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NYC InfoHub
Computer Science for All Info- SOCE certificate

Works Cited

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PK-1 Library program curriculum alignment Aligning the NYS Computer Science and Digital Fluency Standards to the Empire State Information Fluency Continuum

By Tracy Lescault

Impacts of Computing

Tags	NYS Computer Science and Digital Fluency Standards	ESIFC (Empire State Information Fluency Continuum)	Library Class Activity example
Background Knowledge Computing Technology	**K. IC.1:** Identify and discuss how tasks are accomplished with and without computing technology	**Anchor Standard #1** Expresses curiosity about topics of personal interest or curricular focus. Shares what is known about the general topic to elicit and make connections to prior knowledge. With help, sorts and categorizes "like" and "different" objects.	• T- chart of activities that they complete digitally (taking a picture, playing a board game) versus how they would complete these activities without technology. • Compare and contrast artifacts from history versus today (i.e. Flikr Looking into the Past collection) • Brainpop Jr. Parts of a Computer
Rules Acceptable Use	**K.IC.2:** Identify and explain classroom and home rules related to computing technologies	**Standard 2.1** Respects the rights of others to express ideas, use the library, and have equitable access to the resources by listening respectfully, following the rules and procedures of the library, and returning all resources on time.	• Identify school rules to use computing technologies (e.g., don't share your password). • After discussing rules related to digital citizenship, students could play a game of

		Standard 3.3 Safe and Ethical use of Technology Understands acceptable and unacceptable computer usage according to the Acceptable Use Policy related to the use of technology	telephone. Discuss how students can't stop one person from telling others and how it can change from person to person ● Common Sense Education: [My Online Neighborhood](#)
Recognizing familiar technology	**K.IC.3:** Identify computing technologies in the classroom, home and community.	**Standard 1:1 Prior Knowledge** Shares prior knowledge about a subject	● Class discussion: how can we identify something as having "computing technology"? What are some clues we can look for? ● Students could track all of the ways they see technology throughout the weekend to see technology outside of the classroom, such as an electronic toothbrush that tells them how long to brush. ● Flash cards- thumbs up or down on pictures of items that are or are not computers.

			● ABCYA [Find the Technology](#) game
Privacy	**K.IC.4:** Identify public and private spaces in our lives.	**Standard 4.1** Respects personal space and boundaries of others	● A teacher can present a list of spaces (e.g., the classroom, the teacher's house, the library) and have students identify which spaces they can access and which they cannot. Then the class can talk about the differences between these spaces.
	K.IC.5:**This Standard begins in grade band 2-3		
Features of computers	**K.IC.6:** With teacher support, identify different ways people interact with computers and computing devices.	**Standard 1:1 Express** Begins to understand information is shared in different ways and for different purposes.	● Students could use both a mouse and a touch screen to operate a computer. ● How can we interact with the Smartboard in the library? How can adults in their lives interact with their cell phones? ● Class discussion

			about accessibility features on Chromebooks
			● [Epic Books](#)
Career exploration	**K.IC.7:** Identify multiple jobs that use computing technologies	**Standard 1.1 Investigate** Listens and begins to participate in discussions to share information gathered from experiences or resources Verbalizes and clearly describes thoughts and ideas.	● Flipchart or Nearpod of different careers, discuss how each one might need to use technology

Computational Thinking

Tags	NYS Computer Science and Digital Fluency Standards	ESIFC (Empire State Information Fluency Continuum)	Library Class Activity example
Patterns	**K-1.CT.1:** Identify and describe one or more patterns (found in nature or designed), and examine the patterns to find similarities and make predictions.	**Standard 2.1 Media Literacy** Expresses ideas and information through drawings	● Students can study the patterns of snowflakes or butterflies to finish a missing pattern. ● Online [snowflake maker](#) ● Replicate patterns found in nature using Brain Flakes (in library Makerspace) ● Students can replicate

			patterns found in nature using [This Is Sand](#)
Data collection and sorting	**K-1.CT.2** Identify different kinds of data that can be collected from everyday life.	**Standard 1.1 Express** Begins to understand information is shared in different ways and for different purposes.	● Students can create and read data from charts and graphs made about their classroom interests. (MATH, SCIENCE)
Data Visualization	**K-1.CT.3** Identify ways to visualize data, and collaboratively create a visualization of data.	**Standard 1.1 Construct** Verbally and physically demonstrates simple organizational skills such as sorting and categorizing objects and information.	**Resources:** ● Dave's Down to Earth Rock Shop ● The Best Vacation Ever ● The Button Box ● Sorting activities related to the books listed above. Create whole class or partner-driven charts to express data.
Abstraction and Decomposition	**K-1.CT.4** Identify a problem or task and discuss ways to break it into multiple smaller steps	**Standard 1.1 Investigate** Identifies facts about a topic, idea or problem. **Standard 1.2 Design Thinking** Uses resources and active-learning activities provided by the teacher to investigate new ideas or solve problems.	● Brainpop Jr. [Computational Thinking video](#) ● Class discussion: what are our steps for getting ready for school in the morning? List steps on the whiteboard and discuss whether the order of

			these steps matters.
			● Code and Go Mouse game (in library)
			● [Kodable](#)
Following directions Descriptive text	**K-1.CT.5** Recognize that the same task can be described at different levels of detail.	**Standard 1.1 Express** Organizes information by main idea and important details.	● Discuss as a class different ways to ask for a certain book in the library. Ex: Fantasy J.K. Rowling books Wizard books, etc.
Sequencing	**K-1.CT.6:** Follow an algorithm to complete a task	**Standard 1.2 Design Thinking** Engages actively with a small group in trying out a solution, looking at the results, and making changes to improve the results.	● Have a student volunteer become a "robot" or a "computer" and have the class take turns giving them instructions to walk across the room and sit down in a chair. ● [Codespark](#)
Labeling concepts with changing values	**K-1.CT.7:** Identify terms that refer to different concrete values over time.	**Standard 1.1: Construct** Verbally and physically demonstrates simple organizational skills such as sorting and categorizing objects and information.	● Students could identify concepts in their classroom whose value changes, such as the current date, the current weather, or the current student in a particular classroom job.
Repetition Loops	**K-1.CT.8:** Identify a task consisting of steps that are repeated, and recognize which steps are	**Standard 1.2 Design Thinking** Uses resources and active-learning activities	● Students could play a familiar song (happy birthday) or recite a poem.

		provided by the teacher for learning-driven play.	• Kodable "loops" video and looping lessons • Brainpop Jr. Loops video
De-bugging	**K-1.CT.9:** Identify and fix (de-bug) errors within a simple algorithm.	**Standard 1.2 Design Thinking** Engages actively in a design process to use tools and materials to try out a new idea or solution to a problem, assess the results, and try a different solution when necessary.	• Kodable Bug World (free) • As a class, students could create an algorithm for a classroom task, like sharpening pencils or washing hands, then try out the directions and fix any errors.
	K-1.CT.10 Collaboratively create a plan that outlines the steps needed to complete a task.	**Standard 1.2 Design Thinking** Engages actively with a small group in trying out a solution, looking at the results, and making changes to improve the results.	• Kodable • Codespark • Coding floor tiles game in the library

Networks and System Design

Tags	NYS Computer Science and Digital Fluency Standards	ESIFC (Empire State Information Fluency Continuum)	Library Class Activity example
Inputs and outputs	**K-1.NSD.1:** Identify ways people provide input and get output from computing devices.	**Standard 1.1 Prior Knowledge** Connects ideas to own interests.	● Students could label a diagram of a computing system with the words input and output, or students could sort images of computer components into input and output columns on a t-chart. ● Students can identify examples of input/output in their daily lives (e.g., putting money into a vending machine and getting out a ticket/soda/toy) and work with the teacher to group the examples into the input or output categories.
Hardware	**K-1.NSD.2:** Identify basic hardware components that are found in computing devices.	**Standard 1.1 Investigate** With help, finds facts and briefly summarizes them via writing, drawing or verbalization to answer basic research questions. Interprets information	● Using images of different computing devices (e.g., computer station, tablet, printer), students could match labels with hardware components

		represented in pictures, illustrations and simple charts and verbalizes the main idea.	
Hardware and software	**K-1.NSD.3:** Identify basic hardware and/or software problems.	**Standard 1.2 Design Thinking** Engages actively in a design process to use tools and materials to try out a new idea or solution to a problem, assess the results, and try a different solution when necessary.	● Students might notify a teacher when an application or device is not working as expected. Rather than saying, "It doesn't work," a student might describe things like, "The device will not turn on," or "The sound doesn't work."
Networks and the Internet Data sharing	**K-1.NSD.4:** Identify how protocols/rules help people share information over long distances.	**Standard 3.1 Civic Reasoning** Respects the rights of others to express ideas, use the library, and have equitable access to the resources by listening respectfully, following the rules and procedures of the library and returning all resources on time.	● Students could explain how they would send a letter to a person in another city. They can identify the rules for mailing letters (e.g., using stamps), and why those rules exist (e.g., because getting the letter from point A to point B involves lots of different people). The rules help keep everything coordinated.
Networks and Internet Data Storage	**K-1.NSD.5:** Identify physical devices that can store information.	**Standard 1:1 Prior Knowledge** Shares prior knowledge about a subject	● Students can make a list of devices they use at home and at school that store their name.

Cybersecurity

Tags	NYS Computer Science and Digital Fluency Standards	ESIFC (Empire State Information Fluency Continuum)	Library Class Activity example
Risks Information Privacy	**K-1.CY.1:** Identify reasons for keeping information private.	**Standard 3.3 Safe and Ethical Use of Technology** Creates and uses effective username that protects private information.	● : Students could discuss what might happen if they post information on a bulletin board in the hallway of school (public) about a surprise birthday party for a classmate (private). ● Brainpop Jr. Video about Internet Safety ● Google Interland Mindful Mountain ● Digital Passport Password Protect
Safeguards Passwords	**K-1.CY.2:** Identify simple ways to help keep accounts secure.	**Standard 3.3 Safe and Ethical Use of Technology** Understands acceptable and unacceptable computer usage according to the Acceptable Use Policy related to the use of technology	● Digital Passport Password Protect ● Interland Tower of Treasure
Safeguards	**K-1.CY.3:** **This standard begins in Grade band 2-3		

|			
Safeguards Symbols	**K-1.CY.4:** Decode a word or short message using a simple code	**Standard 3.3 Safe and Ethical Use of Technology** Understands acceptable and unacceptable computer usage according to the Acceptable Use Policy related to the use of technology	• Brainstorm different ways to send a secret message • Create secret handshakes with friends at their tables.
Response Information Security Digital Citizenship	**K-1.CY.5:** Identify when it is appropriate to open and/or click on links or files.	**Standard 3.3 Safe and Ethical Use of Technology** Understands acceptable and unacceptable computer usage according to the Acceptable Use Policy related to the use of technology	• Interland Reality River • Digital Passport Share Jumper • Based on classroom rules, students could explain when and where it is appropriate to click on links which can be words, pictures, etc.

