Grade, Subject: 4, Library/Technology	
Unit Name: General Library Skills	___X___ Essential _____ Important _____ Compact
Big Idea: Learners make meaning for themselves and others by collecting, organizing, and sharing resources for personal relevance.	**Length/Duration of Unit**: 6 class periods
PA Content Standards: **AASL Standards Framework for Learners** ***Learners engage with new new knowledge by following a process that includes:*** **I.B.2:** Devising and implementing a plan to fill in knowledge gaps. ***Learners participate in an ongoing inquiry-based process by:*** **I.D.1** Continually seeking knowledge. **I.D.3:** Enacting new understandings through real-world connections ***Learners gather information appropriate to the task by:*** **IV.A.1**: Determining the need to gather information **IV.A.2:** Identifying possible sources of information. **IV.B.1**: Seeking a variety of sources. **IV.B.2**:Collecting information representing diverse perspectives. ***Learners develop and satisfy personal curiosity by:*** **V.A.1:** Reading widely and deeply in multiple formats and write and create for a variety of purposes. **V.A.2**: Reflecting and questioning assumptions and possible misconceptions. **V.A.3:** Engaging in inquiry-based processes for personal growth.	**PA Core Standards:** **CC.1.2. Reading Informational Texts** **CC.1.2.4.G** Interpret various presentations of information within a text or digital source and explain how the information contributes to an understanding of text in which it appears. **CC.1.2.4.L** Read and comprehend literary non-fiction and informational text on grade level, reading independently and proficiently. **CC.1.3 Reading Literature** **CC.1.3.4.K** Read and comprehend literary fiction on grade-level, reading independently and proficiently.
Essential Questions: How do learners act on an information need? How do learners gather information appropriate to a task? How do learners develop and satisfy personal curiosity? How do learners read widely and deeply in multiple formats and create for a variety of purposes?	**Understandings (SWKT…):** ● Libraries use online catalogs to share what materials are available to users both in a library and for digital media. ● Libraries have systems to organize books for users to find materials quickly. ● Nonfiction books are often organized using the Dewey Decimal System ● Fiction books can be organized by author's last name and also by type of fiction (graphic novel, chapter book, picture books)

Knowledge:	**Skills (SWBAT…):**
There are a variety of ways to gain information. There are many types of reading materials for personal enjoyment. People may use an online catalog to find materials that would meet their interests/needs. Libraries organize materials in ways that help people efficiently find what they are looking for.	● Use various print and digital reference sources independently ● Locate fiction texts using a library catalog independently ● Select appropriate books for recreational reading and personal enjoyment. ● With support, sort non-fiction topics into the Dewey Decimal categories ● With support, locate smaller non-fiction topics within the non-fiction sections of the library. ● Conduct searches that differentiate between title, author, subject, series, and keyword searches. ● Explain how the call number/spine label relates to the type of book and its placement in the library. ● Select and read independently grade level appropriate literary fiction in a variety of genres and formats ● Describe how personal interests and abilities impact lifelong learning.
Vocabulary: **OPAC - Online Public Access Catalog** **Catalog -** A listing of all the materials a library owns. **Nonfiction-** A type of book that gives facts and information about a topic **Fiction-** works of literature that are not true stories. **Graphic Novel:** a work of fiction or non-fiction that is presented in comic-strip format and published as a book **Dewey Decimal System:** a way to put books in order by subject. It is often used in public libraries and schools in the United States **Keyword searching:** A type of search for when a user does not know the exact title of a book or is unsure of best subject terms for searching **Subject searching**: A type of search for when a user knows what topic they want to learn about **Series Searching**: A type of search for when the user knows the series that the book is a part of, but may not know the exact title or author(s) of the book **Call Number -** A combination of letters and numbers assigned to all books and to most other items in the library that gives the location of the materials on the library shelves. **Definition Sources:** *Merriam-Webster for Kids* and teacher created	**Resources:** ● Destiny (EASD Online Catalog) ● Library Book Collection

Assessments: *Student Performance:* independently using the Destiny catalog to search in a variety of ways: subject search vs. keyword search, title search, author search, series search *Student Performance:* independently locating materials using the call numbers obtained from Destiny search and/or teacher provided call numbers of fiction books *Student Performance:* cooperatively locating non-fiction sections of the library using the call numbers obtained through Destiny subject searches with teacher support	

Grade, Subject: 4, Library/Technology	
Unit Name: Information Technologies	__X__ Essential _____ Important _____ Compact
Big Idea(s): Students will use technology to communicate effectively. Students will understand how technology impacts our everyday lives.	**Length/Duration of Unit**: 12 class periods

PA Content Standards:

Grades 3–5: Science, Technology & Engineering, and Environmental Literacy & Sustainability Academic (STEELS) Standards

