# STANDARDS PROGRESSION

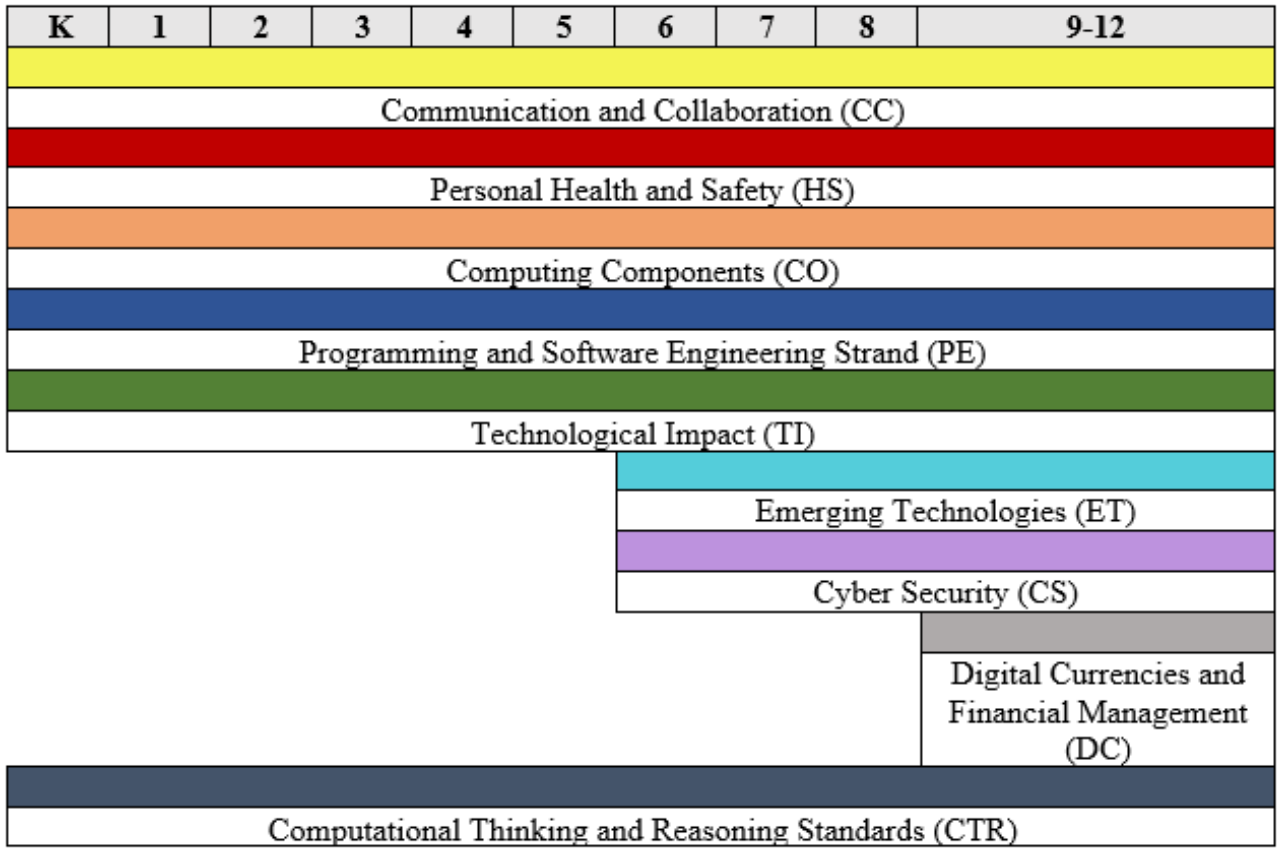
## COMPUTER SCIENCE

FLORIDA DEPARTMENT OF EDUCATION
fldoe.org

# Contents

# Progression of Computer Science Standards and Benchmarks

The table below illustrates Florida's State Academic Standards for Computer Science strands. For each strand in Kindergarten through grade 12, the shaded areas indicate the grade levels where it is addressed. Most of the strands span multiple grade levels, which lends itself to the progression of computer science and the coherence across courses.




Note: This document does not include the examples and clarifications related to each benchmark. These can be found in the Florida's State Academic Standards for Computer Science standards book.

# Vertical and Horizontal Alignment of Computer Science Standards

This document provides a comprehensive overview of the vertical and horizontal alignment of each standard and benchmark within the Florida State Academic Standards for Computer Science across grades K-12. The purpose of this document is to offer a clear, visual representation of how content progresses within and across strands at each grade level, aiding educators in understanding and applying these standards effectively.

The document showcases how content is systematically developed for each grade level and across multiple grade levels to ensure a cohesive and logical learning sequence. The standards progression supports the growth of knowledge and skills as students move through their educational journey.

## Horizontal Alignment

Horizontal alignment refers to the intentional linking of content and skills within a specific grade level or course, across different strands. It ensures that learning experiences are comprehensive and cohesive, with different topics or strands reinforcing one another. Horizontal alignment helps students make connections between different skills and knowledge areas within the same grade. This interconnected learning reinforces comprehension and retention by allowing students to see how different concepts relate to one another. Aligning standards across strands within the same grade level ensures that students are developing a well-rounded set of skills. When horizontal alignment is achieved, students encounter a consistent progression of skills and content throughout their learning experiences in a particular grade level. This consistency helps prevent gaps in learning and reduces redundancy. By connecting content and skills across different strands at the same grade level, students build a strong foundational understanding that prepares them for more complex concepts in subsequent years. Horizontal alignment, therefore, plays a crucial role in providing students with a seamless and integrated learning experience, making it easier for them to draw connections and deepen their understanding of core concepts across strands.

## Vertical Alignment

Vertical alignment refers to the intentional progression of content and skills across multiple grade levels within computer science. It ensures that each grade level builds on the knowledge and skills acquired in previous years while preparing students for future learning. In the context of K-12 computer science education, vertical alignment allows for a systematic approach where the standards have been designed to deepen students' understanding and proficiency over time progressively. Vertical alignment ensures that the skills and concepts taught in earlier grades lay the groundwork for more complex ideas in later grades. This cumulative approach allows students to build their knowledge progressively, making connections between what they have learned previously and new content. Vertical alignment helps educators identify and address any gaps in learning that may have occurred in previous years. By understanding how benchmarks and standards connect across grade levels, educators can tailor instruction to meet the needs of all students, ensuring that everyone is adequately prepared for subsequent material. Vertical alignment fosters long-term skill development by ensuring that essential skills are revisited and expanded upon as students progress through grades. This approach not only strengthens their knowledge but also enhances critical thinking, problem-solving and application skills over time. In summary, vertical alignment is crucial for creating a structured and progressive educational experience that helps students develop a deep and comprehensive understanding of subjects over time. It enhances the effectiveness of instruction and supports student success by ensuring that learning is both intentional and connected across grades.

# Computer Science Standards Progression By Strand

## Communication and Collaboration Strand

| | Standard | Benchmarks | Standard | Benchmarks |
|---|---|---|---|---|
| **Grades 9-12** | ***SC.912.CC.1 Formulate artifacts using collaboration.*** | SC.912.CC.1.1 Evaluate digital modes of communication and collaboration.<br><br>SC.912.CC.1.2 Utilize tools within a project environment to communicate.<br><br>SC.912.CC.1.3 Present information and data using presentation software.<br><br>SC.912.CC.1.4 Create a digital artifact utilizing collaboration, reflection, analysis and iteration. | ***SC.912.CC.2 Defend the use of collaboration to create artifacts.*** | SC.912.CC.2.1 Collaboratively publish information and data to a variety of audiences using digital tools and media-rich resources.<br><br>SC.912.CC.2.2 Assess how collaboration influences the design and development of software artifacts.<br><br>SC.912.CC.2.3 Evaluate program designs and implementations for readability and usability.<br><br>SC.912.CC.2.4 Critique the strengths and weaknesses of a collaborative product. |

| | Standard | Benchmarks | Standard | Benchmarks |
|---|---|---|---|---|
| **Grade 8** | ***SC.8 CC.1 Create a collaborative communication process.*** | SC.8.CC.1.1 Design a digital product.<br><br>SC.8.CC.1.2 Evaluate the benefits of collaboration compared to individual product creation. | ***SC.8.CC.2 Create artifacts using the collaborative process.*** | SC.8.CC.2.1 Publish a digital product individually and collaboratively. |

| | Standard | Benchmarks | Standard | Benchmarks |
|---|---|---|---|---|
| **Grade 7** | ***SC.7 CC.1 Demonstrate the understanding of collaborative tools.*** | SC.7.CC.1.1 Apply multimedia tools for local and global group collaboration. | ***SC.7.CC.2 Synthesize information to create unique artifacts.*** | SC.7.CC.2.1 Organize compiled information using a digital tool. |

