**Appendix E: Technology Standards**

**Grades K-2**

The Lindenwold Public Schools believe that technology is most effective when it is part of the learning experience throughout all courses and grades, wherever possible and appropriate. Our teachers aim to help students consider how to select, use, and recommend technologies to accomplish specific objectives and goals related to the curriculum. Our district-wide use of the Google suite gives all stakeholders regular and consistent opportunities to use Google tools as part of our instruction, assessment, collaboration, and documentation practices.

| **Standard** | 8.1 Computer Science |
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| **Topic** | Computing Systems |
| **Grade Level Bands** | **Core Idea** | **Indicator** | **Performance Expectations** |
| **K-2** | Individuals use computing devices to perform a variety of tasks accurately and quickly. Computing devices interpret and follow the instructions they are given literally. | 8.1.2.CS.1 | Select and operate computing devices that perform a variety of tasks accurately and quickly based on user needs and preferences. |
| A computing system is composed of software and hardware. | 8.1.2.CS.2 | Explain the functions of common software and hardware components of computing systems. |
| Describing a problem is the first step toward finding a solution when computing systems do not work as expected | 8.1.2.CS.3 | Describe basic hardware and software problems using accurate terminology |
| **Key activities:*** Introduction to and use of computers/Chromebooks
* Introduction to and use of Google suite of tools including Search, Docs, Slides, Sheets, Forms, Sites, Maps, YouTube, and Photos
* Introduction to and use of Waterford Institute
* Introduction to and use of various Web tools and websites including:
* Bookflix, My Capstone Library, PebbleGo, abcmouse, Starfall, Abcya, Think Central, Discovery Education, Sumdog, PBS Kids, Mobymax, Animal Planet, Learn 360, National Geographic, KahootIt!,  and  Brainpop Jr.
* Introduction to and use of iMovie and Quicktime.
* Introduction to and use of search engines including Google, KidRex, and Kiddle.
* Organize information and data using Smartboard Tools or Smart Exchange Notebook Resources.
* Introduction to and use of iPad or iPhone Apps such as Epic!, Story Kit, Toontastic, Phonics Genius, YodelOh, BugBrainEd, and Lakeshore Apps.
* Introduction to basic hardware and software problems terminology.
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| **Standard** | 8.1 Computer Science |
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| **Topic** | Networks and the Internet |
| **Grade Level Bands** | **Core Idea** | **Indicator** | **Performance Expectations** |
| **K-2** | Computer networks can be used to connect individuals to other individuals, places, information, and ideas. The Internet enables individuals to connect with others worldwide.  | 8.1.2.NI.1 | Model and describe how individuals use computers to connect to other individuals, places, information, and ideas through a network. |
| 8.1.2.NI.2 | Describe how the Internet enables individuals to connect with others worldwide |
| Connecting devices to a network or the Internet provides great benefits, but care must be taken to use authentication measures, such as strong passwords, to protect devices and information from unauthorized access.  | 8.1.2.NI.3 | Create a password that secures access to a device. Explain why it is important to create unique passwords that are not shared with others. |
| 8.1.2.NI.4 | Explain why access to devices need to be secured. |
| **Key Activities:*** Introduction to the various ways to access the internet.
* Students use Google suite of tools to engage in collaborative creation using photos, words, artistic expressions, etc.
* Basics of creating a strong password.
* Introduction to basic internet security.
* Incorporate lessons and various multimedia from Netsmartz.org teaching primary and elementary students about proper “netiquette.”
* Incorporate lessons and various multimedia from Brainpop Jr. to teach students about technology tools and web safety.