3.5.3-5.A: Use appropriate symbols, numbers, and words to communicate key ideas about technological products and systems.
3.5.3-5.B: Examine information to assess the trade-offs to using a product or system.
3.5.3-5.C: Follow directions to complete a technological task.
3.5.3-5.D: Predict how certain aspects of their daily lives would be different without given technologies.
3.5.3-5.G: Describe the helpful and harmful effects of technology.
3.5.3-5.H: Determine factors that influence changes in a society's technological systems or infrastructure.
3.5.3-5.I: Design solutions by safely using tools, materials, and skills.
3.5.3-5.J: Explain how technologies are developed or adapted when individual or societal needs and wants change.
3.5.3-5.K: Judge technologies to determine the best one to use to complete a given task or meet a need.
3.5.3-5.L: Demonstrate how tools and machines extend human capabilities, such as holding, lifting, carrying, fastening, separating, and computing.
3.5.3-5.T: Apply universal principles and elements of design.
3.5.3-5.Y: Identify the resources needed to get a technical job done, such as people, materials, capital, tools, machines, knowledge, energy, and time.
3.5.3-5.AA: Create representations of the tools people made, how they cultivated to provide food, made clothing, and built shelters to protect themselves.

Business, Computer and Information Technology

Standard Area - 15.3: Communication

15.3.5.A: Create work product with a variety of formats including note taking, outlines, essays, correspondence, journals and presentations. Reference English Language Arts CC.1.4.2.T, CC.1.4.5.F, CC.1.4.5.L, CC.1.4.5.R

15.3.5.G: Prepare appropriate information for impromptu and planned presentations. Reference English Language Arts CC.1.5.2.D

15.3.5.H: Present information as an individual or in a small group. Reference English Language Arts CC.1.5.5.A, CC.1.5.5.C, CC.1.5.5.D, CC.1.5.5.E

15.3.5.M: Apply proper etiquette when using technology.

15.3.5.N: Apply appropriate work ethic in the classroom.

15.3.5.O: Discuss appropriate communication skills within organizations.

15.3.5.Q: Identify communication channels at school, home, and social events.

15.3.5.S: Explain electronic communication (e.g., formal vs. informal, time constraints, geographic location) based on the intended message.

15.3.5.V: Identify mobile communications used in various settings.

15.4: Computer and Information Technologies

15.4.5.A: Identify emerging technologies used for educational and personal success.

15.4.5.B: Identify and demonstrate understanding of ethical, safe, and social online behavior and potential consequences of unethical, unsafe, and inappropriate behavior.

15.4.5.C: Describe the purpose, use, and care of peripheral devices of computer systems including input, processing, storage, and output devices.

15.4.5.D: Demonstrate the ergonomically correct use of more sophisticated input technologies.

15.4.5.G: Create a digital project using appropriate software/application for an authentic task.

15.4.5.K: Use digital media to enhance a content-specific work product.

15.4.5.M: Discuss the impact of emerging technologies on a variety of careers.

Career Education and Work Standards:

13.2. Career Acquisition (Getting a Job)

13.2.5. GRADE 5

E. Apply to daily activities, the essential workplace skills, such as, but not limited to:

- Commitment
- Communication
- Dependability
- Health/safety
- Personal initiative
- Scheduling/time management
- Team building
- Technical literacy
- Technology

PA Core Standards:

CC.1.2.5.G Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently

CC.1.4.5.U With some guidance and support, use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of two pages in a single sitting

CC.1.5.5.D Report on a topic or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly with adequate volume, appropriate pacing, and clear pronunciation.

Essential Questions:

- What is the relationship between technology and society?
- How has technology both created and solved problems?
- How do you select the best technology for a given situation?
- How can technology be used to communicate?
- What makes an effective design?

UNDERSTAND (principles/generalizations)

- Students will understand that technology influences society and society influences technology.
- Students will understand that technology can have both helpful and harmful effects.
- Students will understand that there are trade-offs when assessing and using technology.
- Students will understand that there are many ways technology can be used to communicate.
- Students will understand that applying elements of design to visual communication makes it more aesthetically pleasing and effective.

KNOW (facts):

- Students will know that technology influences society and society influences technology.
- Students will know how to select and use the most suitable applications for communicating and/or creating products that serve a specific purpose.
- Students will know how to apply design principles to projects.

DO (skills, processes; students will be able to…):

- Students will select and use applications as tools to communicate or create products that serve a specific purpose.
- Students will apply design principles to create effective designs.

Vocabulary/Definitions:

General Computer Technology Terms:

- photo credit - showing where you borrowed an image from when using it in a project
- aesthetic - relating to how nice something looks
- hierarchy - using size, emphasis, color, and alignment to show the order of importance in a design

Email & Learning Management System (Schoology) Messaging Vocabulary:

- unsubscribe - remove your email address from a company's mailing list so you do not receive any more emails from them
- SPAM - emails sent to you from a businesses that you did not not ask to receive

Resources:

Videos:

- BrainPOP
- BrainPOP Jr.
- YouTube

CAD / 3D Modeling Applications:

- Tinkercad
- SketchUp for Schools

Course Management Software: Schoology

Google Workspace

- Drive
- Gmail
- Docs
- Slides
- Sheets
- Drawings

Online Infographics Tools:

- Piktochart
- Canva
- Visme

Keyboarding Without Tears (KWT)

Assessments:

Student projects will be graded with teacher created rubrics.