Digital Literacy

| Tags	NYS Computer Science and Digital Fluency Standards	ESIFC (Empire State Information Fluency Continuum)	Library Class Activity example
Digital Use Digital Tools Keyboarding Communication	**K-1.DL.1:** Identify and explore the keys on a keyboard	**Standard 1.2 Design Thinking** Uses resources and active-learning activities provided by the teacher for learning-driven play.	• Students will utilize Paper keyboards and locate and color in each of the letters and numbers in their username and password on the paper keyboard. They will also use star or other

			shaped stickers to identify the shift keys located on the keyboard as well. ● Keyboard Builder on [Typetastic](#) ● [Keyboarding Zoo](#) on ABCYA
Digital Use Digital Tools Collaboration Communication	**K-1.DL.2:** Communicate and work with others using digital tools.	**Standard 3.2** Works collaboratively with a small group using technology for research to meet information needs.	● Collaborative [padlet](#) discussing text read in class ● Commenting on a teacher post in [Google Classroom](#)
Digital Use Searching Keywords	**K-1.DL.3:** Conduct a basic search based on a provided keyword	**Standard 1.1 Investigate** Recognizes that sources can be located in the online catalog by looking up the author, title or key words. Identifies facts about a topic, idea or problem.	● Using Google docs, students search for an image to insert, using a keyword. ● The class works together to search the [library catalog](#) on the Activboard using keywords.
	K-1.DL.4: Use at least one digital tool to create a digital artifact	**Standard 2.2** Information-Fluent learners present their learning and ideas by constructing messages using multiple, authentic formats appropriate for the purpose and audience.	● [Draw It](#) on ABCYA ● [This Is Sand](#)

| Digital Use	**K-1.DL.5:** This standard begins in Grade Band 4-6		
Digital Citizenship	**K-1.DL.6** This standard begins in Grade Band 2-3		
Digital Citizenship	**K-1.DL.7:** Identify actions that promote good digital citizenship, and those that do not.	**Standard 3.3 Safe and Ethical Use of Technology** Identifies behaviors that are examples of cyberbullying and demonstrates effective responses.	- Brainpop Jr. Digital Etiquette - Digital Passport E-Volve - Interland Kind Kingdom - NetSmartz Kids Be Safer Online - Students hold up red light/green light signs at teacher prompts about actions with technology/in online environments, such as "Share your password," "Go to sites linked from our class webpage," "Write something mean about someone," etc. Actions could be added to a running list on a chart displayed in the classroom.

Recommended Texts Grades PK-1:
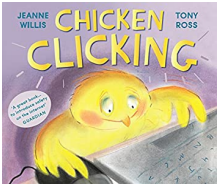
Chicken Clicking by Jeanne Willis
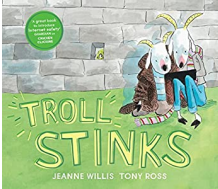
Troll Stinks by Jeanne Willis
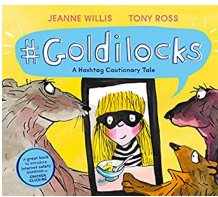
Goldilocks: A Hashtag Cautionary Tale By Jeanne Willis
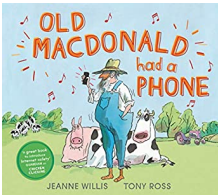
Old MacDonald Had a Phone by Jeanne Willis
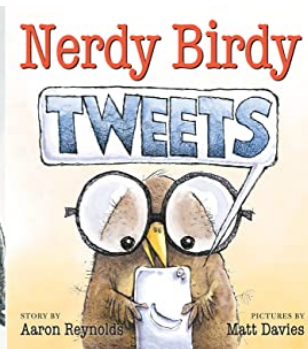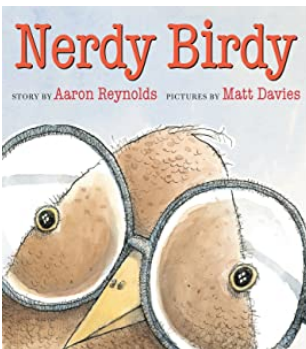
Nerdy Birdy and Nerdy Birds Tweets by Aaron Reynolds
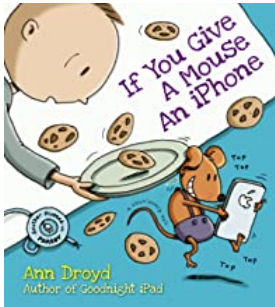
 If You Give a Mouse an Iphone: A Cautionary Tale by Ann Droid

 Unplugged Ninja by Mary Nhin

 The Technology Tail: A Digital Footprint Story by Julia Cook

 Dave's Down to Earth Rock Shop by Stuart J. Murphy
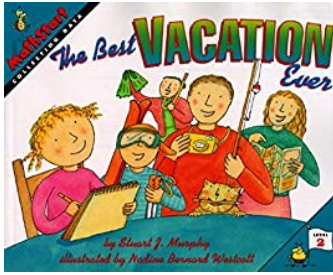
 The Best Vacation Ever by Stuart J. Murphy
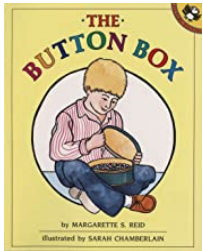
 The Button Box by Margarette S. Reid

End of PK-1 Grade Band

Grades 2-3 Library program curriculum alignment
Aligning the NYS Computer Science and Digital Fluency Standards to the Empire State Information Fluency Continuum

Impacts of Computing 2-3

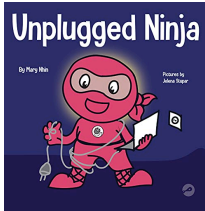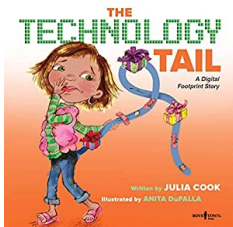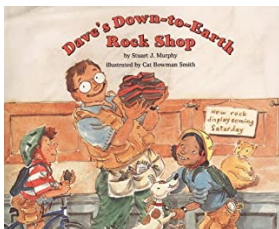| Tags	NYS Computer Science and Digital Fluency Standards	ESIFC (Empire State Information Fluency Continuum)	Library Class Activity example
Background Knowledge Computing Technology over time Society	**2-3IC.1:** Identify and analyze how computing technology has changed the way people live and work.	**Anchor Standard #1** Expresses curiosity about topics of personal interest or curricular focus. Shares what is known about the general topic to elicit and make connections to prior knowledge. With help, sorts and categorizes "like" and "different" objects.	● Use GPS.gov to compare.contrast how we find our way around the world now vs. in the past. *Suggested Texts: Cassie's Journey. Going West in the 1860's by Brett Harvey *Going West: Adapted from the Little House books by Laura Ingalls Wilder Draw or write an additional "chapter" in one of these books, showing how the characters' journey might look different if it had taken place today.

			● Compare and contrast artifacts from history versus today (i.e. Flikr Looking into the Past collection) ● Students could discuss how computer technology has made certain jobs easier.
Rules Acceptable Use	**2-3.IC.2:** Compare and explain rules related to computing technologies and digital information	**Standard 3 Social and Civic Responsibility** Engages in conversations with peers to exchange ideas and information about social and civic issues.	● Students could create digital posters that show what information is ok to share and what is not ok to share online, using Google Docs or Google Slides. ● Students can use Brainpop Movie Maker to create their own Brainpop-esque informational videos to teach the class about rules for being safe online.
Recognizing familiar technology	**2-3.IC.3:** Discuss and explain how computing technology can be used in society and the world.	**Standard 1: Inquiry and Design Thinking** Connect- Responds to background information (delivered through videos, stories, texts, discussions) by restating/retelling main ideas and details about the topic. Construct- Develops own opinion about a topic with	● Students can be "inventors" and design a technology that makes their life easier. They can then explore technology that also relates to that field. ● Students can view a slideshow of unique libraries around the

		evidence to support the opinion. Investigate: Identifies major areas of the library and what main topics are included in each.	world. They can then work in small groups to design their own "dream library" and create a map, digitally or on paper, of this space. They must include technology tools in the design and function of this library in some way.
Privacy	**2-3.IC.4:** Identify public and private digital spaces.	**Standard 3 Social and Civic Responsibility** Demonstrates basic cybersafey (strong passwords, privacy, accessing appropriate sites)	● Students can create their own Fakebook page, making sure that the only include appropriate information that should be shared publicly ● Interland Tower of Treasure ● Safe Online Surfing ● NetSmartz ● Patrol Squad
Ethics Role of Computers	**2-3.IC.5:** Identify and discuss how computers are programmed to make decisions without direct	**Standard 1: Inquiry and Design Thinking** Connect- Responds to background information	● Brainpop Computational Thinking video ● How Google Search

	human input in daily life.	(delivered through videos, stories, texts, discussions) by restating/retelling main ideas and details about the topic.	 ● Students can think about streaming services in terms of what suggestions are offered based on viewing habits.
Accessibility	**2-3.IC.6:** Identify and discuss factors that make a computing device or software application easier or more difficult to use	**Standard 3: Social and Civic Responsibility** Engages in conversations with peers to exchange ideas and information about social and civic issues	● Students could use both a mouse and a touch screen to operate a computer. ● Compare a laptop/chrome book/tablet to a desktop computer in a chart with the class. Discuss where each would be better used. ● Class discussion about accessibility features on Chromebooks ● Students could be given a choice board to complete a collaborative project. They can then discuss the benefits and drawbacks for each choice to determine which would be best for the given activity. **Ex: Google Slides

			Vs. [Padlet](#) for a whole-class comment ● [Epic Books](#) - Is it easier to read a physical book or an ebook? What are some features that might make an ebook easier to read for certain people?
Career exploration	**2-3.IC.7:** Identify a diverse range of roles and skills in computer science.	**Standard 1.1 Investigate** Interprets information represented in pictures, illustrations, simple charts and verbalizes the main idea.	● Students could take on the role of "programmer" during computer science lessons. A teacher might emphasize that programmers collaborate to solve problems with code. ● [Computer Science Career Exploration - Code.org](#)

Computational Thinking 2-3

Tags	NYS Computer Science and Digital Fluency Standards	ESIFC (Empire State Information Fluency Continuum)	Library Class Activity example
Patterns	**2-3-1.CT.1:** Create a model of an object or	**Standard 1 Express** Presents researched	● Students could use tangram

Modeling and simulation	computational process in order to identify patterns and essential elements of the object or process.	information in a variety of ways, (e.g. art, music, poetry, movement, verbally, and/or written language).	manipulatives to create models of different buildings in their neighborhood. Then, the class could compare the models to identify common shapes within the building models. ● [Word Art word clouds](#) developed around a certain theme ● Replicate patterns found in nature using Brain Flakes (in library Makerspace) ● [This Is Sand](#)- Students can use this tool to try to replicate patterns found in nature using the sand ● [ABCYA word clouds](#)
Data Analysis and Visualization	**2-3.CT.2** Identify and describe data collection tools from everyday life.	**Standard 3 Social And Civic Responsibility** Understands acceptable and unacceptable computer usage according to the Acceptable Use Policy related to the use of technology.	● Students could tour their school building and identify tools used to collect data about students and the school (e.g., bulletin board in the library tracking number of books read by students).

