanding of the subject under investigation.

Enduring Understandings: (What are the big ideas? What specific understandings about them are desired? What misunderstandings are predictable?)

Students will understand that...

Practice digital citizenship which includes taking responsibility for their online activities and understanding the impacts of their actions.

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

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

<i>Check all that apply.</i>		<i>Indicate whether these skills are E-Encouraged, T-Taught, or A-Assessed in this unit by marking E, T, A on the line before the appropriate skill.</i>	
21st Century Themes		21st Century Skills	
X	Global Awareness	E,T,A	Critical Thinking & Problem Solving
	Environmental Literacy	E,T,A	Creativity and Innovation
	Health Literacy	E,T,A	Collaboration, Teamwork and Leadership
X	Civic Literacy		Cross-Cultural and Interpersonal Communication
X	Financial, Economic, Business and Entrepreneurial Literacy	E,T,A	Communication and Media Fluency
		E,T,A	Accountability, Productivity and Ethics

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

*Indicate whether these skills are **E**-Encouraged, **T**-Taught, or **A**-Assessed in this unit by marking **E**, **T**, **A** on the line before the appropriate skill.*

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

E, T, A	CRP3. Attend to personal health and financial well-being
E, T, A	CRP4. Communicate clearly and effectively with reason
E, T, A	CRP5. Consider the environmental, social and economic impacts of decisions
E, T, A	CRP6. Demonstrate creativity and innovation
E, T, A	CRP7. Employ valid and reliable research strategies
E, T, A	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them
E, T, A	CRP9. Model integrity, ethical leadership and effective management
E, T, A	CRP10. Plan education and career paths aligned to personal goals
E, T, A	CRP11. Use technology to enhance productivity
E, T, A	CRP12. Work productively in teams while using cultural global competence
Student Learning Goals/Objectives: (What key knowledge and skills will students acquire as a result of this unit? What should they eventually be able to do as a result of such knowledge and skill?)	
<i>Students will know....</i> Appropriate terminology related to spreadsheets	<i>Students will be able to (do)...</i> Create, modify and format data in a spreadsheet cell Create formulas for solving routine calculations Create, modify and format a pie chart Research information for their topic Write a comprehensive summary of project, including why decisions were made and how money was spent Create a flyer advertising event Create a bibliography using www.easybib.com or another digital bibliography tool
Assessment Evidence:	
<i>Performance Tasks</i> Participate in class discussions, group activities	<i>Other Assessment Measures:</i> Spreadsheet Summary

Teaching and Learning Actions: (What learning experiences and instruction will enable students to achieve the desired results?)

Instructional Strategies and Activities

Consider how will the design will:

W = Help the students know Where the unit is going and What is expected? Help the teacher know Where the students are coming from (prior knowledge and interests)?

H= Hook all students and Hold their interest?

E= Equip students, help the Experience the key ideas and Explore the issue?

R=Provide opportunities to Rethink and Revise their understandings and work?

E=Allow students to Evaluate their work and its implications?

T=be Tailored (personalized to the different needs, interests and abilities of learners?)

O=be Organized to maximize initial and sustained engagement as well as effective learning?

Activities will include:

- Scenario and discussion of project

Students will be in pairs and are hypothetically considered the head of a committee for community project or charity event.

Each pair is given a million dollars to spend on your project/event. Each pair needs to decide what the costs will be and create a spreadsheet to show the costs. Class discussion on potential categories and prices.

Model (review for most) with how to create, modify and format data in a spreadsheet cell

Discuss how formulas are math problems for the computer and that there are certain ways to create formulas for solving routine calculations, give examples and allow students to practice

Monitor discussions during work time to see if students are appropriately using terminology related to spreadsheets, post terms

Model how to create, modify and format a pie chart

Discuss what needs to be in the project summary and how to make sure it is well written and comprehensive.

Discuss key items that should be in an advertising flyer and review good visual design.

Model creation of a sample bibliography using www.easybib.com

Students will then research topic and follow steps to create their projects.

Resources

Suggested Time Frame: 10 days.