Grade, Subject: 4, Library/Technology	
Unit Name: Research	___X___ Essential _____ Important _____ Compact
Big Idea: Learners build new knowledge by inquiring, reading, thinking critically, identifying problems, and developing strategies for solving problems.	**Length/Duration of Unit**: 14 class periods
PA Content Standards: **AASL Standards Framework for Learners** ***Learners display curiosity and initiative by:*** **I.A.1:** Formulating questions about a personal interest or a curricular topic. **I.A.2:** Recalling prior and background knowledge as context for new meaning. ***Learners engage with new knowledge by following a process that includes:*** **I.B.1:** Using evidence to investigate questions. **I.B.2:** Devising and implementing a plan to fill knowledge gaps. **I.B.3:** Generating products that illustrate learning. ***Learners act on an information need by:*** **IV.A.1:** Determining the need to gather information. **IV.A. 2:** Identifying possible sources of information. **IV.A.3:** Making critical choices about what information to use. ***Learners gather information appropriate to the task by:*** **IV.B.3:** Systematically questioning and assessing the validity and accuracy of information. **IV.B.4:** Organizing information by priority, topic, or other systematic scheme. ***Learners develop and satisfy personal curiosity by:*** **V.A.1:** Reading widely and deeply in multiple formats and write and create for a variety of purposes. **V.A.2:** Reflecting and questioning assumptions and possible misconceptions. **V.A.3:** Engaging in inquiry-based processes for personal growth. **Learners follow ethical and legal guidelines for gathering and using information by:** VI.A.1: Responsibly applying information, technology, and media to learning.	**PA Core Standards:** **English Language Arts CC.1.2 Reading Informational Text** **CC.1.2.4.E** Use text structure, in and among texts, to interpret information (e.g., chronology, comparison, cause/effect, problem/ solution). **CC.1.2.4.G** Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently. **English Language Arts CC.1.4 Writing** **CC.1.4.4.A** Write informative/ explanatory texts to examine a topic and convey ideas and information clearly. **Standard - CC.1.4.4.B** Identify and introduce the topic clearly. **Standard - CC.1.4.4.C** Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related to the topic; include illustrations and multimedia when useful to aiding comprehension. **CC.1.4.4.R** Demonstrate a grade-appropriate command of the conventions of standard English grammar, usage, capitalization, punctuation, and spelling. **CC.1.4.5.S** Draw evidence from literary or informational texts to support analysis, reflection, and research, applying grade-level reading standards for literature and informational texts. **CC.1.4.4.U** With some guidance and support, use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of one page in a single sitting. **CC.1.4.4.V** Conduct short research projects that build knowledge through investigation of different aspects of a topic.

VI.A.2: Understanding the ethical use of information, technology, and media. **Learners use valid information and reasoned conclusions to make ethical decisions in the creation of knowledge by:** VI.B.1: Ethically using and reproducing others' work. VI.B.2: Acknowledging authorship and demonstrating respect for the intellectual property of others. **Business, Computer and Information Technology** **Standard Area - 15.3: Communication** **15.3.5.A** Create work products with a variety of formats including note taking, outlines, essays, correspondence, journals and presentations. **15.3.5.E** Distinguish between age appropriate and inappropriate print and electronic resources used for introductory research. **15.3.5.G** Prepare appropriate information for impromptu and planned presentations. **15.3.5.H** Present information as an individual or in a small group. **15.3.5.I** Demonstrate note taking and questioning skills. **15.4.5.G** Create a digital project using appropriate software/application for an authentic task. **15.4.5.K** Use digital media to enhance a content-specific work product. **15.4.5.L** Discuss the characteristics of a credible website.	**CC.1.4.4.W** Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources. **English Language Arts CC.1.5 Speaking and Listening** **CC.1.5.4 Speaking and Listening** **CC.1.5.4.A** Engage effectively in a range of collaborative discussions on grade-level topics and texts, building on others' ideas and expressing their own clearly. **CC.1.5.4.B** Paraphrase portions of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally. **C.1.5.4.D** Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly with adequate volume, appropriate pacing, and clear pronunciation. **CC.1.5.4.E** Differentiate between contexts that require formal English versus informal situations. **CC.1.5.4.F** Add audio recordings and visual displays to presentations when appropriate to enhance the development of main ideas or themes.
<u>Essential Questions</u>: How do learners display curiosity and initiative? What makes a good resource for research? How do learners engage with and create meaning from information and texts? How does a learner determine which nonfiction source is appropriate to their needs? How do learners access information in a reference source? How do learners responsibly use information which they have gathered? How will the information gathered through research be shared with others?	**<u>Understandings (SWKT…)</u>:** Learners will understand that there are a variety of sources one can use to learn about a topic. Learners will understand and demonstrate the different ways that one can search for information with print and online sources. Learners will demonstrate ways to gather information using note-taking skills, graphic organizers, and bibliographies to keep record of what resources they used in acquiring information about a topic.