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| | | SC.7.CC.1.2 Identify productivity tools for collaboration.<br><br>SC.7.CC.1.3 Identify the individual roles within a collaborative team. | | SC.7.CC.2.2 Analyze one's own ideas with research-based information to create a unique digital artifact. |

| | Standard | Benchmarks | Standard | Benchmarks |
|---|---|---|---|---|
| **Grade 6** | ***SC.6 CC.1 Apply effective communication digitally.*** | SC.6.CC.1.1 Demonstrate an ability to communicate through various online tools. | ***SC.6.CC.2 Apply information collected using digital resources.*** | SC.6.CC.2.1 Create a digital product individually and collaboratively. |

| | Standard | Benchmarks | Standard | Benchmarks |
|---|---|---|---|---|
| **Grade 5** | ***SC.5 CC.1 Demonstrate effective communication.*** | SC.5.CC.1.1 Identify appropriate and inappropriate uses of technology for communication with others.<br><br>SC.5.CC.1.2 Demonstrate ways with or without technology that collaborating with others can support problem solving.<br><br>SC.5.CC.1.3 Revise and refine thinking based on peer feedback. | ***SC.5.CC.2 Utilize information gathered using digital resources.*** | SC.5.CC.2.1 Research and use information gathered from digital resources.<br><br>SC.5.CC.2.2 Support ideas using collected evidence through research. |

| | Standard | Benchmarks | Standard | Benchmarks |
|---|---|---|---|---|
| **Grade 4** | ***SC.4 CC.1 Demonstrate effective communication both individually and collaboratively*** | SC.4.CC.1.1 Demonstrate ways that technology can foster teamwork.<br>SC.4.CC.1.2 Demonstrate collaboration and problem-solving.<br><br>SC.4.CC.1.3 Discuss ways that collaboration can lead to innovation. | ***SC.4.CC.2 Evaluate digital information resources.*** | SC.4.CC.2.1 Gather information from digital resources.<br><br>SC.4.CC.2.2 Organize information from digital resources. |

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| | | SC.4.CC.1.4 Explain why providing and receiving feedback from others can improve performance for projects.<br><br>SC.4.CC.1.5 Compare different communication technologies. | | |
| | **Standard** | **Benchmarks** | **Standard** | **Benchmarks** |
| **Grade 3** | ***SC.3.CC.1 Assess how communication and collaboration are beneficial.*** | SC.3.CC.1.1 Describe how collaborating with others can be beneficial to a project.<br><br>SC.3.CC.1.2 Use feedback from peers to make revisions using technology.<br><br>SC.3.CC.1.3 Explain that searches may be enhanced by key terms.<br><br>SC.3.CC.1.4 Describe how computer simulations can help communicate ideas in concepts or problem-solving. | ***SC.3.CC.2 Identify uses of technology and responsible uses of modern communication.*** | SC.3.CC.2.1 Identify uses of technology when sending communication over the Internet.<br><br>SC.3.CC.2.2 Describe responsible uses of modern communication media and devices. |
| | **Standard** | **Benchmarks** | | |
| **Grade 2** | ***SC.2.CC.1 Communicate information with digital tools.*** | SC.2.CC.1.1 Describe the similarities and differences among the Internet, websites and online applications. | | |

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| | | SC.2.CC.1.2 Describe the similarities and differences between the Internet, websites and applications.<br><br>SC.2.CC.1.3 Complete basic keyword searches.<br><br>SC.2.CC.1.4 Identify concepts illustrated by a simple simulation. |

| | Standard | Benchmark |
|---|---|---|
| **Grade 1** | ***SC.1.CC.1 Communicate information both individually and collaboratively.*** | SC.1.CC.1.1 Communicate and collaborate with teachers and other students with and without the use of technology. |

| | Standard | Benchmark |
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| **Kindergarten** | ***SC.K.CC.1 Develop an understanding of collaborative conversations.*** | SC.K.CC.1.1 Provide positive feedback. |

## Personal Health and Safety Strand

| | Standard | Benchmarks | Standard | Benchmarks | Standard | Benchmarks |
|---|---|---|---|---|---|---|
| Grades 9-12 | ***SC.912.HS.1. Design a personalized plan for Internet practices.*** | SC.912.HS.1.1 Identify potential dangers to an individual's safety and security online.<br><br>SC.912.HS.1.2 Evaluate the consequences of cyberbullying.<br><br>SC.912.HS.1.3 Determine the consequences of inaction when witnessing unsafe Internet practices.<br><br>SC.912.HS.1.4 Examine the positive outcomes when someone reports suspicious behavior on the Internet.<br><br>SC.912.HS.1.5 Evaluate the risks to personal information while accessing the Internet.<br><br>SC.912.HS.1.6 Describe the impact | ***SC.912.HS.2 Research and revise the effects of digital device use.*** | SC.912.HS.2.1 Prioritize screen time to regulate the use of electronic devices for mental and physical well-being.<br><br>SC.912.HS.2.2 Investigate the correlation between sedentary behavior and digital device use.<br><br>SC.912.HS.2.3 Assess the role of digital health trackers in promoting healthy behaviors.<br><br>SC.912.HS.2.4 Analyze the relationship between eye strain in relation to the use of technology.<br><br>SC.912.HS.2.5 Research the consequences associated with Nature Deficit Disorder (NDD). | ***C.912.HS.3 Assess digital footprints.*** | SC.912.HS.3.1 Discuss the permanency of data on the Internet.<br><br>SC.912.HS.3.2 Analyze how social media influences behavior. |

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| | | of permissible privacy and security.<br><br>SC.912.HS.1.7 Construct strategies to combat cyberbullying or online harassment. | | | | |
| | **Standard** | **Benchmarks** | **Standard** | **Benchmarks** | **Standard** | **Benchmarks** |
| **Grade 8** | ***SC.8.HS.1 Implement safe and healthy Internet practices.*** | SC.8.HS.1.1 Describe the impacts of the presence of technology and the lack of technology on everyday life.<br><br>SC.8.HS.1.2 Develop procedures to protect personal information while accessing the Internet.<br><br>SC.8.HS.1.3 Model a procedure to mitigate risks to personal safety while accessing the Internet. | ***SC.8.HS.2 Analyze the mental and physiological effects of digital device use.*** | SC.8.HS.2.1 Determine the association between hand-eye coordination and the use of digital devices.<br><br>SC.8.HS.2.2 Investigate the causes of headaches associated with digital device usage.<br>SC.8.HS.2.3 Investigate the causes of physical body changes due to device usage.<br><br>SC.8.HS.2.4 Identify the effects on cognitive function as a result of technology use. | ***SC.8.HS.3 Analyze the impact of digital footprints.*** | SC.8.HS.3.1 Discuss how regulating the use of digital media and communication is important for mental and physical well-being.<br><br>SC.8.HS.3.2 Analyze how digital media and communication influence behavior. |

| | Standard | Benchmarks | Standard | Benchmarks | Standard | Benchmarks |
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| **Grade 7** | ***SC.7.HS.1. Analyze Internet practices.*** | SC.7.HS.1.1 Explain the possible consequences of cyberbullying.<br><br>SC.7.HS.1.2 Discuss the impact of online disinhibition on individuals and society.<br><br>SC.7.HS.1.3 Interpret writings and communications using terminology.<br><br>SC.7.HS.1.4 Categorize potential dangers to an individual's safety and security.<br><br>SC.7.HS.1.5 Recognize the importance of reporting suspicious behavior encountered on the Internet.<br><br>SC.7.HS.1.6 Compare the risks and benefits of accessing the Internet.<br><br>SC.7.HS.1.7 Examine safe practices for technology use. | ***SC.7.HS.2. Explain the mental and physiological effects of digital device use.*** | SC.7.HS.2.1 Identify the digital practices that may affect your physical and mental well- being. | ***SC.7.HS.3. Discuss the impact of digital footprints.*** | SC.7.HS.3.1 Discuss how device usage can affect sleeping patterns.<br><br>SC.7.HS.3.2 Discuss the potential risks of device addiction and how to prevent it.<br><br>SC.7.HS.3.3 Explain the possible consequences of cyberbullying and inappropriate use of digital media and communication on personal life and society. |

| | Standard | Benchmarks | Standard | Benchmarks | Standard | Benchmarks |
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| **Grade 6** | ***SC.6.HS.1. Explore safe Internet practices.*** | SC.6.HS.1.1 Identify the connection between strong passwords and Internet safety.<br><br>SC.6.HS.1.2 Discuss the need for downloads to come from trusted sources.<br><br>SC.6.HS.1.3 Describe safe practices when participating in digital communication.<br><br>SC.6.HS.1.4 Evaluate a given website to determine if it is safe for users. | ***SC.6.HS.2. Investigate the mental and physiological effects of digital device use.*** | SC.6.HS.2.1 Define the online disinhibition effect.<br><br>SC.6.HS.2.2 List negative impacts of excessive device usage.<br><br>SC.6.HS.2.3 Implement the 20-20-20 rule for technology. | ***SC.6.HS.3 Explore the impact of digital footprints.*** | SC.6.HS.3.1 Explore the impact that digital media and communication has on our behavior. |

