NORTH DAKOTA
DEPARTMENT OF
PUBLIC INSTRUCTION

North Dakota
Computer Science and Cybersecurity
Content Standards
K-12

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North Dakota Department of Public Instruction
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Document Revision Log

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Superintendent's Foreword

In today's digital world, the success of our students depends not just on reading, writing, and math, but also on understanding how technology shapes our lives, communities, and future careers. Whether it's artificial intelligence, smart devices, or cybersecurity threats, technology is no longer optional. It is foundational.

That is why North Dakota has taken a bold step forward by becoming one of the first states in the nation to require all students to learn computer science and cybersecurity throughout their K-12 experience. These updated content standards reflect our commitment to preparing students for a world that is changing faster than ever before.

These standards, created by North Dakota educators for North Dakota students, are forward-looking and flexible. They teach essential computing skills and responsible digital citizenship without prescribing specific devices or software. They also reflect the urgent need to help students think critically about artificial intelligence, protect their data, and become smart, safe users of digital tools. Beginning in kindergarten, learners will explore how technology works, how it impacts their daily lives, and how to keep themselves and others safe online. By the time they graduate, students will be able to write algorithms, assess cybersecurity risks, understand the ethical implications of AI, and make informed decisions about the digital world around them.

This document is the result of more than ten months of work by an exceptional team of North Dakota educators, supported by NDDPI staff, EduTech partners, and a public review process that engaged families, community members, and subject matter experts. I am deeply grateful to the educators who wrote these standards and to every North Dakotan who shared their time and insights.

With these standards, North Dakota continues to lead the nation in delivering rigorous, relevant, and forward-thinking education. Together, we are preparing our students not only to use technology but also to be creators, protectors, and ethical stewards of it.

Introduction

Scope of the Standards

These standards define what North Dakota learners should know about computer science and cybersecurity. Individuals interested in these career fields can expand their studies through North Dakota Career and Technical Education and other disciplinary opportunities.

Throughout the creation of these standards, the committee was cognizant of the range of technologies and access available in North Dakota school districts. The standards focus on the necessary skills students should obtain and do not require districts to utilize specific hardware or software for understanding or implementation.

Artificial Intelligence within the Standards

Emerging technologies change rapidly in our current world. To ensure longevity, the committee limited the names of specific types of artificial intelligence (AI). Efforts were made to develop general standards for the obsolescence and emergence of technologies.

When these standards were written, generative AI, including large language models, emerged as the general public's understanding of AI. AI is a more encompassing concept than generative AI, and the future of AI is unknown. The standards include AI in the following ways:

- **Computing Devices and Systems**: AI technology is embedded, as well as individually identified, in computing devices, creating systems to help with processing data, making decisions, and performing tasks from learned patterns.
- **Algorithms and Computational Thinking**: AI uses algorithms to process collected data, identify patterns, and solve problems. Algorithmic thinking is essential for AI, as it involves creating step-by-step solutions that AI can follow.
- **Impacts of Computing**: As with all emerging technologies, AI will impact our society and influence future policies, laws, and ethics. The existence of AI requires societal reflection.
- **Digital Citizenship**: As AI becomes integrated into more aspects of daily life, digital citizens need an understanding of AI concepts to navigate AI-powered environments responsibly.
- **Security**: AI has a profound positive impact on security by predicting and enhancing threat detection, but also increases potential risks, including adversarial attacks and privacy concerns.

Composition of the Standards – Standards vs. Curriculum

These standards establish skills learners should achieve by the time they graduate from a North Dakota high school. The curriculum educators use differs from this, which includes the resources and instructional strategies to assist learners in meeting the standards. Curriculum development has been and continues to be the responsibility of the individual school districts.

Standards Development Process

The development of the North Dakota Computer Science and Cybersecurity Content Standards was a multi-phase process. State Superintendent of Public Instruction Kirsten Baesler established a statewide committee through an application process that included teachers and higher education faculty. Over five multi-day sessions, the committee developed a new set of standards. The committee began by reviewing state and national standards. Current disciplinary knowledge and research in computer science and cybersecurity education guided the work, including existing state and national frameworks and presentations by industry experts. Drawing from the information gained from those sources, the committee drafted the initial North Dakota Computer Science and Cybersecurity Content Standards. Input from the public and the content standards review committee was used to inform the development of the new standards. The committee began its work in July 2024 and completed the revised new standards in May 2025.

Organization of the Standards

The standards are organized into concepts and then branch out into sub-concepts, with the individual standards developed at the grade level in K-8 and in grade spans for grades 9-10 and 11-12. Some standards are repeated or are very similar; the committee believes the rigor increases naturally as learners' interests, abilities, and access to resources grow.

Resources

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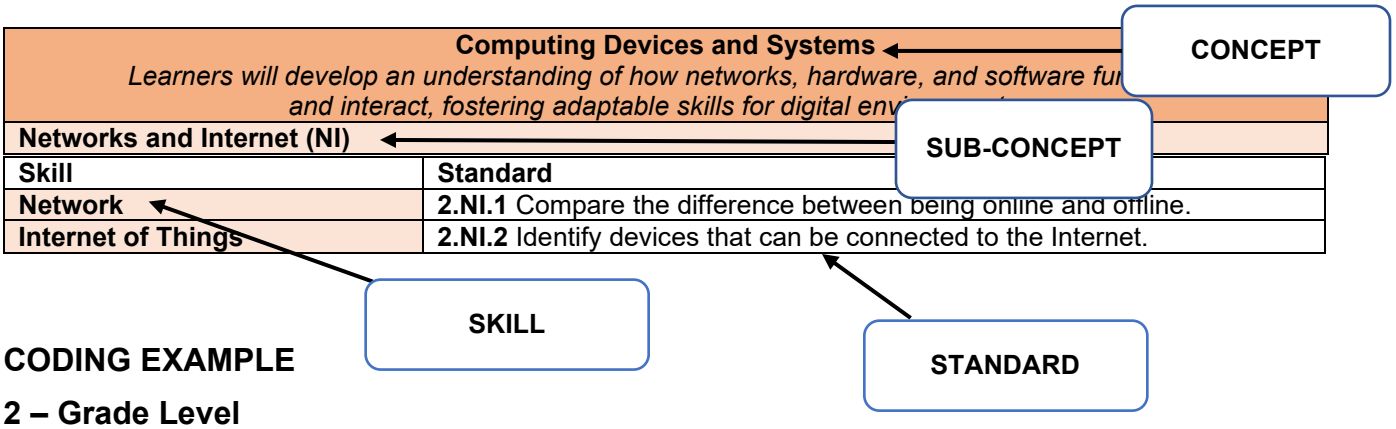
How to Read the Standards

The standards are organized into five main concepts:

- Computing Devices and Systems
- Algorithms and Computational Thinking
- Impacts of Computing
- Digital Citizenship
- Security

These concepts are broken into smaller sub-concepts under each main concept and individual standards under each sub-concept. The standards are organized by grade level in grades K-8 and grade spans for grades 9-10 and 11-12.



CODING EXAMPLE

2 – Grade Level

NI – Sub-Concept

1 – Standard Number

North Dakota Computer Science and Cybersecurity Content Standards

Kindergarten

Computing Devices and Systems Learners will develop an understanding of how networks, hardware, and software function and interact, fostering adaptable skills for digital environments.	
Networks and Internet (NI)	
Skill	**Standard**
Network	**K.NI.1** Identify visual cues indicating if one is online or offline.
Internet of Things	**K.NI.2** Identify examples of devices that can connect to the Internet.
Artificial Intelligence (AI)	**K.NI.3** Understand that while AI may respond like a human, it is a machine.
Hardware and Software (HS)	
Skill	**Standard**
Use, Comparison, and Selection	**K.HS.1** Use basic hardware to accomplish simple tasks (e.g., turn the device on/off, use a mouse or touchscreen).
Troubleshooting	**K.HS.2** Identify the components of a computing device (e.g., mouse, screen, power button, keyboard).
Information Organization, Storage, and Retrieval	**K.HS.3** Recognize that digital information can be stored.