* Students will get a Copyright and Fair Use Introduction <https://www.commonsensemedia.org/videos/copyright-and-fair-use-animation>
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| **Standard** | 8.1 Computer Science |
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| **Topic** | Impacts of Computing |
| **Grade Level Bands** | **Core Idea** | **Indicator** | **Performance Expectations** |
| **K-2** | Computing technology has positively and negatively changed the way individuals live and work (e.g., entertainment, communication, productivity tools).  | 8.1.2.IC.1 | Compare how individuals live and work before and after the implementation of new computing technology.  |
| **Key Activities:*** Use Zoom/Google Meet to partner with classrooms abroad and engage in discussion
* Use collaborative and/or competitive interactive digital games for learning
* Use online web resources (ie, KidsPost, DOGO News, CNN Student News, Scholastic News, CBC4Kids, National Geographic for Kids, Discovery Kids, NASA Kids Club, Time for Kids)  to follow global trends and current events around the world.
* Use Podcasts for kids (Radio WIllow Web, Wild Animal Chronicles, Children’s Fun Storytime, Poem of the Day, The Science Show for Kids, Bookwink) to follow current events and engage in literature discussions.
* Research how people lived and worked before technology.
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| **Standard** | 8.1 Computer Science |
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| **Topic** | Data & Analysis |
| **Grade Level Bands** | **Core Idea** | **Indicator** | **Performance Expectations** |
| **K-2** | Individuals collect, use, and display data about individuals and the world around them.  | 8.1.2.DA.1 | Collect and present data, including climate change data, in various visual formats |
| Computers store data that can be retrieved later. Data can be copied, stored in multiple locations, and retrieved.  | 8.1.2.DA.2 | Store, copy, search, retrieve, modify, and delete data using a computing device |
| Data can be used to make predictions about the world. | 8.1.2.DA.3 |  Identify and describe patterns in data visualizations |
| 8.1.2.DA.4 | Make predictions based on data using charts or graphs |
| **Key Activities:*** Introduction to creating graphs/charts in Google Sheets.
* Students will learn how to appropriately save, copy, and delete items from the Google Suite.
* Students will learn how to interpret graphical data in content based examples.
* Lessons on the scientific process and use of digital tools to facilitate the collection, organization, analysis, and sharing of data and findings.
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| **Standard** | 8.1 Computer Science |
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| **Topic** | Algorithms & Programming |
| **Grade Level Bands** | **Core Idea** | **Indicator** | **Performance Expectations** |
| **K-2** | Individuals develop and follow directions as part of daily life. A sequence of steps can be expressed as an algorithm that a computer can process. | 8.1.2.AP.1 | Model daily processes by creating and following algorithms to complete tasks |
| Real world information can be stored and manipulated in programs as data (e.g., numbers, words, colors, images). | 8.1.2.AP.2 | Model the way programs store and manipulate data by using numbers or other symbols to represent information. |
| Computers follow precise sequences of steps that automate tasks | 8.1.2.AP.3: | Create programs with sequences and simple loops to accomplish tasks |
|  | Complex tasks can be broken down into simpler instructions, some of which can be broken down even further.  | 8.1.2.AP.4 | Break down a task into a sequence of steps. |
| People work together to develop programs for a purpose, such as expressing ideas or addressing problems. The development of a program involves identifying a sequence of events, goals, and expected outcomes, and addressing errors (when necessary). | 8.1.2.AP.5: | Describe a program’s sequence of events, goals, and expected outcomes |
| 8.1.2.AP.6 | Debug errors in an algorithm or program that includes sequences and simple loops. |
| **Key Activities:*** Students will create a video to serve as a model for appropriate school and academic behavior.
* Students will create a how-to video in which they break down a simple task into steps.
* Introduction to basic coding.
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| **Standard** | 8.2 Design Thinking |
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| **Topic** | Engineering Design |
| **Grade Level Bands** | **Core Idea** | **Indicator** | **Performance Expectations** |
| **K-2** | Engineering design is a creative process for meeting human needs or wants that can result in multiple solutions  | 8.2.2.ED.1 | Communicate the function of a product or device |
| 8.2.2.ED.2 | Collaborate to solve a simple problem, or to illustrate how to build a product using the design process |
| 8.2.2.ED.3 | Select and use appropriate tools and materials to build a product using the design process. |
| Limitations (constraints) must be considered when engineering designs.  | 8.2.2.ED.4 | Identify constraints and their role in the engineering design process |
| **Key Activities*** Students use Google suite of tools to guide thinking about problems and how to solve them.