Grades 6-8 Technology Curriculum Map

6 th through 8 th Grade		6 th Grade	7 th Grade	8 th Grade
Technology Curriculum				
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.				
A. Students demonstrate a sound understanding of technology concepts, systems and operations.				
Understand and use technology systems.				
8.1.8.A.1	Demonstrate knowledge of a real world problem using digital tools.	✓	✓	✓
Select and use applications effectively and productively.				
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.A.5	Create a database query, sort and create a report and describe the process, and explain the report results.	✓		
B. Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.				
Create original works as a means of personal or group expression.				
8.1.8.B.1	Synthesize and publish information about a local or global issue or event (ex. Tele-collaborative project, blog, school web).			✓
C. 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.				
8.1.8.C.1	Collaborate to develop and publish work that provides perspectives on a global problem for discussions with learners from other countries. e) Interact, collaborate, and publish with peers, experts, or others by employing a variety of digital environments and media.			

	<ul style="list-style-type: none"> f) Communicate information and ideas to multiple audiences using a variety of media and formats. g) Develop cultural understanding and global awareness by engaging with learners of other cultures. h) Contribute to project teams to produce original works or solve problems. 			
D. Digital Citizenship: Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.				
Advocate and practice safe, legal, and responsible use of information and technology.				
8.1.8.D.1	Understand and model appropriate online behaviors related to cyber safety, 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.	✓	✓	✓
8.1.8.D.5	Understand appropriate uses for social media and the negative consequences of misuse.	✓	✓	✓
E. Research and Information Fluency: Students apply digital tools to gather, evaluate, and use information.				
8.1.8.E.1	Effectively use a variety of search tools and filters in professional public databases to find information to solve a real world problem. <ul style="list-style-type: none"> e) Plan strategies to guide inquiry. f) Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media. g) Evaluate and select information sources and digital tools based on the appropriateness for specific tasks. h) Process data and report results. 		✓	✓
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.				
8.1.8.F.1	Explore a local issue, by using digital tools to collect and analyze data to identify a solution and make an informed decision. <ul style="list-style-type: none"> e) Identify and define authentic problems and significant questions for investigation. f) Plan and manage activities to develop a solution or complete a 			✓

	project. g) Collect and analyze data to identify solutions &/or make informed decisions. h) Use multiple processes and diverse perspectives to explore alternative solutions			
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.				
A. The Nature of Technology: Creativity and Innovation Technology systems impact every aspect of the world in which we live.				
The characteristics and scope of technology.				
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 - smart phone for mobility needs).			
The core concepts of technology.				
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.			
The relationships among technologies and the connections between technology and other fields of study.				
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.			
B. Technology and Society: Knowledge and understanding of human, cultural and societal values are fundamental when designing technological systems and products in the global society.				
The cultural, social, economic and political effects of technology.				
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.			
The effects of technology on the environment.				

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.			
The role of society in the development and use of technology.				
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.			
The influence of technology on history				
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.			
C. Design: The design process is a systematic approach to solving problems.				
The attributes of design				
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.			
The application of engineering design.				
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.5a	Create a technical sketch of a product with materials and measurements labeled.			
The role of troubleshooting, research and development, invention and innovation and experimentation in problem solving.				
8.2.8.C.6	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.			
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 w/annotated sketches to record 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.			
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.				
Apply the design process.				
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 trade-offs 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 STEM-based design challenge using science, engineering, and math principles that validate a solution.			
Use and maintain technological products and systems.				
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.			
Assess the impact of products and systems.				
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.			
Assess the impact of products and 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.			
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.			
E. Computational Thinking: Programming: Computational thinking builds and enhances problem solving, allowing students to move beyond using knowledge to creating knowledge.				
Computational thinking and computer programming as tools used in design and engineering.				
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).		✓	



TECHNOLOGY GRADE 8 CURRICULUM

Middle Township Public Schools

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Cape May Court House, NJ 08210

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Middle School Technology Curriculum Work Committee

Melanie Lisitski

Introduction

This document serves to meet all requirements for curriculum as per the Middle Township Board of Education and the New Jersey Department of Education and will serve as a guide for lesson planning. New Jersey citizens are part of a dynamic, interconnected, and technologically driven global society centered on the creation and communication of knowledge and ideas across geographical, cultural, and linguistic borders. Students in today's schools need to need exposure to technology in order to be high functioning and contributing members, capable of effective communication and possessing advanced technological skills, of today's global society.

Course Description

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

Technology Standards Information

New Jersey's Technology Standards consist of 8.1 Educational Technology and 8.2 Technology, Engineering, Design and Computational Thinking, which work symbiotically to provide students with the necessary skills for college and career readiness.