Algorithms and Computational Thinking Learners will develop and apply a basic understanding of algorithms and computational thinking, enhancing problem-solving and critical-thinking skills.	
Developing and Designing Algorithms (DD)	
Skill	**Standard**
Components of Algorithms	**K.DD.1** Identify smaller steps within a task.
Design and Use of Algorithms	**K.DD.2** Create step-by-step directions to complete simple tasks.
Application and Assessment of Algorithms	**K.DD.3** *Standards begin in third grade.*
Analyzing and Problem Solving (AP)	
Skill	**Standard**
Data Collection and Analysis	**K.AP.1** Collect and sort data and objects based on attributes.
Revising Algorithms and Processes	**K.AP.2** Identify an error in algorithms and processes.
Collaborative Problem Solving	**K.AP.3** *Standard begins in sixth grade.*
Creating Instructions for Artificial Intelligence (AI)	**K.AP.4** *Standard begins in third grade.*

Impacts of Computing Learners will understand how technology shapes individuals and the world and influences safety, policy, law, and ethics.	
Policies and Laws (PL)	
Skill	**Standard**
Copyright and Fair Use	**K.PL.1** Discuss that creative works have owners. (Library Media K.IP.1)
Responsible and Acceptable Use Policies	**K.PL.2** Understand the purpose of and comply with responsible and acceptable use policies. (Library Media K.RU.1)
Laws and User Agreements	**K.PL.3** *Standard begins in sixth grade.*
Ethics (E)	
Skill	**Standard**
Ethical Use of Technology	**K.E.1** Identify positive uses of technology, including AI.
Evaluation of Information	**K.E.2** With guidance, identify facts and opinions. (Library Media K.E.1)
Societal Impacts (S)	
Technological Impacts on Society and Daily Life	**K.S.1** Describe how technology impacts how people live.
Impacts of Artificial Intelligence (AI)	**K.S.2** *Standards begin in sixth grade*.

Kindergarten

Digital Citizenship Learners will practice responsible digital consumption, creation, communication, and interaction.	
Digital Citizenship (DC)	
Skill	**Standard**
Balancing Media Usage	**K.DC.1** With guidance, identify appropriate times to use technology and times to be screen-free. (Library Media K.RU.5)
Impacts of Technology Use on Self and Others	**K.DC.2** Identify basic feelings (e.g., happy, sad, frustrated, excited) that may come from using technology or interacting with others online.
Online Behavior	**K.DC.3** With guidance, discuss appropriate online behavior, the effects on individuals, and age-appropriate responses. (Library Media K.SI.3)
Digital Identity and Digital Footprint	**K.DC.4** With guidance, understand digital identity. (Library Media K.DI.1)

Security To protect individuals and organizations, learners will gain a foundational understanding of safe and best practices for data and system security, including information, network, and physical security.	
Personally Identifiable Information (PI)	
Skill	**Standard**
Sharing and Managing Personal Information	**K.PI.1** With guidance, discuss personal information that is public vs. private. (Library Media K.RU.4)
Threats and Vulnerability (TV)	
Skill	**Standard**
Cybersecurity Threats	**K.TV.1** Understand that not all websites and apps are safe. (Library Media K.RU.3)
Updating Apps and Devices	**K.TV.2** Understand that apps and devices need updates.
Security Controls (SC)	
Skill	**Standard**
Authentication and Authorization	**K.SC.1** Recognize the importance of a password.
Digital Privacy and Security	**K.SC.2** With guidance, describe methods to maintain digital privacy and security when accessing technology (e.g., password, PIN, multi-factor authentication).

First Grade

Computing Devices and Systems Learners will develop an understanding of how networks, hardware, and software function and interact, fostering adaptable skills for digital environments.	
Networks and Internet (NI)	
Skill	**Standard**
Network	**1.NI.1** Identify examples of activities that can be done online or offline.
Internet of Things	**1.NI.2** Describe uses of devices that connect to the Internet.
Artificial Intelligence (AI)	**1.NI.3** Provide examples of how AI can be used in everyday life.
Hardware and Software (HS)	
Skill	**Standard**
Use, Comparison, and Selection	**1.HS.1** Use basic software to accomplish simple tasks (e.g., open/close tabs, websites, apps, programs).
Troubleshooting	**1.HS.2** Identify the components of a computing device and describe how they are used.
Information Organization, Storage, and Retrieval	**1.HS.3** Recognize that digital information can be stored and shared.

Algorithms and Computational Thinking Learners will develop and apply a basic understanding of algorithms and computational thinking, enhancing problem-solving and critical-thinking skills.	
Developing and Designing Algorithms (DD)	
Skill	**Standard**
Components of Algorithms	**1.DD.1** Identify patterns within a task.
Design and Use of Algorithms	**1.DD.2** Create step-by-step directions to solve problems or complete tasks.
Application and Assessment of Algorithms	**1.DD.3** *Standards begin in third grade.*
Analyzing and Problem Solving (AP)	
Skill	**Standard**
Data Collection and Analysis	**1.AP.1** Collect, organize, and represent data using picture and bar graphs.
Revising Algorithms and Processes	**1.AP.2** Identify and fix an error in algorithms and processes.
Collaborative Problem Solving	**1.AP.3** *Standard begins in sixth grade.*
Creating Instructions for Artificial Intelligence (AI)	**1.AP.4** *Standard begins in third grade.*

Impacts of Computing Learners will understand how technology shapes individuals and the world and influences safety, policy, law, and ethics.	
Policies and Laws (PL)	
Skill	**Standard**
Copyright and Fair Use	**1.PL.1** Understand that creative works have owners. (Library Media 1.IP.1)
Responsible and Acceptable Use Policies	**1.PL.2** Understand the purpose of and comply with responsible and acceptable use policies. (Library Media 1.RU.1)
Laws and User Agreements	**1.PL.3** *Standard begins in sixth grade.*
Ethics (E)	
Skill	**Standard**
Ethical Use of Technology	**1.E.1** Identify positive and negative uses of technology, including AI.
Evaluation of Information	**1.E.2** With guidance, identify facts and opinions. (Library Media 1.E.1)
Societal Impacts (S)	
Skill	**Standard**
Technological Impacts on Society and Daily Life	**1.S.1** Describe how technology impacts how people work.
Impacts of Artificial Intelligence (AI)	**1.S.2** *Standard begins in sixth grade.*

First Grade

Digital Citizenship Learners will practice responsible digital consumption, creation, communication, and interaction.	
Digital Citizenship (DC)	
Skill	**Standard**
Balancing Media Usage	**1.DC.1** With guidance, identify appropriate times to use technology and times to be screen-free. (Library Media 1.RU.5)
Impacts of Technology Use on Self and Others	**1.DC.2** Describe the impact of technology on one's learning.
Online Behavior	**1.DC.3** With guidance, recognize inappropriate online behavior and how to report it. (Library Media 1.SI.3).
Digital Identity and Digital Footprint	**1.DC.4** With guidance, understand digital identity and recognize that using technology builds one's digital identity. (Library Media 1.DI.1)

Security To protect individuals and organizations, learners will gain a foundational understanding of safe and best practices for data and system security, including information, network, and physical security.	
Personally Identifiable Information (PI)	
Skill	**Standard**
Sharing and Managing Personal Information	**1.PI.1** With guidance, discuss personal information that is public vs. private. (Library media 1.RU.4)
Threats and Vulnerability (TV)	
Skill	**Standard**
Cybersecurity Threats	**1.TV.1.** Understand that not all websites and apps are safe. (Library Media 1.RU.3)
Updating Apps and Devices	**1.TV.2** Understand that apps and devices need updates.
Security Controls (SC)	
Skill	**Standard**
Authentication and Authorization	**1.SC.1** Recognize the importance of a password.
Digital Privacy and Security	**1.SC.2** With guidance, use authentication methods to access technology (e.g., password, PIN, dual authentication). (Library Media 1.RU.2)

Second Grade

Computing Devices and Systems Learners will develop an understanding of how networks, hardware, and software function and interact, fostering adaptable skills for digital environments.	
Networks and Internet (NI)	
Skill	**Standard**
Network	**2.NI.1** Compare the difference between being online and offline.
Internet of Things	**2.NI.2** Explain how people can use internet-connected devices in everyday life.
Artificial Intelligence (AI)	**2.NI.3** Provide examples of how AI can be used in everyday life.
Hardware and Software (HS)	
Skill	**Standard**
Use, Comparison, and Selection	**2.HS.1** Use basic software and hardware to accomplish a task.
Troubleshooting	**2.HS.2** With guidance, follow basic step-by-step troubleshooting approaches to identify problems with computing devices.
Information Organization, Storage, and Retrieval	**2.HS.3** Recognize that digital information can be stored, shared, and retrieved.