| | Standard | Benchmarks | Standard | Benchmarks | Standard | Benchmarks |
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| **Grade 5** | ***SC.5.HS.1. Implement safe and healthy Internet practices in-home or educational settings.*** | SC.5.HS.1.1 Discuss the importance of a search engine's safe-search feature.<br><br>SC.5.HS.1.2 Describe the role that parental digital monitoring programs play in Internet safety.<br><br>SC.5.HS.1.3 Describe threats to safe and efficient use of electronic devices. | ***SC.5.HS.2. Discuss the mental and physiological effects of digital device use.*** | SC.5.HS.2.1 Define the 20-20-20 rule for technology.<br><br>SC.5.HS.2.2 Discuss ways to counteract digital fatigue. | ***SC.5.HS.3 Discuss the impact of digital media and communication.*** | SC.5.HS.3.1 Explain the impact of digital media, communication and the consequences of cyberbullying and harassment. |

| | Standard | Benchmarks | Standard | Benchmarks |
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| **Grade 4** | ***SC.4.HS.1. Practice safe and healthy Internet practices.*** | SC.4.HS.1.1 Discuss what makes websites and applications appropriate for use at school.<br><br>SC.4.HS.1.2 Discuss how websites and applications can be utilized for different purposes.<br><br>SC.4.HS.1.3 Evaluate the permanence of content posted online.<br><br>SC.4.HS.1.4 Identify the legal and social consequences of cyberbullying. | ***SC.4.HS.2. Explore the mental and physiological effects of digital device use.*** | SC.4.HS.2.1 Identify the impact of digital device usage on behavior. |

| | Standard | Benchmarks | Standard | Benchmarks |
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| **Grade 3** | ***SC.3.HS.1 Determine safe and healthy Internet practices.*** | SC.3.HS.1.1 Discuss the need for parental control settings on network-capable devices.<br><br>SC.3.HS.1.2 Discuss why some sites or games have age requirements. | ***SC.3.HS.2. Explain healthy digital practices.*** | SC.3.HS.2.1 Explore ways to balance movement and screen time.<br><br>SC.3.HS.2.2 Demonstrate the use of healthy digital habits. |

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| | | SC.3.HS.1.3 Explain what actions should be taken if students are either victims or witnesses of cyberbullying or harassment. | | |
| | **Standard** | **Benchmarks** | **Standard** | **Benchmarks** |
| **Grade 2** | ***SC.2.HS.1 Determine safe and unsafe Internet practices.*** | SC.2.HS.1.1 Identify examples of safe and unsafe online communications.<br><br>SC.2.HS.1.2 Demonstrate why personal or family member login usernames, passcodes, passwords and secure logins should not be shared with other people.<br><br>SC.2.HS.1.3 Discuss the difference between weak and strong passwords.<br><br>SC.2.HS.1.4 Recognize that digital content posted online should have the consent of the subject. | ***SC.2.HS.2. Discuss the development of healthy digital practices.*** | SC.2.HS.2.1 Identify healthy digital use habits.<br><br>SC.2.HS.2.2 Identify if there is a need to reduce screen time and how that can be done. |

| | Standard | Benchmarks | Standard | Benchmarks |
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| **Grade 1** | ***SC.1.HS.1 Determine and explain safe and healthy Internet practices.*** | SC.1.HS.1.1 Define and recognize the risks of Internet usage.<br><br>SC.1.HS.1.2 Explain the need for adult permission before using a network-capable device.<br><br>SC.1.HS.1.3 Recognize why student identification is considered secure information. | ***SC.1.HS.2 Discuss how the use of digital devices can affect your health.*** | SC.1.HS.2.1 Define and discuss what makes a healthy balance between unplugged activities and time spent on a digital device. |

| | Standard | Benchmarks | Standard | Benchmarks |
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| **Kindergarten** | ***SC.K.HS.1 Determine safe Internet practices.*** | SC.1.HS.1.1 Determine the risks of Internet usage.<br><br>SC.K.HS.1.2 Explore the need for adult permission before using a network-capable device.<br><br>SC.K.HS.1.3 Discuss that a password helps protect the privacy of information. | ***SC.K.HS.2 Explore how the use of digital devices can affect your health.*** | SC.K.HS.2.1 Explore the impact that technology has on the senses.<br><br>SC.K.HS.2.2 Explore how to create a healthy balance between physical activity and time spent on a digital device. |

SC.K.HS.1.4 Explain that some information is private and should not be shared online or in person.

## Computing Components Strand

| | Standard | Benchmarks | Standard | Benchmarks | Standard | Benchmarks |
|---|---|---|---|---|---|---|
| **Grades 9-12** | ***SC.912.CO.1 Reflect mastery of foundational computer literacy and fluency skills.*** | SC.912.CO.1.1 Describe the efficiency and effectiveness of digital tools or resources used for real-world tasks.<br><br>SC.912.CO.1.2 Identify and select the file format based on trade-offs.<br><br>SC.912.CO.1.3 Select and use the correct file type for specific tasks.<br><br>SC.912.CO.1.4 Describe the relationship between drivers, hardware and operating systems.<br><br>SC.912.CO.1.5 Describe the organization of a computer and its principal components.<br><br>SC.912.CO.1.6 Develop and evaluate criteria for purchasing or upgrading computer system hardware.<br><br>SC.912.CO.1.7 Describe the process of protecting computer hardware from exploitation. | ***SC.912.CO.2 Construct varying hardware configurations.*** | SC.912.CO.2.1 Explore the function of Basic Input/Output System (BIOS) and Unified Extensible Firmware Interface (UEFI) in a computer.<br><br>SC.912.CO.2.2 Explore motherboard variations.<br><br>SC.912.CO.2.3 Discuss the central processing unit (CPU).<br><br>SC.912.CO.2.4 Explore the role of a power supply unit (PSU) in relation to a computer system.<br><br>SC.912.CO.2.5 Analyze the purpose of various random-access memory (RAM) speeds and storage sizes.<br><br>SC.912.CO.2.6 Analyze hardware | ***SC.912.CO.3 Utilize various software components to create computational artifacts.*** | SC.912.CO.3.1 Analyze various operating systems.<br><br>SC.912.CO.3.2 Develop criteria for selecting software when solving a specific real-world problem.<br><br>SC.912.CO.3.3 Examine the difference between Operating System (OS) software and Application software.<br><br>SC.912.CO.3.4 Explain how automated software testing can reduce the cost of the testing effort. |

SC.912.CO.1.8 Describe how the Internet facilitates global communication.

SC.912.CO.1.9 Evaluate the accuracy, relevance, comprehensiveness and bias of electronic information resources.

compatibility issues between industry specific devices.

SC.912.CO.2.7 Evaluate various forms of input and output (IO).

SC.912.CO.2.8 Evaluate the basic components of wired computer networks.

SC.912.CO.2.9 Evaluate the basic components of wireless computer networks.

SC.912.CO.2.10 Explore the components of a data packet.

SC.912.CO.2.11 Investigate the issues that impact network functionality.

SC.912.CO.2.12 Describe common network protocols.

SC.912.CO.2.13
Discern how common network protocols are applied by client-server and peer-to-peer networks.

SC.912.CO.2.14
Explore the role of dynamic host control protocol (DHCP) in a networking system.

SC.912.CO.2.15
Analyze the importance of subnetting.

SC.912.CO.2.16
Describe how devices are identified on a network.

SC.912.CO.2.17
Identify similarities and differences between Internet protocol versions.

SC.912.CO.2.18
Examine 2.4 gigahertz (GHz) and 5 gigahertz (GHz) wireless networks.

| | Standard | Benchmarks | Standard | Benchmarks | Standard | Benchmarks |
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| **Grade 8** | ***SC.8.CO.1 Demonstrate foundational computer literacy fluency.*** | SC.8.CO.1.1 Integrate information from multiple file formats into a single artifact.<br><br>SC.8.CO.1.2 Create a collaborative project utilizing an online digital application. | ***SC.8.CO.2 Explore hardware compatibility requirements.*** | SC.8.CO.2.1 Explain how to disassemble or reassemble a desktop computer.<br><br>SC.8.CO.2.2 Explore different hardware specifications and their impact on the performance of the computer.<br><br>SC.8.CO.2.3 Identify the major components of a network. | ***SC.8.CO.3 Explore software compatibility requirements.*** | SC.8.CO.3.1 Compare the benefits and limitations of desktop applications and their complimentary online subscription version. |

| | Standard | Benchmarks | Standard | Benchmarks | Standard | Benchmark |
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| **Grade 7** | ***SC.7.CO.1 Develop foundational computer literacy fluency.*** | SC.7.CO.1.1 Identify the kinds of content associated with different file types.<br><br>SC.7.CO.1.2 Differentiate between different file types.<br><br>SC.7.CO.1.3 Describe the relationship between hardware and software.<br><br>SC.7.CO.1.4 Utilize a set of websites to find information for a given topic. | ***SC.7 CO.2 Draw connections between hardware components.*** | SC.7.CO.2.1 Explain the difference between wired, local area, wireless and mobile networks.<br><br>SC.7.CO.2.2 Identify and describe the function of the main internal parts of a basic computing device.<br><br>SC.7.CO.2.3 Explore devices that contain firmware. | ***SC.7 CO.3 Draw connections between software components.*** | SC.7.CO.3.1 Differentiate between desktop applications and software as a service (SaaS). |