Knowledge: Using keywords to search within print materials and online databases. Characteristics of age appropriate websites Retrieving meaningful information from a source Paraphrasing information	**Skills (SWBAT…):** ● Learners will be able to choose a topic to investigate. ● Learners will use information to answer questions and draw evidence from nonfiction to meet an information need. ● Learners will apply strategies summarize main points from non-fiction text ● Learners will use text features and search tools (table of contents, index) to locate and interpret information in print and digital sources. ● Learners will use information ethically and record information appropriately using graphic organizers and answer sheets. ● Learners will list the sources utilized for information (bibliography) ● Learners will evaluate and select information resources based on the appropriateness for specific tasks. ● Learners will add multimedia components and visual, and/or audio displays to enhance the development of the main ideas of their research.
Vocabulary: **Research:** the collecting of information about a particular subject **Encyclopedia**: a book or set of books giving information on many subjects or on many aspects of one subject and typically arranged alphabetically. **Almanac:** a usually annual publication containing statistical, tabular, and general information **Database**: a collection of data that is organized especially to be used by a computer **Keywords:** a word of interest or importance **Search Engine:** a site on the World Wide Web that uses computer software to locate key words in other sites **Sources**: a person or a publication that supplies information **Bibliography:** a list of writings about a subject or author or by an author **Index:** an alphabetical list in a printed work that gives with each item listed the page number where it may be found **Glossary:** list of the hard or unusual words found in a book **Plagiarism:** using someone's words without giving them credit **Summarize:** covering the main points briefly **Copyright:** the date a work or source was published or accessed by a	**Resources:** Various nonfiction print materials in the IMC World Book Online PebbleGo! World Almanac for Kids POWER Library BrainPOP/ BrainPOP Jr.

user **Definition sources**: *Merriam-Webster for Kids* and teacher created	
Assessments: Student projects will be graded with a rubric.	

Grade, Subject: 4, Library/ Technology	
Unit Name: Digital Citizenship (Library)	___X___ Essential _____ Important _____ Compact
Big Idea: Learners demonstrate safe, legal, and ethical creation and sharing of knowledge products both with support and independently white engaging in a community of practice and an interconnected world.	**Length/Duration of Unit**: 4 class periods
PA Content Standards: **Business Computer Information Technology (BCIT) 15.3 Communication** **Standard - 15.3.5.A** Create work product with a variety of formats including note taking, outlines, essays, correspondence, journals and presentations. Reference English Language Arts CC.1.4.2.T, CC.1.4.5.F, CC.1.4.5.L, CC.1.4.5.R **Standard - 15.3.5.E** Distinguish between age appropriate and inappropriate print and electronic resources used for introductory research. Reference English Language Arts CC.1.4.5.U **Standard - 15.3.5.T** Explain the importance of digital citizenship. Reference Business, Computer and Information Technologies 15.4.5.B **BCIT 15.4 Computer and Information Technologies** **Standard - 15.4.5.B** Identify and demonstrate understanding of	**PA Core Standards:** **English Language Arts CC.1.2: Reading Informational Text** **Standard - CC.1.2.4.A** Determine the main idea of a text and explain how it is supported by key details; summarize the text. **English Language Arts CC.1.4: Writing** **Standard - CC.1.4.4.C** Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related to the topic; include illustrations and multimedia when useful to aiding comprehension. **Standard - CC.1.4.4.I** Provide reasons that are supported by facts and details. **Standard - CC.1.4.4.V** Conduct short research projects that build knowledge through investigation of different aspects of a topic. **Standard - CC.1.4.4.W** Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize

ethical, safe, and social online behavior and potential consequences of unethical, unsafe, and inappropriate behavior. **Standard - 15.4.5.L** Discuss the characteristics of a credible website. **AASL Standards Framework for Learners** **IV. Curate** ***Learners act on an information need by:*** IV.A.2 Identifying possible sources of information. IV.A.3 Making critical choices about information sources to use. **VI. Engage** ***Learners follow ethical and legal guidelines for gathering and using information by:*** **VI.A.1** responsibly applying information, technology, and media to learning. **VI.A.2** Understanding the ethical use of information, technology, and media. **VI.B.2** Acknowledging authorship and demonstrating respect for the intellectual property of others.	information, and provide a list of sources. **English Language Arts CC.1.5 Speaking and Listening** **Standard - CC.1.5.4.B** Paraphrase portions of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.
<u>Essential Questions</u>: ● How do learners follow ethical, responsible, safe, and legal guidelines for gathering, creating and sharing information, technology, and media? ● How do learners use valid information and reasoned conclusions to make ethical decisions in creating new knowledge? ● How do learners engage with information to extend their personal learning?	**<u>Understandings (SWKT…)</u>:** Students will understand that… ● good digital citizens use apps and websites approved by trusted adults, use their own ideas and words, evaluate websites for appropriateness, keep personal information private, and are aware and cautious of their digital footprint. ● digital tools can be used to work with others and create a unique product. ● the internet is a valuable resource where factual information can be found, evaluated for usefulness and credibility, and applied to learning.
<u>Knowledge:</u> ● When someone makes something on their own, they are a creator. ● When a creator uses someone else's product (an article, an image, a song, etc.) they need to give credit ● Characteristics of age appropriate websites ● Content used from the internet or print materials requires proper citation in a bibliography	**<u>Skills (SWBAT…)</u>:** ● Properly cite resources used in a bibliography using MLA format. ● Explain the importance of following copyright guidelines ● Demonstrate and apply grade-level appropriate note taking skills, including paraphrasing, summarizing, and direct quotations from a resource.