Algorithms and Computational Thinking Learners will develop and apply a basic understanding of algorithms and computational thinking, enhancing problem-solving and critical-thinking skills.	
Developing and Designing Algorithms (DD)	
Skill	**Standard**
Components of Algorithms	**2.DD.1** Identify smaller steps and patterns within a task.
Design and Use of Algorithms	**2.DD.2** Create step-by-step directions to solve problems or complete tasks.
Application and Assessment of Algorithms	**2.DD.3** *Standard begins in third grade.*
Analyzing and Problem Solving (AP)	
Skill	**Standard**
Data Collection and Analysis	**2.AP.1** Analyze data and interpret the results to solve one-step comparison problems using information from the graphs. (Mathematics 2.DPS.D.3)
Revising Algorithms and Processes	**2.AP.2** Use a trial-and-error process to identify and fix errors in algorithms and processes.
Collaborative Problem Solving	**2.AP.3** *Standard begins in sixth grade.*
Creating Instructions for Artificial Intelligence (AI)	**2.AP.4** *Standard begins in third grade.*

Impacts of Computing Learners will understand how technology shapes individuals and the world and influences safety, policy, law, and ethics.	
Policies and Laws (PL)	
Skill	**Standard**
Copyright and Fair Use	**2.PL.1** Demonstrate an understanding that creative works are protected by law. (Library Media 2.IP.1)
Responsible and Acceptable Use Policies	**2.PL.2** Understand the purpose of and comply with responsible and acceptable use policies. (Library Media 2.RU.1)
Laws and User Agreements	**2.PL.3** Standard begins in sixth grade.
Ethics (E)	
Skill	**Standard**
Ethical Use of Technology	**2.E.1** Describe the positive and negative uses of technology, including AI.
Evaluation of Information	**2.E.2** Identify facts and opinions. (Library Media 2.E.1)
Societal Impacts (S)	
Skill	**Standard**
Technological Impacts on Society and Daily Life	**2.S.1** Identify the positive and negative impacts of technology on how people live, work, and interact.
Impacts of Artificial Intelligence (AI)	**2.S.2** *Standard begins in sixth grade.*

Second Grade

Digital Citizenship Learners will practice responsible digital consumption, creation, communication, and interaction.	
Digital Citizenship (DC)	
Skill	**Standard**
Balancing Media Usage	**2.DC.1** Identify appropriate times to use technology and times to be screen-free. (Library Media 2.RU.5)
Impacts of Technology Use on Self and Others	**2.DC.2** Apply strategies to show care and respect in online communication (e.g., pausing before responding, standing up for others).
Online Behavior	**2.DC.3** Recognize and report inappropriate online behavior. (Library Media 2.SI.3)
Digital Identity and Digital Footprint	**2.DC.4** With guidance, understand digital identity and recognize that using technology builds one's digital identity. (Library Media 2.DI.1)

Security To protect individuals and organizations, learners will gain a foundational understanding of safe and best practices for data and system security, including information, network, and physical security.	
Personally Identifiable Information (PI)	
Skill	**Standard**
Sharing and Managing Personal Information	**2.PI.1** Identify personal information that is public vs. private. (Library Media 2.RU.4)
Threats and Vulnerability (TV)	
Skill	**Standard**
Cybersecurity Threats	**2.TV.1** Understand that cybersecurity threats exist (e.g., phishing, malware, clickbait). (Library Media 2.RU.3)
Updating Apps and Devices	**2.TV.2** Recognize that trusted updates can change or improve apps and devices.
Security Controls (SC)	
Skill	**Standard**
Authentication and Authorization	**2.SC.1** Describe the concept of a strong password and its importance.
Digital Privacy and Security	**2.SC.2** Describe methods to maintain digital privacy and security when accessing technology (e.g., password, PIN, multi-factor authentication).

Third Grade

Computing Devices and Systems Learners will develop an understanding of how networks, hardware, and software function and interact, fostering adaptable skills for digital environments.	
Networks and Internet (NI)	
Skill	**Standard**
Network	**3.NI.1** Identify examples of ways information is sent and received across wireless paths (e.g., Wi-Fi, Bluetooth).
Internet of Things	**3.NI.2** Explain how devices connected to the Internet can be used to share data.
Artificial Intelligence (AI)	**3.NI.3** Recognize tools or machines that use AI.
Hardware and Software (HS)	
Skill	**Standard**
Use, Comparison, and Selection	**3.HS.1** Use software skills to complete tasks (e.g., typing, copy/paste, drawing) using hardware.
Troubleshooting	**3.HS.2** With guidance, follow basic troubleshooting steps to identify problems with computing devices.
Information Organization, Storage, and Retrieval	**3.HS.3** With guidance, organize digital information.

Algorithms and Computational Thinking Learners will develop and apply a basic understanding of algorithms and computational thinking, enhancing problem-solving and critical-thinking skills.	
Developing and Designing Algorithms (DD)	
Skill	**Standard**
Components of Algorithms	**3.DD.1** Define an algorithm.
Design and Use of Algorithms	**3.DD.2** Create a simple algorithm using coding patterns (e.g., sequences, loops, or conditionals).
Application and Assessment of Algorithms	**3.DD.3** Test the outcome(s) of algorithms that use coding patterns (e.g., sequences, loops, or conditionals).
Analyzing and Problem Solving (AP)	
Skill	**Standard**
Data Collection and Analysis	**3.AP.1** Analyze data and make simple statements to solve one- and two-step problems using information from the graphs. (Mathematics 3.DPS.D.3)
Revising Algorithms and Processes	**3.AP.2** Use a trial-and-error process to identify and fix errors in algorithms and processes.
Collaborative Problem Solving	***3.AP.3** Standard begins in sixth grade.*
Creating Instructions for Artificial Intelligence (AI)	**3.AP.4** With guidance, identify key words to describe a topic, problem, or need.

Impacts of Computing Learners will understand how technology shapes individuals and the world and influences safety, policy, law, and ethics.	
Policies and Laws (PL)	
Skill	**Standard**
Copyright and Fair Use	**3.PL.1** Define copyright and fair use. (Library Media 3.IP.1)
Responsible and Acceptable Use Policies	**3.PL.2** Understand the purpose of and comply with responsible and acceptable use policies. (Library Media 3.RU.1)
Laws and User Agreements	**3.PL.3** *Standard begins in sixth grade.*
Ethics (E)	
Skill	**Standard**
Ethical Use of Technology	**3.E.1** Identify ethical and unethical uses of technology, including AI.
Evaluation of Information	**3.E.2** Identify facts and opinions. (Library Media 3.E.1)
Societal Impacts (S)	
Skill	**Standard**
Technological Impacts on Society and Daily Life	**3.S.1** Identify the positive and negative impacts of technology on how people live, work, and interact.
Impacts of Artificial Intelligence (AI)	**3.S.2** *Standard begins in sixth grade.*

Third Grade

Digital Citizenship Learners will practice responsible digital consumption, creation, communication, and interaction.	
Digital Citizenship(DC)	
Skill	**Standard**
Balancing Media Usage	**3.DC.1** Understand the importance of balancing media and non-media activities. (Library Media 3.RU.5)
Impacts of Technology Use on Self and Others	**3.DC.2** Describe ways technology impacts relationships with others (e.g., family, friends).
Online Behavior	**3.DC.3** Identify various forms of cyberbullying (e.g., hacking, harassing, outing, flaming) and reporting strategies. (Library Media 3.SI.3)
Digital Identity and Digital Footprint	**3.DC.4** Recognize that using technology builds one's digital identity. (Library Media 3.DI.1)

Security To protect individuals and organizations, learners will gain a foundational understanding of safe and best practices for data and system security, including information, network, and physical security.	
Personally Identifiable Information (PI)	
Skill	**Standard**
Sharing and Managing Personal Information	**3.PI.1** Identify situations when private information can be shared online. (Library Media 3.RU.4)
Threats and Vulnerability (TV)	
Skill	**Standard**
Cybersecurity Threats	**3.TV.1** With guidance, identify cybersecurity threats (e.g., phishing, malware, clickbait). (Library Media 3.RU.3)
Updating Apps and Devices	**3.TV.2** Recognize that trusted updates can change or improve apps and devices.
Security Controls (SC)	
Skill	**Standard**
Authentication and Authorization	**3.SC.1** Describe the concept of a strong password and its importance.
Digital Privacy and Security	**3.SC.2** Use methods to maintain digital privacy and security when accessing technology (e.g., password, PIN, multi-factor authentication). (Library Media 3.RU.2)

Fourth Grade

Computing Devices and Systems Learners will develop an understanding of how networks, hardware, and software function and interact, fostering adaptable skills for digital environments.	
Networks and Internet (NI)	
Skill	**Standard**
Network	**4.NI.1** Identify examples of ways information is sent and received across physical paths (e.g., cables, routers).
Internet of Things	**4.NI.2** Explain how apps, websites, and wireless tools collect information about what users do when they are connected to the Internet.
Artificial Intelligence (AI)	**4.NI.3** Define generative AI and provide examples, including large language models.
Hardware and Software (HS)	
Skill	**Standard**
Use, Comparison, and Selection	**4.HS.1** Explore software features while using hardware.
Troubleshooting	**4.HS.2** With guidance, follow step-by-step troubleshooting approaches and interpret error messages to identify problems with computing devices.
Information Organization, Storage, and Retrieval	**4.HS.3** With guidance, retrieve digital information.