"Advances in technology have drastically changed the way we interact with the world and each other. The digital age requires that we understand and are able to harness the power of technology to live and learn". - International Society for Technology in Education

In this ever-changing digital world where citizenship is being re-imagined, our students must be able to harness the power of technology to live, solve problems and learn in college, on the job and throughout their lives. Enabled with digital and civic citizenship skills, students are empowered to be responsible members of today's diverse global society.

Readiness in this century demands that students actively engage in critical thinking, communication, collaboration, and creativity. Technology empowers students with real-world data, tools, experts and global outreach to actively engage in solving meaningful problems in all areas of their lives. The power of technology discretely supports all curricular areas and multiple levels of mastery for all students.

"A major consequence of accelerating technological change is a difference in levels of technological ability and understanding. The workforce of the future must have the ability to use, manage, and understand technology." – International Technology and Engineering Educators Association

The design process builds in our students the recognition that success is not merely identifying a problem but working through a process and that failure is not an end but rather a point for reevaluation. Whether applied as a skill in product development, in the learning environment, in daily life, in a local or more global arena, the design process supports students in their paths to becoming responsible, effective citizens in college, careers and life.

Computational thinking provides an organizational means of approaching life and its tasks. It develops an understanding of technologies and their operations and provides students with the abilities to build and create knowledge and new technologies. Not all students will be programmers, but they should have an understanding of how computational thinking can build knowledge and control technology.

Pacing Guide

<u>UNIT TITLE</u>	<u>ENDURING UNDERSTANDINGS</u>	<u>NJSLS</u>	<u>TIMEFRAME</u>
Air Quality Index	It is important to be sure we use accurate information when performing research and creating projects. There are a variety of digital tools that perform the same purpose. Analyzing data is an important part of presenting solutions to problems.	8.1.8.A.1 8.1.8.B.1 8.1.8.E.1 8.1.8.F.1	<u>45 days</u>
Digital Citizenship	Technology use can have positive or negative impact on both users and those affected by their use.	8.1.8.D.1 8.1.8.D.3 8.1.8.D.4 8.1.8.D.5	<u>6 days</u>

Content Area:	Technology	Grade(s) 8
Unit Plan Title:	Air Quality Index	
Standard		
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.		
Overview/Rationale		
<ul style="list-style-type: none">Digital tools offer opportunities for new experiences and means of outreach and collaboration that support creative and innovative approaches to problem solving and product development.Information spreads worldwide within seconds due to technological advancements and has an immediate impact. The ability to find, evaluate and use accurate information is more important than ever in the technological age.Each of us can have a global impact in today’s world, so filtering information and applying critical thinking to solve problems and make decisions is a foundational skill.		
Strand(s)		
8.1.B. Creativity and Innovation: <i>Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.</i>		
8.1.E: Research and Information Fluency: <i>Students apply digital tools to gather, evaluate, and use information.</i>		
8.1.F: Critical thinking, problem solving, and decision making: <i>Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.</i>		
Technology Standard(s) (Established Goals)		
8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools.		
8.1.8.B.1 Synthesize and publish information about a local or global issue or event (ex. telecollaborative project, blog, school web).		
8.1.8.E.1 Effectively use a variety of search tools and filters in professional public databases to find information to solve a real world problem.		
8.1.8.F.1 Apply digital tools to collect, organize, and analyze data that support a scientific finding.		
Interdisciplinary Standard(s)		
English Language Arts		
CCRA.W.8 Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source,		

and integrate the information while avoiding plagiarism.

Enduring Understandings: (What are the big ideas? What specific understandings about them are desired? What misunderstandings are predictable?)

Students will understand that...

It is important to be sure we use accurate information when performing research and creating projects.

There are a variety of digital tools that perform the same purpose.

Analyzing data is an important part of presenting solutions to problems.

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

Why is the evaluation and appropriate use of accurate information more important than ever in the technological age?

How do we evaluate the accuracy of data?

What digital tools can we use to record data?

What is the best way to analyze our findings?

How can we use our analysis to present an argument or solution to an issue/problem?

What tools will we use to create supporting materials for our argument/solution?

