Appendix of Technology Standards and Infusion Exemplars Grades 9-12

Content Area:TechnologyCourse(s):Sample Course, Pre-Cal/Trig ATime Period:Sample Length & Grade LevelLength:Sample Length & Grade LevelStatus:Published

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 9-12

Belleville Board of Education

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Board Approved: September 23, 2019

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 9-12

What **Technology Infusion** and/or strategies are integrated into this unit to enhance learning? Please list all hardware, software and strategies. Please find a technology pedagogy wheel for assistance while completing this section.

ELA:

- Digital Brain Dump with Flipgrid and Socrative
- <u>Caption This! A fun, deep-thinking Google Drawings activity.</u>
- Create an online portfolio including a social media page and business card for a character identity using Canva.
- "Add and Pass" activity in docs- Digital version of adding onto a story and passing to next group of students until finished. Begin with an image on a blank document (can be a scene from a story or even a historical figure).
- <u>Writable.com</u>- 600+ prompts and assignments
- <u>ThinkCERCA.com</u>-Web-based literacy program that selfold the development of critical thinking and argumentative writing skills.
- <u>Commonlit.org</u>-Feature rich literacy resource.
- readwritethink.org: *A-ll's Well that Sells Well: A Creative Introduction to Shakespeare*: After taking a virtual tour of The Globe Theater in Elizabethan London, students compare attending a performance at The Globe to attending a current professional production (such as a play on Broadway) or to viewing a movie at a local theater. They discuss the similarities and differences in the theaters and imagine what types of products might have been advertised in Elizabethan time, if The Globe showed commercials before the play like modern movie theaters do. They create a commercial advertisement geared toward an Elizabethan audience to promote one of today's products or conveniences. This activity helps students better understand the Elizabethan times and Elizabethan theater audiences, as well as persuasive advertising techniques.
- readwritethink.org: *Creating Psychological Profiles of Characters in To Kill a Mockingbird*: Design a digital poster and plan a presentation representing a psychological profiles for a selected character while determining what specific factors (such as family, career, environment, and so forth) have the greatest influence on the characters' decision making throughout the novel.
- readwritethink.org: Ghosts and Fears in Language Arts: Exploring the Ways Writers Scare Readers:

Fright Fair Projects: "Why people like to be scared"-Students can create a Google survey on what movies fellow teens watch, whether or not they watch horror movies and if so why do they like them? Statistics on how well scary movies do at the box office can be researched and fellow students who enjoy horror films can be interviewed. Findings can be presented in the form of a digital news broadcast.

- readwritethink.org: *An Introduction to Graphic Novels:Podcast*readwritethink.org: *Comics and Graphic Novels*
- Create a Book Trailer

MATH:

- Digital Brain Dump with Flipgrid and Socrative.
- Khan Academy: Algebra Functions
- <u>Math by Kahoot-Algebra</u> (Curriculum Aligned Games and videos)
- <u>Kahoot:Math by Kahoot-Algebra</u> (Model and Solve Equations with Variables ob Both Sides)
- YouTube: Algebra Basics: Solving Equations Part 1-Math Antics
- YouTube: Algebra Basics: Solving Equations Part 2-Math Antics
- YouTube:Basic Linear Functions-Math Antics
- Khan Academy:Solving Equations
- Khan Acaemy:Geometry-Law of Detachment

SCIENCE:

- Digital Brain Dump with Flipgrid and Socrative
- YouTube:Intro to Chemistry, Basic Concepts-Periodic Table
- Khan Academy: Introduction to Chemistry
- Weather and Climate- Bozeman Science
- Create PowToon on subject material
- Khan Academy:High School Biology:Cells
- <u>Khan Academy:High School Biology:Evolution</u>

SOCIAL STUDIES:

- Google Earth
- Digital Brain Dump with Flipgrid and Socrative.
- Caption This! A fun, deep-thinking Google Drawings activity
- <u>Digital History</u>- A comprehensive collection of historical data on United States history.
- Digital History: The Great Depression
- Create an online portfolio including a social media page and business card for a historian using Canva.
- <u>iCivics.org</u> gives students the necessary tools to learn about and participate in civic life, and teaches the materials and support to achieve this goal. Their free resources include interactive digital tools, print-and-go lessons and award winning games.
- <u>http://www.loc.go</u>v: Library of Congress: News, events, new content and more from the National Library of Congress and Specifice subject areas- From legislature to poetry, from music to science, from cataloging to copyright.