Algorithms and Computational Thinking Learners will develop and apply a basic understanding of algorithms and computational thinking, enhancing problem-solving and critical-thinking skills.	
Developing and Designing Algorithms (DD)	
Skill	**Standard**
Components of Algorithms	**4.DD.1** Identify the key components of a simple algorithm (e.g., sequences, loops, conditional statements).
Design and Use of Algorithms	**4.DD.2** Create a simple algorithm to solve a problem using coding patterns (e.g., sequences, loops, or conditionals).
Application and Assessment of Algorithms	**4.DD.3** Test the outcome(s) of algorithms that use coding patterns (e.g., sequences, loops, or conditionals).
Analyzing and Problem Solving (AP)	
Skill	**Standard**
Data Collection and Analysis	**4.AP.1** Use graphs and diagrams to solve problems.
Revising Algorithms and Processes	**4.AP.2** Identify and correct errors in algorithms or processes.
Collaborative Problem Solving	**4.AP.3** *Standard begins in sixth grade.*
Creating Instructions for Artificial Intelligence (AI)	**4.AP.4** With guidance, create questions based on a topic, problem, or need. (Library Media 4.I.1)

Impacts of Computing Learners will understand how technology shapes individuals and the world and influences safety, policy, law, and ethics.	
Policies and Laws (PL)	
Skill	**Standard**
Copyright and Fair Use	**4.PL.1** With guidance, demonstrate an understanding of copyright and fair use. (Library Media 4.IP.1)
Responsible and Acceptable Use Policies	**4.PL.2** Understand the purpose of and comply with responsible and acceptable use policies. (Library Media 4.RU.1)
Laws and User Agreements	**4.PL.3** *Standard begins in sixth grade.*
Ethics (E)	
Skill	**Standard**
Ethical Use of Technology	**4.E.1** Explain how technology, including AI, may be used ethically or unethically.
Evaluation of Information	**4.E.2** With guidance, understand that biases exist and distinguish between facts and opinions in various sources. (Library Media 4.E.1)

Fourth Grade

Impacts of Computing Learners will understand how technology shapes individuals and the world and influences safety, policy, law, and ethics.	
Societal Impacts (S)	
Skill	**Standard**
Technological Impacts on Society and Daily Life	**4.S.1** Explain the positive and negative impacts of technology on how people live, work, and interact.
Impacts of Artificial Intelligence (AI)	**4.S.2** *Standard begins in sixth grade.*

Digital Citizenship Learners will practice responsible digital consumption, creation, communication, and interaction.	
Digital Citizenship (DC)	
Skill	**Standard**
Balancing Media Usage	**4.DC.1** Evaluate the use of media time. (Library Media 4.RU.5)
Impacts of Technology Use on Self and Others	**4.DC.2** Describe the personal impact of technology on one's learning and relationships.
Online Behavior	**4.DC.3** Identify cyberbullying prevention and reporting strategies. (Library Media 4.SI.3)
Digital Identity and Digital Footprint	**4.DC.4** Recognize that using technology builds one's digital identity. (Library Media 4.DI.1)

Security To protect individuals and organizations, learners will gain a foundational understanding of safe and best practices for data and system security, including information, network, and physical security.	
Personally Identifiable Information (PI)	
Skill	**Standard**
Sharing and Managing Personal Information	**4.PI.1** Discuss the risks related to sharing private information online (e.g., identity theft, data collection, and personal safety).
Threats and Vulnerability (TV)	
Skill	**Standard**
Cybersecurity Threats	**4.TV.1** Identify cybersecurity threats (e.g., phishing, malware, clickbait).
Updating Apps and Devices	**4.TV.2** Explain the importance of using trusted sources for updating apps and devices.
Security Controls (SC)	
Skill	**Standard**
Authentication and Authorization	**4.SC.1** Define authentication and identify various authentication methods (e.g., passwords, fingerprint or facial recognition, multi-factor authentication).
Digital Privacy and Security	**4.SC.2** Use methods to maintain digital privacy and security when accessing technology (e.g., password, PIN, multi-factor authentication). (Library Media 4.RU.2)

Fifth Grade

Computing Devices and Systems Learners will develop an understanding of how networks, hardware, and software function and interact, fostering adaptable skills for digital environments.	
Networks and Internet (NI)	
Skill	**Standard**
Network	**5.NI.1** Explain the difference between physical and wireless paths.
Internet of Things	**5.NI.2** Explain why data is collected when devices are connected to the Internet (e.g., to personalize content, improve services).
Artificial Intelligence (AI)	**5.IN.3** Define generative AI and provide examples, including large language models.
Hardware and Software (HS)	
Skill	**Standard**
Use, Comparison, and Selection	**5.HS.1** Use software features and hardware to accomplish a task.
Troubleshooting	**5.HS.2** With guidance, follow troubleshooting approaches to identify problems with computing devices.
Information Organization, Storage, and Retrieval	**5.HS.3** With guidance, organize, retrieve, and share digital information.

Algorithms and Computational Thinking Learners will develop and apply a basic understanding of algorithms and computational thinking, enhancing problem-solving and critical-thinking skills.	
Developing and Designing Algorithms (DD)	
Skill	**Standard**
Components of Algorithms	**5.DD.1** Identify key components of a simple algorithm (e.g., sequences, loops, or conditional statements).
Design and Use of Algorithms	**5.DD.2** Create a simple algorithm to solve a problem using coding patterns (e.g., loops, conditionals, functions, or variables).
Application and Assessment of Algorithms	**5.DD.3** Test the outcome(s) of a simple algorithm that uses coding patterns (e.g., loops, conditionals, functions, or variables).
Analyzing and Problem Solving (AP)	
Skill	**Standard**
Data Collection and Analysis	**5.AP.1** Utilize graphs and diagrams to represent, analyze, and solve problems.
Revising Algorithms and Processes	**5.AP.2** Identify and correct errors in algorithms or processes.
Collaborative Problem Solving	**5.AP.3** *Standard begins in sixth grade.*
Creating Instructions for Artificial Intelligence (AI)	**5.AP.4** Create questions from identified key words based on a topic, problem, or need. (Library Media 5.I.1, 5.I.2)

Impacts of Computing Learners will understand how technology shapes individuals and the world and influences safety, policy, law, and ethics.	
Policies and Laws (PL)	
Skill	**Standard**
Copyright and Fair Use	**5.PL.1** With guidance, demonstrate an understanding of copyright and fair use. (Library Media 5.IP.1)
Responsible and Acceptable Use Policies	**5.PL.2** Understand the purpose of and comply with responsible and acceptable use policies. (Library Media 5.RU.1)
Laws and User Agreements	*Standard begins in sixth grade.*
Ethics (E)	
Skill	**Standard**
Ethical Use of Technology	**5.E.1** Identify motivations that influence the ethical and unethical use of technology, including AI.
Evaluation of Information	**5.E.2** With guidance, understand that biases exist and distinguish between facts and opinions in various sources. (Library Media 5.E.1)

Fifth Grade

Impacts of Computing Learners will understand how technology shapes individuals and the world and influences safety, policy, law, and ethics.	
Societal Impacts (S)	
Skill	**Standard**
Technological Impacts on Society and Daily Life	**5.S.1** Explain the positive and negative impacts of technology on how people live, work, and interact.
Impacts of Artificial Intelligence (AI)	**5.S.2** *Standard begins in sixth grade.*

Digital Citizenship Learners will practice responsible digital consumption, creation, communication, and interaction.	
Digital Citizenship(DC)	
Skill	**Standard**
Balancing Media Usage	**5.DC.1** Identify strategies for media balance. (Library Media 5.RU.5)
Impacts of Technology Use on Self and Others	**5.DC.2** Describe the personal impact of technology use on one's learning and relationships.
Online Behavior	5.DC.3 Demonstrate cyberbullying prevention and reporting strategies. (Library Media 5.SI.3).
Digital Identity and Digital Footprint	**5.DC.4** Give examples of how using technology builds one's digital identity.

