Appendix of Technology Standards and Infusion Exemplars Grades K-2

Content Area: **Technology**

Course(s): Sample Course, World Language Gr. 1

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Appendix of Technology Standards and Infusion Exemplars

Department of Curriculum and Instruction



Belleville Public Schools

Curriculum Guide

Appendix of Technology Standards and Infusion Exemplars

Grade K-2

Belleville Board of Education

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Appendix of Technology Standards and Exemplars

The purpose of this appendix is to serve as a guide for educators to meet the technological requirements as per the NJDOE website:

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.

Technology Infusion Exemplars by Discipline for Grades K-2

ELA:

- Have students type spelling words on Google Docs.
- Create "All About Me" poster using Google Doc template.
- Skype another class in the district
- starfall.com
- <u>abcya.com</u>(Alphabet Bingo; Alphabet Sliders; Alphabet Order; Fuzz Bugs Farms: Consonant Blends; Trace the Beat: Letter and Number Tracing Fun with the Fridge: ABC and 123 Magnets; Word Clouds; Contraction Action; Story Maker)
- Techy Life of Jenn K-2: Google Literacy Centers
- RoomRecess.com(Educational Reading and Word Games in addition to video lessons)
- SheppardSoftware.com
- Kahoot
- IXL
- YouTube:"Name That Letter" from Letter Sounds by Rock 'N Learn
- YouTube:Sight Words Level 2 Kindergarten Reading Boost by Rock'N Learn
- YouTube:Learn to Name and Count U.S. Coins by Rock 'N Learn
- YouTube:Telling Time to the Half Hour and Hour Song | 1st Grade & 2nd Grade

- YouTube:3D Shapes Song For Kids | Spheres, Cylinders, Pyramids, Cubes, & Cones
- BrainPOP Jr.: Reading and Writing: Authors
- BrainPOP Jr: Reading and Writing: Phonics
- BrainPOP Jr.: Reading and Writing: Story Elements
- BrainPOP Jr.: Reading and Writing: Sentence
- BrainPOP Jr.: Reading and Writing:Writing
- Word Art
- Raz-Kids(subscription pending)

MATH:

- starfall.com
- <u>abcya.com</u>(Fuzz Bugs-Counting, Sorting and Comparing; Fuzz Bugs Patterns; First to Five; Marble Math: Addition with Manipulatives K-2; Molly Adds Up to 10; Molly Adds and Subtracts from 10; Bubble Skip Counting; Money Bingo; Learning Coins; Bingo Ahapes and Color; Shape Patterns; Same and Different Donut Game; Tangrams; Monster Shape Maker)
- prodigygames.com(Can be linked to Google Classroom): Grade 1-2
- YouTube: The Money Song/Penny, Nickel. Dime. Quater/ Jack Hartman
- YouTube: Let's Learn Fractions
- YouTube: Math for Kids: Measurement, "How Do You Measure Up" Fun & Learning Game for Children
- RoomRecess.com(Educational Math Games in addition to video lessons)
- SheppardSoftware.com
- IXL
- Scratch(coding)
- BrainPOP Jr.: Number Sense: Patterns; One Hundred; Comparing Numbers; Even and Odd; Place Value; Rounding
- BrainPOP Jr.: Addition and Subtraction
- BrainPOP Jr.: Measurement
- BrainPOP Jr.: Money
- BrainPOP Jr.: Time
- BrainPOP Jr.: Geometry
- BrainPOP Jr.: Fractions
- BrainPOP Jr: Math Strategies
- xtraMath.com
- Kahoot

SCIENCE:

- abcya.com(Dress for the weather; 5 Senses; Weird and Watery Alphabet; Let Me Grow; States of Matter)
- SheppardSoftware.com
- IXL
- Scratch(coding)
- YouTube: Crash Course Kids
- BrainPOP Jr.: Science Unit: Butterflies
- BrainPOP Jr.: Science Unit: Animals: Camouflage; Classifying Animals; Fish; Food Chain; Frogs; Hibernation; Migration; Mammals
- Kahoot
- Soft Schools: Animal Facts
- Science Kids-Animal Facts
- Enchanted Learning: Enchanted Learning is a wonderful website where students can learn about many different topics to

- support the curriculum
- Weathering and Erosion: Readworks
- How Plants Grow: Readworks
- Solids and Liquids: Readworks
- <u>Amazing Space</u>-Learn about astronomy, space, telescopes, stars, and discoveries. Includes "Tonight's Sky" constellations, deep sky objects and planets.