- <u>Historical Thinking Matters.org</u>: A pick for best social studies websites "focused on key topics in U.S. history, that is designed to teach students how to critically read primary souces and how to critique and construct historical narratives.
- <u>Historical Thinking Matters: Rosa Parks</u> (Black History Month)
- YouTube: Larry King Live (1995)- Interview with Rosa Parks (Black History Month)
- NPR: National Public Radio-Podcasts
- <u>Ted Talks: Uglyy History: Witch Hunts</u>



Win 8.1 Apps/Tools Pedagogy Wheel

New Jersey Student Learning Standards (NJSLS-S)

Adopted 10.1.14

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 Operat	tions and Conc	epts: Students demonstrate a sound understanding of				
technology concepts, s		systems and operations.						
Grade	Content Statement		Indicator	Indicator				
Level	Students will:							
bands								
P	Understan	d and use technology	8.1.P.A.1	Use an input device to select an item and navigate the				
	systems.			screen				
			8.1.P.A.2	Navigate the basic functions of a browser.				
	Select and effectively	use applications and productively.	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				
			0.111 1.11	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	Understan	d and use technology	8.1.2.A.1	Identify the basic features of a digital device and explain				
	systems.			its purpose.				
	Select and	use applications	8.1.2.A.2	Create a document using a word processing application.				
	effectively and productively.		8.1.2.A.3	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	Enter information into a spreadsheet and sort the				
				information.				
			8.1.2.A.6	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	Understan	d and use technology	8.1.5.A.1	Select and use the appropriate digital tools and				
	systems.			resources to accomplish a variety of tasks including				
				solving problems.				
	Select and	use applications	8.1.5.A.2	Format a document using a word processing application				
	effectively	and productively.		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.
6-8	Understand systems.	d and use technology	8.1.8.A.1	Demonstrate knowledge of a real world problem using digital tools.
	Select and effectively	use applications 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.
9-12	Understand systems.	d and 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.
	Select and effectively	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	Area	Technology		
Standard		8.1 Educational Techno synthesize information	ology: All stud in order to sol	ents will use digital tools to access, manage, evaluate, and ve problems individually and collaborate and to create
Strand		B. Creativity and Innov develop innovative pro	vation: Student	s demonstrate creative thinking, construct knowledge and ess using technology
Grade	Content St	atement	Indicator	Indicator
Level bands	Students w	vill:		
Р	Apply exis	ting knowledge to ew 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	Create orig of persona	ginal works as a means l or 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	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 know	vledge.			
Strand		C. Communication and	Collaboration: Students use digital media and environments to			
communicate and work		collaborative	y, including at a distance, to support individual learning			
Grade	Content St	and contribute to the le	Indicator	'S.		
Level	Content Statement		mulcator	Indicator		
bands						
Р	Interact, co with peers	ollaborate, 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	8.1.2.C.1	Engage in a variety of developmentally appropriate		
	environme	ents and media.		learning activities with students in other classes,		
	Communi	cate information and		schools, or countries using various media formats such		
3-5	ideas to m	ultiple audiences using	8.1.5.C.1	Engage in online discussions with learners of other		
	a variety o	f media and formats.	0.110.011	cultures to investigate a worldwide issue from multiple		
				perspectives and sources, evaluate findings and present		
	Develop c	ultural understanding		possible solutions, using digital tools and online		
	engaging y	with learners of other		resources for all steps.		
6-8	cultures.		8.1.8.C.1	Collaborate to develop and publish work that provides		
				perspectives on a global problem for discussions with		
	Contribute	to project teams to		learners from other countries.		
9-12	produce of problems	iginal works or solve	8.1.12.C.1	Develop an innovative solution to a real world problem		