			● Students could develop their own Google Forms to survey their classmates about their interests, hobbies, etc.
Data Analysis and Visualization	**2-3.CT.3** Present the same data in multiple visual formats in order to tell a story about the data.	**Standard 1 Inquiry and Design Thinking** Express: Presents researched information in a variety of ways	● **https://weavly.org/** ● Re-tell a story we have read in class using a graphic novel format rather than strictly written word using StoryBoard That ● Use Google forms to collect data from classmates, and then present the data in at least 2 different formats
Abstraction and Decomposition	**2-3CT.4** Identify multiple ways that the same problem could be decomposed into smaller steps	**Standard 1 Inquiry and Design Thinking** Formulates questions for investigation of a topic with guidance.	● Brainpop Jr. Computational Thinking video ● codeSpark Academy: Coding App for Kids ● Code.org abstraction with Mad Glibs ● Kodable
Abstraction and Decomposition	**2-3.CT.5** Identify the essential details	**Standard 1 Inquiry and Design Thinking**	● Intro to Abstraction

	needed to perform a general task in different settings or situations.	Formulates questions for investigation of a topic with guidance. Express: Organizes information by main ideas and important details.	
Algorithms and Programming	**2-3.CT.6:** Create two or more algorithms for the same task	**Standard 1.2 Design Thinking** Express: Presents information clearly so that main points are evident	● Have a student volunteer become a "robot" or a "computer" and have the class take turns giving them instructions to walk across the room and sit down in a chair. ● [Codespark](#) ● [Brainpop Computer Programming](#)
Algorithms and Programming	**2-3.CT.7:** Name/label key pieces of information in a set of instructions, noting whether each name/label refers to a fixed or changing value	**Standard 1.1 Inquiry and Design Thinking** Express- Presents information clearly so that the main points are evident.	● Students could create a plan for arranging tables at a party, providing a name for factors such as number of tables and number of attendees. Students can then identify which factors change if there are 10 vs. 20 vs. 100 people who attend. ● Using the Makey-Makey kits in the library, create new labeled functions for key on the

			Chromebook keyboards.
Algorithms and Programming	**2-3.CT.8:** Identify steps within a task that should only be carried out under certain precise conditions.	**Standard 1 - Construct** Develops own opinion about a topic with evidence to support the opinion	● Students could choreograph a dance using an algorithm. They would identify when dance steps are repeated. (PHYSICAL EDUCATION) ● Students should play a whole-class game of Simon Says, where the "Simon" is walking them through the steps of a common algorithm (walking to their desk, etc) ● Students could play a whole-class game of Red Light, Green Light, discussion the conditions that they have to move, stop, etc.
De-bugging	**2-3.CT.9:** Identify and debug errors within an algorithm or program that includes sequencing or repetition.	**Standard 1 Design Thinking** Engages actively in a design process to use tools, resources and materials to try the brainstormed solutions, assess the results, and modify the solutions when needed.	● Kodable Bug World (free) ● Bridge Designer ● Work together as a class to try to solve the Bridge Riddle
Algorithms and Programming	**2-3.CT.10**	**Standard 1 Making Sense of**	● Kodable

	Develop and document a plan that outlines specific steps taken to complete a project	**Information and Notetaking** Uses simple notetaking strategies (eg. graphic organizer)	● Have students outline the steps to tying their shoes or getting ready for lunch and create a diagram showing each of the steps.

Networks and System Design 2-3

Tags	NYS Computer Science and Digital Fluency Standards	ESIFC (Empire State Information Fluency Continuum)	Library Class Activity example
Hardware and Software	**2-3.NSD.1:** Describe and demonstrate several ways a computer program can receive data and instructions (input) and can present results (output)	**Standard 1 Express** Chooses the format for the product based on personal preference or uses the format chosen by the teacher or librarian.	● Makey-Makey kits ● Students can try out different input/output methods, such as text can be input through a keyboard, a touch screen, or even microphone (voice to text). ● Class discussion: what are the different ways we could find out what the temperature is

			today?
Hardware and Software	**2-3.NSD.2:** Explain the function of software in computing systems, using descriptive/precise language.	**Standard 1 Inquiry and Design Thinking** Express: presents information clearly so that the main points are evident.	● Students can discuss the difference between apps, browsers, and operating systems. Teachers can compare the body/mind connection to hardware/software to help students understand the differences. ● [Hardware Software song](#)
Hardware and software	**2-3.NSD.3:** Describe and attempt troubleshooting steps to solve a simple technology problem	**Standard 1 Design Thinking** Engages actively in a design process to use tools, resources and materials to try the brainstormed solutions, assess the results, and modify the solutions when needed.	● Students should try to fix a simple error like their monitor will not turn on (make sure it's plugged in).
Networks and the Internet Data sharing	**2-3.NSD.4:** Recognize that information can be communicated using different representations that satisfy different rules	**Standard 3.1 Civic Reasoning** Respects the rights of others to express ideas, use the library, and have equitable access to the resources by listening respectfully, following the rules and procedures of the library and returning all resources on time.	● Students could learn about Morse code, which converts letters into a series of taps. This allows the message to be sent through physical objects (e.g., tapping on a wall to send a message to someone in the next room). The taps can also be converted into electrical

			signals that can be sent through wires. ● [Morse Code Translator](#)
Networks and Internet Data Storage	**2-3.NSD.5:** Describe and navigate to various locations where digital information can be stored	**Standard 1 Inquiry and Design Thinking** Express: Presents information clearly so that main points are evident.	● Have students identify multiple places to store information, like hard drives, thumb drives and cloud storage. ● Have students create a Google doc, and then locate that same Google doc within their Google Drive.

Cybersecurity 2-3

Tags	NYS Computer Science and Digital Fluency Standards	ESIFC (Empire State Information Fluency Continuum)	Library Class Activity example
Risks Information Privacy	**2-3.CY.1:** Compare reasons why an individual should keep information private or make information public.	**Standard 3 Social and Civic Responsibility** Demonstrates basic cybersafety (strong passwords, privacy, accessing appropriate sites)	● Students could take strips of paper with information like phone numbers, birthdays, pets names, passwords, etc. Then place the paper strips into the categories "ok to share with everyone," "ok to share

			with people you know," and "keep private" on a shared chart. ● Have students fill in their Digital Footprint with information that would be ok to share. ● [My Digital Footprint Lesson](#) ● Brainpop Jr. Video about [Internet Safety](#) ● [Google Interland Mindful Mountain](#) ● [Digital Passport Password Protect](#)
Safeguards Passwords	**2-3.CY.2:** Compare and contrast behaviors that do and do not keep information secure.	**Standard 3 Social and Civic Responsibility** Demonstrates basic cybersafety (strong passwords, privacy, accessing appropriate sites)	● [Digital Passport Password Protect](#) ● [Interland Tower of Treasure](#)
Safeguards	**2-3.CY.3:** Identify why someone might choose to share an account, app access or devices	**Standard 3 Social and Civic Responsibility** Demonstrates basic cybersafety (strong passwords, privacy, accessing appropriate sites)	● Students could discuss who has access to shared accounts and why it might be both helpful and risky. They might consider an account that is shared with family members to stream movies or an educational app that is

			shared by the entire class.
Safeguards Symbols	**2-3.CY.4:** Encode or decode a short message or phrase	**Standard 3 Social and Civic Responsibility** Demonstrates basic cybersafety (strong passwords, privacy, accessing appropriate sites)	● Brainstorm different ways to send a secret message ● Create secret handshakes with friends at their tables.
Response Information Security Digital Citizenship	**2-3.CY.5:** Identify unusual activity of applications and devices that should be reported to a responsible adult.	**Standard 3 Social and Civic Responsibility** Demonstrates basic cybersafety (strong passwords, privacy, accessing appropriate sites)	● Interland Reality River ● Digital Passport Share Jumper ● Twalkers ● Students could explain that they should not click on pop-ups or click-bait in an app or online, and also report any unusual behavior such as applications not loading or opening.

Digital Literacy 2-3

Tags	NYS Computer Science and Digital Fluency Standards	ESIFC (Empire State Information Fluency Continuum)	Library Class Activity example
Digital Use Digital Tools Keyboarding Communication	**2-3.DL.1:** Locate and use the main keys on a keyboard to enter text independently	**Standard 1 Inquiry and Design Thinking** Express: Presents information clearly so that the main points are evident.	• Students use a keyboard to type a narrative written during a writing workshop to create a class book of stories. (ELA) • Typetastic • Dance Mat Typing
Digital Use Digital Tools Collaboration Communication	**2-3.DL.2:** Communicate and work with others using digital tools to share knowledge and convey ideas.	**Standard 3.2** Engages in conversations with peers to exchange ideas and information about social and civic issues.	• Collaborative padlet discussing text read in class • Commenting on a teacher post in Google Classroom • Students can each poll the class on different likes/dislikes and present the information to the class.
Digital Use Searching	**2-3.DL.3:** Conduct basic searches based on student-identified	**Standard 1 Inquiry and Design Thinking** Sources: Searches the online	• Using Google docs, students search for an image to insert, using a

Keywords	keywords.	catalog with assistance to locate materials	keyword. ● The class works together to search the library catalog on the Activboard using keywords. ● Students can be given a topic and they decide on a short list of key words to search for that topic.
	2-3.DL.4: Use a variety of digital tools and resources to create digital artifacts.	**Standard 1 Inquiry and Design Thinking** Express: Presents researched information in a variety of ways	● Draw It on ABCYA ● This Is Sand ● https://sketch.io/
Digital Use	**2-3.DL.5:** This standard begins in Grade Band 4-6		
Digital Citizenship	**2-3.DL.6** Describe ways that information may be shared online.	**Standard 3.3 Social and Civic Responsibility** Understands acceptable and unacceptable computer usage according to the AUP related to the use of technology.	● The teacher leads a discussion about photos found online: how people post them, how they sometimes let other people see them, and sometimes they choose to keep them private, and how if the students are playing a game and the game wants to take their picture,

			they need to ask a responsible grown-up if it's okay. Play either of these games together or independently during class time to review online safety rules. ● [Band Runner](#) ● [Internet Safety Walk the Plank](#)
Digital Citizenship	**2-3.DL.7:** Understand what it means to be part of a digital community and describe ways to keep it a safe, respectful place.	**Standard 3.3 Social and Civic Responsibility** Understands acceptable and unacceptable computer usage according to the AUP related to the use of technology.	● Brainpop Jr. [Digital Etiquette](#) ● Digital Passport [E-Volve](#) ● Interland [Kind Kingdom](#) ● NetSmartz Kids [Be Safer Online](#) ● Review class rules regarding interactions within Google Classroom ● [Putting a Stop to Online Meanness](#) ● [Online and On Guard](#)