SOCIAL STUDIES:

- Teacher Tube Videos (rules, citizens, cooperation)
- My World Interactive Digital Companion
- Webquests (rules, citizens, cooperation)
- Google Maps
- <u>abcya.com</u>(Mapping-Take a Trip;USA Geography)
- SheppardSoftware.com
- IXL
- BrainPOP Jr.: Social Studies Unit: American History
- BrainPOP Jr.: Social Studies Unit: Holidays
- BrainPOP Jr.: Social Studies Unit: Communities
- BrainPOP Jr.: Social Studies Unit: Government
- BrainPOP Jr.: Social Studies Unit: Citizenship
- BrainPOP Jr.: Social Studies Unit: Continents and Oceans; Reading Maps; Rural, Suburban, Urban and Landforms
- National Geographic for Kids
- History Channel.com
- Scholastic News.com
- Quia
- Enchanted Learning: Enchanted Learning is a wonderful website where students can learn about many different topics to support the curriculum.
- Kahoot

LIBRARY/MEDIA

- skype an author
- starfall.com
- <u>abcya.com</u>(Internet Safety: Cyber-Five; Find the Technology; Make a Robot; Create A Car; Typing Rocket, Junior; Keyboard Zoo; Keyboard Zoo 2)
- RoomRecess.com
- Bookflix
- SheppardSoftware.com
- Scratch(coding)
- Team UmiZoomi
- BrainPOP Jr.: Technology: Parts of a Computer
- BrainPOP Jr.: Technology: Taking Photos
- BrainPOP Jr.: Technology: Internet Safety
- BrainPOP Jr.: Authors
- BrainPOP Jr.: Library; Choosing a Book; Reading Nonficion; Book Reports; Facts and Opinion
- BrainPop Jr.: Social Studies Unit: Biographies
- Enchanted Learning: Enchanted Learning is a wonderful website where students can learn about many different topics to support the curriculum

- Kahoot
- Word Art

MUSIC:

- abcya.com(Sound Burst; Melody Maker; Trace to the Beat: Letter and Number Tracing)
- BrainPOP Jr.: Musical Instruments
- BrainPOP Jr.: Percussion Instruments
- BrainPOP Jr.: Woodwind Instruments
- BrainPOP Jr.: Musical Alphabet
- BrainPOP Jr.: Pitch, Tone and Beat
- BrainPOP Jr.: Time Signature and Note Values
- BrainPOP Jr.: Wolfgang Amadeus Mozart
- Team Umizoomi: Music Maker
- Enchanted Learning: Enchanted Learning is a wonderful website where students can learn about many different topics to support the curriculum.
- Kahoot
- Team Umizoomi: Nick Jr. Coloring Book
- YouTube:Little Einsteins-Leo and the Musical Families
- Singing Fingers
- Chicago Philharmonic
- Skype a musician

ART:

- Skype a local artist
- abcya.com(Magic Mirror Paint; Paint; Shapes and Color; Pixel Art-Sound Bursts
- BrainPOP Jr.: Art: Collage
- BrainPOP Jr.: Art: Color
- BrainPOP Jr.: Art: Elements of Art
- BrainPOP Jr.: Art: Picasso, Van Gogh, O'Keeffe
- BrainPOP Jr.: Art: Sculpture
- <u>Enchanted Learning</u>: Enchanted Learning is a wonderful website where students can learn about many different topics to support the curriculum.
- Kahoot

PE/HEALTH

- Sheppard Software.com(Nutrition For Kids)
- YouTube: Sid the Science Kid: Muscle Investigation
- YouTube: Sid the Science Kid: The Snack Chart
- You Tube: Sid the Science Kid: Break It Down
- YouTube: Sid the Science Kid: Did You Hear What Happened to the Tooth?
- Team UmiZoomi: Nick Jr.: Finding Feelings
- BrainPOP Jr.: Health Unit: Bodies-Senses
- BrainPOP Jr.: Health Unit: Teeth
- BrainPOP Jr.: Health Unit: Food

