Grades 3, 4, 5 Technology Curriculum

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Grades 3, 4, 5 Technology Curriculum Work Committee

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Introduction

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

Course Description

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

Technology Standards

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

UNIT TITLE	ENDURING UNDERSTANDINGS	NJSLS	TIMEFRAME
Creating a Car	Students will understand that choosing different materials and designs will help or hinder the ability of their car to go the farthest. Students will also see the importance of tracking their progress to determine if they should proceed or change their hypothesis.	**8.1.E** **8.2.A.2** **8.2.5.C.1** **8.2.5.C.2** **8.2.5.C.3** **8.2.5.C.4**	**10 class periods**
Story Telling with Flat Stanley	Students will understand that….. Stories have a beginning, middle and end. Choosing text and pictures can add to the overall meaning of the story. Collaboration to write, revise, and edit can strengthen key ideas in a story. Also, using technology to produce and publish writing demonstrates evidence of an overall command of keyboarding skills.	**8.1.5.A.1** **8.1.5.A.2** **8.1.P.B.1** **8.1.2.B.1**	**10 class periods**
Extinct and Endangered Animals	Students will understand that many factors have changed the life cycle of many species and that with time and knowledge some of these species can regenerate. Students will also understand why some may never regenerate and be able to communicate why not. Students will understand and choose a technology tool that is the most effective way to show their findings.	**8.1.5.E.1** **8.1.5.F.1** **8.1.5.A.2** **8.1.5.A.3**	**15 class periods**
Google Websites	Students will understand that different countries have many different resources that contribute to the lifestyle depending on the resources available.	**8.1.5.A.1** **8.1.5.A.2**	**20 class periods**

Content Area:	Technology	Grade(s) 3-4
Unit Plan Title:	Creating a Car	

Standard

8.1 – Ed Tech and/or 8.2 Tech Ed, etc.   8.1.E, 8.2.A.2, 8.2.5.C.1, 8.2.5.C.2, 8.2.5.C.3, 8.2.5.C.4

Overview/Rationale

Students will create cars using supplies provided by the teacher while marking their progress using Google Classroom. They will use the internet to get ideas for the materials and the shape of the vehicle. The goal is to determine what materials and shape will make the car travel the furthest. Students will understand Google Classroom tools to support and change cars based on their findings.

Strand(s)

Strand A – F for 8.1 and/or
Strand A – E for 8.2
Be certain to identify if it is standard 8.1 or 8.2
8E. Research and Information Fluency: students apply digital tools to gather, evaluate, and use information.
8C. The design process is a systematic approach to solving problems.

Technology Standard(s) (Established Goals)

8.1.E, 8.2.A.2, 8.2.5.C.1, 8.2.5.C.2, 8.2.5.C.3, 8.2.5.C.4

Interdisciplinary Standard(s)

SCI.3-4.5.1.4.B.a, SCI.3-4.5.1.4.B.1, SCI.3-4.5.1.4.B.b, SCI.3-4.5.1.4.B.2, SCI.3-4.5.1.4.B.c, SCI.3-4.5.1.4.B.3, SCI.3-4.5.1.4.B.d

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

Students will understand that choosing different materials and designs will help or hinder the ability of their car to go the farthest. Students will also see the importance of tracking their progress to determine if they should proceed or change their hypothesis.

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

1. What materials and design of a vehicle will allow it to travel the furthest?

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.*

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

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

*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.*

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

Student Learning Goals/Objectives: (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 that different designs and different materials will have an impact on the final product.	Students will be able to manipulate materials to create a working vehicle. Students will be able to maneuver through a Google Slide presentation adding text boxes with text to show understanding of their thought process Students will insert pictures to track the progress of their creation. Students will also use the internet to guide their though process.

Assessment Evidence:

Performance Tasks: Students will show their theories through the product (the car) and through logical thinking by means of Google Tools.	Other Assessment Measures: Students will journal by means of Google Slides daily. They will also take a quiz on their experience using Google Forms. Students will share their information with peers that will give feedback about their findings.