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| | | SC.7.CO.1.5 Utilize government websites to facilitate civic engagement.<br><br>SC.7.CO.1.6 Describe strategies for determining the reliability of resources or information on the Internet. | | SC.7.CO.2.4 Explain the connection of natural resources on the manufacturing of computer hardware components. | | |
| | **Standard** | **Benchmarks** | **Standard** | **Benchmarks** | **Standard** | **Benchmarks** |
| **Grade 6** | ***SC.6.CO.1 Implement foundational computer literacy fluency.*** | SC.6.CO.1.1 Identify multiple file format types.<br><br>SC.6.CO.1.2 Identify applications that have different desktop and online versions.<br><br>SC.6.CO.1.3 Identify the differences between wired and wireless computer networks.<br><br>SC.6.CO.1.4 Describe how information is translated and communicated between computers and devices over a network. | ***SC.6.CO.2. Evaluate hardware components.*** | SC.6.CO.2.1 Identify and describe the major hardware components and functions of computer systems. | ***SC.6.CO.3. Evaluate software components.*** | SC.6.PE.3.1 Describe the essential characteristics of a software artifact.<br><br>SC.6.CO.3.2 Describe the main functions of an operating system.<br><br>SC.6.CO.3.3 Explain how an operating system provides user and system services.<br><br>SC.6.CO.3.4 Describe the major software components and functions of computer systems. |

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| | | SC.6.CO.1.5 Explain that a database is a collection of digital data that can be organized, stored and retrieved in a designated order.<br><br>SC.6.CO.1.6 Research questions using digital information resources. | | | | SC.6.CO.3.5 Evaluate various forms of input and output (IO) and peripheral devices. |
| | **Standard** | **Benchmarks** | **Standard** | **Benchmarks** | **Standard** | **Benchmarks** |
| **Grade 5** | ***SC.5.CO.1 Apply foundational computer literacy skills.*** | SC.5.CO.1.1 Describe the function and purpose of various input/output devices.<br><br>SC.5.CO.1.2 Create a digital project that answers a research question, clearly communicating thoughts and ideas.<br><br>SC.5.CO.1.3 Explore the use of keyboard shortcuts.<br><br>SC.5.CO.1.4 Explore the use of the keyboard with proper finger placement for all rows. | ***SC.5.CO.2 Introduce the concept of hardware components.*** | SC.5.CO.2.1 Identify hardware components in the computation cycle as input, processing, output and storage.<br><br>SC.5.CO.2.2 Troubleshoot hardware problems that may occur during everyday use. | ***SC.5.CO.3 Introduce the concept of software components.*** | SC.5.CO.3.1 Identify software components in the computation cycle as input, processing, output and storage.<br><br>SC.5.CO.3.2 Troubleshoot software problems that may occur during everyday use. |

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| | | SC.5.CO.1.5 Explain how computers access a network and how to effectively troubleshoot.<br><br>SC.5.CO.1.6 Explain how computers can communicate to transfer data. |
| | **Standard** | **Benchmarks** |
| **Grade 4** | ***SC.4.CO.1 Introduce foundational computer literacy skills*** | SC.4.CO.1.1 Demonstrate keyboarding skills for communication.<br><br>SC.4.CO.1.2 Create and edit multimedia artifacts using digital tools.<br><br>SC.4.CO.1.3 Publish multimedia artifacts using digital tools based on feedback.<br><br>SC.4.CO.1.4 Determine whether software can be described as a system or application software.<br>SC.4.CO.1.5 Troubleshoot digital problems that may occur during daily use. |

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| | | SC.4.CO.1.6 Discuss ways computers connect.<br><br>SC.4.CO.1.7 Compare hardware and software. |
| | **Standard** | **Benchmarks** |
| **Grade 3** | ***SC.3.CO.1 Differentiate and evaluate computer components.*** | SC.3.CO.1.1 Classify hardware as input, output, both or neither.<br><br>SC.3.CO.1.2 Use the keyboard of a computer to write short paragraphs or short stories.<br><br>SC.3.CO.1.3 Identify digital tools used for writing activities.<br><br>SC.3.CO.1.4 Identify digital tools for data collection.<br><br>SC.3.CO.1.5 Use digital tools for sharing information.<br><br>SC.3.CO.1.6 Apply self-editing practices to improve accuracy.<br><br>SC.3.CO.1.7 Categorize software based on its main purpose. |

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| | | SC.3.CO.1.8 Introduce how network systems are part of a global communication network. |

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| **Grade 2** | ***SC.2.CO.1 Evaluate computer components.*** | SC.2.CO.1.1 Identify the characteristics of hardware.<br><br>SC.2.CO.1.2 Demonstrate the proper handling of computers and devices.<br><br>SC.2.CO.1.3 Use the keyboard of a computer to write simple sentences.<br><br>SC.2.CO.1.4 Create an audio or video recording.<br><br>SC.2.CO.1.5 Create and present a digital product.<br><br>SC.2.CO.1.6 Explain that a computer program is running when a program or command is executed.<br><br>SC.2.CO.1.7 Identify the characteristics of software. |

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| | | SC.2.CO.1.8 Introduce network system tools and how to determine if they are connected to a network.<br><br>SC.2.CO.1.9 Identify the strength of a network system from the symbol on a computing device. |

| | Standard | Benchmarks |
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| **Grade 1** | ***SC.1.CO.1 Differentiate and utilize computer components.*** | SC.1.CO.1.1 Recognize and operate different types of computer components.<br><br>SC.1.CO.1.2 Create and review projects using digital tools.<br><br>SC.1.CO.1.3 Identify tools that can be used for data collection.<br><br>SC.1.CO.1.4 Identify tools that can be used for sharing information.<br><br>SC.1.CO.1.5 Demonstra te how to complete a task using a digital device. |

SC.1.CO.1.6 Discuss the importance of saving digital work.

SC.1.CO.1.7 Use the keyboard of a computer to write consonant-vowel-consonant (CVC) and consonant-vowel-consonant-e (CVCe) words.

SC.1.CO.1.8 Type a username and password accurately.

SC.1.CO.1.9 Recognize and operate different types of computer applications.

SC.1.CO.1.10 Create multimedia products.
SC.1.CO.1.11 Demonstrate proper care for electronic devices.

| | Standard | Benchmarks |
|---|---|---|
| **Kindergarten** | ***SC.K.CO.1 Identify computer components.*** | SC.K.CO.1.1 Recognize components of computing devices.<br><br>SC.K.CO.1.2 Identify what types of computer components can be used with senses.<br><br>SC.K.CO.1.3 Identify tools used for creative expression.<br><br>SC.K.CO.1.4 Create a project that expresses thoughts and ideas.<br><br>SC.K.CO.1.5 Explore the keyboard of a computer through Consonant-Vowel-Consonant (CVC) words.<br><br>SC.K.CO.1.6 Recognize that universal icons represent tools or information.<br><br>SC.K.CO.1.7 Discuss proper care for electronic devices. |

## Programming and Software Engineering Strand

| | Standard | Benchmarks | Standard | Benchmarks | Standard | Benchmarks | Standard | Benchmarks |
|---|---|---|---|---|---|---|---|---|
| Grades 9-12 | ***SC.912.PE.1 Create, implement and analyze programs that include sequencing, selection and iteration.*** | SC.912.PE.1.1 Write code segments.<br><br>SC.912.PE.1.2 Create iterative and non-iterative structures within a program.<br><br>SC.912.PE.1.3 Create selection structures within a program.<br><br>SC.912.PE.1.4 Write a void function that does not return a value.<br><br>SC.912.PE.1.5 Write a non-void function that will return a value.<br><br>SC.912.PE.1.6 Create a nested array to aggregate data. | ***SC.912.PE.2 Create and analyze data to solve real-world problems.*** | SC.912.PE.2.1 C reate a matrix from connected lists.<br><br>SC.912.PE.2.2 Evaluate the purpose of sublist indexing.<br><br>SC.912.PE.2.3 Compare techniques for analyzing massive data collections. | ***SC.912.PE.3 Apply computational thinking to real-world problems.*** | SC.912.PE.3.1 Evaluate arithmetic expressions using operator precedence.<br><br>SC.912.PE.3.2 D ecompose a problem by defining new code segments.<br><br>SC.912.PE.3.3 Design and implement a simple simulation that is representative of a natural phenomenon.<br><br>SC.912.PE.3.4 Evaluate algorithms by their efficiency, correctness and clarity. | ***SC.912.PE.4 Apply the software development life cycle.*** | SC.912.PE.4.1 Explore software development cycles that can be used to solve problems at different software development stages.<br><br>SC.912.PE.4.2 Develop a software artifact according to a common software development methodology.<br><br>SC.912.PE.4.3 Identify the tools required to develop a program.<br><br>SC.912.PE.4.4 Identify the software environment required to create a program within a specific language. |

SC.912.PE.1.7
Define multiple variables to the same value while utilizing aliasing.