- BrainPOP Jr.: Health Unit: Reduce, Reuse, Recycle
- BrainPOP Jr.: Health Unit: Be Well; Be Safe; Be Responsible
- BrainPOP Jr.: Health Unit: Feelings
- Enchanted Learning: Enchanted Learning is a wonderful website where students can learn about many different topics to support the curriculum.
- Kahoot
- GoNoodle
- Just Dance-YouTube
- YouTube: The Vegetable Song
- YouTube: How to Keep Your Body Clean, Eat Healthy and Stay Fit With Excercise-Learning Games for Kids: Kids
 Educational



2014 New Jersey Student Learning Standards - Technology

Content Area		Technology						
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.						
Strand		A. Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations.						
Grade Level bands	Content Statement Students will:		Indicator	Indicator				
P	Understand and systems.	d use technology	8.1.P.A.1 8.1.P.A.2	Use an input device to select an item and navigate the screen Navigate the basic functions of a browser.				
	Select and use effectively and		8.1.P.A.3	Use digital devices to create stories with pictures, numbers, letters and words.				
			8.1.P.A.4	Use basic technology terms in the proper context in conversation with peers and teachers (e.g., camera, tablet, Internet, mouse, keyboard, and printer).				
			8.1.P.A.5	Demonstrate the ability to access and use resources on a computing device.				
K-2	systems.	l use technology	8.1.2.A.1 8.1.2.A.2	Identify the basic features of a digital device and explain its purpose.				
		lect and use applications fectively and productively.		Create a document using a word processing application. Compare the common uses of at least two different digital applications and identify the advantages and disadvantages of using each.				
			8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).				
			8.1.2.A.5 8.1.2.A.6	Enter information into a spreadsheet and sort the information. Identify the structure and components of a database.				
			8.1.2.A.7	Enter information into a database or spreadsheet and filter the information.				
3-5	systems.	l use technology	8.1.5.A.1	Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.				
		d use applications y 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 8.1.5.A.6	Create and use a database to answer basic questions. Export data from a database into a spreadsheet; analyze and produce a report that explains the analysis of the data.				
6-8	Understand and systems.	l use technology	8.1.8.A.1	Demonstrate knowledge of a real world problem using digital tools.				
	Select and use effectively and		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.				
9-12	Understand and systems.	d use technology	8.1.12.A.1	Create a personal digital portfolio which reflects personal and academic interests, achievements, and career aspirations by using a variety of digital tools and resources.				

		use applications and productively.	8.1.12.A.2	Produce and edit a multi-page digital document for a commercial or professional audience and present it to peers and/or professionals in that related area for review.
			8.1.12.A.3	Collaborate in online courses, learning communities, social networks or virtual worlds to discuss a resolution to a problem or issue.
			8.1.12.A.4	Construct a spreadsheet workbook with multiple worksheets, rename tabs to reflect the data on the worksheet, and use mathematical or logical functions, charts and data from all worksheets to convey the results.
			8.1.12.A.5	Create a report from a relational database consisting of at least two tables and describe the process, and explain the report results.
Content A	rea	Technology		
Standard			order to solve	s will use digital tools to access, manage, evaluate, and problems individually and collaborate and to create and
Strand		B. Creativity and Innovat innovative products and p		emonstrate creative thinking, construct knowledge and develop chnology.
Grade	Content Sta	tement	Indicator	Indicator
Level bands	Students wi	ill:		
Р		ing knowledge to w ideas, products, or	8.1.P.B.1	Create a story about a picture taken by the student on a digital camera or mobile device.
K-2	processes.		8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.
3-5		inal works as a means of group expression.	8.1.5.B.1	Collaborative to produce a digital story about a significant local event or issue based on first-person interviews.
6-8			8.1.8.B.1	Synthesize and publish information about a local or global issue or event (ex. telecollaborative project, blog, school web).
9-12			8.1.12.B.2	Apply previous content knowledge by creating and piloting a digital learning game or tutorial.
Content A	rea	Technology		
Standard			order to solve	s will use digital tools to access, manage, evaluate, and problems individually and collaborate and to create and
Strand				tudents use digital media and environments to communicate and ance, to support individual learning and contribute to the learning
Grade	Content Sta		Indicator	Indicator
Level Bands				
P		llaborate, and publish experts, or others by	8.1.P.C.1	Collaborate with peers by participating in interactive digital games or activities.
K-2	employing a variety of digital environments and media. Communicate information and ideas		8.1.2.C.1	Engage in a variety of developmentally appropriate learning activities with students in other classes, schools, or countries using various media formats such as online collaborative tools, and social media.
3-5	to multiple audiences using a variety of media and formats. Develop cultural understanding and		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.
6-8	global awareness by engaging with learners of other cultures. Contribute to project teams to		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.
9-12	produce ori problems.	ginal works or solve	8.1.12.C.1	Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through social media or in an online community.