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

Instructional Strategies and Activities D	**Consider how will the design will:** **W** = Students will follow directions in Google Classroom that will give them resources to help them succeed. **H**= Students will Watch YouTube videos and Brainpop movie to get background knowledge. **E**= Students will **R**=Students will journal daily to evaluate their findings and change their thinking accordingly. **E**=Students will test their cars and then peruse the internet to make any needed changes to their vehicles. **T**=Students will be given ample resources to accomplish the task at hand. **O**= Students will keep their findings and learned information on a Google document daily. The intended activities for the 10 days should be listed here and differentiation noted for SE, ELL and/or advanced students.

Resources

Computers and Internet Identify any sources used here – websites, etc.

Suggested Time Frame:	10 School Days

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

Content Area:	Technology		Grade(s) 3-5
Unit Plan Title:	Story Telling With Flat Stanley		

Standard

8.1 Educational Tec 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 will collaborate with a partner to create a "Flat Stanley" character. This character will be the focal point of a story that the students will write and publish using Google Docs or Google Slides. Students will take pictures of Flat Stanley and also gather pictures from the Internet to illustrate each slide or page. Each story will have a theme of Environmental Awareness, Civic Consciousness, or Health Awareness.

Strand(s)

A. Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts.
B. Creativity and Innovation: Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.

Technology Standard(s) (Established Goals)

8.1.5.A.1, 8.1.5.A.2, 8.1.P.B.1, 8.1.2.B.1

Interdisciplinary Standard(s)

LA.5.CCSS.ELA.W.5.3a, LA.5.CCSS.ELA.W.5.3b, LA.5.CCSS.ELA.W.5.3c, LA.5.CCSS.ELA-Literacy.W.5.3e, LA.5.CCSS.ELA-Literacy.CCRA.W.5, LA.5.CCSS.ELA-Literacy.CCRA.W.6, LA.5.CCSS.ELA-Literacy.W.5.6, LA.4.CCSS.ELA-Literacy.W.4.3a, LA.4.CCSS.ELA-Literacy.W.4.3b, LA.4.CCSS.ELA-Literacy.W.4.3e, LA.4.CCSS.ELA-Literacy.W.4.6, LA.3.CCSS.ELA-Literacy.W.3.3a, LA.3.CCSS.ELA-Literacy.W.3.3c, LA.3.CCSS.ELA-Literacy.CCRA.W.4

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

Students will understand that….. Stories have a beginning, middle and end. Choosing text and pictures can add to the overall meaning of the story. Collaboration to write, revise, and edit can strengthen key ideas in a story. Also, using technology to produce and publish writing demonstrates evidence of an overall command of keyboarding skills.

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

How do I publish a piece that is in sequential order so the reader can understand from the beginning to the end?
What pictures and text do I need to give the reader a more effective understanding of the events in my story?

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.
	21st Century Themes		**21st Century Skills**
	Global Awareness	T	Critical Thinking & Problem Solving
X	Environmental Literacy	T	Creativity and Innovation
X	Health Literacy	A	Collaboration, Teamwork and Leadership
X	Civic Literacy	E	Cross-Cultural and Interpersonal Communication
	Financial, Economic, Business and Entrepreneurial Literacy	E	Communication and Media Fluency
		E	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
T	CRP2. Apply appropriate academic and technical skills
	CRP3. Attend to personal health and financial well-being
T	CRP4. Communicate clearly and effectively with reason
E	CRP5. Consider the environmental, social and economic impacts of decisions
T	CRP6. Demonstrate creativity and innovation
E	CRP7. Employ valid and reliable research strategies
T	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them
E	CRP9. Model integrity, ethical leadership and effective management
	CRP10. Plan education and career paths aligned to personal goals
A	CRP11. Use technology to enhance productivity
E	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 that publishing a story to share with others takes planning, revision and creativity.	*Students will be able to (do)… use the keyboard, search the internet, insert pictures, use a digital camera, collaborate with a partner and publish a finished piece using technology.*
Assessment Evidence:	
Performance Tasks: Students will share their story with others and discuss what fueled their stories. They will also be given a rubric at the beginning to continually monitor their progress.	*Other Assessment Measures: Students will be cued during class to show their understanding of daily expectations. Students will self-assess and reflect upon their learning using a rubric which will focus their attention to the process of writing and publishing.*