SC.912.PE.1.8
Define a class to store data attributes.

SC.912.PE.1.9
Create methods that a class can inherit.

SC.912.PE.1.10
Write programs that validate user input.

SC.912.PE.1.11
Compare the differences in execution of interpreted and compiled languages.

SC.912.PE.1.12
Classify programming languages.

SC.912.PE.3.5
Differentiate automated testing platforms and their uses.

SC.912.PE.3.6
Explain the different types of testing that can be performed in a complex software system.

SC.912.PE.3.7
Introduce complex problems and understand that these problems may be computationa-lly unsolvable.

SC.912.PE.3.8
Describe the concept of parallel processing as a strategy to solve large problems.

SC.912.PE.4.5
Define user prompts for clarity and usability within a program.

SC.912.PE.4.6
Write a program that utilizes both input and output.

SC.912.PE.4.7
Use internal documentation to collaboratively design a program according to accepted standards.

SC.912.PE.4.8
Create mobile computing applications and/or dynamic web pages using a variety of design and development tools, programming languages and mobile devices/ emulators.

SC.912.PE.1.13 Describe and identify types of programming errors.

SC.912.PE.1.14 Design and implement variables in a program using global and local scope.

SC.912.PE.1.15 Implement a program using an integrated development environment (IDE) commonly used.

SC.912.PE.1.16E xplain the distinction between a programming language's standard library and the Application Programming Interface (API).

SC.912.PE.3.9 Demonstrate concurrency by separating processes into threads of execution and dividing data into parallel streams.

SC.912.PE.3.10 Simplify a complex problem by using abstraction to manage complexity using functions and parameters, classes and methods.

SC.912.PE.3.11 Perform advanced searches to locate information and design a data-collection approach to gather original data.

SC.912.PE.1.17
Examine the building blocks of algorithms.

SC.912.PE.1.18
Develop a computer program.

SC.912.PE.1.19
Review a computer program to verify program functionality, programming styles, program usability and adherence to common programming standards.

SC.912.PE.1.20
Write programs that use standard logic operators.

SC.912.PE.1.21
Use Boolean logic to perform logical operations.

SC.912.PE.3.12
Explain how data analysis is used to enhance the understanding of complex natural and human systems.

SC.912.PE.3.13
Create a computational model that utilizes data to analyze and enhance the understanding of complex natural and human systems.

SC912.PE.3.14
Analyze data by identifying patterns through modeling and simulation of real-world data.

SC.912.PE.1.22
Explain structures and their uses within a program.

SC.912.PE.1.23
Compile, run, test and debug a digital artifact.

SC.912.PE.3.15
Test the accuracy of scientific hypotheses using computer models and simulations.

SC.912.PE.3.16
Design a representation of a computer program.

SC.912.PE.3.17
Test the accuracy of scientific hypotheses using computer models and simulations.

SC.912.PE.3.17
Summarize the differences between an array and an array list.

SC.912.PE.3.18
Explain the principles of cryptography.

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| | | | | | | SC.912.PE.3.19 Determine which encryption method is suitable for an intended task. | | |
| | **Standard** | **Benchmarks** | **Standard** | **Benchmarks** | **Standard** | **Benchmarks** | **Standard** | **Benchmarks** |
| **Grade 8** | ***SC.8.PE.1 Utilize coding segments for a purpose.*** | SC.8.PE.1.1 Use an expression for a specified purpose.<br><br>SC.8.PE.1.2 Create a programming process for decomposing a problem.<br><br>SC.8.PE.1.3 Create a function with parameters.<br><br>SC.8.PE.1.4 Explain the use of iterative structures and their uses as a code segment. | ***SC.8.PE.2 Create and analyze data to solve problems.*** | SC.8.PE.2.1 Select and use applicable data-collection technology.<br><br>SC.8.PE.2.2 Utilize data-collection technology to report results for content-related problems.<br><br>SC.8.CO.2.3 Utilize data from simulations to test hypotheses. | ***SC.8.PE.3 Apply computational thinking to scenario-based problems.*** | SC.8.PE.3.1 Represent natural phenomena using a model.<br><br>SC.8.PE.3.2 Explore the purpose of a class.<br><br>SC.8.PE.3.3 Evaluate the benefits and limitations of the use of models. | ***SC.8.PE.4 Analyze the software development life cycle.*** | SC.8.PE.4.1 Explore the purpose of the software development life cycle.<br><br>SC.8.PE.4.2 Explain the phases of a simple software development life cycle.<br><br>SC.8.PE.4.3 Discuss the role of maintenance in the software development cycle. |

SC.8.PE.1.5
Create an algorithm to solve one or more parts of a decomposed problem.

SC.8.PE.1.6
Create an algorithm that can collect data.

SC.8.PE.1.7
Design an application for a specified purpose.

SC.8.PE.1.8
Recognize different numerical data types.

SC.8.PE.1.9
Design a program that will assist a user with equations using standard mathematical operators.

SC.8.PE.1.10
Create a code segment using iteration.

SC.8.PE.2.4
Perform a variety of operations such as sorting, filtering and searching in a database.

SC.8.PE.2.5
Utilize organized data within a database to solve a problem.

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| | | | | | | SC.7.PE.1.11 Identify the limitations that need to be recognized when creating an algorithm.<br><br>SC.8.PE.1.12 Select an efficient algorithm for a given task based on certain criteria. | | |
| | **Standard** | **Benchmarks** | **Standard** | **Benchmarks** | **Standard** | **Benchmarks** | **Standard** | **Benchmarks** |
| **Grade 7** | ***SC.7.PE.1 Construct coding segments for a purpose.*** | SC.7.PE.1.1 Create a function for a specific purpose.<br><br>SC.7.PE.1.2 Write a code segment that will explore a list using iteration.<br><br>SC.7.PE.1.3 Develop a logical expression using operator precedence. | ***SC.7.PE.2 Use data to make predictions.*** | SC.7.PE.2.1 Predict outputs while showing an understanding of inputs.<br><br>SC.7.PE.2.2 Analyze digital data within a database. | ***SC.7.PE.3 Apply computational thinking to programming.*** | SC.7.PE.3.1 Define parameters for individual and collaborative projects using Boolean logic.<br><br>SC.7.PE.3.2 Modify and create a simulation to analyze and illustrate a concept in depth.<br><br>SC.7.PE.3.3 Use modeling and simulations to | ***SC.7.PE.4 Explain the phases of the software development life cycle.*** | SC.7.PE.4.1 Define the phases of the software development life cycle. |

SC.7.PE.1.4
Develop an arithmetic expression using operator precedence.

SC.7.PE.1.5
Identify the types and uses of variables in a program.

SC.7.PE.1.6
Develop problem solutions using a block programming language.

SC.7.PE.1.7
Create online content using advanced design tools.

SC.7.PE.1.8
Identify different types of programming errors.

SC.8.PE.1.9
Debug a program using iterative development.

test scientific hypotheses.

SC.7.PE.3.4
Define the concept of a class related to object-oriented programming.

SC.7.PE.3.5
Identify the purpose of indexing the order of elements in a list.

SC.7.PE.3.6
Perform program tracing to predict the behavior of programs.

SC.7.PE.3.7
Identify the types and uses of variables in a program.

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| | | SC.8.PE.1.10 Write a code segment that will explore a list using iteration.<br><br>SC.7.PE.1.11 Create iterative and non-iterative structures in a code segment. | | | | | | |
| | Standard | Benchmarks | Standard | Benchmarks | Standard | Benchmarks | Standard | Benchmarks |
| Grade 6 | ***SC.6.PE.1 Develop code segments to solve a problem.*** | SC.6.PE.1.1 Identify the types of operations that can be performed on different data types.<br><br>SC.6.PE.1.2 Develop a program using a string data type.<br><br>SC.6.PE.1.3 Develop a program using a numeric data type. | ***SC.6.PE.2 Create visual representations of data.*** | SC.6.PE.2.1 Create designated graph types using data.<br><br>SC.6.PE.2.2 Analyze a database.<br><br>SC.6.PE.2.3 Create a simple database. | ***SC.6.PE.3 Relate problem-solving strategies to computational thinking.*** | SC.6.PE.3.1 Identify what kinds of real-world problems can be solved using modeling and simulation.<br><br>SC.6.PE.3.2 Interact with content-specific models and simulations to support learning, research and problem-solving. | ***SC.6.PE.4 Define the software development life cycle.*** | SC.7.PE.4.1 Introduce the phases of the software development life cycle. |

SC.6.PE.1.4
Index selected items within a list.

SC.6.PE.1.5
Compare data types and their uses.