Content Area		Technology							
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.							
Strand		D. Digital Citizenship: Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.							
Grade Level bands	Content Sta	atement	Indicator	Indicator					
K-2		and practice safe, legal, sible use of information logy.	8.1.2.D.1	Develop an understanding of ownership of print and nonprint information.					
3-5		and practice safe, legal, sible use of information logy.	8.1.5.D.1 8.1.5.D.2	Understand the need for and use of copyrights. Analyze the resource citations in online materials for proper use.					
	Demonstrat for lifelong	te personal responsibility glearning.	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 lead citizenship.	dership for digital	8.1.5.D.4	Understand digital citizenship and demonstrate an understanding of the personal consequences of inappropriate use of technology and social media.					
6-8	and responsible use of information				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 for lifelong	te personal responsibility glearning.	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.					
0.10			8.1.8.D.5	Understand appropriate uses for social media and the negative consequences of misuse.					
9-12	and respons	<u> </u>	8.1.12.D.1	Demonstrate appropriate application of copyright, fair use and/or Creative Commons to an original work.					
	Demonstrate for lifelong	te personal responsibility learning.	8.1.12.D.2	Evaluate consequences of unauthorized electronic access (e.g., hacking) and disclosure, and on dissemination of personal information.					
			8.1.12.D.3	Compare and contrast policies on filtering and censorship both locally and globally.					
	Exhibit lead citizenship.	dership for digital	8.1.12.D.4	Research and understand the positive and negative impact of one's digital footprint.					
		I m	8.1.12.D.5	Analyze the capabilities and limitations of current and emerging technology resources and assess their potential to address personal, social, lifelong learning, and career needs.					
Content A	Area	Technology							
synthesize information in communicate knowledge		order to solve	ts will use digital tools to access, manage, evaluate, and problems individually and collaborate and to create and						
			tion Fluency: S	tudents apply digital tools to gather, evaluate, and use					
Grade Level	Content Sta		Indicator	Indicator					
bands P	Students w	ill: gies to guide inquiry.	8.1.P.E.1	Use the Internet to explore and investigate questions with a teacher's support.					

K-2	Locate, orga synthesize, information sources and Evaluate an	d select information	8.1.2.E.1	Use digital tools and online resources to explore a problem or issue.
		digital tools based on iateness for specific		
3-5	Locate, orgi synthesize, information sources and	ies to guide inquiry. anize, analyze, evaluate, and ethically use from a variety of media. d select 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.
	sources and	digital tools based on inteness for specific		
6-8	Plan strategies to guide inquiry. Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media. Evaluate and select information sources and digital tools based on the appropriateness for specific		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.
	tasks. Process data and report results.			
9-12	Locate, orga	ies to guide inquiry. anize, analyze, evaluate, and ethically use	8.1.12.E.1	Produce a position statement about a real world problem by developing a systematic plan of investigation with peers and experts synthesizing information from multiple sources.
	synthesize, and ethically use information from a variety of sources and media. Evaluate and select information sources and digital tools based on the appropriateness for specific tasks.		8.1.12.E.2	Research and evaluate the impact on society of the unethical use of digital tools and present your research to peers.
	Process data and report results.			
Content A Standard	rea	synthesize information in communicate knowledge.	order to solve p	s will use digital tools to access, manage, evaluate, and problems individually and collaborate and to create and
Strand			I decision making: Students use critical thinking skills to plan olve problems, and make informed decisions using appropriate	
Grade Level bands	Content Sta Students wi		Indicator	Indicator