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** = Read books and discuss literary features that make a coherent story. Teacher monitors time to have each part completed in a timely manner. **H**= Read students work that was creative, effective and on task. **E**= Equip students by asking questions and sharing ideas with the class. **R**=Students will read others stories through the process and give ideas of where to go. **E**=Allow students to Evaluate their work and its implications through class discussions. **T**= Tailored by giving the students choices of how to publish, using speech to text if necessary, working in groups and getting ideas from experience. **O**=Organized through a graphic organizer either paper or computer based
Resources	
Computers, cameras, paper, crayons, markers,	
Suggested Time Frame:	10 forty minutes class periods

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

Content Area:	Technology		Grade(s) 5
Unit Plan Title:	Extinct and Endangered Species		

Standard

8.1.5.E.1, 8.1.5.F.1, 8.1.5.A.2, 8.1.5.A.3

Overview/Rationale

Students will understand that changes in environmental conditions can affect the ability of species to survive. Students will accomplish this by researching, analyzing, and sharing information through self-created websites or a computer based presentation tool.

Strand(s)

    A.   Students demonstrate a sound understanding of technology concepts, systems and operations.

    E. Students apply digital tools to gather, evaluate, and use information.

Technology Standard(s) (Established Goals)

8.1.5.E.1, 8.1.5.F.1, 8.1.5.A.2, 8.1.5.A.3

Interdisciplinary Standard(s)

SCI.5-6.5.3.6.E.a, SCI.5-6.5.3.6.E.1

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

Students will understand that many factors have changed the life cycle of many species and that with time and knowledge some of these species can regenerate. Students will also understand why some may never regenerate and be able to communicate why not. Students will understand and choose a technology tool that is the most effective way to show their findings.

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

    2.   What impacts do the environment and humans have on living species and their ability to survive?

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.*
21st Century Themes	**21st Century Skills**

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

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

*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.*

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

Student Learning Goals/Objectives: (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 understand that many factors contribute to the extinction and/or	*Students will be able to use technology to create an informative*

endangerment of living species.	*presentation to show their understanding of the impacts of society and environmental factors of living beings. They will use pictures, text, backgrounds, and other graphics to show their understanding of the subject.*

Assessment Evidence:

Performance Tasks: Students will demonstrate their understanding of the key concepts of extinction and endangered species by creating effective websites and or presentations for their peers to observe and comment on.	**Other Assessment Measures***: Students will journal their thinking by responding daily to a teacher created question about their thinking process and write about their findings and critically thinking about how their ideas changed. Students will also peer comment on other's work through constructive comments in Google Classroom. Last, students will be assessed answering questions using Google Forms.*

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

Instructional Strategies and Activities D	**Consider how will the design will:** **W** = Students will begin by filling out a teacher created form in Google Forms. Teacher will assign groups and topics based on the student responses. Brainpop and Youtube videos will give background knowledge about the subject of extinct and endangered species. **H**= Expose students to different technology tools that they can choose from to allow personal creativity. **E**= Model each part of the process to focus the students on their task to provide the best final product and understanding as possible. **R**=Teacher will provide daily reflective questions. **E**=Students will be given different levels of technology and information for each project. **O**=Daily journaling and modeling will help students keeps all of their thoughts, ideas, and information in one place.

Resources

Computers and Internet

Suggested Time Frame:	15 School Days

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

Content Area:	Technology	Grade(s) 5
Unit Plan Title:	Google Websites	

Standard

8.1.5.A.1, 8.1.5.A.2,

Overview/Rationale

Students will research different countries and then create a website with pictures and information about the country they chose.. They
    will create an add that convinces others to come to that country based on available resources.

Strand(s)

1. Students demonstrate a sound understanding of technology concepts, systems and operations.

Technology Standard(s) (Established Goals)

8.1 educational Technology: All students will use digital technology to access, manage, evaluate, and synthesize information in order to solve
problems individually and collaborate and to create and communicate knowledge.