Security To protect individuals and organizations, learners will gain a foundational understanding of safe and best practices for data and system security, including information, network, and physical security.	
Personally Identifiable Information (PI)	
Skill	**Standard**
Sharing and Managing Personal Information	**5.PI.1** Identify risks of online sharing of private information (e.g., identity theft, data collection, and personal safety). (Library Media 5.RU.4)
Threats and Vulnerability (TV)	
Skill	**Standard**
Cybersecurity Threats	**5.TV.1** Identify strategies to prevent cybersecurity threats (e.g., phishing, malware, clickbait). (Library Media 5.RU.3)
Updating Apps and Devices	**5.TV.2** Explain the importance of using trusted sources for updating apps and devices.
Security Controls (SC)	
Skill	**Standard**
Authentication and Authorization	**5.SC.1** Define authentication and identify various authentication methods (e.g., passwords, fingerprint or facial recognition, multi-factor authentication).
Digital Privacy and Security	**5.SC.2** Use methods to maintain digital privacy and security when accessing technology (e.g., password, PIN, multi-factor authentication). (Library Media 5.RU.2)

Sixth Grade

Computing Devices and Systems Learners will develop an understanding of how networks, hardware, and software function and interact, fostering adaptable skills for digital environments.	
Networks and Internet (NI)	
Skill	**Standard**
Network	**6.NI.1** Identify network connection types (e.g., Wi-Fi, mobile data, Ethernet).
Internet of Things	**6.NI.2** Identify the risks and benefits of the Internet of Things (IoT).
Artificial Intelligence (AI)	**6.NI.3** Explore how generative AI creates text, images, or other content based on patterns it has learned from data.
Hardware and Software (HS)	
Skill	**Standard**
Use, Comparison, and Selection	**6.HS.1** Select software and basic software features to accomplish a task.
Troubleshooting	**6.HS.2** With guidance, identify software and hardware problems and apply troubleshooting strategies.
Information Organization, Storage, and Retrieval	**6.HS.3** With guidance, organize, store, retrieve, and share digital information efficiently.

Algorithms and Computational Thinking Learners will develop and apply a basic understanding of algorithms and computational thinking, enhancing problem-solving and critical-thinking skills.	
Developing and Designing Algorithms (DD)	
Skill	**Standard**
Components of Algorithms	**6.DD.1** With guidance, describe the function of the components of an algorithm.
Design and Use of Algorithms	**6.DD.2** With guidance, create an algorithm to solve a problem using multiple coding patterns (e.g., loops, conditionals, functions, or variables).
Application and Assessment of Algorithms	**6.DD.3** Test algorithms or processes to determine if the predicted outcome matches the actual results.
Analyzing and Problem Solving (AP)	
Skill	**Standard**
Data Collection and Analysis	**6.AP.1** With guidance, analyze collected data to identify patterns or answer questions.
Revising Algorithms and Processes	**6.AP.2** With guidance, revise and improve algorithms or processes across disciplines.
Collaborative Problem Solving	**6.AP.3** With guidance, ask for and use feedback from others to improve an algorithm or process.
Creating Instructions for Artificial Intelligence (AI)	**6.AP.4** Use keywords and phrases to create prompts that help digital tools or AI generate relevant information or responses.

Impacts of Computing Learners will understand how technology shapes individuals and the world and influences safety, policy, law, and ethics.	
Policies and Laws (PL)	
Skill	**Standard**
Copyright and Fair Use	**6.PL.1** With guidance, properly use copyrighted works, works in the Creative Commons, and works in the public domain by applying fair use guidelines.
Responsible and Acceptable Use Policies	**6.PL.2** Understand the purpose of and comply with responsible and acceptable use policies. (Library Media 6.RU.1)
Laws and User Agreements	**6.PL.3** With guidance, understand the purpose of specific federal, state, and local laws related to cybersecurity and privacy (e.g., FERPA, CIPA, COPPA, CFAA, HIPAA).

Sixth Grade

Impacts of Computing Learners will understand how technology shapes individuals and the world and influences safety, policy, law, and ethics.	
Ethics (E)	
Skill	**Standard**
Ethical Use of Technology	**6.E.1** Describe the motivations that influence the ethical and unethical use of technology, including AI.
Evaluation of Information	**6.E.2** With guidance, evaluate information sources to identify bias and determine reliability.
Societal Impacts (S)	
Skill	**Standard**
Technological Impacts on Society and Daily Life	**6.S.1** Examine the positive and negative impacts of current and emerging technology on how people live, work, and interact.
Impacts of Artificial Intelligence (AI)	**6.S.2** Identify the benefits and challenges of using generative AI, such as accuracy, bias, or privacy concerns.

Digital Citizenship Learners will practice responsible digital consumption, creation, communication, and interaction.	
Digital Citizenship (DC)	
Skill	**Standard**
Balancing Media Usage	**6.DC.1** Compare and contrast strategies for personal media balance. (Library Media 6.RU.5)
Impacts of Technology Use on Self and Others	**6.DC.2** Identify the positive and negative impacts online activities may have on relationships.
Online Behavior	**6.DC.3** Identify strategies for responding to positive and negative online situations and discuss the impact of responses on individuals.
Digital Identity and Digital Footprint	**6.DC.4** Reflect on online activities and determine how they impact one's digital identity online and offline. (Library Media 6.DI.1)

Security To protect individuals and organizations, learners will gain a foundational understanding of safe and best practices for data and system security, including information, network, and physical security.	
Personally Identifiable Information (PI)	
Skill	**Standard**
Sharing and Managing Personal Information	**6.PI.1** Discuss the benefits versus risks of sharing personal information online (e.g., identity theft, data collection, and personal safety). (Library Media 6.RU.4)
Threats and Vulnerability (TV)	
Skill	**Standard**
Cybersecurity Threats	**6.TV.1** With guidance, use strategies to prevent cybersecurity threats (e.g., phishing, malware, clickbait, data collection, and identity theft). (Library Media 6.RU.3)
Updating Apps and Devices	**6.TV.2** Identify the different types of app and device updates.
Security Controls (SC)	
Skill	**Standard**
Authentication and Authorization	**6.SC.1** Explain how authentication and authorization methods can protect users.
Digital Privacy and Security	**6.SC.2** Use methods to maintain digital privacy and security when accessing technology (e.g., password, PIN, multi-factor authentication). (Library Media 6.RU.2)

Seventh Grade

Computing Devices and Systems Learners will develop an understanding of how networks, hardware, and software function and interact, fostering adaptable skills for digital environments.	
Networks and Internet (NI)	
Skill	**Standard**
Network	**7.NI.1** Describe network connection types (e.g., Wi-Fi, mobile data, Ethernet).
Internet of Things	**7.NI.2** Describe the risks and benefits of the Internet of Things (IoT).
Artificial Intelligence (AI)	**7.NI.3** Describe how generative AI creates text, images, or other content based on patterns it has learned from data.
Hardware and Software (HS)	
Skill	**Standard**
Use, Comparison, and Selection	**7.HS.1** Select and use software features and hardware to accomplish a task.
Troubleshooting	**7.HS.2** Identify software and hardware problems and apply troubleshooting strategies.
Information Organization, Storage, and Retrieval	**7.HS.3** Organize, store, retrieve, and share digital information efficiently.

Algorithms and Computational Thinking Learners will develop and apply a basic understanding of algorithms and computational thinking, enhancing problem-solving and critical-thinking skills.	
Developing and Designing Algorithms (DD)	
Skill	**Standard**
Components of Algorithms	**7.DD.1** Describe the function of the components of an algorithm.
Design and Use of Algorithms	**7.DD.2** Create an algorithm to solve a problem using multiple coding patterns (e.g., loops, conditionals, functions, or variables).
Application and Assessment of Algorithms	**7.DD.3** Test algorithms or processes to determine if the predicted outcome matches the actual results.
Analyzing and Problem Solving (AP)	
Skill	**Standard**
Data Collection and Analysis	**7.AP.1** Analyze collected data to identify patterns or answer questions.
Revising Algorithms and Processes	**7.AP.2** With guidance, revise and improve algorithms or processes across disciplines.
Collaborative Problem Solving	**7.AP.3** Ask for and use feedback from others to improve an algorithm or process.
Creating Instructions for Artificial Intelligence (AI)	**7.AP.4** Compare how different word choices or question formats in AI prompts can change the results or quality of the response.

Impacts of Computing Learners will understand how technology shapes individuals and the world and influences safety, policy, law, and ethics.	
Policies and Laws (PL)	
Skill	**Standard**
Copyright and Fair Use	**7.PL.1** With guidance, properly use copyrighted works, works in the Creative Commons, and works in the public domain by applying fair use guidelines.
Responsible and Acceptable Use Policies	**7.PL.2** Understand the purpose of and comply with responsible and acceptable use policies. (Library Media 7.RU.1)
Laws and User Agreements	**7.PL.3** With guidance, understand the purpose of specific federal, state, and local laws related to cybersecurity and privacy (e.g., FERPA, CIPA, COPPA, CFAA, HIPAA).