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

<i>Check all that apply.</i> 21st Century Themes		<i>Indicate whether these skills are E-Encouraged, T-Taught, or A-Assessed in this unit by marking E, T, A on the line before the appropriate skill.</i> 21st Century Skills	
X	Global Awareness	E, T, A	Critical Thinking & Problem Solving
X	Environmental Literacy	E, T, A	Creativity and Innovation
X	Health Literacy	E	Collaboration, Teamwork and Leadership
X	Civic Literacy	E	Cross-Cultural and Interpersonal Communication
X	Financial, Economic, Business and	E, T, A	Communication and Media Fluency

	Entrepreneurial Literacy	E, T, A	Accountability, Productivity and Ethics
In this unit plan, the following Career Ready Practices are addressed:			
Indicate whether these skills are E-Encouraged, T-Taught, or A-Assessed in this unit by marking E, T, A on the line before the appropriate skill.			
	E, T	CRP1. Act as a responsible and contributing citizen and employee	
	E, T, A	CRP2. Apply appropriate academic and technical skills	
	E, T	CRP3. Attend to personal health and financial well-being	
	E, T, A	CRP4. Communicate clearly and effectively with reason	
	E, T, A	CRP5. Consider the environmental, social and economic impacts of decisions	
	E, T, A	CRP6. Demonstrate creativity and innovation	
	E, T	CRP7. Employ valid and reliable research strategies	
	E, T, A	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them	
	E, T	CRP9. Model integrity, ethical leadership and effective management	
		CRP10. Plan education and career paths aligned to personal goals	
	E, T, A	CRP11. Use technology to enhance productivity	
Student Learning Goals/Objectives: (What key knowledge and skills will students acquire as a result of this unit? What should they eventually be able to do as a result of such knowledge and skill?)			
Students will know.... What digital tool options are available for different tasks. Why communication is important. Why accurate information is vital during research.		Students will be able to (do)... <ul style="list-style-type: none">• 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.• Identify and define authentic problems and significant questions for investigation.	

	<ul style="list-style-type: none"> • 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.
Assessment Evidence:	
<p>Performance Tasks</p> <ul style="list-style-type: none"> • Determine real time air quality for several cities around the world. • Use digital tools to record this information over a period of time • Analyze findings and determine the best time to participate in outside activities • Prepare an argument with solutions for “cleaning up” a city • Prepare an argument with supporting evidence for visiting a city • Present argument to class with supporting materials (ie. Electronic presentation, brochure, etc. that included data analysis and bibliography) • Post projects to teacher approved internet host 	<p>Other Assessment Measures:</p> <ul style="list-style-type: none"> • Spreadsheet of Data recording • Graph of Data • Explanation of data • Clean City Project • Dirty City Project • Class Presentation
Teaching and Learning Actions: (What learning experiences and instruction will enable students to achieve the desired results?)	
<p><i>Instructional Strategies and Activities</i></p>	<p>Consider how will the design will:</p> <p>W = Help the students know Where the unit is going and What is expected? Help the teacher know Where the students are coming from (prior knowledge and interests)?</p> <p>H= Hook all students and Hold their interest?</p> <p>E= Equip students, help the Experience the key ideas and Explore the issue?</p> <p>R=Provide opportunities to Rethink and Revise their understandings and work?</p> <p>E=Allow students to Evaluate their work and its implications?</p> <p>T=be Tailored (personalized to the different needs, interests and abilities of learners)?</p> <p>O=be Organized to maximize initial and sustained engagement as well as effective learning?</p> <p>Activities will include:</p> <p>Activator -</p> <p>*Use situation with Troops overseas in recent years vs. Gettysburg - How does/did information travel? How does the</p>

	<p>method of travel impact accuracy? Use controversy regarding KONY - How do we know what is accurate? What does it mean when you hear "they say...?"</p> <p>Is it good or bad that information can travel so fast? Give an instance where you feel it is good... bad....</p> <p>*Introduce Vocabulary - evaluate, accuracy, data, digital tools. Look up and record in Learning Log.</p> <p>*Discuss how they will start the project. What key words/search tools will you use to find Air Pollution data? What digital tools will you use to record the data that you find? Discuss with partner and record in learning log.</p> <p>Students will record data daily, over several weeks.</p> <p>Once data is complete, they will begin to work on independent projects.</p>
Resources	
<p>Use PBL model - http://www.studygs.net/pbl.htm</p> <p>https://www.airnow.gov/index.cfm?action=airnow.main</p> <p>http://aqicn.org/city/beijing/</p> <p>http://www.airqualitynow.eu/index.php</p> <p>http://www.qr-code-generator.com/</p>	
Suggested Time Frame:	45 days

D – Indicates differentiation at the Lesson Level (Identify Modifications for ELL, Gifted and Talented, Title 1, Special Education)