• Web resources require evaluation for usefulness and credibility • Collaborative technologies can be used to work with others, including peers, experts, or community members	
Vocabulary: **Attribute:**To give credit to the person who created something, such as listing the author's name and the date, or a citation. **Copyright: (©)**: legal protection that creators have over the things they create **Plagiarism:** Use of someone's creative work without attribution. **Bibliography:** a list of writings about a subject or author or by an author **Citation:** A way of giving credit when certain material in your work came from another source. **Definition Sources:** *Merriam-Webster for Kids*, University of Washington	**Resources:** • CommonSense Media • BrainPop • Nonfiction books from library collection • World Book Online Database • PebbleGO! Online Database • Teacher selected websites that relate to topics being researched
Assessments: Student Projects will be graded with Rubrics	

Grade, Subject: 4, Library/Technology	
Unit Name: Engineering	__X__ Essential _____ Important _____ Compact
Big Idea: Students will learn how to use the engineering design process to solve problems. Students will think about how technology impacts daily lives.	**Length/Duration of Unit**: 15 class periods
PA Content Standards:	

Grades 3–5: Science, Technology & Engineering, and Environmental Literacy & Sustainability Academic (STEELS) Standards

3.5.3-5.A: Use appropriate symbols, numbers, and words to communicate key ideas about technological products and systems.
3.5.3-5.B: Examine information to assess the trade-offs to using a product or system.
3.5.3-5.C: Follow directions to complete a technological task.
3.5.3-5.D: Predict how certain aspects of their daily lives would be different without given technologies.
3.5.3-5.E Explain why responsible use of technology requires sustainable management of resources.
3.5.3-5.F: Classify resources used to create technologies as either renewable or nonrenewable.
3.5.3-5.G: Describe the helpful and harmful effects of technology.
3.5.3-5.H: Determine factors that influence changes in a society's technological systems or infrastructure.
3.5.3-5.I: Design solutions by safely using tools, materials, and skills.
3.5.3-5.J: Explain how technologies are developed or adapted when individual or societal needs and wants change.
3.5.3-5.K: Judge technologies to determine the best one to use to complete a given task or meet a need.
3.5.3-5.L: Demonstrate how tools and machines extend human capabilities, such as holding, lifting, carrying, fastening, separating, and computing.
3.5.3-5.M: Demonstrate essential skills of the engineering design process.
3.5.3-5.N: Identify why a product or system is not working properly.
3.5.3-5.O: Describe requirements of designing or making a product or system.
3.5.3-5.P: Evaluate the strengths and weaknesses of existing design solutions, including their own solutions.
3.5.3-5.Q: Practice successful design skills.
3.5.3-5.R: Apply tools, techniques, and materials in a safe manner as part of the design process.
3.5.3-5.S: Illustrate that there are multiple approaches to design.
3.5.3-5.T: Apply universal principles and elements of design.
3.5.3-5.U: Evaluate designs based on criteria, constraints, and standards.
3.5.3-5.V: Interpret how good design improves the human condition.
3.5.3-5.W: Describe the properties of different materials.
3.5.3-5.X: Explain how various relationships can exist between technology and engineering and other content areas.
3.5.3-5.Y: Identify the resources needed to get a technical job done, such as people, materials, capital, tools, machines, knowledge, energy, and time.
3.5.3-5.Z: Create a new product that improves someone's life.
3.5.3-5.BB: Illustrate how, when parts of a system are missing, it may not work as planned.
3.5.3-5.CC: Describe how a subsystem is a system that operates as a part of another larger system.
3.5.3-5.DD: Demonstrate how simple technologies are often combined to form more complex systems.
3.5.3-5.EE: Explain how solutions to problems are shaped by economic, political, and cultural forces.
3.5.3-5.FF: Compare how things found in nature differ from things that are human-made, noting differences and similarities in how they are produced and used.
3.5.3-5.GG: Describe the unique relationship between science and technology, and how the natural world can contribute to the human-made world to foster innovation.
3.5.3-5.HH: Differentiate between the role of scientists, engineers, technologists, and others in creating and maintaining technological systems.