Seventh Grade

Impacts of Computing Learners will understand how technology shapes individuals and the world and influences safety, policy, law, and ethics.	
Ethics (E)	
Skill	**Standard**
Ethical Use of Technology	**7.E.1** Understand the effect of unethical uses of technology, including AI, on the security, privacy, and intellectual property of self and others.
Evaluation of Information	**7.E.2** With guidance, evaluate information sources to identify bias and determine reliability.
Societal Impacts (S)	
Skill	**Standard**
Technological Impacts on Society and Daily Life	**7.S.1** Examine the positive and negative impacts of equitable access to technology on how people live, work, and interact.
Impacts of Artificial Intelligence (AI)	**7.S.2** Discuss how using AI can raise ethical questions about fairness, truthfulness, and how personal data is used.

Digital Citizenship Learners will practice responsible digital consumption, creation, communication, and interaction.	
Digital Citizenship (DC)	
Skill	**Standard**
Balancing Media Usage	**7.DC.1** Evaluate personal media usage and apply strategies to create media balance. (Library Media 7.RU.5)
Impacts of Technology Use on Self and Others	**7.DC.2** Identify the potential impact social media use may have on self-identity, overall wellness, and relationships.
Online Behavior	**7.DC.3** Identify strategies for responding to positive and negative online situations and discuss the impact of responses on individuals.
Digital Identity and Digital Footprint	**7.DC.4** Evaluate one's digital identity and its impact online and offline. (Library Media 7.DI.1)

Security To protect individuals and organizations, learners will gain a foundational understanding of safe and best practices for data and system security, including information, network, and physical security.	
Personally Identifiable Information (PI)	
Skill	**Standard**
Sharing and Managing Personal Information	**7.PI.1** Evaluate the benefits versus risks of sharing personal information online (e.g., identity theft, data collection, and personal safety). (Library Media 7.RU.4)
Threats and Vulnerability (TV)	
Skill	**Standard**
Cybersecurity Threats	**7.TV.1** Use strategies to prevent cybersecurity threats (e.g., phishing, malware, clickbait, data collection, and identity theft). (Library Media 7.RU.3)
Updating Apps and Devices	**7.TV.2** Describe how updates maintain the performance and security of apps and devices.
Security Controls (SC)	
Skill	**Standard**
Authentication and Authorization	**7.SC.1** Identify the risks of not using authentication and authorization methods for users and organizations.
Digital Privacy and Security	**7.SC.2** Use methods to maintain digital privacy and security when accessing technology (e.g., password, PIN, multi-factor authentication). (Library Media 7.RU.2)

Eighth Grade

Computing Devices and Systems Learners will develop an understanding of how networks, hardware, and software function and interact, fostering adaptable skills for digital environments.	
Networks and Internet (NI)	
Skill	**Standard**
Network	**8.NI.1** Describe how data is shared over network connection types (e.g., Wi-Fi, mobile data, Ethernet).
Internet of Things	**8.NI.2** Evaluate the risks and benefits of the Internet of Things (IoT).
Artificial Intelligence (AI)	**8.NI.3** Explain that generative AI uses algorithms and training data to recognize patterns and generate responses and explain why the quality of data matters.
Hardware and Software (HS)	
Skill	**Standard**
Use, Comparison, and Selection	**8.HS.1** Select and use software features and hardware to accomplish a task.
Troubleshooting	**8.HS.2** Identify software and hardware problems and apply troubleshooting strategies.
Information Organization, Storage, and Retrieval	**8.HS.3** Organize, store, retrieve, and share digital information efficiently.

Algorithms and Computational Thinking Learners will develop and apply a basic understanding of algorithms and computational thinking, enhancing problem-solving and critical-thinking skills.	
Developing and Designing Algorithms (DD)	
Skill	**Standard**
Components of Algorithms	**8.DD.1** Explain how to find and fix errors in an algorithm to ensure it works as intended.
Design and Use of Algorithms	**8.DD.2** Create an algorithm to solve a problem using multiple coding patterns (e.g., loops, conditionals, functions, or variables).
Application and Assessment of Algorithms	**8.DD.3** Test algorithms or processes to determine if the predicted outcome matches the actual results.
Analyzing and Problem Solving (AP)	
Skill	**Standard**
Data Collection and Analysis	**8.AP.1** Collect, organize, and analyze data to support claims or make informed decisions.
Revising Algorithms and Processes	**8.AP.2** Revise and improve algorithms or processes across disciplines.
Collaborative Problem Solving	**8.AP.3** Work collaboratively to test algorithms or processes to identify issues and improve.
Creating Instructions for Artificial Intelligence (AI)	**8.AP.4** Test and revise AI prompts to improve the accuracy, clarity, or usefulness of the responses.

Impacts of Computing Learners will understand how technology shapes individuals and the world and influences safety, policy, law, and ethics.	
Policies and Laws (PL)	
Skill	**Standard**
Copyright and Fair Use	**8.PL.1** Properly use copyrighted works, works in the Creative Commons, and works in the public domain by applying fair use guidelines.
Responsible and Acceptable Use Policies	**8.PL.2** Understand the purpose of and comply with responsible and acceptable use policies. (Library Media 8.RU.1)
Laws and User Agreements	**8.PL.3** Understand the purpose of specific federal, state, and local laws related to cybersecurity and privacy (e.g., FERPA, CIPA, COPPA, CFAA, HIPAA).

Eighth Grade

Impacts of Computing Learners will understand how technology shapes individuals and the world and influences safety, policy, law, and ethics.	
Ethics (E)	
Skill	**Standard**
Ethical Use of Technology	**8.E.1** Describe the consequences of unethical use of technology, including AI, on the security, privacy, and intellectual property of self and others.
Evaluation of Information	**8.E.2** Evaluate information sources to identify bias and determine reliability.
Societal Impacts (S)	
Skill	**Standard**
Technological Impacts on Society and Daily Life	**8.S.1** Describe how current and emerging technology is changing the way people live, work, and interact.
Understanding and Using Artificial Intelligence (AI)	**8.S.2** Explain how ethical concerns like bias, misinformation, and misuse of personal data can affect individuals and society when using AI.

Digital Citizenship Learners will practice responsible digital consumption, creation, communication, and interaction.	
Digital Citizenship (DC)	
Skill	**Standard**
Balancing Media Usage	**8.DC.1** Evaluate personal media usage and apply strategies to create media balance. (Library Media 8.RU.5)
Impacts of Technology Use on Self and Others	**8.DC.2** Discuss the potential impact social media use may have on self-identity, overall wellness, and relationships.
Online Behavior	**8.DC.3** Identify strategies for responding to positive and negative online situations and discuss the impact of responses on individuals.
Digital Identity and Digital Footprint	**8.DC.4** Evaluate one's digital identity and its impact online and offline. (Library Media 8.DI.1)

Security To protect individuals and organizations, learners will gain a foundational understanding of safe and best practices for data and system security, including information, network, and physical security.	
Personally Identifiable Information (PI)	
Skill	**Standard**
Sharing and Managing Personal Information	**8.PI.1** Evaluate the benefits versus risks of sharing personal information online (e.g., identity theft, data collection, and personal safety). (Library Media 8.RU.4)
Threats and Vulnerability (TV)	
Skill	**Standard**
Cybersecurity Threats	**8.TV.1** Use strategies to prevent cybersecurity threats (e.g., phishing, malware, clickbait, data collection, and identity theft). (Library Media 8.RU.3)
Updating Apps and Devices	**8.TV.2** Discuss the benefits of updates and the risks of not updating apps and devices.
Security Controls (SC)	
Skill	**Standard**
Authentication and Authorization	**8.SC.1** Discuss the risks of not using authentication and authorization methods for users and organizations.
Digital Privacy and Security	**8.SC.2** Use methods to maintain digital privacy and security when accessing technology (e.g., password, PIN, multi-factor authentication). (Library Media 8.RU.2)

Ninth – Tenth Grades

NOTE: The high school standards reflect the basic knowledge and skills learners should have when graduating. Learners who require more advanced standards should follow the NDCTE standards.

Computing Devices and Systems Learners will develop an understanding of how networks, hardware, and software function and interact, fostering adaptable skills for digital environments.	
Networks and Internet (NI)	
Skill	**Standard**
Network	**9-10.NI.1** Identify the advantages and disadvantages of transmitting information over the Internet, including speed, reliability, cost, and security.
Internet of Things	**9-10.NI.2** Analyze the purpose of the Internet of Things (IoT).
Artificial Intelligence (AI)	**9-10.NI.3** Explain how generative AI models process inputs and produce outputs, including the role of machine learning, training methods, and the importance of computational power.
Hardware and Software (HS)	
Skill	**Standard**
Use, Comparison, and Selection	**9-10.HS.1** Compare and contrast appropriate devices, hardware, and/or software (including cloud software and AI-integrated tools) to complete tasks.
Troubleshooting	**9-10.HS.2** Identify software and hardware problems using specific terminology and apply troubleshooting strategies.
Information Organization, Storage, and Retrieval	**9-10.HS.3** Compare and contrast a variety of storage options to fit a need.