Content Area:	Technology	Grade(s) 8
Unit Plan Title:	Digital Citizenship	
Standard		
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.		
Overview/Rationale		
Students must practice digital citizenship which includes taking responsibility for their online activities and understanding the impacts of their actions.		
Strand(s)		
D. Digital Citizenship: <i>Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.</i>		
Technology Standard(s) (Established Goals)		
8.1.8. D.1 Understand and model appropriate online behaviors related to cyber safety, cyber bullying, cyber security, and cyber ethics including appropriate use of social media. 8.1.8. D.3 Demonstrate an understanding of fair use and Creative Commons to intellectual property. 8.1.8. D.4 Assess the credibility and accuracy of digital content. 8.1.8. D.5 Understand appropriate uses for social media and the negative consequences of misuse.		
Interdisciplinary Standard(s)		
Enduring Understandings: (What are the big ideas? What specific understandings about them are desired? What misunderstandings are predictable?)		
Students will understand that... Technology use can have positive or negative impact on both users and those affected by their use.		
Essential Question(s) : (What provocative questions will foster inquiry, understanding, and transfer of learning?)		
What is a digital footprint, and what does yours convey?		

When can you trust what you find on the Web?
 Does the way we think about digital drama have anything to do with gender?
 When does inappropriate online behavior cross the line to cyberbullying, and what can you do about it?
 What rights do you have as a creator?

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

<i>Check all that apply.</i> 21st Century Themes		<i>Indicate whether these skills are E-Encouraged, T-Taught, or A-Assessed in this unit by marking E, T, A on the line before the appropriate skill.</i> 21st Century Skills	
X	Global Awareness	E	Critical Thinking & Problem Solving
	Environmental Literacy	E	Creativity and Innovation
	Health Literacy	E	Collaboration, Teamwork and Leadership
X	Civic Literacy	E	Cross-Cultural and Interpersonal Communication
	Financial, Economic, Business and Entrepreneurial Literacy	E, T, A	Communication and Media Fluency
		E, T, A	Accountability, Productivity and Ethics

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

<i>Indicate whether these skills are E-Encouraged, T-Taught, or A-Assessed in this unit by marking E, T, A on the line before the appropriate skill.</i>	
E, T, A	CRP1. Act as a responsible and contributing citizen and employee
E, T, A	CRP2. Apply appropriate academic and technical skills
E, T, A	CRP3. Attend to personal health and financial well-being
E, T, A	CRP4. Communicate clearly and effectively with reason
E, T, A	CRP5. Consider the environmental, social and economic impacts of decisions
	CRP6. Demonstrate creativity and innovation
	CRP7. Employ valid and reliable research strategies
	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them
	CRP9. Model integrity, ethical leadership and effective management

	CRP10. Plan education and career paths aligned to personal goals
	CRP11. Use technology to enhance productivity
	CRP12. Work productively in teams while using cultural global competence
Student Learning Goals/Objectives: (What key knowledge and skills will students acquire as a result of this unit? What should they eventually be able to do as a result of such knowledge and skill?)	
<p><i>Students will know....</i></p> <p>that everyone has a digital footprint and that the information from it can be searched; copied and passed on; seen be a large, invisible audience and can be persistent.</p> <p>How the ease of publishing on the Web might affect how much they can trust the content of some sites.</p> <p>that certain criteria that will help them evaluate websites</p> <p>how to express their own impression of digital drama</p> <p>learn about the various ways that students can be cyberbullied, including flaming, deceiving and harassing</p> <p>the key points required for a creative work to fall under fair use</p>	<p><i>Students will be able to (do)...</i></p> <p>Recognize that people's online information can be helpful or harmful to their reputation and image</p> <p>Consider their own digital footprints and what you want that to look like in the future.</p> <p>Apply specific criteria to a site to determine how trustworthy and useful it is</p> <p>Compare underlying messages about drama on reality TV with "real world" digital drama among young teams.</p> <p>think critically about the gender stereotypes associated with drama</p> <p>analyze online behaviors that "cross the line"</p> <p>adopt the point of view of teens who have been cyberbullied and offer solutions</p> <p>judge whether a specific case can be called fair use</p> <p>understand the value of fair use by reworking and remixing copyrighted material into a collage or video</p>
Assessment Evidence:	
<p><i>Performance Tasks</i></p> <p>Participate in class discussions, group activities</p>	<p><i>Other Assessment Measures:</i></p> <p>"Footprint" ideas</p> <p>Ticket out the door -3 Things that can be a part of someone's digital footprint, 2 Things that you should consider when posting anything online, 1- Who is responsible for your digital footprint.</p> <p>Recording of website evaluation results</p> <p>Learning Log - Why should you evaluate a website before using it? Which</p>