K-2	Identify and define authentic problems and significant questions for investigation. Plan and manage activities to	8.1.2.F.1	Use geographic mapping tools to plan and solve problems.
	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.		
3-5	Identify and define authentic problems and significant questions for investigation.	8.1.5.F.1	Apply digital tools to collect, organize, and analyze data that support a scientific finding.
	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		
6-8	Identify and define authentic problems and significant questions for investigation.	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.
	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.		
9-12	Identify and define authentic problems and significant questions for investigation.	8.1.12.F.1	Evaluate the strengths and limitations of emerging technologies and their impact on educational, career, personal and or social needs.
	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.		

Content	Area Technology					
Standard	8.2 Technology E All students will of technological desi	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.				
Strand	A. The Nature of					
Grade Level bands	Content Statement Students will be able to understand:	Indicator	Indicator			
K-2	The characteristics and scope of technology.	8.2.2.A.1 8.2.2.A.2	Define products produced as a result of technology or of nature. Describe how designed products and systems are useful at school, home and work.			
	The core concepts of technology.	8.2.2.A.3	Identify a system and the components that work together to accomplish its purpose.			
	The relationships among technologies and the connections between technology and other fields of study.	8.2.2.A.4 8.2.2.A.5	Choose a product to make and plan the tools and materials needed. Collaborate to design a solution to a problem affecting the community.			
3-5	The characteristics and scope of technology.	8.2.5.A.1 8.2.5.A.2	Compare and contrast how products made in nature differ from products that are human made in how they are produced and used. Investigate and present factors that influence the development and			
	The core concepts of	8.2.5.A.3	function of a product and a system. Investigate and present factors that influence the development and			
	technology.		function of products and systems, e.g., resources, criteria and constraints.			
	The relationships among technologies and the connections between	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.			
	technology and other fields of study.	8.2.5.A.5	Identify how improvement in the understanding of materials science impacts technologies.			
6-8	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	8.2.8.A.4 8.2.8.A.5	Redesign an existing product that impacts the environment to lessen its impact(s) on the environment. Describe how resources such as material, energy, information, time,			
	technology and other fields of study.		tools, people, and capital contribute to a technological product or system.			
9-12	The characteristics and scope of technology.	8.2.12.A.1	Propose an innovation to meet future demands supported by an analysis of the potential full costs, benefits, trade-offs and risks, related to the use of the innovation.			
	The core concepts of technology.	8.2.12.A.2	Analyze a current technology and the resources used, to identify the trade-offs in terms of availability, cost, desirability and waste.			
	The relationships among technologies and the connections between technology and other fields of study.	8.2.12.A.3	Research and present information on an existing technological product that has been repurposed for a different function.			

Content	23						
Standard	All students will of technological des global society, an	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.					
Strand		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.					
Grade	Content Statement	Indicator	Indicator				
Level	Students will be able to						
bands	understand:						
K-2	The cultural, social,	8.2.2.B.1	Identify how technology impacts or improves life.				
	economic and political effects of technology.						
	The effects of technology on the environment.	8.2.2.B.2	Demonstrate how reusing a product affects the local and global environment.				
	The role of society in the development and use of technology.	8.2.2.B.3	Identify products or systems that are designed to meet human needs.				
	The influence of technology on history.	8.2.2.B.4	Identify how the ways people live and work has changed because of technology.				
3-5	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.				
6-8	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	8.2.8.B.5	Identify new technologies resulting from the demands, values, and interests of individuals, businesses, industries and societies.				
	technology.	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.				
9-12	The cultural, social, economic and political	8.2.12.B.1	Research and analyze the impact of the design constraints (specifications and limits) for a product or technology driven by a				