Recommended Texts Grades 2-3:

I Am Odd, I Am New by Benjamin Giroux
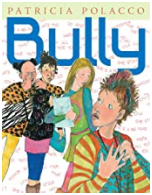
Bully By Patricia Polacco

Once Upon A Time Online By David Bedford
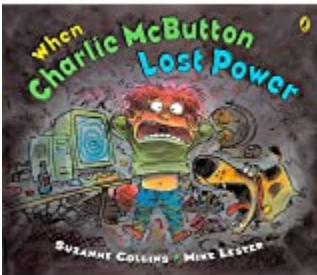
 When Charlie McButton Lost Power by Suzanne Collins

 But It's Just a Game By Julia Cook

 Tek, the Modern Caveboy By Patrick McDonnell

 Unplugged By Steve Antony
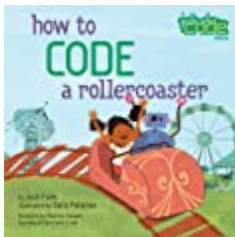
 How to Code a Rollercoaster By Josh Funk

4-6 Library program curriculum alignment
Aligning the NYS Computer Science and Digital Fluency Standards to the Empire State Information Fluency Continuum

Impacts of Computing 4-6

Tags	NYS Computer Science and Digital Fluency Standards	ESIFC (Empire State Information Fluency Continuum)	Library Class Activity example
Background Knowledge Computing Technology over time Society	**4-6IC.1:** Describe computing technologies that have changed the world, and express how those technologies influence, and are influenced by, cultural practices.	**Standard 1: Inquiry and Design Thinking** Grade 4- Connect: Identifies aspects of the broad topic that would be important and interesting to pursue through inquiry. Grade 5- Wonder: Begins to assess questions to determine which can be answered by simple facts, which cannot be answered, and which would lead to an interesting inquiry.	● Have students visit webpages that translate into different language and discuss how this can help people with an internet connection access information. ● Students could compare answers where one group only uses book resources

		Grade 6-Design Thinking Selects and uses resources and technology to investigate identified problems through active experimentation, experience, creation and engagement.	and another group uses technology to answer questions. They can then discuss how technology changes their availability to information. ● Discuss how different technology advances have always changed the way that people live. Together on a whiteboard, divide human history into several major categories (cavemen, middle ages, Industrial Revolution, Modern Technology). In each segment, describe at least on technology and how it changed the way that people in that time lived. ● [Technology and Invention article](#) ● Fill out a [Brain Dump](#) page on what students already know about how technology positively or negatively impacts their lives
Rules	**4-6.IC.2:**	**Standard 3 Social and Civic**	● Students could identify

Acceptable Use	Explain how laws impact the use of computing technologies and digital information.	**Responsibility** Grade 4- Uses strategies to avoid plagiarizing by summarizing, paraphrasing, quoting, and crediting the information used. Grade 6- Abides by the AUP by accessing only appropriate information and using technology responsibly.	how government regulation of the internet affects people's access to information. ● Library.FYI
Recognizing familiar technology	**4-6.IC.3:** Explain current events that involve computing technologies.	**Standard 1: Inquiry and Design Thinking** Making sense of information and notetaking: Differentiates between important and unimportant details. Takes notes using one or more of a variety of notetaking strategies. Construct: Interprets information and ideas by defining, classifying and inferring.	● Student can post to a discussion board about a current event or technology trend. ● Compare electronic cars (such as Tesla) to gasoline-powered cars. ● NewsELA articles regarding various current events.
Privacy	**4-6.IC.4:** Explain who has access to data in different digital spaces	**Standard 3 Social and Civic Responsibility** Abides by the AUP by accessing only appropriate information and using technology responsibly.	● Students can create their own Fakebook page, making sure that the only include appropriate information that should be shared publicly ● Interland Tower of Treasure

Ethics Role of Computers Machine Thinking	**4-6.IC.5:** Explain how computer systems play a role in human decision-making.	**Inquiry and Design Thinking** Evidence: Selects information from multiple sources that answers the research questions.	- Brainpop [Computational Thinking](#) video [How Google Search Works](#) - Students can think about streaming services in terms of what suggestions are offered based on viewing habits. [Quick! Draw](#) [Teachable Machine](#) [Experiments With Google](#)
Accessibility	**4-6.IC.6:** Identify and explain ways to	**Standard 3: Social and Civic Responsibility**	Analyze specific classroom

	improve the accessibility and usability of a computing software application for the diverse needs and wants of users.	Identifies and challenges own assumptions about community issues and diverse cultures by seeking and considering multiple viewpoints and cultural perspectives.	applications from the perspective of different disabilities and offer suggestions. ● Class discussion about accessibility features on Chromebooks ● Students could be given a choice board to complete a collaborative project. They can then discuss the benefits and drawbacks for each choice to determine which would be best for the given activity. **Ex: Google Slides Vs. Padlet for a whole-class comment ● Epic Books - Is it easier to read a physical book or an ebook? What are some features that might make an ebook easier to read for certain people?
Career exploration	**4-6.IC.7:** Identify a diverse range of role models in computer science.	**Standard 1.1 Investigate** Selects and uses an appropriate print, video or electronic source to answer questions.	● A teacher might provide leveled articles for students to read about people in computer science that

			reflect diversity in race/ethnicity, gender, disability, sexual orientation, and other characteristics.
			● Students could research historical figures in Computer Science and computer device history.
			● Students could login and use Xello: College & Career Readiness Software that Inspires Students to investigate different technology careers and the important requirements and characteristics of each.

Computational Thinking 4-6

Tags	NYS Computer Science and Digital Fluency Standards	ESIFC (Empire State Information Fluency Continuum)	Library Class Activity example

Patterns Modeling and simulation	**4-6-1.CT.1:** Develop a computational model of a system that shows changes in output when there are changes in inputs.	**Standard 1 Inquiry and Design Thinking** Express: Presents conclusions and supporting facts in a variety of ways.	[This Is Sand](#)- Students can use this tool to try to replicate patterns found in nature using the sand [ABCYA word clouds](#) - Students could use the movement of a rope to simulate a sound wave and then explain what happens (in terms of pitch) if they slow down (lower pitch) or speed up (higher pitch) the oscillations modeled by the simulation of sound waves using the rope. [PHET Simulations](#) [Semantris](#) [Connect It](#)
Data Analysis and Visualization	**4-6.CT.2** Collect digital data related to a real-life question or need.	**Standard 3 Social And Civic Responsibility** Abides by the AUP by accessing only appropriate information and using technology responsibly.	- Students could tour their school building and identify tools used to collect data about students and the school (e.g., bulletin board in the library tracking number of books read by students). - Students could

			develop their own [Google Forms](#) to survey their classmates about their interests, hobbies, etc.
Data Analysis and Visualization	**4-6.CT.3** Visualize a simple data set in order to highlight relationships and persuade an audience.	**Standard 1 Inquiry and Design Thinking** Evidence: Evaluates information within a source for accuracy, relevance, comprehensiveness, and point of view.	● Students could sort a data set of sports teams by wins, points scored, or points allowed. ● Use Google forms to collect data from classmates, and then present the data in at least 2 different formats
Abstraction and Decomposition	**4-6CT.4** Decompose a problem into smaller named tasks, some of which can themselves be decomposed into smaller steps.	**Standard 1 Inquiry and Design Thinking** Design Thinking: Engages actively in a design process to use tools, resources, and materials to try the "if…then" solutions that seem to have the most potential, assess the results, and modify the solution when needed.	● Brainpop Jr. [Computational Thinking video](#) ● [codeSpark Academy: Coding App for Kids](#) ● Code.org [abstraction with Mad Glibs](#) ● [Kodable](#) ● Little Bits in the library ● UB tech robotic kids in the library. ● [Dynamic Systems](#)

			● As a class, choose a problem from [Spark Lab's Now What Invention Game](#) and have students work together in small groups to come up with innovative solutions (bellringer)
Abstraction and Decomposition	**4-6.CT.5** Identify and name a task within a problem that gets performed multiple times while solving that problem, but with slightly different concrete details each time.	**Standard 1 Inquiry and Design Thinking** Design Thinking: Engages actively in a design process to use tools, resources, and materials to try the "if…then" solutions that seem to have the most potential, assess the results, and modify the solution when needed.	● [Intro to Abstraction](#)
Algorithms and Programming	**4-6.CT.6:** Compare two or more algorithms and discuss the advantages or each for a specific task.	**Standard 1 Design Thinking** Evidence: Begins to analyze multiple points of view from multiple sources to determine similarities and differences.	● [Have students make a Cootie Catcher](#) together in class. Have the questions asked within their folded papers be centered around algorithms and programming ● [Codespark](#) ● [Brainpop Computer Programming](#)
Algorithms and Programming	**4-6.CT.7:** Identify pieces of information that might change as a	**Standard 1 Inquiry and Design Thinking** Connect: Identifies keywords	● Students can explore how their history of recent documents

	program or process runs.	and ideas that appear in background information and class conversation.	change over the course of time, depending on what files they are opening. Another example can be music applications that track the number of times a song is played.
Algorithms and Programming	**4-6.CT.8:** Develop algorithms or programs that use repetition and conditionals for creative expressions or to solve a problem.	**Standard 1 - Construct** Design Thinking: Engages actively in a design process to use tools, resources, and materials to try the "if…then" solutions that seem to have the most potential, assess the results, and modify the solution when needed.	● Students could guide a paper mouse through a maze to find cheese by developing a set of rules for the "mouse" to follow. Rules could include the following: move forward one space and repeat until the mouse hits a wall, and if there is a wall, turn left then move forward. ● Students could use Boolean expressions and conditionals to search the library catalog, identifying how their results change accordingly. ● Khan Academy intro to Javascript (requires student data unless aliases are created by teacher/librarian beforehand)
De-bugging	**4-6.CT.9:**	**Standard 1 Design Thinking**	● Kodable Bug World

	Explain each step of an algorithm or program that includes repetition and conditionals for the purposes of debugging.	Design Thinking: Engages actively in a design process to use tools, resources, and materials to try the "if...then" solutions that seem to have the most potential, assess the results, and modify the solution when needed.	(free) ● Bridge Designer ● Work together as a class to try to solve the Bridge Riddle ● Khan Academy intro to Javascript (requires student data unless aliases are created by teacher/librarian beforehand)
Algorithms and Programming	**4-6.CT.10** Describe the steps taken and choices made to design and develop a solution using an interactive design process	**Standard 1 Inquiry and Design Thinking** Reflect: Identifies the important features for a good product and presentation.	● Kodable ● Students could play a game where they try to solve problems faster than a computer. They can then describe the solutions they tried and how the revised their approach. ● The class could complete a Shark Tank invention project in small groups

Networks and System Design 4-6

Tags	NYS Computer Science and Digital Fluency Standards	ESIFC (Empire State Information	Library Class Activity example