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 different countries have many different resources that contribute to the lifestyle depending on the resources
    available.*

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

What resources are essential to our wellbeing?

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.*

21ˢᵗ Century Themes		21ˢᵗ Century Skills	
x	Global Awareness	x	Critical Thinking & Problem Solving
x	Environmental Literacy	x	Creativity and Innovation
	Health Literacy	x	Collaboration, Teamwork and Leadership
	Civic Literacy		Cross-Cultural and Interpersonal Communication
x	Financial, Economic, Business and Entrepreneurial Literacy	x	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.*

x	CRP1. Act as a responsible and contributing citizen and employee
x	CRP2. Apply appropriate academic and technical skills
	CRP3. Attend to personal health and financial well-being
	CRP4. Communicate clearly and effectively with reason
x	CRP5. Consider the environmental, social and economic impacts of decisions
x	CRP6. Demonstrate creativity and innovation
x	CRP7. Employ valid and reliable research strategies
x	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them
	CRP9. Model integrity, ethical leadership and effective management
x	CRP10. Plan education and career paths aligned to personal goals
x	CRP11. Use technology to enhance productivity
x	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 to create websites to share their ideas about global resources.	*Students will be able to create websites using Google classroom adding information and pictures about energy sources. They will be able to gather information online and synthesize that to form ideas about energy over the globe.*

Assessment Evidence:

Performance Tasks: Students will show understanding of Global Energy Issues by the websites that they create to give information about their findings.	**Other Assessment Measures***: Students will have a rubric that they can follow to measure their understanding and the teacher can see their progress.*

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

Instructional Strategies and Activities *W= Students will be given a KWY sheet to access prior knowledge and help decide where the student will go.* *H= View pictures and resources to help students decide their focus.* *E= Watch Youtube videos and visit predesigned sites.* *R= Using google Slides first, pre designed by the teacher, they can change their thinking before applying their knowledge to their website.* *E= Present website to class that assess and can ask questions.* *T= Students will be given materials and aides to help in their completion of this project.* *O= All information will be stored in Google Classroom for the teacher to peruse as needed. Teacher conferences with groups on a daily basis.*	***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?

Resources

Computers, internet, Google Classroom

Suggested Time Frame:	20 school days.

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

Grades 3 -5 Technology Curriculum Map

3rd through 5th Grade		3rd Grade	4th Grade	5th Grade
Technology				
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. Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations.				
Understand and use technology systems.				
8.1.5.A.1	Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems	✔	✔	✔
Select and use applications effectively and productively.				
8.1.5.A.2	Format a document using a word processing application to enhance text and include graphics, symbols and/ or pictures	✔	✔	✔
8.1.5.A.3	Use a graphic organizer to organize information about problem or issue			✔
8.1.5.A.4	Graph data using a spreadsheet, analyze and produce a report that explains the analysis of the data			✔
8.1.5.A.5	Create and use a database to answer basic questions.			✔
8.1.5.A.6	Export data from a database into a spreadsheet; analyze and produce a report that explains the analysis of the data.			✔
B. Creativity and Innovation: Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.				
8.1.5.B.1	Collaborative to produce a digital story about a significant local event or issue based on first-person interviews.	✔	✔	✔
C. Communication and Collaboration: Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.				
8.1.5.C.1	Engage in online discussions with learners of other cultures to investigate a worldwide issue from multiple perspectives and sources, evaluate findings and present possible solutions, using digital tools and online resources for all steps.	✔	✔	✔
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				
8.1.5.D.1	Understand the need for and use of copyrights.	✔	✔	✔
8.1.5.D.2	Analyze the resource citations in online materials for proper use.			✔
Demonstrate personal responsibility for lifelong learning.				
8.1.5.D.3	Demonstrate an understanding of the need to practice cyber safety, cyber security, and cyber ethics when using technologies and social media.	✔	✔	✔
Exhibit leadership for digital citizenship.				
8.1.5.D.4	Understand digital citizenship and demonstrate an understanding of the personal consequences of inappropriate use of technology and social media.	✔	✔	✔
E. Research and Information Fluency: Students apply digital tools to gather, evaluate, and use information.				
8.1.5.E.1	Use digital tools to research and evaluate the accuracy of, relevance to, and appropriateness of using print and non-print electronic information sources to complete a variety of tasks.	✔	✔	✔
F. Critical thinking, problem solving, and decision making: Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.				
8.1.5.F.1	Apply digital tools to collect, organize, and analyze data that support a scientific finding.			✔
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.				
8.2.5.A.1	Compare and contrast how products made in nature differ from products that are human made in how they are produced and used.		✔	
8.2.5.A.2	Investigate and present factors that influence the development and function of a product and a system.	✔	✔	
The core concepts of technology.				
8.2.5.A.3	Investigate and present factors that influence the development and function of products and systems, e.g., resources, criteria and constraints.	✔	✔	