	problems.			present ideas for feedback through social media or in an		
				online community.		
Content Area Technology						
Content A	Area	Technology				
Standard	Area	Technology 8.1 Educational Techno	ology: All stud	ents will use digital tools to access, manage, evaluate, and		
Standard	Area	Technology 8.1 Educational Techno synthesize information and communicate know	ology: All stud in order to sol vledge.	ents will use digital tools to access, manage, evaluate, and ve problems individually and collaborate and to create		
Standard Strand	Area	Technology 8.1 Educational Techno synthesize information and communicate know D. Digital Citizenship:	ology: All stud in order to sol vledge. Students unde	ents will use digital tools to access, manage, evaluate, and ve problems individually and collaborate and to create rstand human, cultural, and societal issues related to		
Standard Strand	Area	Technology 8.1 Educational Technology and communicate know D. Digital Citizenship: technology and practice	ology: All stud in order to sol vledge. Students unde e legal and eth	ents will use digital tools to access, manage, evaluate, and ve problems individually and collaborate and to create rstand human, cultural, and societal issues related to ical behavior.		
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Standard Standard Strand Grade Level bands K-2 3-5	Area Content St Advocate and respor informatio Advocate and respor	Technology 8.1 Educational Technology synthesize information and communicate know D. Digital Citizenship: technology and practice ratement and practice safe, legal, nsible use of n and technology. and practice safe, legal, nsible use of n and practice safe, legal, nsible use of	blogy: All stud in order to sol vledge. Students unde e legal and eth Indicator 8.1.2.D.1 8.1.5.D.1 8.1.5.D.2	ents will use digital tools to access, manage, evaluate, and ve problems individually and collaborate and to create rstand human, cultural, and societal issues related to ical behavior. Indicator Develop an understanding of ownership of print and nonprint information. Understand the need for and use of copyrights. Analyze the resource citations in online materials for		
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				media.
	Demonstra responsibi	ate personal lity for lifelong	8.1.8.D.2	Demonstrate the application of appropriate citations to digital content.
	learning.		8.1.8.D.3	Demonstrate an understanding of fair use and Creative Commons to intellectual property.
	Exhibit lea	ndership for digital	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.
9-12	Advocate and resport informatio	and practice safe, legal, ssible use of n and technology.	8.1.12.D.1	Demonstrate appropriate application of copyright, fair use and/or Creative Commons to an original work.
	Demonstra responsibi learning.	ate personal lity for lifelong	8.1.12.D.2	Evaluate consequences of unauthorized electronic access (e.g., hacking) and disclosure, and on dissemination of personal information.
	Ŭ		8.1.12.D.3	Compare and contrast policies on filtering and censorship both locally and globally.
	Exhibit lea	adership for digital	8.1.12.D.4	Research and understand the positive and negative impact of one's digital footprint.
	enzensnip.		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		
Standard	Standard 8.1 Educational Technology and communicate know		ology: All stud in order to sol ⁻ vledge.	ents will use digital tools to access, manage, evaluate, and ve problems individually and collaborate and to create
Strand		E: Research and Inform information.	nation Fluency	: Students apply digital tools to gather, evaluate, and use
Grade Level	Content St	atement	Indicator	Indicator
P	Plan strate	gies to guide inquiry.	8.1.P.E.1	Use the Internet to explore and investigate questions with a teacher's support
K-2	Plan strategies to guide inquiry Locate, organize, analyze, evaluate synthesize and		8.1.2.E.1	Use digital tools and online resources to explore a problem or issue.
	ethically u variety of	se information from a sources and media.		
	Evaluate and select information sources and digital tools based on the appropriateness for specific tasks.			
3-5	Plan strate	gies to guide inquiry.	8.1.5.E.1	Use digital tools to research and evaluate the accuracy of, relevance to, and appropriateness of using print and
	Locate, or evaluate, s ethically u variety of	ganize, analyze, ynthesize, and se information from a sources and media.		non-print electronic information sources to complete a variety of tasks.
	Evaluate a sources an	nd select information d digital tools based on		