Career Education and Work Standards:

13.2. Career Acquisition (Getting a Job)

13.2.5. GRADE 5

E. Apply to daily activities, the essential workplace skills, such as, but not limited to:

- Commitment
- Communication
- Dependability
- Health/safety
- Personal initiative
- Scheduling/time management
- Team building
- Technical literacy
- Technology

Essential Questions:

- How do engineers solve problems?
- What do you do when your solution to a problem doesn't work?
- What factors are involved when developing a solution to a problem?
- What is the relationship between science, technology, and engineering?
- What is the importance of using renewable resources?
- What are the effects of technology?
- Why is knowing about the properties of different materials important?
- How would your daily life be different without various technologies?
- How do you identify why a product or system is not working properly?
- How does knowledge of the natural world and science lead to new technologies and inventions?

Understandings (SWKT…):

- Students will understand that there is a process that engineers use to solve problems.
- Students will understand that there are always limiting factors and trade-offs in any design.
- Students will understand both the differences and similarities between science, technology and engineering.
- Students will understand that sometimes there are both helpful and harmful effects of technology.
- Students will understand some technology comes from understanding how something in nature works
- Students will understand that knowing the properties of different materials is important to be able to apply them to various uses.

Knowledge:

- Students will know that engineers use the engineering design process to solve problems.
- Students will know the difference between science and engineering.
- Students will know that engineering is the use of science and technology to design and create products and processes to aid society.
- Students will know the types of things that are created by engineers.
- Students will know the difference between renewable and nonrenewable resources.
- Students will know how to follow visual and written directions to create a functioning system.
- Students will know that when part of a system is missing the system may not work correctly.

Skills (SWBAT…):

- Students will be able to use the Engineering Design Process to solve design challenges.
- Students should be able to work as a team to test, evaluate and improve solutions.
- Students will be able to make sketches to communicate their designs.
- Students will practice troubleshooting to fix a system if it is not working properly.
- Students will follow visual and written directions to create a functioning system.
- Students will be able to identify why a system is not working properly.
- Students will communicate their idea for a design through sketches and CAD.

Vocabulary:

- technology - Technology is the use of knowledge to invent new devices or tools.
- system - a group of interrelated components that when put together achieve a desired goal
- Engineering - the application of science and math to solve problems
- Engineering Design Process - steps to follow when working on a project or solving a problem
- trade-off - a compromise when it is not possible to have everything that is desired in a solution
- prototype - a first working model which can be tested to see if it works
- iteration - repeating the design process to continuously improve a design
- ideation - coming up with ideas
- constraints - limitations or a restrictions on a design (Examples: time, cost, and materials)
- criteria - the requirements that must be met (A design is only successful if all the criteria are met.)
- scale model - A smaller or larger version of something that is proportionally correct

Resources:

Videos:

- BrainPOP
- BrainPOP Jr.
- YouTube

Websites:

- Teach Engineering Website
- TEEAP Website
- ITEEA Website

Snap Circuits Kits

CAD / 3D Modeling Applications:

- Tinkercad
- SketchUp for Schools

● mockup (mock-up) - a non-working model of a design used for teaching, demonstration, design evaluation, and/or promotion ● aesthetic - relating to how nice something looks ● sketch - rough drawing representing the main features of an object or scene ● circuit - a complete path for electricity to flow through, also referred to as a closed circuit ● open circuit - when electricity cannot flow through the circuit usually due to a switch opening up the circuit or a disconnected or broken wire ● short circuit - A short circuit is a condition in an electrical circuit where the electrical current flows through an unintended, shorter pathway instead of following the circuit. ● conductor - a substance or material that allows electricity to flow through it. ● insulator - A material or an object that does not easily allow electricity to pass through it ● resistor - an electrical component that limits the flow of electricity. Some resistors are used to intentionally generate heat or light such as the filament in a light bulb, and the heating elements in an electric oven, cooktop burners, or toaster ● switch - device for opening and closing electrical circuits ● terminals - the positive and negative ends of the battery or power source ● load - any component of a circuit that consumes power or energy. Light bulbs, motors, and buzzers are all examples of a load. ● battery - a device that stores chemical energy, and converts it to electricity	
Assessments: Student projects will be graded with teacher created rubrics.	

Grade, Subject: 4, Library/Technology	
Unit Name: Coding	
Big Idea: Students will learn the basics of coding to complete a task.	**Length/Duration of Unit**: 6 class periods

PA Content Standards:

Grades 3–5: Science, Technology & Engineering, and Environmental Literacy & Sustainability Academic (STEELS) Standards