Algorithms and Computational Thinking Learners will develop and apply a basic understanding of algorithms and computational thinking, enhancing problem-solving and critical-thinking skills.	
Developing and Designing Algorithms (DD)	
Skill	**Standard**
Components of Algorithms	**9- 10. DD.1** Solve problems by deconstructing them into their components.
Design and Use of Algorithms	**9-10.DD.2** Recognize, design, and use algorithms to solve problems across disciplines.
Application and Assessment of Algorithms	**9-10.DD.3** Examine algorithms for potential inconsistencies or inefficiencies.
Analyzing and Problem Solving (AP)	
Skill	**Standard**
Data Collection and Analysis	**9-10.AP.1** Collect, organize, analyze, and interpret data.
Revising Algorithms and Processes	**9-10.AP.2** Revise and improve algorithms or processes across disciplines.
Collaborative Problem Solving	**9-10.AP.3** Work collaboratively to generate multiple solutions to a task, discuss each solution's potential benefits and drawbacks, and determine an effective approach.
Creating Instructions for Artificial Intelligence (AI)	**9-10.AP.4** Evaluate how different sets of instructions given to an AI impact its output.

Impacts of Computing Learners will understand how technology shapes individuals and the world and influences safety, policy, law, and ethics.	
Policies and Laws (PL)	
Skill	**Standard**
Copyright and Fair Use	**9-10.PL.1** Properly use copyrighted works, works in the Creative Commons, and works in the public domain by applying fair use guidelines.
Responsible and Acceptable Use Policies	**9-10.PL.2** Understand the purpose of and comply with responsible and acceptable use policies. (Library Media 10.RU.1)
Laws and User Agreements	**9-10.PL.3** Explain the importance of understanding specific laws and user agreements about technology.

Ninth – Tenth Grades

Impacts of Computing Learners will understand how technology shapes individuals and the world and influences safety, policy, law, and ethics.	
Ethics (E)	
Skill	**Standard**
Ethical Use of Technology	**9-10.E.1** Identify and explain ethical issues related to technology use (e.g., AI, privacy, location sharing, intellectual property) and the responsibility of users and creators.
Evaluation of Information	**9-10.E.2** Evaluate the accuracy, perspective, credibility, and relevance of information, media, AI-generated content, or other resources.
Societal Impacts (S)	
Skill	**Standard**
Technological Impacts on Society and Daily Life	**9-10.S.1** Make predictions on how current and emerging technology (e.g., driverless cars, large language AI models, remote work, digital personal assistants) may impact the workplace and personal lives.
Impacts of Artificial Intelligence (AI)	**9-10.S.2** Evaluate AI outputs to identify limitations, inaccuracies, biases, misinformation, and privacy concerns.

Digital Citizenship Learners will practice responsible digital consumption, creation, communication, and interaction.	
Digital Citizenships (DC)	
Skill	**Standard**
Balancing Media Usage	**9-10.DC.1** Evaluate personal media usage and apply strategies to create media balance. (Library Media 10.RU.5)
Impacts of Technology Use on Self and Others	**9-10.DC.2** Evaluate the potential benefits and harms that social media use may have on self-identity and overall wellness.
Online Behavior	**9-10.DC.3** Demonstrate respect and integrity online. (Library Media 10.SI.3)
Digital Identity and Digital Footprint	**9-10.DC.4** Evaluate one's digital identity and recognize the potential future impact of one's actions in the digital world.

Security To protect individuals and organizations, learners will gain a foundational understanding of safe and best practices for data and system security, including information, network, and physical security.	
Personally Identifiable Information (PI)	
Skill	**Standard**
Sharing and Managing Personal Information	**9-10.PI.1** Monitor and manage information personally shared online about oneself and others.
Threats and Vulnerability (TV)	
Skill	**Standard**
Cybersecurity Threats	**9-10.TV.1** Develop strategies to help resolve issues arising from cybersecurity threats.
Updating Apps and Devices	**9-10.TV.2** Differentiate between security updates and feature updates and explain their purposes.
Security Controls (SC)	
Skill	**Standard**
Authentication and Authorization	**9-10.SC.1** Evaluate the advantages and disadvantages of authentication and authorization methods.
Digital Privacy and Security	**9-10.SC.2** Implement best practices to secure personal information when accessing technology (e.g., password, PIN, multi-factor authentication). (Library Media 10.RU.2)

Eleventh – Twelfth Grades

NOTE: The high school standards reflect the basic knowledge and skills learners should have when graduating. Learners who require more advanced standards should follow the NDCTE standards.

Computing Devices and Systems Learners will develop an understanding of how networks, hardware, and software function and interact, fostering adaptable skills for digital environments.	
Networks and Internet (NI)	
Skill	**Standard**
Network	**11-12.NI.1** Choose an appropriate connection to transmit information based on speed, reliability, cost, and security.
Internet of Things	**11-12.NI.2** Compare and contrast the benefits and security risks of the Internet of Things (IoT).
Artificial Intelligence (AI)	**11-12.NI.3** Identify and explain the technological components of AI, including networks and server resources necessary for operation, information databases, and software development.
Hardware and Software (HS)	
Skill	**Standard**
Use, Comparison, and Selection	**11-12.HS.1** Choose appropriate devices, hardware, and software (including cloud software and AI-integrated tools) to complete tasks and justify the choice made.
Troubleshooting	**11-12.HS.2** Implement systematic troubleshooting strategies to identify and fix errors.
Information Organization, Storage, and Retrieval	**11-12.HS.3** Develop personal procedures and policies for utilizing storage needs (e.g., local backups, cloud computing).

Algorithms and Computational Thinking Learners will develop and apply a basic understanding of algorithms and computational thinking, enhancing problem-solving and critical-thinking skills.	
Developing and Designing Algorithms (DD)	
Skill	**Standard**
Components of Algorithms	**11-12.DD.1** Deconstruct problems into components to create solutions to existing problems.
Design and Use of Algorithms	**11-12.DD.2** Use and adapt common algorithms to solve computational problems.
Application and Assessment of Algorithms	**11-12.DD.3** Evaluate a variety of algorithms that could be used for similar processes in real-world applications.
Analyzing and Problem Solving (AP)	
Skill	**Standard**
Data Collection and Analysis	**11-12.AP.1** Determine and utilize an effective method to collect and represent complex data.
Revising Algorithms and Processes	**11-12.AP.2** Revise and improve algorithms or processes across disciplines.
Collaborative Problem Solving	**11-12.AP.3** Work collaboratively to analyze complex problems, develop multiple solutions, evaluate the effectiveness of each solution, and justify the reasoning behind the chosen approach.
Creating Instructions for Artificial Intelligence (AI)	**11-12.AP.4** Evaluate how comprehensively AI outputs address the given task or problem.

Impacts of Computing Learners will understand how technology shapes individuals and the world and influences safety, policy, law, and ethics.	
Policies and Laws (PL)	
Skill	**Standard**
Copyright and Fair Use	**11-12.PL.1** Explain the beneficial and harmful effects of intellectual property laws on innovation, creativity, and collaboration.
Responsible and Acceptable Use Policies	**11-12.PL.2** Understand the purpose of and comply with responsible and acceptable use policies. (Library Media 12.RU.1)
Laws and User Agreements	**11-12.PL.3** Explain the importance of understanding specific laws and user agreements about technology.

Eleventh – Twelfth Grades

Impacts of Computing Learners will understand how technology shapes individuals and the world and influences safety, policy, law, and ethics.	
Ethics (E)	
Skill	**Standard**
Ethical Use of Technology	**11-12.E.1** Analyze complex ethical dilemmas related to emerging technologies (e.g., AI, data privacy, intellectual property, surveillance) and evaluate the responsibilities of users, developers, and policymakers.
Evaluation of Information	**11-12.E.2** Justify source selection based on accuracy, perspective, credibility, and relevance of information, media, AI-generated content, or other resources.
Societal Impacts (S)	
Skill	**Standard**
Technological Impacts on Society and Daily Life	**11-12.S.1** Explain how current and emerging technology (e.g., driverless cars, large language AI models, remote work, digital personal assistants) may change cultural and environmental aspects of society.
Impacts of Artificial Intelligence (AI)	**11-12.S.2** Identify and explain the ethical considerations of using AI including the awareness of biases, misinformation, resource consumption, and security risks.