	effects of technology.			cultural, social, economic or political need and publish for review.
		s of technology	8.2.12.B.2	Evaluate ethical considerations regarding the sustainability of
	on the env			environmental resources that are used for the design, creation and
				maintenance of a chosen product.
				manifemente of a chosen product.
	The role of	of society in the	8.2.12.B.3	Analyze ethical and unethical practices around intellectual property
		ent and use of	0.2.12.1.3	rights as influenced by human wants and/or needs.
	technology			rights as influenced by fluthan wants and/of ficeds.
			8.2.12.B.4	Investigate a technology used in a given new of -flictory
		ence of technology	0.2.12.B.4	Investigate a technology used in a given period of history, e.g., stone
	on history	•		age, industrial revolution or information age, and identify their impact
				and how they may have changed to meet human needs and wants.
			0.0.10.5.5	D 14 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
			8.2.12.B.5	Research the historical tensions between environmental and economic
				considerations as driven by human needs and wants in the development
				of a technological product, and present the competing viewpoints to
				peers for review.
	I	Tr. 1 1	<u> </u>	
Content A	rea	Technology		
Standard				neering, Design, and Computational Thinking - Programming:
				erstanding of the nature and impact of technology, engineering,
				nal thinking and the designed world as they relate to the individual,
		global society, and		
Strand				a systematic approach to solving problems.
Grade	Content S	tatement	Indicator	Indicator
Level				
bands	Students v	vill be able to		
	understand	d:		
K-2	The attribu	utes of design.	8.2.2.C.1	Brainstorm ideas on how to solve a problem or build a product.
			8.2.2.C.2	Create a drawing of a product or device that communicates its function
				to peers and discuss.
			8.2.2.C.3	Explain why we need to make new products.
	The applic	eation of	8.2.2.C.4	Identify designed products and brainstorm how to improve one used in
	engineerin		0.2.2.0.4	the classroom.
	Chighicerii	is design.	8.2.2.C.5	Describe how the parts of a common toy or tool interact and work as
			0.2.2.0.3	· ·
				part of a system.
	TP1 1	6. 11 1	0.0.0.0.0	
		of troubleshooting,	8.2.2.C.6	Investigate a product that has stopped working and brainstorm ideas to
		nd development,		correct the problem.
		and innovation		
	and experimentation in problem solving.			
3-5	The attribu	utes 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 lead to new products.
	The applic	cation of	8.2.5.C.4	Collaborate and brainstorm with peers to solve a problem evaluating all
	engineerin		5.2.5.5.	solutions to provide the best results with supporting sketches or models.
		-D	8.2.5.C.5	Explain the functions of a system and subsystems.
			0.2.3.0.3	Explain the functions of a system and subsystems.
	The role o	of troubleshooting,	8.2.5.C.6	Examine a malfunctioning tool and identify the process to troubleshoot
			0.2.3.0.0	and present options to repair the tool.
		nd development,		and present options to repair the tool.
		and innovation	0.25.6.7	W 1 'd
		imentation in	8.2.5.C.7	Work with peers to redesign an existing product for a different purpose.
	problem s		0000	
6-8	The attribute	utes 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.	
	The application of engineering design.		8.2.8.C.3	Evaluate the function, value, and aesthetics of a technological product or system, from the perspective of the user and the producer.	
			8.2.8.C.4	Identify the steps in the design process that would be used to solve a designated problem.	
			8.2.8.C.5	Explain the interdependence of a subsystem that operates as part of a system.	
			8.2.8.C.5.a	Create a technical sketch of a product with materials and measurements labeled.	
	research a	of troubleshooting, and development, and innovation	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.	
	and exper problem s	imentation in olving.	8.2.8.C.7	Collaborate with peers and experts in the field to research and develop a product using the design process, data analysis and trends, and maintain a design log with annotated sketches to record the developmental cycle.	
			8.2.8.C.8	Develop a proposal for a chosen solution that include models (physical graphical or mathematical) to communicate the solution to peers.	
9-12	The attrib	utes of design.	8.2.12.C.1	Explain how open source technologies follow the design process.	
			8.2.12.C.2	Analyze a product and how it has changed or might change over time to meet human needs and wants.	
	The applic		8.2.12.C.3	Analyze a product or system for factors such as safety, reliability, economic considerations, quality control, environmental concerns, manufacturability, maintenance and repair, and human factors engineering (ergonomics).	
			8.2.12.C.4	Explain and identify interdependent systems and their functions.	
			8.2.12.C.5	Create scaled engineering drawings of products both manually and digitally with materials and measurements labeled.	
	research a	of troubleshooting, and development, and innovation	8.2.12.C.6	Research an existing product, reverse engineer and redesign it to improve form and function.	
	and exper problem s	imentation in olving.	8.2.12.C.7	Use a design process to devise a technological product or system that addresses a global problem, provide research, identify trade-offs and constraints, and document the process through drawings that include data and materials.	
Content A	Area	Technology	•	1	
Standard		8.2 Technology E All students will d	levelop an unde gn, computation	ineering, Design, and Computational Thinking - Programming: erstanding of the nature and impact of technology, engineering, onal thinking and the designed world as they relate to the individual,	
Strand		D. Abilities for a	Fechnological [*]	World: The designed world is the product of a design process that sources into products and systems.	
Grade	Content S		Indicator	Indicator	
Level bands	1	will understand			
K-2	Apply the	design process.	8.2.2.D.1	Collaborate and apply a design process to solve a simple problem from everyday experiences.	
	Use and maintain technological products and		8.2.2.D.2	Discover how a product works by taking it apart, sketching how parts fit, and putting it back together.	
	systems.	-	8.2.2.D.3	Identify the strengths and weaknesses in a product or system.	
			8.2.2.D.4	Identify the resources needed to create technological products or systems.	
		e impact of and systems.	8.2.2.D.5	Identify how using a tool (such as a bucket or wagon) aids in reducing work.	
3-5	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.	
		e impact of 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.	
6-8	Apply the	e 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 rechnolog systems.	naintain gical products and	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		8.2.8.D.5	Explain the impact of resource selection and the production process in	
	products	products and systems.		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.	
9-12	Apply the	Apply the design process.		Design and create a prototype to solve a real world problem using a design process, identify constraints addressed during the creation of the prototype, identify trade-offs made, and present the solution for peer review.	
			8.2.12.D.2	Write a feasibility study of a product to include: economic, market, technical, financial, and management factors, and provide recommendations for implementation.	
		Use and maintain technological products and systems.		Determine and use the appropriate resources (e.g., CNC (Computer Numerical Control) equipment, 3D printers, CAD software) in the design, development and creation of a technological product or system.	
	Assess th	e impact of	8.2.12.D.4	Assess the impacts of emerging technologies on developing countries.	
		and systems.	8.2.12.D.5	Explain how material processing impacts the quality of engineered and fabricated products.	
				Synthesize data, analyze trends and draw conclusions regarding the effect of a technology on the individual, society, or the environment and publish conclusions.	
Content	Area	Technology	1	1	
Standard		8.2 Technology I All students will of	develop an unde	neering, Design, and Computational Thinking - Programming: erstanding of the nature and impact of technology, engineering,	
			ign, computation the design of the environments of the environments.	onal thinking and the designed world as they relate to the individual,	
Strand				gramming: Computational thinking builds and enhances problem solving,	