3.5.3-5.A Use appropriate symbols, numbers and words to communicate key ideas about technological products and systems.
3.5.3-5.B Examine information to assess the trade-offs of using a product or system.
3.5.3-5.C Follow directions to complete a technological task.
3.5.3-5.D Predict how certain aspects of their daily lives would be different without given technologies.
3.5.3-5.G Describe the helpful and harmful effects of technology.
3.5.3-5.H Determine factors that influence changes in a society's technological systems or infrastructure.
3.5.3-5.I Design solutions by safely using tools, materials, and skills.
3.5.3-5.J Explain how technologies are developed or adapted when individual or societal needs and wants change.
3.5.3-5.K Judge technologies to determine the best one to use to complete a given task or meet a need.
3.5.3-5.L Demonstrate how tools and machines extend human capabilities, such as holding, lifting, carrying, fastening, separating, and computing.
3.5.3-5.N Identify why a product or system is not working properly.
3.5.3-5.O Describe requirements of designing or making a product or system.
3.5.3-5.P Evaluate the strengths and weaknesses of existing design solutions, including their own solutions.
3.5.3-5.R Apply tools, techniques, and materials in a safe manner as part of the design process.
3.5.3-5.S Illustrate that there are multiple approaches to design.
3.5.3-5.T: Apply universal principles and elements of design.
3.5.3-5.U Evaluate designs based on criteria, constraints, and standards.
3.5.3-5.Y Identify the resources needed to get a technical job done, such as people, materials, capital, tools, machines, knowledge, energy, and time.
3.5.3-5.Z Create a new product that improves someone's life.
3.5.3-5.BB Illustrate how, when parts of a system are missing, it may not work as planned.
3.5.3-5.CC Describe how a subsystem is a system that operates as a part of another larger system.
3.5.3-5.DD Demonstrate how simple technologies are often combined to form more complex systems.
3.5.3-5.EE Explain how solutions to problems are shaped by economic, political, and cultural forces.
3.5.3-5.HH Differentiate between the role of scientists, engineers, technologists, and others in creating and maintaining technological systems.

In January 2018 the Pennsylvania State Board of Education endorsed the Computer Science Teachers Association (CTSA) K-12 standards Opens In A New Window.

CSTA K–12 CS Standards
Level 1B: Grades 3-5 (Ages 8-11)

Computing Systems
1B-CS-01: Describe how internal and external parts of computing devices function to form a system.
1B-CS-02: Model how computer hardware and software work together as a system to accomplish tasks.
1B-CS-03: Determine potential solutions to solve simple hardware and software problems using common troubleshooting strategies.
1B-NI-04: Model how information is broken down into smaller pieces, transmitted as packets through multiple devices over networks and the Internet, and reassembled at the destination.
1B-NI-05: Discuss real-world cybersecurity problems and how personal information can be protected.

Data and Analysis
1B-DA-06: Organize and present collected data visually to highlight relationships and support a claim.
1B-DA-07: Use data to highlight or propose cause-and-effect relationships, predict outcomes, or communicate an idea.

Algorithms and Programming
1B-AP-08: Compare and refine multiple algorithms for the same task and determine which is the most appropriate.
1B-AP-09: Create programs that use variables to store and modify data.
1B-AP-10: Create programs that include sequences, events, loops, and conditionals.
1B-AP-11: Decompose (break down) problems into smaller, manageable subproblems to facilitate the program development process.
1B-AP-12: Modify, remix, or incorporate portions of an existing program into one's own work, to develop something new or add more advanced features.
1B-AP-13: Use an iterative process to plan the development of a program by including others' perspectives and considering user preferences.
1B-AP-14: Observe intellectual property rights and give appropriate attribution when creating or remixing programs.
1B-AP-15: Test and debug (identify and fix errors) a program or algorithm to ensure it runs as intended.
1B-AP-16: Take on varying roles, with teacher guidance, when collaborating with peers during the design, implementation, and review stages of program development.
1B-AP-17: Describe choices made during program development using code comments, presentations, and demonstrations.

Impacts of Computing
1B-IC-18: Discuss computing technologies that have changed the world, and express how those technologies influence, and are influenced by, cultural practices.
1B-IC-19: Brainstorm ways to improve the accessibility and usability of technology products for the diverse needs and wants of users.
1B-IC-20: Seek diverse perspectives for the purpose of improving computational artifacts.

1B-IC-21: Use public domain or creative commons media, and refrain from copying or using material created by others without permission.

Career Education and Work Standards:

13.2. Career Acquisition (Getting a Job)

13.2.5. GRADE 5

E. Apply to daily activities, the essential workplace skills, such as, but not limited to:

- Commitment
- Communication
- Dependability
- Health/safety
- Personal initiative
- Scheduling/time management
- Team building
- Technical literacy
- Technology

Essential Questions:	**Understandings (SWKT…):**
● How can technology be used to improve our lives? ● How are computer programs created?	● Students will understand the fundamentals of computer programming. ● Students will understand that coding is how applications are created.
Knowledge:	**Skills (SWBAT…):**
● Students will know that an algorithm is a set of step-by-step instructions to solve a problem. ● Students will know that sequencing is the specific order in which instructions have to be performed in an algorithm. ● Students will know that coding is how applications are created. ● Students will know that debugging is how you find errors in code.	● Students will be able to create an algorithm. ● Students will be able to code a program using block coding. ● Students will be able to troubleshoot why their code doesn't work through debugging.