* Students will be given an age appropriate engineering task and will use the internet to research and the Google Suite to collaborate with classmates.
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| **Standard** | 8.2 Design Thinking |
| --- | --- |
| **Topic** | Interaction of Technology and Humans  |
| **Grade Level Bands** | **Core Idea** | **Indicator** | **Performance Expectations** |
| **K-2** | Human needs and desires determine which new tools are developed.  | 8.2.2.ITH.1 | Identify products that are designed to meet human wants or needs. |
| 8.2.2.ITH.2 | Explain the purpose of a product and its value. |
| Technology has changed the way people live and work. Various tools can improve daily tasks and quality of life. | 8.2.2.ITH.3 | Identify how technology impacts or improves life. |
| 8.2.2.ITH.4 | Identify how various tools reduce work and improve daily tasks |
| 8.2.2.ITH.5 | Design a solution to a problem affecting the community in a collaborative team and explain the intended impact of the solution. |
| **Key Activities*** Students will research a given invention and identify the human need that it was designed to meet.
* Ongoing use of assistive technology and developing an understanding of which types of accommodations are most effective.
* Students will work in groups to identify a community problem and design an appropriate solution.
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| **Standard** | 8.2 Design Thinking |
| --- | --- |
| **Topic** | Nature of Technology  |
| **Grade Level Bands** | **Core Idea** | **Indicator** | **Performance Expectations** |
| **K-2** | Innovation and the improvement of existing technology involves creative thinking.  | 8.2.2.NT.1 | Model and explain how a product works after taking it apart, identifying the relationship of each part, and putting it back together |
| 8.2.2.NT.2 | Brainstorm how to build a product, improve a designed product, fix a product that has stopped working, or solve a simple problem |
| **Key Activities*** Students will be given an object and will be asked to hypothesize how it works.
* Students will be given a current product on the market and will work collaboratively to improve that product.
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| **Standard** | 8.2 Design Thinking |
| --- | --- |
| **Topic** | Effects of Technology on the Natural World  |
| **Grade Level Bands** | **Core Idea** | **Indicator** | **Performance Expectations** |
| **K-2** | The use of technology developed for the human designed world can affect the environment, including land, water, air, plants, and animals. Technologies that use natural sources can have negative effects on the environment, its quality, and inhabitants. Reusing and recycling materials can save money while preserving natural resources and avoiding damage to the environment. | 8.2.2.ETW.1 | Classify products as resulting from nature or produced as a result of technology |
| 8.2.2.ETW.2 | Identify the natural resources needed to create a product |
| 8.2.2.ETW.3 | Describe or model the system used for recycling technology |
| 8.2.2.ETW.4 | Explain how the disposal of or reusing a product affects the local and global environment |
| **Key Activities*** Introduction to natural versus man-made products.
* Introduction to natural resources.
* Introduction to recycling.
* Consider how design of human civilization affects the environment and vice versa.
* Students will suggest ways in which common school items could be reused.
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| **Standard** | 8.2 Design Thinking |
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| **Topic** | Ethics & Culture |
| **Grade Level Bands** | **Core Idea** | **Indicator** | **Performance Expectations** |
| **K-2** | The availability of technology for essential tasks varies in different parts of the world. | 8.2.2.EC.1 | Identify and compare technology used in different schools, communities, regions, and parts of the world. |
| **Key Activities*** Students will research the cost and availability of the internet in various countries.
* Students can discuss their own experiences with access to technology in their homes.
* Students can compare and contrast how certain tasks (like farming, factory production, etc.) are accomplished in different parts of the world.
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