	the approp tasks.	riateness 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 		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.
9-12	 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 tasks. Process data and report results. 		8.1.12.E.1 8.1.12.E.2	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. Research and evaluate the impact on society of the unethical use of digital tools and present your research to peers.
Content A	Area	Technology		
Standard		8.1 Educational Techno synthesize information and communicate know	ology: All stud in order to sol ^v vledge.	ents will use digital tools to access, manage, evaluate, and ve problems individually and collaborate and to create
Strand		F: Critical thinking, pro to plan and conduct res using appropriate digita	bblem solving, earch, manage al tools and res	and decision making: Students use critical thinking skills projects, solve problems, and make informed decisions ources.
Grade Level bands	Content St Students w	atement <i>i</i> ill:	Indicator	Indicator
K-2	Identify and define authentic problems and significant questions for investigation.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.Identify and define authentic		8.1.2.F.1	Use geographic mapping tools to plan and solve problems.
3-5	Identify an	d define authentic	8.1.5.F.1	Apply digital tools to collect, organize, and analyze data

	 problems and significant questions for investigation. 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 		that support a scientific finding.
6-8	Identify and define authentic problems and significant questions for investigation. 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.	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.
9-12	Identify and define authentic problems and significant questions for investigation. 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.	8.1.12.F.1	Evaluate the strengths and limitations of emerging technologies and their impact on educational, career, personal and or social needs.

2014 New Jersey Core Curriculum Content Standards - Technology

Content A	rea	Technology				
Standard	Standard 8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming			eering, Design, and Computational Thinking - Programming:		
		All students will dev	velop an under	standing of the nature and impact of technology, engineering, tecl		
computational thinking and the designed world as they relate to the individual, global socie			signed world as they relate to the individual, global society, and the			
Strand A. The Nature of T		A. The Nature of Te	chnology: Cre	ativity and Innovation Technology systems impact every aspect o		
we live.		we live.				
Grade	Content Statement		Indicator	Indicator		
Level	Students will be able to					

bands	understand:			
K-2	The charac	cteristics and scope	8.2.2.A.1	Define products produced as a result of technology or of nature.
	of technology.		8.2.2.A.2	Describe how designed products and systems are useful at schoc
	The core c	oncepts of	8.2.2.A.3	Identify a system and the components that work together to accc
	technology	/.	8.2.2.A.4	Choose a product to make and plan the tools and materials neede
	The relation technologi connection technology study.	onships among es and the ns between y and other fields of	8.2.2.A.5	Collaborate to design a solution to a problem affecting the comm
3-5	The charac	cteristics and scope	8.2.5.A.1	Compare and contrast how products made in nature differ from J
	of technolo	ogy.	82542	human made in how they are produced and used.
			8.2.3.A.2	product and a system.
	The core c	oncepts of	8.2.5.A.3	Investigate and present factors that influence the development a
	technology	<i>/</i> .		and systems, e.g., resources, criteria and constraints.
	The relation	onships among	8.2.5.A.4	Compare and contrast how technologies have changed over time
	technologi connection	es and the is between		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 scie
				technologies.
6-8	The charac	eteristics and scope	82841	Research a product that was designed for a specific demand and
00	of technolo	ogv.	0.2.0.71.1	product has changed to meet new demands (i.e. telephone for co
		65		phone for mobility needs)
				phone for mobility needs).
	The core c technology	oncepts of	8.2.8.A.2	Examine a system, consider how each part relates to other parts, redesign to improve the system.
			8.2.8.A.3	Investigate a malfunction in any part of a system and identify its
	The relation	onships among	8.2.8.A.4	Redesign an existing product that impacts the environment to let
	technologi	es and the		the environment.
	connection	ns between	8.2.8.A.5	Describe how resources such as material, energy, information, ti
	technology	y and other fields of		capital contribute to a technological product or system.
9-12	The charac	cteristics and scope	8.2.12.A.1	Propose an innovation to meet future demands supported by an a
·	of technolo	ogy.		full costs, benefits, trade-offs and risks, related to the use of the
	The core c	oncepts of	8.2.12.A.2	Analyze a current technology and the resources used, to identify
	technology	/.		of availability, cost, desirability and waste.
	The relation	onships among	8.2.12.A.3	Research and present information on an existing technological p
	technologi	es and the		repurposed for a different function.
	connection	ns between		
	technology	and other fields of		
	study.			
Canta t t		Tesharitara		
Content A	rea	lechnology	Landing Tradi	
Standard		0.2 rechnology Ed	ucation, Engli	incerning, Design, and Computational Tranking - Programming:
		computational think	king and the d	esigned world as they relate to the individual global society and t
Strand		B. Technology and	Society: Kno	wledge and understanding of human, cultural and societal values :
		designing technolog	gical systems a	and products in the global society.
Grade	Content Statement		Indicator	Indicator