SC.6.PE.1.6:
Develop a program using a Boolean data type.

SC.6.PE.1.7
Write code segments that use standard mathematical operators.

SC.6.PE.1.8 Use a function for a specified purpose.

SC.6.PE.1.9 Use looping techniques for a specified purpose.

SC.6.PE.3.3
Design a digital model.

SC.6.PE.3.4
Identify the benefits of the use of models.

SC.6.PE.3.5
Create a visual representation of a solution to a problem.

SC.6.PE.3.6
Evaluate the logical flow of a step-by-step program by acting it out through computer-free activities.

SC.6.PE.3.7
Select tools and technology resources to accomplish a variety of tasks and solve problems.

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| | | SC.6.PE.1.10 Use conditional statements for a specified purpose.<br><br>SC.6.PE.1.11 Design solutions that use repetition and two-way selection. | | | | |
| | **Standard** | **Benchmarks** | **Standard** | **Benchmarks** | **Standard** | **Benchmarks** |
| **Grade 5** | ***SC.5.PE.1 Investigate the uses of computer programs.*** | SC.5.PE.1.1 Explain how computers model intelligent behavior.<br><br>SC.5.PE.1.2 Create, test and modify a program in a graphical environment.<br><br>SC.5.PE.1.3 Create a program using arithmetic operators, conditionals and repetition in programs. | ***SC.5.PE.2 Interpret visual representations of data.*** | SC.5.PE.2.1 Describe examples of databases from everyday life.<br><br>SC.5.PE.2.2 Identify data types and data structures.<br><br>SC.5.PE.2.3 Analyze the data from a given scenario. | ***SC.5.PE.3 Demonstrate problem-solving strategies.*** | SC.5.PE.3.1 Identify the concepts illustrated by a simulation that offers problems and solutions.<br><br>SC.5.PE.3.2 Solve problems using digital graphic organizers.<br><br>SC.5.PE.3.3 Explain that there are several possible algorithms for searching within a dataset. |

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| | | SC.5.PE.1.4 Detect and correct program errors. | | | | SC.5.PE.3.4 Explain how to identify and correct logical errors in algorithms. |
| | **Standard** | **Benchmarks** | **Standard** | **Benchmarks** | **Standard** | **Benchmarks** |
| **Grade 4** | ***SC.4.PE.1 Explain the purpose of coding.*** | SC.4.PE.1.1 Explain that when writing programs, a specific initial program environment is necessary.<br><br>SC.4.PE.1.2 Create a condition that will modify a situation or value in the program. | ***SC.4.PE.2 Classify visual representations of data.*** | SC.4.PE.2.1 Collect, organize and graph data.<br><br>SC.4.PE.2.2 Analyze a graphical representation of data. | ***SC.4.PE.3 Analyze problem-solving strategies.*** | SC.4.PE.3.1 Describe how computational thinking can be used to solve real-world issues in science and engineering.<br><br>SC.4.PE.3.2 Create a list of steps (algorithm) to solve a real-world problem. |
| | **Standard** | **Benchmarks** | **Standard** | **Benchmarks** | **Standard** | **Benchmarks** |
| **Grade 3** | ***SC.3.PE.1 Explore coding concepts.*** | SC.3.PE.1.1 Explore using graphics, blocks or visual cues to design a program. | ***SC.3.PE.2 Organize types of data.*** | SC.3.PE.2.1 Collect data using a digital tool.<br><br>SC.3.PE.2.2 Compile data collected and draw conclusions based on trends. | ***SC.3.PE.3 Develop problem-solving strategies.*** | SC.3.PE.3.1 Create a repeatable pattern.<br><br>SC.3.PE.3.2 Demonstrate how programs written differently can have the same outcome. |

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| | | SC.3.PE.1.2 Create a program that includes user choices based on defined conditions. | | SC.3.PE.2.3 Analyze data for trends. | | SC.3.PE.3.3 Use graphical programming or visual cues to represent a set of instructions (algorithm) that includes repetition.<br><br>SC.3.PE.3.4 Create a model of a simulation of system and explain what the model shows.<br><br>SC.3.PE.3.5 Explain the process of sorting information into a useful order. |
| | **Standard** | **Benchmarks** | **Standard** | **Benchmarks** | **Standard** | **Benchmarks** |
| **Grade 2** | ***SC.2.PE.1 Introduce conditional logic.*** | SC.2.PE.1.1 Construct code segments using tools that do not require a textual programming language. | ***SC.2.PE.2 Sort types of data.*** | SC.2.PE.2.1 Collect data using a variety of computing methods. | ***SC.2.PE.3 Model problem-solving strategies.*** | SC.2.PE.3.1 Create a repeatable pattern to solve a problem.<br><br>SC.2.PE.3.2 Develop a plan that could be used to create a story. |

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| | | | | SC.2.PE.2.2 Explore dividing a collection of data or objects into like groups.<br><br>SC.2.PE.2.3 Create data visualizations. | | SC.2.PE.3.3 Demonstrate the use of conditional logic.<br><br>SC.2.PE.3.4 Solve questions using models, simulations or data. |
| | **Standard** | **Benchmarks** | **Standard** | **Benchmarks** | **Standard** | **Benchmarks** |
| **Grade 1** | **SC.1.PE.1 Demonstrate that coding is developing a set of instructions.** | SC.1.PE.1.1 Explain that computers only follow the program's instructions. | **SC.1.PE.2 Recognize types of data.** | SC.1.PE.2.1 Determine what makes data important.<br><br>SC.1.PE.2.2 Sort data using visual representation tools.<br><br>SC.1.PE.2.3 Use a model or simulation to collect data to answer a question. | **SC.1.PE.3 Recognize problem-solving strategies.** | SC.1.PE.3.1 Create a pattern you can repeat to complete a task.<br><br>SC.1.PE.3.2 Extend a repeated pattern.<br><br>SC.1.PE.3.3 Describe how data collected from models or simulations can be used to solve real-world problems. |

| | Standard | Benchmarks | Standard | Benchmarks | Standard | Benchmarks |
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| **Kindergarten** | ***SC.K.PE.1 Recognize that tasks are completed in a sequential order.*** | SC.K.PE.1.1 Discuss a computer program as a series of steps created by people to tell a computer how to complete a task.<br><br>SC.K.PE.1.2 Develop a series of steps to complete a task. | ***SC.K.PE.2 Identify data.*** | SC.K.PE.2.1 Recognize different types of data.<br><br>SC.K.PE.2.2 Use different data representations to make comparisons. | ***SC.K.PE.3 Introduce problem-solving.*** | SC.K.PE.3.1 Arrange or sort information.<br><br>SC.K.PE.3.2 Solve problems involving logical order thinking or sequencing with or without technology.<br><br>SC.K.PE.3.3 Observe patterns of daily life and routines.<br><br>SC.K.PE.3.4 Create and use repeating patterns using letters, numbers or symbols. |

## Technological Impact Strand

| | Standard | Benchmarks | Standard | Benchmarks |
|---|---|---|---|---|
| Grades 9-12 | ***SC.912.TI.1 Assess the impact of technological advancements.*** | SC.912.TI.1.1 Analyze historical trends in hardware and software.<br><br>SC.912.TI.1.2 Identify ways to use technology to support lifelong learning.<br><br>SC.912.TI.1.3 Analyze the impact of digital media.<br><br>SC.912.TI.1.4 Analyze the impact of digital media on culture and persona.<br><br>SC.912.TI.1.5 Describe the impact of computing on business and commerce.<br><br>SC.912.TI.1.6 Describe how technology impacts personal life.<br><br>SC.912.TI.1.7 Evaluate ways in which technology may improve accessibility for the varying needs of learners, including students with disabilities (SWD).<br><br>SC.912.TI.1.8 Explain how economic and societal factors are affected by access to critical information.<br><br>SC.912.TI.1.9 Evaluate access and distribution of technology in a global society. | ***SC.912.TI.2 Research and apply the use of tools for regulatory compliance.*** | SC.912.TI.2.1 Research how social media and technology can be used to distort, exaggerate or misrepresent information.<br><br>SC.912.TI.2.2 Demonstrate knowledge of the Internet safety policy as it applies to state and district guidelines.<br><br>SC.912.TI.2.3 Recognize the terms and policies associated with the use of public access points.<br><br>SC.912.TI.2.4 Explore the legal ramifications of technology use.<br><br>SC.912.TI.2.5 Describe and model the legal use of modern communication media and devices.<br><br>SC.912.TI.2.6 Evaluate the impacts of the irresponsible use of information on collaborative projects.<br><br>SC.912.TI.2.7 Describe differences between open source, freeware and proprietary software licenses and how they apply to different types of software. |