		Fluency Continuum)	

Hardware and Software	**4-6.NSD.1:** Propose improvements to the design of a computing technology based on an analysis of user interactions with that technology	**Standard 1 Inquiry and Design Thinking** Reflect: Identifies the important features for a good product and presentation.	● Makey-Makey kits ● UBTech Robotics Kits ● Algodoo (free, must be downloaded)
Hardware and Software	**4-6.NSD.2:** Model how computer hardware and software work together as a system to accomplish tasks.	**Standard 1 Inquiry and Design Thinking** Evidence: Begins to analyze multiple points of view from multiple sources to determine similarities and differences.	● Students can discuss the difference between apps, browsers, and operating systems. Teachers can compare the body/mind connection to hardware/software to help students understand the differences. ● Students can try out different input/output methods, such as text can be input through a keyboard, a touch screen, or even microphone (voice to text).
Hardware and software	**4-6.NSD.3:**	**Standard 1 Design Thinking**	● Students should try to

	Determine potential solutions to solve hardware and software problems using common troubleshooting strategies	Design Thinking: Engages actively in a design process to use tools, resources, and materials to try the "if…then" solutions that seem to have the most potential, assess the results, and modify the solution when needed.	fix a simple error like their monitor will not turn on (make sure it's plugged in). ● A teacher might lead students in creating a classroom checklist for basic problems, such as the device not responding, no power, no network connection, application crashing, no sound, or password entry not working. ● Student Helpdesk
Networks and the Internet Data sharing	**4-6.NSD.4:** Model how data is structured to transmit through a network	**Standard 1: Inquiry and Design Thinking** Design Thinking: Engages actively in a design process to use tools, resources, and materials to try the "if…then" solutions that seem to have the most potential, assess the results, and modify the solution when needed.	● The teacher could run a series of live simulations in which students act out the flow of information through servers, routers, and other devices to transmit a message ● Morse Code Translator
Networks and Internet Data Storage	**4-6.NSD.5:** Describe that data can be stored locally or remotely in a network.	**Standard 1 Inquiry and Design Thinking** Evidence: Uses textual and visual elements to read and comprehend information on websites	● Students could explain the difference between video games that are stored locally, that you can play without internet, and other games are stored on a server and cannot be

			played without internet.
			● Have students create a Google doc, and then locate that same Google doc within their Google Drive.

Cybersecurity 4-6

Tags	NYS Computer Science and Digital Fluency Standards	ESIFC (Empire State Information Fluency Continuum)	Library Class Activity example
Risks Information Privacy	**4-6.CY.1:** Explain why different types of information might need to be protected.	**Standard 3 Social and Civic Responsibility** Demonstrates basic netiquette behavior by interacting respectfully with others and contributing to a positive online community.	● Phishing quiz by Google ● My Digital Footprint Lesson ● Brainpop Jr. Video about Internet Safety ● Google Interland Mindful Mountain ● Digital Passport Password Protect ● Internet of Me ● Digital Compass

Safeguards Passwords	**4-6.CY.2:** Describe common safeguards for protecting personal information.	**Standard 3 Social and Civic Responsibility** Demonstrates basic netiquette behavior by interacting respectfully with others and contributing to a positive online community.	• [Common Sense Digital Compass™ | Educational games for kids to ...](#) • [Interland Tower of Treasure](#) • [Powerful Passwords](#) • [How Safe Is Your Password?](#) - Have the class compete to see who can develop a password that would take the bots the longest to decipher
Safeguards	**4-6.CY.3:** Describe trade-offs between allowing information to be public and keeping information private and secure.	**Standard 3 Social and Civic Responsibility** Demonstrates basic netiquette behavior by interacting respectfully with others and contributing to a positive online community.	• Students could list the pros and cons of sharing pictures and information about their activities on social media. • [Common Sense Digital Compass™ | Educational games for kids to ...](#) - Play as a class with the character "Breaker" and make decisions for him throughout his day, related to his information privacy
Safeguards Symbols	**4-6.CY.4:** Model and explain the purpose of simple cryptographic methods	**Standard 1 Inquiry and Design Thinking** Evidence: Begins to analyze multiple points of view from	• Students could use a cipher or Vigenere Square to encrypt a message for a

		multiple sources to determine similarities and differences.	classmate. the classmate can use the same cipher to decrypt the message. ● [Pigpen Cipher](#)-Students can take turns creating and cracking messages created using the PigPen cipher ● [https://www.brainpop.com/science/famousscientists/alanturing/](#) Brainpop video about Alan Turing who cracked the ENIGMA code ● [Navajo Code Talkers](#) ● [Crypto Club](#)
Response Information Security Digital Citizenship	**4-6.CY.5:** Explain suspicious activity of applications and devices	**Standard 3 Social and Civic Responsibility** Demonstrates basic netiquette behavior by interacting respectfully with others and contributing to a positive online community.	● [Interland Reality River](#) ● [Digital Passport Share Jumper](#) ● [Twalkers](#) ● .[Deep Space Danger](#) ● [Security Cat's Online Cyberspace Academy](#)

Digital Literacy 4-6

Tags	NYS Computer Science and Digital Fluency Standards	ESIFC (Empire State Information Fluency Continuum)	Library Class Activity example
Digital Use Digital Tools Keyboarding Communication	**4-6.DL.1:** Type on a keyboard while demonstrating proper keyboarding technique	**Standard 2 Multiple Literacies** Creates and delivers presentation with attention to quality of content, ==effective use of tool==, and self-confidence and effectiveness of delivery.	• https://www.typing.com/ • Typetastic • Keyboarding Zoo on ABCYA
Digital Use Digital Tools Collaboration Communication	**4-6.DL.2:** Select appropriate digital tools to communicate and collaborate while learning with others.	**Standard 2 Multiple Literacies** Evaluates the effect of different media elements on the overall impact of the media source.	• Students use a shared online document to provide feedback on peers' work and track changes over time. • Students can use email in an appropriate manner to ask a teacher or other school professional a question. They can state when it is appropriate to email someone versus instant message versus phone call.
Digital Use	**4-6.DL.3:**	**Standard 1 Inquiry and**	• Students can conduct a

Searching Keywords	Conduct and refine advanced multi-criteria digital searches to locate content relevant to varied learning goals.	**Design Thinking** Evidence: Uses navigation tools of pre-selected websites and databases to locate relevant information. Evaluates information within a source for accuracy, relevance, comprehensiveness and point of view. Begins to analyze multiple points of view from multiple sources to determine similarities and differences.	search of the library catalog and/or databases in order to find information relevant to a class topic. ● Library.fyi: Select your library system
	4-6.DL.4: Use a variety of digital tools and resources to create and revise digital artifacts.	**Standard 2 Multiple Literacies** Creates and delivers presentation with attention to quality of content, effective use of tool, and self-confidence and effectiveness of delivery.	● https://anchor.fm/ ● https://sketch.io/ ● Animaker ● https://www.baamboozle.com/ ● Chart It ● Citizen DJ ● Cloud Stop Motion ● Flip Grid
Digital Use	**4-6.DL.5:** Identify common features of digital technologies	**Standard 2 Multiple Literacies** Analyzes information presented visually through	● Students start to identify similar buttons in word processing programs, or in other

		illustrations, photographs, diagrams, or maps to determined main ideas and compare to ideas presented in printed text.	applications.
Digital Citizenship	**4-6.DL.6** Describe persistence of digital information and explain how actions in online spaces can have consequences.	**Standard 3 Social and Civic Responsibility** Demonstrates basic netiquette behavior by interacting respectfully with others and contributing to a positive online community.	Play either of these games together or independently during class time to review online safety rules. ● Band Runner ● Internet Safety Walk the Plank ● Students use a tool that displays archived versions of websites (such as "Wayback Machine") to research how information is available even if it seems to be deleted.
Digital Citizenship	**4-6.DL.7:** Identify and describe actions in online spaces that could potentially be unsafe or harmful	**Standard 3.3 Social and Civic Responsibility** Abides by the AUP by accessing online appropriate information and using technology responsibly.	● Brainpop Jr. Digital Etiquette ● Digital Passport E-Volve ● Interland Kind Kingdom

			• NetSmartz Kids [Be Safer Online](#)
			• Review class rules regarding interactions within Google Classroom
			• [Putting a Stop to Online Meanness](#)
			• [Online and On Guard](#)
			• [Lego Gloom Busters](#)
			• Have students create digital escape rooms (centered around the theme of online safety and digital citizenship) using Google slides. Then challenge their classmates to escape from their creations!

Recommended Texts:

Bad Kitty Gets A Phone By Nick Bruel

But I Read It On the Internet! By Toni Buzzeo

EPIC! Collection of Digital Citizenship ebooks

Grades 7-8 Library Program Curriculum Alignment
Aligning the NYS Computer Science and Digital Fluency Standards to the Empire State Information Fluency Continuum

Impacts of Computing 7-8

Tags	NYS Computer Science and Digital Fluency Standards	ESIFC (Empire State Information Fluency Continuum)	Library Class Activity example
Background Knowledge	**7-8IC.1:**	**Standard 1: Inquiry and**	● Brainpop Computer

Computing Technology over time Society	Compare and contrast tradeoffs associated with computing technologies that affect individuals and society.	**Design Thinking** Construct: Uses common organizational patterns (e.g. chronological order, cause and effect, ==compare/contrast==) to organize information in order to draw conclusions.	[Science Collection](#) ● Have students research history of computers. What factors made computer more commonplace, what effects did that have on society/jobs? ● Have students use [Newsela: An Online Education Platform for Content](#) to find information on how technologies affect people in today's society.
Rules Acceptable Use	**7-8.IC.2:** Evaluate the impact of laws or regulations on the development and use of computing technologies and digital information. .	**Standard 1 Inquiry and Design Thinking** Employs reflective notetaking strategies to capture own thinking and inferences about the evidence being noted in words and phrases, summarized, paraphrased or quoted	● [The Four Factors of Fair Use](#) ● [Library.FYI](#) ● Students could research how laws protect intellectual property rights of digital materials and how those laws changed the music industry.
Recognizing familiar technology	**7-8.IC.3:** Identify and discuss issues of ethics surrounding computing technologies and current events.	**Standard 1: Inquiry and Design Thinking** Evidence: Selects high-quality information from multiple sources that answers the research questions, provides a balance of diverse	● [Should This Exist?](#) ● [NewsELA](#) articles regarding various current events. ● [Lab-Grown Wooly](#)

		perspectives, and includes both main ideas and supporting details.	Mammoths Students can create a slideshow, doc, speech, etc. taking on side of this topic.
Privacy	**7-8.IC.4:** Identify and discuss issues related to the collection and use of public and private data.	**Standard 3 Social and Civic Responsibility** Demonstrates understanding of a digital footprint and constructs own footprint accordingly.	● Students can create their own Fakebook page, making sure that the only include appropriate information that should be shared publicly ● Interland Tower of Treasure ● Safe Online Surfing ● NetSmartz ● Digital Compass ● InCtrl: Teaching Key Digital Citizenship Concepts to Children ● Teen Voices: Oversharing and Your Digital Footprint ● Students could describe how facial recognition surveillance video is used in a store to track customers for security or information

			about purchase habits. Students might discuss who owns that data and what it is acceptable to do with the data.
Ethics Role of Computers Machine Thinking	**7-8.IC.5:** Analyze potential sources of bias that could be introduced to complex computer systems and the potential impact of these biases on individuals.	**Standard 1 Inquiry and Design Thinking** Evidence: Evaluates the accuracy, authority, perspective and bias of sources and information.	• AI, Ain't I A Woman? • Everyone Has Invisible Bias
Accessibility	**7-8.IC.6:** Assess the accessibility of a computing device or software application in terms of user needs.	**Standard 1 Inquiry and Design Thinking** Design Thinking: Builds on real-world experiences to broaden perspective and open creative possibilities	• Epic Books - Is it easier to read a physical book or an ebook? What are some features that might make an ebook easier to read for certain people? • Create-ability
Career exploration	**7-8.IC.7:** Explore a range of computer-science related career paths.	**Standard 1 Inquiry and Design Thinking** Wonder: Writes questions that would lead to an inquiry independently based on key ideas or areas of focus.	• Students could login and use Xello: College & Career Readiness Software that Inspires Students to investigate different technology careers and the important requirements

			and characteristics of each.
			• [Code.org careers in tech](#)