	<p>2 questions are most important? Why?</p> <p>Worksheet answers, "ticket out the door" give example of a generalization, truth about reality TV and online drama. 2 ways you can help remove gender stereotypes or drama from your life.</p> <p>Video discussion questions Learning Log - Paragraph about the lesson and how they feel and what they think they can do going forward.</p> <p>Collage/video, Learning Log - Even if you created something that's fair use, why is it important to give credit to the work you used to make it?</p>
<p><i>Teaching and Learning Actions: (What learning experiences and instruction will enable students to achieve the desired results?)</i></p>	
<p><i>Instructional Strategies and Activities</i></p>	<p>Consider how will the design will:</p> <p>W = Help the students know Where the unit is going and What is expected? Help the teacher know Where the students are coming from (prior knowledge and interests)?</p> <p>H= Hook all students and Hold their interest?</p> <p>E= Equip students, help the Experience the key ideas and Explore the issue?</p> <p>R=Provide opportunities to Rethink and Revise their understandings and work?</p> <p>E=Allow students to Evaluate their work and its implications?</p> <p>T=be Tailored (personalized to the different needs, interests and abilities of learners?)</p> <p>O=be Organized to maximize initial and sustained engagement as well as effective learning?</p> <p>Activities to include:</p> <p>Lead discussion on -</p> <p>How many of you have... sent a message or posted a comment online?</p> <p>Created a profile on a social media site?</p> <p>Used some type of photo-sharing site/app?</p> <p>"googled" your own name? Were there any results? What were they?</p> <p>Explain that this leaves a trail called a digital footprint and it never goes away.</p> <p>Watch "Digital Footprint" video. Discuss "imagery" in the video how they relate to privacy (Lighthouse=search engine, Copies/Whispering in Ear=how messaged travel, Stadium/Jumbotron=public broadcasting, Permanent Marker=how hard it is to remove something posted online) Define persistent and invisible audience. Review concept of digital footprint.</p> <p>Activity - "Choose a Host" In groups review information provided about 2 job candidates. Choose the best one based upon qualities portrayed in their digital footprints. Discuss, review and reflect.</p> <p>Discussion - What do you want your digital footprint to look like in 10 years? Create a visual footprint.</p>

	<p>Review Key Vocabulary (Evaluate, trustworthy, criteria, community - on the web, site map)</p> <p>Class discussion - What websites do you go to when you are assigned a research project? How do you know that those are trustworthy sites?</p> <p>Class discussion - who would you trust to.... write a book about animals in Australia? Write a book about a new health care law passed by Congress? Diagnose your illness when you're sick? Do you think you and I are qualified to write a book about exploring the moon? Why/Why not? Can we publish an article about exploring the moon on the Internet? How does the ease of publishing on the Web might affect how much they can trust the content of some sites?</p> <p>Use the "test before you trust" handout to test, use the criteria provided to help them evaluate websites</p> <p>Discuss the criteria and compare the results of the websites tested.</p> <p>Prepare students to free-write - Reflect on the word <i>drama</i>. How do you define it, what does it mean to you? (Give 2 minutes to put thoughts down) Discuss thoughts. Ask do you feel people enjoy <i>drama</i>, both online and off? Why/Why not?</p> <p>Put students into groups, define generalization. Provide student handout to each students. Watch "Discussing Digital Drama" Complete column A of handout. Discuss generalizations about boys and girls shown in video. Discuss feelings about generalizations.</p> <p>Watch "Real Housewives" clip. Have groups discuss and complete column B of handout. Discuss generalizations about men and women shown in video. Discuss whether or not reality TV promotes gender stereotypes.</p> <p>Discuss if impressions of online drama have changed from the activities. Discuss if students feel teens are influenced by TV. Discuss factors that shape the way teens act online and if online drama encourages gender stereotypes.</p> <p>Review Key Vocabulary</p> <p>Class discussion - What are some ways that you and your friends tease each other "for fun?" What are the signs that the teasing has moved from being harmless to "crossing the line?" How does that feel?</p> <p>Watch video about a real-life bullying situation and analyze online behaviors that "cross the line"</p> <p>Read and discuss 2 different cases to learn about the various ways that students can be cyberbullied, including flaming, deceiving and harassing</p> <p>Class discussion and decision about how adopt the point of view of teens who have been cyberbullied and offer solutions</p> <p>Review 2 previous lessons' content. What are the rights and responsibilities involved with creative work?</p> <p>Review key vocabulary and show examples of public domain works, discuss what we are allowed to do with these works, under "public domain," discuss 4 points of fair use with handout. Use graphic organizer to discuss levels</p> <p>Use sample videos and case scenarios, discuss and judge which are fair use</p> <p>Create a collage or video using fair use guidelines</p>
Resources	
https://www.commonsensemedia.org/educators/digital-citizenship	
Suggested Time Frame:	6 days (5 class periods for lessons, 1 for unit assessment)