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| | | SC.912.TI.1.10 Analyze technology-related career paths.<br><br>SC.912.TI.1.11 Evaluate the benefits of technology regarding environmental concerns.<br><br>SC.912.TI.1.12 Examine the history of networking devices.<br><br>SC.912.TI.1.13 Examine the historical impact of social media. | | SC.912.TI.2.8 Evaluate the consequences of misrepresenting digital work as your own.<br><br>SC.912.TI.2.9 Analyze how different categories of software licenses can be used to share and protect intellectual property.<br><br>SC.912.TI.2.10 Analyze how access to information may not include the right to distribute the information.<br><br>SC.912.TI.2.11 Utilize citation tools when using digital information.<br><br>SC.912.TI.2.12 Describe legal regulations that govern Internet usage and interaction. |
| | **Standard** | **Benchmarks** | **Standard** | **Benchmarks** |
| **Grade 8** | ***SC.8.TI.1 Examine the causes, course and consequences of technological advancements.*** | SC.8.TI.1.1 Examine the historical progression and impact of digital media and communication.<br><br>SC.8.TI.1.2 Describe the influence of access-to-information technologies over time. | ***SC.8.TI.2 Investigate tools and methods used for regulatory compliance.*** | SC.8.TI.2.1 Describe legal and ethical behaviors when using technology.<br><br>SC.8.TI.2.2 Use a local or federal government website to engage with a public official.<br><br>SC.8.TI.2.3 Compare various technology-related career paths. |

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| Grade 7 | ***SC.7.TI.1 Research the relationship between consumerism and technological advancements.*** | SC.7.TI.1.1 Discuss the ways that technology has increased the capacity for communication within a community.<br><br>SC.7.TI.1.2 Evaluate the responsible and irresponsible use of information on collaborative projects.<br><br>SC.7.TI.1.3 Identify how media is used to influence information.<br><br>SC.7.TI.1.4 Analyze technology-related career paths.<br><br>SC.7.TI.1.5 Summarize the historical impact of digital media and communication.<br><br>SC.7.TI.1.6 Explore the innovation of computer components. | ***SC.7.TI.2 Recognize the regulations surrounding the use of information.*** | SC.7.TI.2.1 Describe legal and ethical behaviors when using information and technology and describe the consequences of misuse.<br><br>SC.7.TI.2.2 Describe and model responsible use of modern communication media and devices.<br><br>SC.7.TI.2.3 Recognize the legal use of modern communication media and devices.<br><br>SC.7.TI.2.4 Explore the ethical use of collected data.<br><br>SC.7.TI.2.5 Explain how copyright law and licensing protect the owner of intellectual property. |

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| Grade 6 | ***SC.6.TI.1 Research technology innovations.*** | SC.6.TI.1.1 Recognize the data content sources that make your digital footprint.<br><br>SC.6.TI.1.2 Explore the history of computers and other devices.<br><br>SC.6.TI.1.3 Create a timeline for the innovation of an electronic device.<br><br>SC.6.TI.1.4 Describe various technology-related career paths. | ***SC.6.TI.2 Introduce the regulations surrounding the use of information.*** | SC.6.TI.2.1 Recognize the consequences of plagiarism on the development of creative works.<br><br>SC.6.TI.2.2 Demonstrate compliance with the school's Acceptable Use Policy.<br><br>SC.6.TI.2.3 Explain fair use for using copyrighted materials. |

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| | | | | SC.6.TI.2.4 Generate citations for text and non-text sources using a digital tool. |
| | **Standard** | **Benchmarks** | **Standard** | **Benchmarks** |
| **Grade 5** | ***SC.5.TI.1 Present periods of technological progress.*** | SC.5.TI.1.1 Explain how access to technology helps empower individuals and groups.<br><br>SC.5.TI.1.2 Explore various technology-related career paths.<br><br>SC.5.TI.1.3 Evaluate audio and video technologies and their impact on communication. | ***SC.5.TI.2 Demonstrate ways to avoid the misuse of information.*** | SC.5.TI.2.1 Compare digital resources.<br><br>SC.5.TI.2.2 Describe the purpose of copyright.<br><br>SC.5.TI.2.3 Describe the possible consequences for improper use of digital materials that are protected by copyright.<br><br>SC.5.TI.2.4 Verify information from digital resources.<br><br>SC.5.TI.2.5 Demonstrate how to cite sources. |
| | **Standard** | **Benchmarks** | **Standard** | **Benchmarks** |
| **Grade 4** | ***SC.4.TI.1 Research a period of technological progress.*** | SC.4.TI.1.1 Explain how over time digital literacy has been used to simplify tasks and functions.<br><br>SC.4.TI.1.2 Explore and identify the functions of adaptive technologies and how they have changed over time.<br><br>SC.4.TI.1.3 Explain how Artificial Intelligence (AI) affects our ability to access, create and modify content. | ***SC.4.TI.2 Explain the consequences of the misuse of information.*** | SC.4.TI.2.1 Define plagiarism and explore the impacts of plagiarized materials. |

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| | | SC.4.TI.1.4 Compare human and computer performance on similar tasks. | | |

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| **Grade 3** | ***SC.3.TI.1 Investigate periods of technological progress.*** | SC.3.TI.1.1 Summarize how different types of computing devices are used to communicate with others on a daily basis.<br><br>SC.3.TI.1.2 Identify adaptive technology and discuss how it has changed over time.<br><br>SC.3.TI.1.3 Discuss the uses of Artificial Intelligence (AI) in daily life. | ***SC.3.TI.2 Recognize the consequences of the misuse of Information.*** | SC.3.TI.2.1 Demonstrate awareness of copyright laws to show respect for the ideas of others when using digital artifacts.<br><br>SC.3.TI.2.2 Identify various digital artifacts and whether they are copyrighted or trademarked.<br><br>SC.3.TI.2.3 Cite evidence using direct and indirect citations.<br><br>SC.3.TI.2.4 Identify digital information resources used to answer research questions. |

| | Standard | Benchmarks | Standard | Benchmark |
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| **Grade 2** | ***SC.2.TI.1 Create a timeline of technological progress.*** | SC.2.TI.1.1 Recognize that people use computing technology in the workplace or school to perform many important tasks and functions.<br><br>SC.2.TI.1.2 Recognize that people use computing technology at home to perform many important tasks and functions.<br><br>SC.2.TI.1.3 Identify and compare Artificial Intelligence (AI) devices to other devices. | ***SC.2.TI.2 Explain the consequences of not following the rules.*** | SC.2.TI.2.1 Evaluate if given information (written or visual) is accurate. |

| | Standard | Benchmarks | Standard | Benchmarks |
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| **Grade 1** | ***SC.1.TI.1 Comparing technological progress over time.*** | SC.1.TI.1.1 Discuss that individuals can use computing technology in the workplace or school to perform many important tasks and functions.<br><br>SC.1.TI.1.2 Explore that individuals can use computing technology at home to perform many important tasks and functions.<br><br>SC.1.TI.1.3 Explore Artificial Intelligence (AI)-powered devices. | ***SC.1.TI.2 Recognize the consequences of not following rules.*** | SC.1.TI.2.1 Identify why personal information should be kept private.<br><br>SC.1.TI.2.2 Compare information from two different digital resources on the same topic to confirm accuracy. |

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| **Kindergarten** | ***SC.K.TI.1 Introduce the technological progress.*** | SC.K.TI.1.1 Explore the use of technology in daily life. | ***SC.K.TI.2 Explain the importance of rules.*** | SC.K.TI.2.1 Introduce and state the importance of rules. |

## Emerging Technologies Strand

| | Standard | Benchmarks | Standard | Benchmarks | Standard | Benchmarks |
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| **Grades 9-12** | ***SC.912.ET.1 Analyze the impact of emerging technologies on daily life.*** | SC.912.ET.1.1 Describe the emerging features of mobile devices, smart devices and vehicles.<br><br>SC.912.ET.1.2 Describe the physical and cognitive challenges faced by users when learning to use computer interfaces.<br><br>SC.912.ET.1.3 Analyze the process and design innovative software to support specialized forms of human-computer interaction.<br><br>SC.912.ET.1.4 Examine device-to-device interactions that exclude human input.<br><br>SC.912.ET.1.5 Explore the concepts of virtual and augmented reality. | ***SC.912.ET.2 Analyze the impact of artificial intelligence and its applications.*** | SC.912.ET.2.1 Explore the history of Artificial Intelligence (AI).<br><br>SC.912.ET.2.2 Describe the major branches of Artificial Intelligence (AI).<br><br>SC.912.ET.2.3 Evaluate the application of algorithms to Artificial Intelligence (AI).<br><br>SC.912.ET.2.4 Evaluate the Artificial Intelligence (AI) of computers to model human behaviors.<br><br>SC.912.ET.2.5 Describe major applications of artificial intelligence (AI) and machine learning. | ***SC.912.ET.3 Analyze characteristics of robotics.*** | SC.912.ET.3.1 Describe the advancement of robotics.<br><br>SC.912.ET.3.2 Examine how robotics are used to address human challenges.<br><br>SC.912.ET.3.3 Evaluate how the natural world has influenced robotic designs. |