The relationships among technologies and the connections between technology and other fields of study.				
8.2.5.A.4	Compare and contrast how technologies have changed over time due to human needs and economic, political and/or cultural influences.	✔	✔	✔
8.2.5.A.5	Identify how improvement in the understanding of materials science impacts technologies.	✔	✔	✔
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.				
8.2.5.B.1	Examine ethical considerations in the development and production of a product through its life cycle.	✔		
The effects of technology on the environment.				
8.2.5.B.2	Examine systems used for recycling and recommend simplification of the systems and share with product developers.		✔	✔
8.2.5.B.3	Investigate ways that various technologies are being developed and used to reduce improper use of resources.		✔	✔
The role of society in the development and use of technology.				
8.2.5.B.4	Research technologies that have changed due to society's changing needs and wants.		✔	✔
8.2.5.B.5	Explain the purpose of intellectual property law.		✔	✔
The influence of technology on history.				
8.2.5.B.6	Compare and discuss how technologies have influenced history in the past century.	✔	✔	✔
C. Design: The design process is a systematic approach to solving problems				
The attributes of design.				
8.2.5.C.1	Collaborate with peers to illustrate components of a designed system.	✔	✔	
8.2.5.C.2	Explain how specifications and limitations can be used to direct a product's development.	✔	✔	
8.2.5.C.3	Research how design modifications have led to new products.	✔	✔	
The application of engineering design.				
8.2.5.C.4	Collaborate and brainstorm with peers to solve a problem evaluating all solutions to provide the best results with supporting sketches or models.			✔

8.2.5.C.5	Explain the functions of a system and subsystems	✔	✔	✔
The role of troubleshooting, research and development, invention and innovation and experimentation in problem solving.				
8.2.5.C.6	Examine a malfunctioning tool and identify the process to troubleshoot and present options to repair the tool.	✔	✔	✔
8.2.5.C.7	Work with peers to redesign an existing product for a different purpose.	✔	✔	✔
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.				
8.2.5.D.1	Identify and collect information about a problem that can be solved by technology, generate ideas to solve the problem, and identify constraints and trade-offs to be considered.	✔	✔	✔
8.2.5.D.2	Evaluate and test alternative solutions to a problem using the constraints and trade-offs identified in the design process to evaluate potential solutions.	✔	✔	✔
Use and maintain technological products and systems				
8.2.5.D.3	Follow step by step directions to assemble a product or solve a problem.	✔	✔	✔
8.2.5.D.4	Explain why human-designed systems, products, and environments need to be constantly monitored, maintained, and improved.	✔	✔	✔
8.2.5.D.5	Describe how resources such as material, energy, information, time, tools, people and capital are used in products or systems.	✔	✔	✔
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.				
8.2.5.E.1	Identify how computer programming impacts our everyday lives.	✔	✔	✔
8.2.5.E.2	Demonstrate an understanding of how a computer takes input of data, processes and stores the data through a series of commands, and outputs information.	✔	✔	✔

8.2.5.E.3	Using a simple, visual programming language, create a program using loops, events and procedures to generate specific output.	✔	✔	✔
8.2.5.E.4	Use appropriate terms in conversation (e.g., algorithm, program, debug, loop, events, procedures, memory, storage, processing, software, coding, procedure, and data).	✔	✔	✔