Grades 6-8 Technology Curriculum Map

6 th through 8 th Grade		6 th Grade	7 th Grade	8 th Grade
Technology Curriculum				
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.				
A. Students demonstrate a sound understanding of technology concepts, systems and operations.				
Understand and use technology systems.				
8.1.8.A.1	Demonstrate knowledge of a real world problem using digital tools.	✓	✓	✓
Select and use applications effectively and productively.				
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.A.5	Create a database query, sort and create a report and describe the process, and explain the report results.	✓		
B. Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.				
Create original works as a means of personal or group expression.				
8.1.8.B.1	Synthesize and publish information about a local or global issue or event (ex. Tele-collaborative project, blog, school web).			✓
C. 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.				
8.1.8.C.1	Collaborate to develop and publish work that provides perspectives on a global problem for discussions with learners from other countries. i) Interact, collaborate, and publish with peers, experts, or others by employing a variety of digital environments and media. j) Communicate information and ideas to multiple audiences using a variety of media and formats. k) Develop cultural understanding and global awareness by engaging with learners of other cultures.			

	l) Contribute to project teams to produce original works or solve problems.			
D. Digital Citizenship: Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.				
Advocate and practice safe, legal, and responsible use of information and technology.				
8.1.8.D.1	Understand and model appropriate online behaviors related to cyber safety, 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.	✓	✓	✓
8.1.8.D.5	Understand appropriate uses for social media and the negative consequences of misuse.	✓	✓	✓
E. Research and Information Fluency: Students apply digital tools to gather, evaluate, and use information.				
8.1.8.E.1	Effectively use a variety of search tools and filters in professional public databases to find information to solve a real world problem. i) Plan strategies to guide inquiry. j) Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media. k) Evaluate and select information sources and digital tools based on the appropriateness for specific tasks. l) Process data and report results.		✓	✓
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.				
8.1.8.F.1	Explore a local issue, by using digital tools to collect and analyze data to identify a solution and make an informed decision. i) Identify and define authentic problems and significant questions for investigation. j) Plan and manage activities to develop a solution or complete a project. k) Collect and analyze data to identify solutions &/or make informed decisions. l) Use multiple processes and diverse perspectives to explore alternative solutions			✓

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.				
A. The Nature of Technology: Creativity and Innovation Technology systems impact every aspect of the world in which we live.				
The characteristics and scope of technology.				
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 - smart phone for mobility needs).			
The core concepts of technology.				
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.			
The relationships among technologies and the connections between technology and other fields of study.				
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.			
B. Technology and Society: Knowledge and understanding of human, cultural and societal values are fundamental when designing technological systems and products in the global society.				
The cultural, social, economic and political effects of technology.				
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.			
The effects of technology on the environment.				
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.			
The role of society in the development and use of technology.				

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.			
The influence of technology on history				
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.			
C. Design: The design process is a systematic approach to solving problems.				
The attributes of design				
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.			
The application of engineering design.				
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.5a	Create a technical sketch of a product with materials and measurements labeled.			
The role of troubleshooting, research and development, invention and innovation and experimentation in problem solving.				
8.2.8.C.6	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.			
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 w/annotated sketches to record 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.			
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.				
Apply the design process.				
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 trade-offs 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 STEM-based design challenge using science, engineering, and math principles that validate a solution.			
Use and maintain technological products and systems.				
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.			
Assess the impact of products and systems.				
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.			
Assess the impact of products and 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.			
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.			
E. Computational Thinking: Programming: Computational thinking builds and enhances problem solving, allowing students to move beyond using knowledge to creating knowledge.				
Computational thinking and computer programming as tools used in design and engineering.				
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).		✓	