Computational Thinking

Tags	NYS Computer Science and Digital Fluency Standards	ESIFC (Empire State Information Fluency Continuum)	Library Class Activity example
Patterns Modeling and simulation	**7-8-1.CT.1:** Compare the results of alternative models or simulations to determine and evaluate how the input data and assumptions change the results.	**Standard 1 Inquiry and Design Thinking** Design Thinking: Builds on real-world experiences to broaden perspective and open creative possibilities.	• Use UB tech robotics kits in class, in small groups. Students can use simple coding that can help them quickly see their input produce an output. • [PHET Simulations](#) • [Semantris](#) • [Connect It](#)
Data Analysis and Visualization	**7-8.CT.2** Collect and use digital data in a computational artifact.	**Standard 3 Social And Civic Responsibility** Abides by the AUP by accessing only appropriate	• Students could develop their own [Google Forms](#) to survey their

		information and using technology responsibly.	classmates about their interests, hobbies, etc. Students could survey students to develop a data table and graph of favorite meals to help develop a menu and then send these suggestions to the school cafeteria staff.
Data Analysis and Visualization	**7-8.CT.3** Refine and visualize a data set in order to persuade an audience.	**Standard 2 Multiple Literacies** Deconstructs media claims and arguments by looking at logical fallacies, <mark>persuasive techniques</mark>, and the use of language of the medium.	● Students could access government data sets for science (tide, hurricane data, sunrise/sunset) and sort and analyze the data to get specific information to support a claim. ● Iditarod Unit- students could analyze temperature and weather charts for different regions of Alaska and create a persuasive letter to write to race organizers, suggesting an alternate location for the starting and/or ending point of the race.
Abstraction and Decomposition	**7-8CT.4** Write a program using functions or procedures whose names or other documentation	**Standard 1 Inquiry and Design Thinking** Design Thinking: Engages actively in a design process to	● Brainpop Jr. [Computational Thinking video](link)

	convey their purpose within the larger task.	use tools, resources and materials to test the hypothesis or desired result by creating a solution or model, testing the results, modifying the model when needed, and determining the validity of the hypothesis or the quality of the model.	• codeSpark Academy: Coding App for Kids • Code.org abstraction with Mad Glibs • Kodable • Little Bits in the library • UB tech robotic kids in the library. • Dynamic Systems • Scratch - Imagine, Program, Share (if Edlaw2D approved)
Abstraction and Decomposition	**7-8.CT.5** Identify multiple similar concrete computations in a program, then create a function to generalize over them using parameters to accommodate their differences.	**Standard 1 Inquiry and Design Thinking** Design Thinking:Design Thinking: Engages actively in a design process to use tools, resources and materials to test the hypothesis or desired result by creating a solution or model, testing the results, modifying the model when needed, and determining the validity of the hypothesis or the quality of the model.	• Intro to Abstraction • Students can generalize many similar functions to one function such as generalizing individual functions that draw a square, draw a triangle, and draw an octagon to a single function that draws a polygon based on an input for the number of sides. (
Algorithms and Programming	**7-8.CT.6:** Design, compare and refine algorithms for a specific task within a program.	**Standard 1 Design Thinking** Design Thinking:Design Thinking: Engages actively in a design process to use tools,	• Khan Academy JavaScript • Codespark

			● [Brainpop Computer Programming](#)
		resources and materials to test the hypothesis or desired result by creating a solution or model, testing the results, modifying the model when needed, and determining the validity of the hypothesis or the quality of the model.	
Algorithms and Programming	**7-8.CT.7:** Design or remix a program that uses a variable to maintain the current value of a key piece of information.	**Standard 1 Inquiry and Design Thinking** Builds on real-world experiences to broaden perspective and open creative possibilities.	● [Mad Takes Mad Libs Generator](#) ● Students could program a game that uses a score variable to store the users points while playing the game.
Algorithms and Programming	**4-6.CT.8:** Develop or remix a program that effectively combines one or more control structures for creative expression or to solve a problem.	**Standard 1 - Inquiry and Design Thinking** Design Thinking: Engages actively in a design process to use tools, resources and materials to test the hypothesis or desired result by creating a solution or model, testing the results, modifying the model when needed, and determining the validity of the hypothesis or the quality of the model.	● [CodeCombat - Coding games to learn Python and JavaScript ...](#) ● Students could use Boolean expressions and conditionals to search the library catalog, identifying how their results change accordingly. ● [Khan Academy intro to Javascript](#) (requires student data unless aliases are created by teacher/librarian beforehand)
De-bugging	**7-8.CT.9:**	**Standard 1 Design Thinking**	● [Kodable Bug World](#)

	Read and interpret code to predict the outcome of various programs that involve conditionals and repetition for the purposes of debugging.	Design Thinking: Engages actively in a design process to use tools, resources and materials to test the hypothesis or desired result by creating a solution or model, testing the results, modifying the model when needed, and determining the validity of the hypothesis or the quality of the model	(free) ● [Bridge Designer](#) ● Work together as a class to try to solve the [Bridge Riddle](#) ● [Khan Academy intro to Javascript](#) (requires student data unless aliases are created by teacher/librarian beforehand) ● [Debug the maze](#)
Algorithms and Programming	**7-8.CT.10** Document the iterative design process of developing a computational artifact that incorporates user feedback and preferences.	**Standard 1 Inquiry and Design Thinking** Reflect: Identifies and evaluates the importance of features for a good product, presentation and engagement in the process of inquiry.	● [Kodable](#) ● Students could develop a story map or storyboard to illustrate the steps their class takes to walk from their classroom to the cafeteria. ● Students could view the fire evacuation map and procedure for the library, and make suggestions based upon the speed, accessibility and distance of alternate routes.

Networks and System Design

Tags	NYS Computer Science and Digital Fluency Standards	ESIFC (Empire State Information Fluency Continuum)	Library Class Activity example
Hardware and Software	**7-8.NSD.1:** Design a user interface for a computing technology that considers usability, accessibility, and desirability.	**Standard 2 Multiple Literacies** Determines the purpose and intended audience of a media presentation.	- Makey-Makey kits - UBTech Robotics Kits - Algodoo (free, must be downloaded) - MIT App Creator 3-D Slash - Vid Code *Subscription Needed for use beyond free version
Hardware and Software	**7-8.NSD.2:** Design a project that combines hardware and software components.	**Standard 1 Inquiry and Design Thinking** Design Thinking: Engages actively in a design process to use tools, resources and materials to test the hypothesis or desired result by creating a solution or model, testing the results, modifying	- Vidcode: Creative Coding Students could design an app for finding free filtered water stations in the area that would use GPS, magnetometer,

		the model when needed, and determining the validity of the hypothesis or the quality of the mode	and touch screen sensors as well as the phone's WIFI and a map API.
Hardware and software	**7-8.NSD.3:** Identify and fix problems with computing devices and their components using a systematic troubleshooting method or guide.	**Standard 1 Inquiry and Design Thinking** Design Thinking: Engages actively in a design process to use tools, resources and materials to test the hypothesis or desired result by creating a solution or model, testing the results, modifying the model when needed, and determining the validity of the hypothesis or the quality of the mode	- Student Helpdesk to troubleshoot Chromebook issues - Students could follow a troubleshooting flowchart that guides them through a process of checking connections and settings, changing software to see if hardware will work, and swapping in working components. - Students could create a troubleshooting flowchart for anyone using a school device.
Networks and the Internet Data sharing	**7-8.NSD.4:** Design a protocol for transmitting data through a multi-point network	**Standard 1: Inquiry and Design Thinking** Express: Creates products for authentic reasons and audiences.	r Students can simulate how information is sent in packets by doing a relay race. Each student will have a different part of the message and compete to see who can race to get the whole message to the other side the fastest.

			● Have students take on the roles of newscasters and demonstrate how they would transmit their news items as a **unicast, multicast, or a broadcast**
Networks and Internet Data Storage	**7-8.NSD.5:** Summarize how remote data is stored and accessed in a network.	**Standard 1 Inquiry and Design Thinking** Construct: Forms opinions, judgements or claims backed up by supporting evidence, and clear reasoning.	● Students could create a diagram that illustrates the use of remote storage in cloud computing, a school's data server, or distributed media. Students could discuss how local copies of data are synced with data from the remote server. ● Assign students random roles (schools, businesses, etc) and varying amounts of "data" and have them estimate what storage size they would need in order to accommodate the storage that they have been allocated.

Cybersecurity 7-8

Tags	NYS Computer Science and Digital Fluency Standards	ESIFC (Empire State Information Fluency Continuum)	Library Class Activity example
Risks Information Privacy	**7-8.CY.1:** Determine the types of personal information and digital resources that an individual may have access to that needs to be protected.	**Standard 3 Social and Civic Responsibility** Observes Internet safety procedures, including safeguarding personal information and equipment.	● [Phishing quiz by Google](#) ● [My Digital Footprint Lesson](#) ● [Protect your students' data and privacy](#) ● [Google Interland Mindful Mountain](#) ● [Privacy and Security Online](#) ● [Internet of Me](#) ● [Digital Compass](#)
Safeguards Passwords	**7-8.CY.2:** Describe physical, digital, and behavioral safeguards that can be employed in different situations.	**Standard 3 Social and Civic Responsibility** Observes Internet safety procedures, including safeguarding personal information and equipment.	● [Common Sense Digital Compass™ | Educational games for kids to ...](#) ● Students can identify situations where common safeguards would not work. For example, 2-step authentication will not work if someone is using their mobile phone as the

			authentication device and they are in an area without cell phone coverage.
			●
Safeguards	**7-8.CY.3:** Describe trade-offs of implementing specific security safeguards	**Standard 1 Inquiry and Design Thinking** Making Sense of Information and Notetaking: Employs reflective notetaking strategies to capture own thinking and inferences about the evidence being noted in words and phrases, summarized, paraphrased or quoted.	● Students could examine the pros and cons of using different methods of authentication, for example passwords, biometrics, or key-fobs and the trade-offs of using single-factor vs multi-factor authentication.
Safeguards

Symbols | **7-8.CY.4:** Describe the limitations of cryptographic methods. | **Standard 1 Inquiry and Design Thinking** Evidence: Reads laterally in the digital environment to discover divergent and conflicting information as well as corroborating information. | ● Students could use a cipher or Vigenere Square to encrypt a message for a classmate. the classmate can use the same cipher to decrypt the message.