			nd using knowledge to creating knowledge.
Grade Level bands	Content Statement Students will be able to understand:	Indicator	Indicator
K-2	Computational thinking and computer programming as	8.2.2.E.1	List and demonstrate the steps to an everyday task.
	tools used in design and engineering.	8.2.2.E.2	Demonstrate an understanding of how a computer takes input through a series of written commands and then interprets and displays information as output.
		8.2.2.E.3	Create algorithms (a sets of instructions) using a pre-defined set of commands (e.g., to move a student or a character through a maze).
		8.2.2.E.4	Debug an algorithm (i.e., correct an error).
		8.2.2.E.5	Use appropriate terms in conversation (e.g., basic vocabulary words: input, output, the operating system, debug, and algorithm).
3-5	Computational thinking and computer programming as	8.2.5.E.1	Identify how computer programming impacts our everyday lives.
	tools used in design and engineering.	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).
6-8	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).
9-12	Computational thinking and computer programming as	8.2.12.E.1	Demonstrate an understanding of the problem-solving capacity of computers in our world.
	tools used in design and engineering.	8.2.12.E.2	Analyze the relationships between internal and external computer components.
		8.2.12.E.3	Use a programming language to solve problems or accomplish a task (e.g., robotic functions, website designs, applications, and games).
		8.2.12.E.4	Use appropriate terms in conversation (e.g., troubleshooting, peripherals, diagnostic software, GUI, abstraction, variables, data types and conditional statements).