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| | | SC.912.ET.1.6 Analyze the impact on natural resources due to manufacturing of computer hardware components.<br><br>SC.912.ET.1.7 Describe how technology has changed the way people build and manage organizations and how technology impacts personal life. | | SC.912.ET.2.6 Describe how predictive Artificial Intelligence (AI) can be used to solve problems.<br><br>SC.912.ET.2.7 Describe common measurements of machine intelligence. | | |
| | **Standard** | **Benchmarks** | **Standard** | **Benchmarks** | **Standard** | **Benchmark** |
| **Grade 8** | ***SC.8.ET.1 Identify emerging technologies that impact daily life.*** | SC.8.ET.1.1 Identify the emerging features of mobile devices, smart devices and vehicles.<br><br>SC.8.ET.1.2 Identify challenges faced by users when learning to use computer interfaces.<br><br>SC.8.ET.1.3 Identify the impact of natural resources on the manufacturing of computer hardware components. | ***SC.8.ET.2 Investigate artificial intelligence and its applications.*** | SC.8.ET.2.1 Explore the use of an artificial intelligence (AI) device to accomplish a task.<br><br>SC.8.ET.2.2 Discuss the utilization of intelligent behavior in technology. | ***SC.8.ET.3 Investigate characteristics of robotics.*** | SC.8.ET.3.1 Investigate the advancement of robotics. |

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| | | SC.8.ET.1.4 Analyze the increasing impact of access to the Internet on daily life. | | | | |
| | **Standard** | **Benchmarks** | **Standard** | **Benchmarks** | **Standard** | **Benchmarks** |
| **Grade 7** | ***SC.7. ET.1. Recognize emerging technologies that impact daily life.*** | SC.7.ET.1.1 Investigate the latest technologies and the potential they have to improve our lives at home, work and in society.<br><br>SC.7.ET.1.2 Explore emerging technologies that have the potential to impact education. | ***SC.7. ET.2. Recognize artificial intelligence and its applications.*** | SC.7.ET.2.1 Explore future technologies and the role artificial intelligence (AI) may play. | ***SC.7. ET.3. Recognize characteristics of robotics.*** | SC.7.ET.3.1 Describe ways in which adaptive technologies can assist users in their daily lives.<br><br>SC.7.ET.3.2 Identify ways humans interact with computers.<br><br>SC.7.ET.3.3 Identify ways humans interact with hardware components. |
| | **Standard** | **Benchmarks** | **Standard** | **Benchmarks** | **Standard** | **Benchmarks** |
| **Grade 6** | ***SC.6.ET.1 Identify emerging technologies.*** | SC.6.ET.1.1 Identify technology used to support specialized forms of human-computer interaction (HCI).<br><br>SC.6.ET.1.2 Identify technology skills needed in the workplace. | ***SC.6.ET.2. Identify artificial intelligence and its applications.*** | SC.6.ET.2.1 Identify the characteristics of Artificial Intelligence (AI).<br><br>SC.6.ET.2.2 Discuss the benefits associated with Artificial Intelligence (AI). | ***SC.6.ET.3. Identify characteristics of robotics.*** | SC.6.ET.3.1 Explain why some tasks can be accomplished faster by computers.<br><br>SC.6.ET.3.2 Describe how humans and machines interact to accomplish tasks that neither can accomplish alone. |

## Cybersecurity Strand

| | Standard | Benchmarks | Standard | Benchmarks | Standard | Benchmarks |
|---|---|---|---|---|---|---|
| **Grades 9-12** | ***SC.912.CS.1 Assess and apply physical security strategies.*** | SC.912.CS.1.1 Identify possible risks to maintaining data confidentiality.<br><br>SC.912.CS.1.2 Describe computer security vulnerabilities.<br><br>SC.912.CS.1.3 Evaluate computer security vulnerabilities. | ***SC.912.CS.2 Research and analyze network security impacts.*** | SC.912.CS.2.1 Analyze security and privacy issues that relate to computer networks and network connected devices.<br><br>SC.912.CS.2.2 Describe security and privacy issues that relate to computer networks including the permanency of data on the Internet, online identity and privacy.<br><br>SC.912.CS.2.3 Apply network security concepts and strategies to real-world simulations. | ***SC.912.CS.3 Reflect on the consequences of social engineering.*** | SC.912.CS.3.1 Investigate ransomware attacks.<br><br>SC.912.CS.3.2 Explore access control rules.<br><br>SC.912.CS.3.3 Analyze the limitations of a program's temporary storage and the security vulnerabilities.<br><br>SC.912.CS.3.4 Trace the social engineering attack cycle. |

| | Standard | Benchmarks | Standard | Benchmarks | Standard | Benchmark |
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| **Grade 8** | ***SC.8.CS.1 Explain the physical security of devices.*** | SC.8.CS.1.1 Analyze threats and vulnerabilities to information security for individuals and organizations. | ***SC.8.CS.2 Evaluate network security.*** | SC.8.CS.2.1 Evaluate security and privacy issues that relate to computer networks and Internet of Things (IoT) devices. | ***SC.8.CS.3 Identify the consequences of social engineering.*** | SC.8.CS.3.1 Discuss the increase of ransomware attacks.<br><br>SC.8.CS.3.2 Discuss the necessity of immediate security updates of a program. |

SC.8.CS.1.2 Explain how authentication and authorization methods can protect users.

SC.8.CS.1.3 Describe defense in-depth strategies to protect simple networks.

SC.8.CS.1.4 Explain how malicious actions threaten network security.

SC.8.CS.1.5 Explain how malicious actions threaten physical security.

SC.8.CS.1.6 Describe defense in depth and how physical access controls work together.

SC.8.CS.1.7 Explore the process of protecting computer hardware from exploitation.

SC.8.CS.2.2 Describe security and privacy issues that relate to computer networks.

SC.8.CS.2.3 Describe the permanency of data on the Internet, online identity and personal privacy.

SC.8.CS.3.3 Identify the steps of the social engineering attack cycle.

| | Standard | Benchmarks | Standard | Benchmark | Standard | Benchmarks |
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| **Grade 7** | ***SC.7.CS.1. Describe the physical security of devices.*** | SC.7.CS.1.1 Describe data in its three states and potential threats to each state.<br><br>SC.7.CS.1.2. Explain the concept of access control and how to limit access to authorized users.<br><br>SC.7.CS.1.3. Examine the basics of cybersecurity needs for business, government and organizations.<br><br>SC.7.CS.1.4 List and define the elements of the Confidentiality, Integrity and Availability (CIA) triad.<br><br>SC.7.CS.1.5 Explain components of access control.<br><br>SC.7.CS.1.6 Identify the characteristics of strong versus weak passwords in data and identity security. | ***SC.7.CS.2 Investigate the interactions of network devices.*** | SC.7.CS.2.1 Define the Internet of things. (IoT) | ***SC.7.CS.3 Explore the attributes of social engineering.*** | SC.7.CS.3.1 Identify the types of cyberattacks.<br>SC.7.CS.3.2 Explore social engineering attacks.<br><br>SC.7.CS.3.3 Identify data vulnerabilities. |

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| | | SC.7.CS.1.7 Explain the proper use and operation of security technologies.<br><br>SC.7.CS.1.8 Identify actions that protect electronic devices. | | |
| | **Standard** | **Benchmarks** | **Standard** | **Benchmark** |
| **Grade 6** | ***SC.6.CS.1. Explore the physical security of devices.*** | SC.6.CS.1.1 Define the states of data.<br><br>SC.6.CS.1.2 Illustrate the concept of access control and how to limit access to authorized users.<br><br>SC.6.CS.1.3 Discuss the importance of cybersecurity.<br><br>SC.6.CS.1.4 Determine information that should remain confidential.<br><br>SC.6.CS.1.5 Identify the need for encryption.<br><br>SC.6.CS.1.6 Recognize the importance of digital identity. | ***SC.6.CS.2. Explore network security concepts.*** | SC.6.CS.2.1 Identify the need for security safeguards on personal devices. |

## Digital Currencies and Financial Management Strand

| | Standard | Benchmarks | Standard | Benchmarks | Standard | Benchmarks |
|---|---|---|---|---|---|---|
| **Grades 9-12** | ***SC.912.DC.1. Analyze the history of cryptocurrency.*** | SC.912.DC.1.1 Examine the history of cryptocurrency and blockchain technologies.<br><br>SC.912.DC. 1.2 Analyze the effects of cryptocurrencies on the current financial market. | ***SC.912.DC.2. Examine the types of digital currencies.*** | SC.912.DC. 2.1 Differentiate between a digital currency and a security.<br><br>SC.912.DC.2.2 Discuss the risks associated with digital currencies.<br><br>SC.912.DC.2.3 Compare decentralized currencies to centralized currencies. | ***SC.912.DC.3. Evaluate and analyze digital tools used for financial management.*** | SC.912.DC. 3.1 Evaluate digital tools that aid in personal financial literacy and money management.<br><br>SC.912.DC. 3.2 Analyze the opportunities created with digital stock portfolios. |