Level bands	Students will be able to understand:		
K-2	The cultural, social, economic and political effects of technology.	8.2.2.B.1	Identify how technology impacts or improves life.
	The effects of technology on the environment.	8.2.2.B.2	Demonstrate how reusing a product affects the local and global
	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 n
	The influence of technology on history.	8.2.2.B.4	Identify how the ways people live and work has changed becau
3-5	The cultural, social, economic and political effects of technology.	8.2.5.B.1	Examine ethical considerations in the development and product through its life cycle.
	The effects of technology on the environment.	8.2.5.B.2	Examine systems used for recycling and recommend simplifica share with product developers.
		8.2.5.B.3	Investigate ways that various technologies are being developed 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 chang
		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
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 develop product or system over time and present results to peers.
		8.2.8.B.2	Identify the desired and undesired consequences from the use o
	The effects of technology on the environment.	8.2.8.B.3	Research and analyze the ethical issues of a product or system c report findings for review by peers and /or experts.
		8.2.8.B.4	Research examples of how humans can devise technologies to r 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, a individuals, businesses, industries and societies.
	technology.	8.2.8.B.6	Compare and contrast the different types of intellectual property patents and trademarks.
	The influence of technology on history.	8.2.8.B.7	Analyze the historical impact of waste and demonstrate how a r reused or remanufactured into a new product.
9-12	The cultural, social, economic and political effects of technology.	8.2.12.B.1	Research and analyze the impact of the design constraints (spec for a product or technology driven by a cultural, social, econom publish for review.
	The effects of technology on the environment.	8.2.12.B.2	Evaluate ethical considerations regarding the sustainability resources that are used for the design, creation and mainter product.
	The role of society in the development and use of technology.	8.2.12.B.3	Analyze ethical and unethical practices around intellectual prop influenced by human wants and/or needs.

	The influence of technology on history.		8.2.12.B.4	Investigate a technology used in a given period of history, e.g., revolution or information age, and identify their impact and how changed to meet human needs and wants.
			8.2.12.B.5	Research the historical tensions between environmental and ecc as driven by human needs and wants in the development of a te and present the competing viewpoints to peers for review.
Content A	Area	Technology		
Standard		8.2 Technology Ed All students will de computational think	lucation, Engin velop an under king and the de	neering, Design, and Computational Thinking - Programming: rstanding of the nature and impact of technology, engineering, tec rsigned world as they relate to the individual, global society, and t
Strand		C. Design: The desi	ign process is a	a systematic approach to solving problems.
Grade Level bands	Content St Students w	atement vill be able to	Indicator	Indicator
K-2	The attribu	ites of design.	8.2.2.C.1	Brainstorm ideas on how to solve a problem or build a product.
		and of analytic	8.2.2.C.2	Create a drawing of a product or device that communicates its f discuss.
			8.2.2.C.3	Explain why we need to make new products.
	The applic	ation of	8.2.2.C.4	Identify designed products and brainstorm how to improve one
	engineerin	g design.	8.2.2.C.5	Describe how the parts of a common toy or tool interact and wc
	The role of troubleshooting, research and development, invention and innovation and experimentation in problem		8.2.2.C.6	Investigate a product that has stopped working and brainstorm i problem.
3-5	5 The attributes of design.		8.2.5.C.1	Collaborate with peers to illustrate components of a designed sy
			8.2.5.C.2	Explain how specifications and limitations can be used to direct development.
			8.2.5.C.3	Research how design modifications have lead to new products.
	The applic engineerin	ation of g design.	8.2.5.C.4	Collaborate and brainstorm with peers to solve a problem evalu 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 troubleshootin research and development invention and innovation		8.2.5.C.6	Examine a malfunctioning tool and identify the process to troub options to repair the tool.
	experimen solving.	tation in problem	8.2.5.C.7	Work with peers to redesign an existing product for a different
6-8	The attribu	ites of design.	8.2.8.C.1	Explain how different teams/groups can contribute to the overal
			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 p the perspective of the user and the producer.
	The applic engineerin	ation of g design.	8.2.8.C.4	Identify the steps in the design process that would be used to so problem.
		0 0-	8.2.8.C.5	Explain the interdependence of a subsystem that operates as par
			8.2.8.C.5.a	Create a technical sketch of a product with materials and measu