Vocabulary:

Coding Vocabulary

- code - Code is the instructions in a program that tell computers what to do.
- coding - Coding is giving a computer instructions or a program to perform a specific task. You may also hear coding referred to as software programming, computer programming, or programming.
- sequence - a set of instructions in a specific order
- algorithm - a detailed, step-by-step process followed to accomplish a specific task or to solve a specific problem.
- program - a list of steps that can be completed by a machine. Programs are used to form applications.
- application (app) - a program or software designed for a particular purpose. Applications are designed for end users.
- programming - the act of creating a program. It is also called coding.
- decomposition - breaking a problem down into smaller more manageable pieces
- bug - an error in a program
- debugging - finding and fixing problems in a program
- loop - the action of doing something over and over again
- repeat - to do something again

Scratch Vocabulary

- stage - where your project is displayed when active
- backdrop - the background displayed on your Scratch stage
- sprite = the objects on the Scratch stage that performs actions
- costume = used to animate or change the appearance of the sprite in your game or story
- events - events activate scripts which allow them to run
- conditionals - Conditionals are statements that are only executed when a certain condition is met. An example of this is an if-statement.
- operators - support for mathematical and logical expressions
- data - storing, retrieving, and updating values

Resources:

Videos:

- BrainPOP
- BrainPOP Jr.
- YouTube

Applications:

- Scratch
- EdScratch
- SAM Studio

Websites:

- code.org

Assessments:
Student projects will be graded with teacher created rubrics.

Elizabethtown Area School District Curriculum Date Adopted:

Grade, Subject: 4, Library/Technology	
Unit Name: Online Safety (Technology)	__X__ Essential _____ Important _____ Compact
Big Idea: Students will use technology safely and responsibly.	**Length/Duration of Unit**: 3 class periods

PA Content Standards:

Grades 3–5: Science, Technology & Engineering, and Environmental Literacy & Sustainability Academic (STEELS) Standards
3.5.3-5.G: Describe the helpful and harmful effects of technology.

Grades 3–5: Business, Computer and Information Technology
15.3.5.M: Apply proper etiquette when using technology.
15.3.5.T: Explain the importance of digital citizenship. Reference Business, Computer and Information Technologies 15.4.5.B
15.4.5.B: Identify and demonstrate understanding of ethical, safe, and social online behavior and potential consequences of unethical, unsafe, and inappropriate behavior.

International Society for Technology in Education (ISTE) 2016 Standards for Students
1.2.b Students engage in positive, safe, legal and ethical behavior when using technology, including social interactions online or when using networked devices.

Essential Questions:	**Understandings (SWKT…):**
● How do you use technology safely and responsibly? ● What are some potential problems with electronic communication? ● Why do you have to be careful about what you post online?	● Students will understand that technology has both helpful and harmful effects. ● Students will understand that they have to be careful online because there are scams designed to trick users into giving out personal information or install malicious software.

	● Students will understand that when communicating electronically it is possible that a message was sent and could be received by people other than the believed sender and recipient. ● Students will understand that there is malicious software and that they have to be careful about where they install software and apps from.
Knowledge: ● Students will know some of the ways technology has been helpful and some of the ways it is/has been harmful. ● Students will know that there are scams designed to trick users into giving out personal information or install malicious software. ● Students will know how to make a strong password and keep their online accounts secure. ● Students will know that there can be situations where they receive a message from a person's account but it may not have actually been sent by someone else. ● Students will know that there can be situations where they send a message to someone but others may also be able to see or read it. ● Students will know that they have to be careful about where they install software and apps from.	**Skills (SWBAT…):** ● Students will demonstrate how to make a strong password. ● Students will be able to use technology in a safe and responsible way.
Vocabulary: Digital Citizenship and Online Safety Vocabulary ● troll - a person who intentionally posts things online to make other people angry or upset ● trustworthy - able to be relied on as honest or truthful ● intellectual property - something that someone creates including written ideas, artwork, designs, photos, videos, music, inventions, etc. ● copyright - law designed to protect the rights of creators so that they can make money and/or benefit from their works called intellectual property ● Phishing - when a person sends a fake text, email, or creates a pop-up message to trick people into sharing their personal information, passwords, or financial information.	**Resources:** Videos: ● BrainPOP ● BrainPOP Jr. ● YouTube

● Social Networking - websites and apps that allow users to communicate, share pictures and information, ask questions, and follow other users or add them as friends. ● privacy - the ability of a person or group of people to hide information about themselves. It is also how people choose what information about themselves they want to share. ● strong password - a password that is not easy to guess and usually contains both uppercase and lowercase letters and special characters ● unsecure website - the connection between the website and your web browser is not encrypted. This means that any information you enter on the website, such as passwords, credit card numbers, or personal information, could potentially be intercepted by a third party ● malware - short for malicious software and it means any program that does harm to a device or steals ● plagiarize - using someone's words without giving them credit	

Assessments:

Student projects will be graded with teacher created rubrics.