● Pigpen Cipher-Students can take turns creating and cracking messages created using the PigPen cipher

● https://www.brainpop.com/science/famousscientists/alanturing/ |

			Brainpop video about Alan Turing who cracked the ENIGMA code ● [Navajo Code Talkers](#) ● [Crypto Club](#) ● [School Code Breaking](#) ● [Password Guessing Game](#)
Response Information Security Digital Citizenship	**7-8.CY.5:** Describe actions to be taken before and after an application or device reports a security problem or performs unexpectedly.	**Standard 3 Social and Civic Responsibility** Demonstrates critical evaluation strategies that are appropriate for various types of sources.	● [Interland Reality River](#) ● Students could recommend changing passwords immediately after an account is compromised and create sample secure passwords and passphrases. ● https://www.fbi.gov/investigate/cyber ●

Digital Literacy 7-8

Tags	NYS Computer Science and	ESIFC	Library Class Activity example

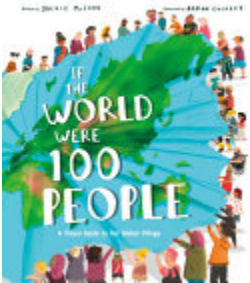|	Digital Fluency Standards	(Empire State Information Fluency Continuum)	
Digital Use Digital Tools Keyboarding Communication	**7-8.DL.1:** Type on a keyboard while demonstrating proper keyboarding technique, with increased speed and accuracy.	**Standard 2 Multiple Literacies** Uses the language of the medium and the characteristics of the technology tool to create and deliver an effective presentation.	• https://www.typing.com/ 3-minute typing tests, keep track of weekly scores and use online graphing software to create a digital representation of their progress in the areas of both speed and accuracy.
Digital Use Digital Tools Collaboration Communication	**7-8.DL.2:** Communicate and collaborate with others using a variety of digital tools to create and revise a collaborative project.	**Standard 3 Social and Civic Responsibility** Engages effectively in collaborative discussions with diverse groups.	• When using a shared online document, students know how to share a document with other students so that they can work on the document collaboratively. • Padlet: You are beautiful
Digital Use Searching Keywords	**7-8.DL.3:** Compare types of search tools, choose a search tool for effectiveness and efficiency, and evaluate the quality of search tools based on returned results.	**Standard 1 Inquiry and Design Thinking** Evaluates quality of information within electronic and print resources for usefulness, currency, authority, and accuracy. .	• Students can conduct a search of the library catalog and/or databases in order to find information relevant to a class topic. • Library.fyi: Select your library system

	7-8.DL.4: Select and use digital tools to create, revise, and publish digital artifacts.	**Standard 2 Multiple Literacies** Determines the purpose and intended audience of a media presentation.	● https://anchor.fm/ ● https://sketch.io/ ● Animaker ● https://www.baamboozle.com/ ● Chart It ● Citizen DJ ● Cloud Stop Motion ● Flip Grid
Digital Use	7-8.DL.5: Transfer knowledge of technology in order to explore new technologies.	**Standard 2 Multiple Literacies** Analyzes visual text to gather information and draw inferences about meaning.	● Students familiar with spreadsheets can start to explore database software. (i.e. Google Sheets vs. Excel) ● Students can create Google Slideshows and then use online software such as Prezi: Presentations and videos with engaging visuals for hybrid teams and evaluate the effectiveness of each tool.
Digital Citizenship	7-8.DL.6 Explain the connection between the persistence of data on the Internet, personal	**Standard 3 Social and Civic Responsibility** Demonstrates understanding of digital footprint and	● Students use a tool that displays archived versions of websites

|			
	online identity, and personal privacy.	constructs own footprint accordingly. .	(such as "Wayback Machine") to research how information is available even if it seems to be deleted. ● Have students review the "terms and conditions" of a commonly used site/app. Have them note anything surprising or confusing. ● Students can research how someone's digital footprint negatively impacted their life.
Digital Citizenship	**7-8.DL.7:** Describe safe, appropriate, positive, and responsible online behavior and identify strategies to combat negative online behavior.	**Standard 3.3 Social and Civic Responsibility** Abides by the AUP by accessing online appropriate information and using technology responsibly.	● Interland Kind Kingdom ● NetSmartz Kids Be Safer Online ● Review class rules regarding interactions within Google Classroom ● Putting a Stop to Online Meanness ● Online and On Guard ● Lego Gloom Busters

			● Have students create digital escape rooms (centered around the theme of online safety and digital citizenship) using Google slides. Then challenge their classmates to escape from their creations! ● Students could identify why they should find and use truthful information online. ● Students can investigate sites such as those listed below, and evaluate each one according to our class criteria. They can then decide in the end which of the websites they deem to be legitimate and trustworthy, and those that they believe are a hoax. ● [Dihydrogen Monoxide Research Division - dihydrogen monoxide info](#) ● [Mike the Headless Chicken Festival - Fruita, CO - June 3rd and 4th …](#) ● [Save The Pacific Northwest Tree](#)

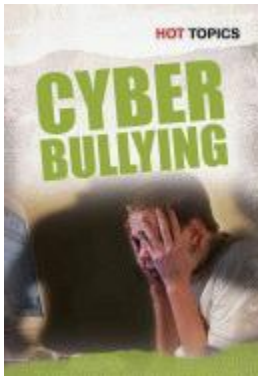|			Octopus
			• Dog Island Free Forever
			• Ninja Burger

Recommended Texts:

If The World Were 100 People by Jaqueline Mccann
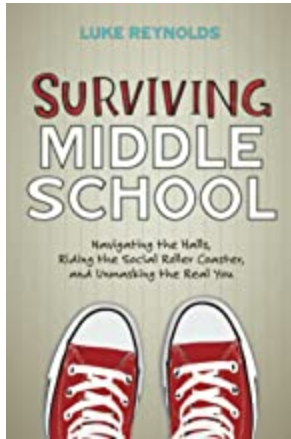
<u>Surviving Middle School: Navigating the Halls, Riding the Social Rollercoaster, and Unmasking the Real You</u> by Luke Reynolds

<u>Cyberbullying</u> by Nick Hunter
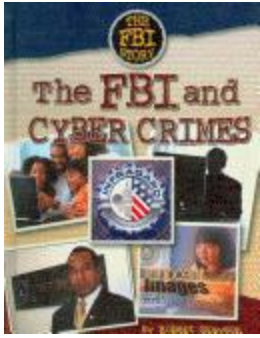
The FBI and Cyber Crimes By Robert Greyson
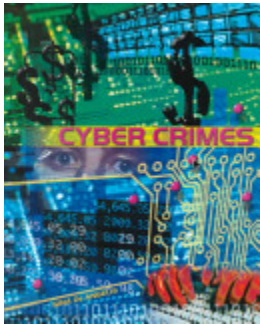
Cyber Crimes By Gina Deangelis

End of Grade Band 7-8

Grades 9-12 Library Program Curriculum Alignment
Aligning the NYS Computer Science and Digital Fluency Standards to the Empire State Information Fluency Continuum

Impacts of Computing 9-12

Tags	NYS Computer Science and Digital Fluency Standards	ESIFC (Empire State Information Fluency Continuum)	Library Class Activity example
Background Knowledge Computing Technology over time Society	**9-12IC.1:** Evaluate the impact of computing technologies on equity, access, and influence in a global society.	**Standard 1: Inquiry and Design Thinking** Making sense of information and notetaking: Evaluates the development of an argument or claim and the strength of the supporting and refuting evidence provided within the source.	● Students could explore the digital divide and see what some of the causes of it. Students could also explore what other issues are related to the digital divide (ex. Poverty) ● Seeing a Dr. "online" instead of going to them. Discuss how this can help access to healthcare. Internet access across the world, ex. Africa. How to get it to them? Discuss options and plans that already exist. ● Have students use Newsela: An Online Education Platform for Content to find information on how technologies affect people in today's society. ● Slogans Using Machine Learning
Rules Acceptable Use	**9-12.IC.2:** Debate laws and regulations that impact the development	**Standard 1 Inquiry and Design Thinking** Express- Creates a product	● Students could investigate past internet crimes to see

	and use of computing technologies and digital information.	and presentation to present an argument, claim, point of view, interpretation, or new model most effectively for a specific audience.	impacts on current regulations. ● [EdLaw 2D](#) Students could research the specifics of laws related to technology use in education, and should develop a presentation either supporting or rejecting these laws. ● Students could discuss why copyright protection and attribution are important to intellectual property and how easy it would be to use computer technologies to steal other's work. (
Recognizing familiar technology	**9-12.IC.3:** Debate issues of ethics related to real world computing technologies	**Standard 1: Inquiry and Design Thinking** Construct- Draws clear and appropriate conclusions supported by evidence and examples.	● Ethical responsibilities of social media and where they fit in reporting world events. Compare and contrast social media news feed to a real news feed about a current event.
Privacy	**9-12.IC.4:** Assess personal and societal trade-offs related to computing technologies and data privacy	**Standard 3 Social and Civic Responsibility** Analyzes the consequences and costs of hacking, spamming, consumer fraud, virus setting, intrusion and	● Students can create their own [Fakebook](#) page, making sure that the only include appropriate information that should be shared

		other unethical uses of information and communication technology and identifies ways for addressing those risks.	publicly • Students could discuss the monitoring of road traffic. They might discuss the trade-offs: changing signals in real time to improve road efficiency and safety versus concerns around consent for personal data collection and potential sharing of personal data with other agencies like the police department or insurance companies . • Incognito Mode • Class discussion: How can a user profile (TikTok FYP, targeted sales ads, etc.) be a positive thing? What negative aspects of this data collection exist? Is the privacy trade-off worth the more streamlined user experience?
Ethics	**9-12.IC.5:** Describe ways that complex	**Standard 1 Inquiry and Design Thinking**	• Students might consider the ethical