	The role of troubleshooting, research and development,		8.2.8.C.6	Collaborate to examine a malfunctioning system and identify th used to troubleshoot, evaluate and test options to repair the proc
	invention	and innovation and		better solution.
	experimentation in problem solving.		8.2.8.C.7	Collaborate with peers and experts in the field to research and d the design process, data analysis and trends, and maintain a desistence of the developmental cycle.
			8.2.8.C.8	Develop a proposal for a chosen solution that include models (p mathematical) to communicate the solution to peers.
9-12	The attribut	ites of design.	8.2.12.C.1	Explain how open source technologies follow the design proces
			8.2.12.C.2	Analyze a product and how it has changed or might change ove needs and wants.
	The applic engineerin	ation of g design.	8.2.12.C.3	Analyze a product or system for factors such as safety, reliabilit considerations, quality control, environmental concerns, manufa- maintenance and repair, and human factors engineering (ergons
			8212C4	Explain and identify interdependent systems and their functions
			8.2.12.C.5	Create scaled engineering drawings of products both manually a materials and measurements labeled.
	The role of troubleshooting, research and development, invention and innovation and experimentation in problem solving.		8.2.12.C.6	Research an existing product, reverse engineer and redesign it t function.
			8.2.12.C.7	Use a design process to devise a technological product or syster global problem, provide research, identify trade-offs and constr process through drawings that include data and materials
Content A	Area Technology			process infough drawings that include data and matchais.
Standard	dard8.2 Technology EcAll students will de computational thinndD. Abilities for a T		lucation, Engir velop an unde cing and the de echnological V	retaining, Design, and Computational Thinking - Programming: rstanding of the nature and impact of technology, engineering, tec resigned world as they relate to the individual, global society, and t Vorld: The designed world is the product of a design process that and systems
Grade Level bands	Content Statement Students will understand how to:		Indicator	Indicator
K-2	Apply the design process.		8.2.2.D.1	Collaborate and apply a design process to solve a simple proble experiences.
	Use and m technologi	Use and maintain		Discover how a product works by taking it apart, sketching how 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 o
	Assess the and system	impact of products ns.	8.2.2.D.5	Identify how using a tool (such as a bucket or wagon) aids in re
3-5	Apply the	design process.	8.2.5.D.1	Identify and collect information about a problem that can be sol generate ideas to solve the problem, and identify constraints and considered.
			8.2.5.D.2	Evaluate and test alternative solutions to a problem using the cc identified in the design process to evaluate potential solutions.
	Use and m	aintain	8.2.5.D.3	Follow step by step directions to assemble a product or solve a
	technologi	cal products and	8.2.5.D.4	Explain why human-designed systems, products, and environme
	systems.			constantly monitored, maintained, and improved.
			8.2.5.D.5	Describe how resources such as material, energy, information, t
	A			capital are used in products or systems.
1	Assess the	ssess the impact of products		Explain the positive and negative effect of products and system

	and system	ns.		species and the environment, and when the product or system sl
			8.2.5.D.7	Explain the impact that resources such as energy and materials
6.9	Amplextha	design masses	0 2 0 D 1	produce products or system have on the environment.
0-8	Apply the	design process.	8.2.8.D.1	under specific constraints.
			8.2.8.D.2	Identify the design constraints and trade-offs involved in design
				how the prototype might fail and how it might be improved) by
				problem and reporting results in a multimedia presentation, des
			0.2.9.D.2	engineering notebook.
			8.2.8.D.3	engineering, and math principles that validate a solution.
	Use and m	naintain	8.2.8.D.4	Research and publish the steps for using and maintaining a proc
	technologi systems.	ical products and		incorporate diagrams or images throughout to enhance user con
	Assess the	impact of products	8.2.8.D.5	Explain the impact of resource selection and the production pro
	and systen	ns.		development of a common or technological product or system.
			8.2.8.D.6	Identify and explain how the resources and processes used in th
				current technological product can be modified to have a more p environment.
9-12	9-12 Apply the design process.		8.2.12.D.1	Design and create a prototype to solve a real world problem usi identify constraints addressed during the creation of the prototy
				made, and present the solution for peer review.
			8.2.12.D.2	Write a feasibility study of a product to include: economic, mar financial, and management factors, and provide recommendatio
	Use and m	aintain	8.2.12.D.3	Determine and use the appropriate resources (e.g., CNC (Comp
	technological products and systems.			Control) equipment, 3D printers, CAD software) in the design, creation of a technological product or system.
	Assess the	impact of products	8.2.12.D.4	Assess the impacts of emerging technologies on developing cou
	and systen	ns.	8.2.12.D.5	Explain how material processing impacts the quality of enginee
			8212D6	Synthesize data analyze trends and draw conclusions regarding
			0.2.12.10.0	technology on the individual, society, or the environment and p
Contont A	*29	Tachnology		
Standard	Irea	8 2 Technology Ed	ucation Engir	peering Design and Computational Thinking - Programming:
Standard		All students will de	velop an under	rstanding of the nature and impact of technology, engineering, tec
		computational think	ting and the de	esigned world as they relate to the individual, global society, and t
Strand		E. Computational	Thinking: Pro	ogramming: Computational thinking builds and enhances prot
0 1		students to move be	yond using kn	nowledge to creating knowledge.
Grade	Content Si	tatement	Indicator	Indicator
hands	understand	1. de able to		
bands	understand	4.		
K-2	Computati	ional thinking and	8.2.2.E.1	List and demonstrate the steps to an everyday task.
	computer	programming as		
	tools used	in design and	8.2.2.E.2	Demonstrate an understanding of how a computer takes in
	engineerin	ıg.		of written commands and then interprets and displays info
			8.2.2.E.3	Create algorithms (a sets of instructions) using a pre-defin

			(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 vocabul output, the operating system, debug, and algorithm).
3-5	Computational thinking and computer programming as tools used in design and engineering.	8.2.5.E.1	Identify how computer programming impacts our everyday live
		8.2.5.E.2	Demonstrate an understanding of how a computer takes input o stores the data through a series of commands, and outputs infor
		8.2.5.E.3	Using a simple, visual programming language, create a program and procedures to generate specific output.
		8.2.5.E.4	Use appropriate terms in conversation (e.g., algorithm, program procedures, memory, storage, processing, software, coding, pro
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 activity and within different careers where they are used.
		8.2.8.E.2	Demonstrate an understanding of the relationship between hard
		8.2.8.E.3	Develop an algorithm to solve an assigned problem using a spec and use peer review to critique the solution.
		8.2.8.E.4	Use appropriate terms in conversation (e.g., programming, lang ROM, Boolean logic terms).
9-12	Computational thinking and computer programming as tools used in design and engineering.	8.2.12.E.1	Demonstrate an understanding of the problem-solving capacity world.
		8.2.12.E.2	Analyze the relationships between internal and external co
		8.2.12.E.3	Use a programming language to solve problems or accomproblem of the problem of th
		8.2.12.E.4	Use appropriate terms in conversation (e.g., troubleshootir diagnostic software, GUI, abstraction, variables, data type statements).

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