Role of Computers Machine Thinking	computer systems can be designed for inclusivity and to mitigate unintended consequences.	Construct: Develops a line of arguments or claim that incorporates and/or refutes competing interpretations or conflicting evidence with credible evidence.	and social implications of police departments using artificial intelligence to identify and respond to potential criminal activity. Then make recommendations for how to make such a tool increase equity in policing and mitigate unintended bias caused by the system.
Accessibility	**9-12.IC.6:** Create accessible computational artifacts that meet standard compliance requirements or otherwise meet the needs of users with disabilities.	**Standard 1 Inquiry and Design Thinking** Express: Publishes final product for an authentic audience and real-world application	● Students could make sure that a website they are designing is ADA compliant. Students might consider the needs of users with learning disabilities when designing an educational app. ● Ask students brainstorm a design for differently abled persons – ex. No movement, missing arm, blind, etc. How can they access technology? ● Students could do a project where they develop a protype of a device to help students

			with disabilities use computer technology easier ● Students could create a computer application to assist those with disabilities. ● MIT App Inventor
Career exploration	**9-12.IC.7:** Investigate the use of computer science in multiple fields.	**Standard 1 Inquiry and Design Thinking** Wonder: Refines questions to provide a framework for the inquiry and to fulfill the purpose of the research.	● Students could login and use Xello: College & Career Readiness Software that Inspires Students to investigate different technology careers and the important requirements and characteristics of each. ● Code.org careers in tech ● VidCode

Computational Thinking 9-12

Tags	NYS Computer Science and Digital Fluency Standards	ESIFC (Empire State Information Fluency Continuum)	Library Class Activity example
Patterns Modeling and simulation	**9-12-1.CT.1:** Create a simple digital model that makes predictions of outcomes.	**Standard 1 Inquiry and Design Thinking** Express: Publishes final product for an authentic audience and real-world application	• Use UB tech robotics kits in class, in small groups. Students can use simple coding that can help them quickly see their input produce an output. • PHET Simulations • Semantris • Connect It • Digital Model of US Census Data
Data Analysis and Visualization	**9-12.CT.2** Collect and evaluate data from multiple sources for use in a computational artifact.	**Standard 1 Inquiry and Design Thinking** Evidence: Evaluates and selects evidence from multiple sources based on relevance and usefulness to answer research questions, currency, authority, accuracy, comprehensiveness and point of view.	• Students could develop their own Google Forms to survey their classmates about their interests, hobbies, etc. Students could survey students to develop a data table and graph of favorite meals to help

			develop a menu and then send these suggestions to the school cafeteria staff. ● [Me+You](#) ● Students could use computational approaches to pull existing data from other sources to create a computational artifact in multiple subject areas.
Data Analysis and Visualization	**9-12.CT.3** Refine and visualize complex data sets to tell different stories with the same data set.	**Standard 1 Inquiry and Design Thinking** Evidence: Analyzes the impact of point of view, perspective, and purpose of the information provided by a source.	● Students could combine a data set on average household income by zip code and a data set on health by zip code in order to identify differences in occurrences of asthma based on locale and income in order to persuade an audience to take action on environmental social justice issues. ● [Google Trends](#) ● Iditarod Unit- students could analyze temperature and weather charts for different regions of Alaska and create a

			persuasive letter to write to race organizers, suggesting an alternate location for the starting and/or ending point of the race. ● [Gap Minder Tools](#) ● [Me+You](#)
Abstraction and Decomposition	**9-12CT.4** Implement a program using a combination of student-defined and third-party functions to organize the computation.	**Standard 1 Inquiry and Design Thinking** Express: Publishes final product for an authentic audience and real-world application	● Students who want to create an app that solves a community problem might first break down the project as: front-end, back-end, and data/API. They could then take one subsystem at a time and break it down further by programmable features (i.e. The front-end might need a form, a button, a menu, and a list of links.) ● [Dynamic Systems](#) ● [Scratch - Imagine, Program, Share](#) (if Edlaw2D approved)
Abstraction and	**9-12.CT.5**	**Standard 1 Inquiry and**	● [Intro to Abstraction](#)

Decomposition	Modify a function or procedure in a program to perform its computation in a different way over the same inputs, while preserving the result of the overall program.	**Design Thinking** Construct: Organizes information independently, deciding the structure based on the relationships among ideas and general patterns discovered.	• [Khan Academy](#) • [Ear Sketch](#) • [Java Script Open Processing](#)
Algorithms and Programming	**9-12.CT.6:** Demonstrate how at least two classic algorithms work, and analyze the trade-offs related to two or more algorithms for completing the same task.	**Standard 1 Design Thinking** Construct: Organizes information independently, deciding the structure based on the relationships among ideas and general patterns discovered.	• [Khan Academy JavaScript](#) • [Codespark](#) • [Brainpop Computer Programming](#) • : Students could model sorting algorithms with books on a bookshelf and contrast different methods in terms of shelf space and the time spent.
Algorithms and Programming	**9-12.CT.7:** Design or remix a program that utilizes a data structure to maintain changes to related pieces of data.	**Standard 1 Inquiry and Design Thinking** Express: Creates a product and presentation to present an argument, claim, point of view, interpretation, or new model most effectively for a specific audience.	• [Mad Takes Mad Libs Generator](#) • [Pollinator Pathmaker](#) • Students could program a game that uses a score variable to store the users points while playing the game. • Students could create a list and associate it with a variable name

			then add elements to the list, observing that the same name can be used to access the updated contents. ● Students could create a table of contents or index within a Google document using the bookmark function
Algorithms and Programming	**9-12.CT.8:** Develop a program that effectively uses control structures in order to create a computational program for practical intent, personal expression, or to address a societal issue.	**Standard 1 - Inquiry and Design Thinking** Express: Creates a product and presentation to present an argument, claim, point of view, interpretation, or new model most effectively for a specific audience.	● [CodeCombat - Coding games to learn Python and JavaScript ...](#) ● Students could use Boolean expressions and conditionals to search the library catalog, identifying how their results change accordingly. ● [Khan Academy intro to Javascript](#) (requires student data unless aliases are created by teacher/librarian beforehand) ● Students could program a choose-your-own-adventure game that uses multiple choice options and probability to determine outcomes. ● Students could create

			their own Escape Rooms using Google slides
De-bugging	**9-12.CT.9:** Systematically test and refine programs using a range of test cases, based on anticipating common errors and user behavior.	**Standard 2: Multiple Literacies** Assesses and revises own products by using the criteria of clarity, accuracy, relevance, sufficiency, logic, depth and breadth.	● [Khan Academy intro to Javascript](#) (requires student data unless aliases are created by teacher/librarian beforehand) ● Students could test the boundaries of input values and the outcome of each branch in a conditional statement. ● [Debug the maze](#)
Algorithms and Programming	**9-12.CT.10** Collaboratively design and develop a program or computational artifact for a specific audience and create documentation outlining implementation features to inform collaborators and users.	**Standard 1 Inquiry and Design Thinking** Express: Creates a product and presentation to present an argument, claim, point of view, interpretation, or new model most effectively for a specific audience.	● Students could view the fire evacuation map and procedure for the library, and make suggestions based upon the speed, accessibility and distance of alternate routes . ● [Linux Survival](#) ● [RepLit](#)

Networks and System Design 9-12

Tags	NYS Computer Science and Digital Fluency Standards	ESIFC (Empire State Information Fluency Continuum)	Library Class Activity example
Hardware and Software	**9-12.NSD.1:** Design a solution to a problem that utilizes embedded systems to automatically gather input from the environment.	**Standard 1 Inquiry and Design Thinking** Express: Creates a product and presentation to present an argument, claim, point of view, interpretation, or new model most effectively for a specific audience.	- UBTech Robotics Kits - Algodoo (free, must be downloaded) - MIT App Creator 3-D Slash - Vid Code *Subscription Needed for use beyond free version - Students might propose embedded systems that address public health and safety such as coming up with solutions that use embedded systems in a car to address car accidents, texting while driving, pets overheating when left alone in a car, etc. - Students can design a new hybrid car or

			household appliance that uses less unrenewable energy.
Hardware and Software	**9-12.NSD.2:** Explain the levels of interaction existing between the application software, system software, and hardware of a computing system.	**Standard 1 Inquiry and Design Thinking** Express: Creates a product and presentation to present an argument, claim, point of view, interpretation, or new model most effectively for a specific audience.	● [Vidcode: Creative Coding](#) ● Students could create a diagram representing the levels of interaction involved in text editing. They would show that software interacts with the operating system to receive input from the keyboard, convert the input to bits for storage, and interpret the bits as readable text to display on the monitor.
Hardware and software	**9-12.NSD.3:** Develop and communicate multi-step troubleshooting strategies others can use to identify and fix problems with computing devices and their components.	**Standard 4 Personal Growth and Agency** Identifies an authentic problem or issues, researches and shares research information to raise awareness of the issue or the changes needed, identifies effective ways to address the issue and collaborates to advocate or take action to implement those ideas.	● Students could create step by step instructions for a help desk employee. ● Students could create a troubleshooting flowchart for anyone using a school device. ● Establish a student-run help desk for other

			students. Have them be a resource for those who are having simple issues. Students could model how to troubleshoot for other students.
Networks and the Internet Data sharing	**9-12.NSD.4:** Describe the components and design characteristics that allow data and information to be moved, stored, and referenced over the Internet	**Standard 1: Inquiry and Design Thinking** Construct: Develops clear and appropriate conclusions supported by evidence and examples.	● Students could create a computational artifact that explains the path of data transmission from their device to a website hosted on another continent and back using the network (including but not limited to servers, routers, etc.). ●
Networks and Internet Data Storage	**7-8.NSD.5:** Describe how emerging technologies are impacting networks and how they are used.	**Standard 1 Inquiry and Design Thinking** Construct: Develops clear and appropriate conclusions supported by evidence and examples.	● Students could create a diagram that illustrates how a photo they take with their phone gets uploaded to the internet and then synced to their other devices. ● Students might discuss how cloud computing affects the scale of networks and access to shared resources. ● Discuss and research how emerging

			technologies have advanced health care services.

Cybersecurity 9-12

Tags	NYS Computer Science and Digital Fluency Standards	ESIFC (Empire State Information Fluency Continuum)	Library Class Activity example
Risks Information Privacy	**9-12.CY.1:** Determine the types of personal and organizational information and digital resources that an individual may have access to that needs to be protected.	**Standard 3 Social and Civic Responsibility** Analyzes the consequences and costs of hacking, spamming, consumer fraud, virus setting, intrusion and other unethical uses of information and communication and identifies ways for addressing these risks.	- Phishing quiz by Google - Cybersecurity Lab - Students could research events in business, industry, and government involving organizational security breaches and pinpoint the type of data and resources compromised and how it was used. - Students could research past events how some systems are hacked - baby monitors, ring doorbells, Alexa, Nest, etc.

Safeguards Passwords	**9-12.CY.2:** Describe physical, digital, and behavioral safeguards that can be employed to protect the confidentiality, integrity, and accessibility of information.	**Standard 3 Social and Civic Responsibility** Abides by the Acceptable Use Policy in all respects.	• Formulate recommendations for setting up a secure home or small business network. • [Code HS](#)

Works Cited

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