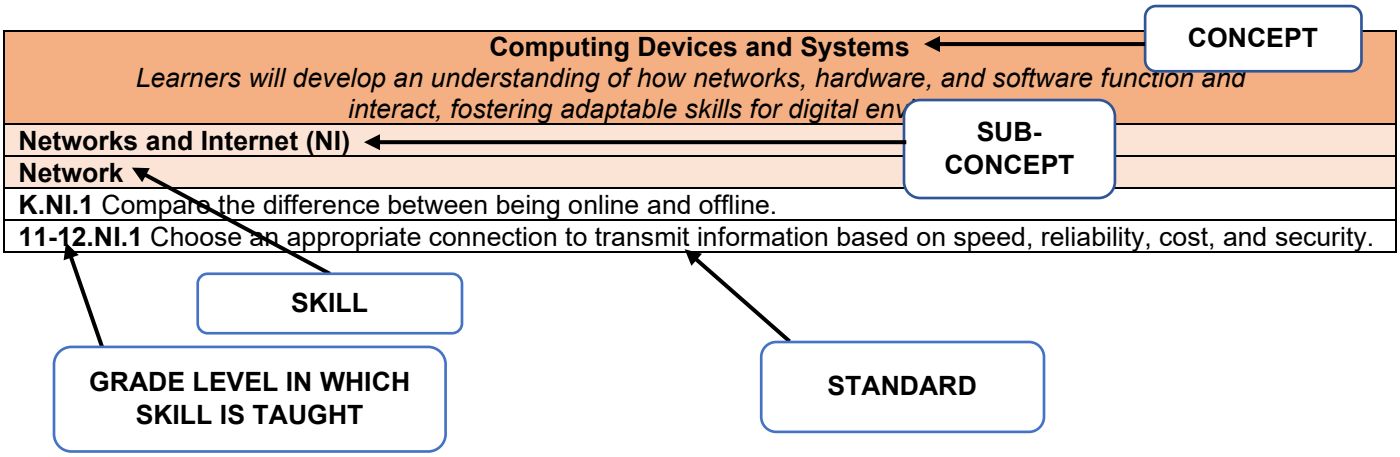
Digital Citizenship Learners will practice responsible digital consumption, creation, communication, and interaction.	
Digital Citizenship (DC)	
Skill	**Standard**
Balancing Media Usage	**11-12.DC.1** Evaluate personal media usage and apply strategies to create media balance. (Library Media 12.RU.5)
Impacts of Technology Use on Self and Others	**11-12.DC.2** Propose strategies for maintaining a healthy balance in social media usage.
Online Behavior	**11-12.DC.3** Demonstrate respect and integrity online. (Library Media 12.SI.3)
Digital Identity and Digital Footprint	**11-12.DC.4** Assess and refine one's digital identity and footprint to maintain a positive online presence.

Security To protect individuals and organizations, learners will gain a foundational understanding of safe and best practices for data and system security, including information, network, and physical security.	
Personally Identifiable Information (PI)	
Skill	**Standard**
Sharing and Managing Personal Information	**11-12.PI.1** Monitor and manage information personally shared online about oneself and others.
Threats and Vulnerability (TV)	
Skill	**Standard**
Cybersecurity Threats	**11-12.TV.1** Develop a sense of self-efficacy that allows one to act on and resolve issues arising from cybersecurity threats.
Updating Apps and Devices	**11-12.TV.2** Analyze and evaluate the urgency of installing updates, considering the differences between security and feature updates.
Security Controls (SC)	
Skill	**Standard**
Authentication and Authorization	**11-12.SC.1** Implement best practices associated with authentication and authorization methods.
Digital Privacy and Security	**11-12.SC.2** Implement best practices to secure personal information when accessing technology (e.g., password, PIN, multi-factor authentication). (Library Media 12.RU.2)

K-12 Computer Science and Cybersecurity Content Standards Skills Progressions

This section of the standards shows how skills develop over time. It is organized by specific skills.

How to Read the Skills Progressions



Computing Devices and Systems *Learners will develop an understanding of how networks, hardware, and software function and interact, fostering adaptable skills for digital environments.*
Networks and Internet (NI)
Network
K.NI.1 Identify visual cues indicating if one is online or offline.
1.NI.1 Identify examples of activities that can be done online or offline.
2.NI.1 Compare the difference between being online and offline.
3.NI.1 Identify examples of ways information is being sent and received across wireless paths (e.g., Wi-Fi, Bluetooth).
4.NI.1 Identify examples of ways information is being sent and received across physical paths (e.g., cables, routers).
5.NI.1 Explain the difference between physical and wireless paths.
6.NI.1 Identify network connection types (e.g., Wi-Fi, mobile data, Ethernet).
7.NI.1 Describe network connection types (e.g., Wi-Fi, mobile data, Ethernet).
8.NI.1 Describe how data is shared over network connection types (e.g., Wi-Fi, mobile data, Ethernet).
9-10.NI.1 Identify the advantages and disadvantages of transmitting information over the Internet, including speed, reliability, cost, and security.
11-12.NI.1 Choose an appropriate connection to transmit information based on speed, reliability, cost, and security.
Internet of Things
K.NI.2 Identify examples of devices that can connect to the internet.
1.NI.2 Describe uses of devices that connect to the internet.
2.NI.2 Explain how people can use internet-connected devices in everyday life.
3.NI.2 Explain how devices connected to the Internet can be used to share data.
4.NI.2 Explain how apps, websites, and wireless tools collect information about what users do when they are connected to the Internet.
5.NI.2 Explain why data is collected when devices are connected to the Internet (e.g., to personalize content, improve services).
6.NI.2 Identify the risks and benefits of the Internet of Things (IoT).
7.NI.2 Describe the risks and benefits of the Internet of Things (IoT).
8.NI.2 Evaluate the risks and benefits of the Internet of Things (IoT).
9-10.NI.2 Analyze the purpose of the Internet of Things (IoT).
11-12.NI.2 Compare and contrast the benefits and security risks of the Internet of Things (IoT).
Artificial Intelligence (AI)
K.NI.3 Understand that while AI may respond like a human, it is a machine.
1.NI.3 Provide examples of how AI can be used in everyday life.
2.NI.3 Provide examples of how AI can be used in everyday life.
3.NI.3 Recognize tools or machines that use AI.
4.NI.3 Define generative AI and provide examples, including large language models.
5.NI.3 Define generative AI and provide examples, including large language models.
6.NI.3 Explore how generative AI creates text, images, or other content based on patterns it has learned from data.
7.NI.3 Describe how generative AI creates text, images, or other content based on patterns it has learned from data.
8.NI.3 Explain that generative AI uses algorithms and training data to recognize patterns and generate responses and explain why the quality of data matters.
9-10.NI.3 Explain how generative AI models process inputs and produce outputs, including the role of machine learning, training methods, and the importance of computational power.
11- 12.NI.3 Identify and explain the technological components of AI, including networks and server resources necessary for operation, information databases, and software development.

Hardware and Software (HS)
Use, Comparison, and Selection
K.HS.1 Use basic hardware to accomplish simple tasks (e.g., turn the device on/off, use a mouse or touchscreen).
1.HS.1 Use basic software to accomplish simple tasks (e.g., open/close tabs, websites, apps, programs).
2.HS.1 Use software and hardware to accomplish a task.
3.HS.1 Use software skills to complete tasks (e.g., typing, copy/paste, drawing) using hardware.
4.HS.1 Explore software features while using hardware.
5.HS.1 Use software features and hardware to accomplish a task.
6.HS.1 Select software and basic software features to complete a task.
7.HS.1 Select and use software features and hardware to accomplish a task.
8.HS.1 Select and use software features and hardware to accomplish a task.
9-10.HS.1 Compare and contrast appropriate devices, hardware, and/or software (including cloud software and AI-integrated tools) to complete tasks.
11-12.HS.1 Choose appropriate devices, hardware, and software (including cloud software and AI-integrated tools) to complete tasks and justify the choice made.
Troubleshooting
K.HS.2 Identify components of a computing device (e.g., mouse, screen, power button, keyboard).
1.HS.2 Identify components of a computing device and describe how they are used.
2.HS.2 With guidance, follow basic step-by-step troubleshooting approaches to identify problems with computing devices.
3.HS.2 With guidance, follow basic troubleshooting steps to identify problems with computing devices.
4.HS.2 With guidance, follow step-by-step troubleshooting approaches and interpret error messages to identify problems with computing devices.
5.HS.2 With guidance, follow troubleshooting approaches to identify problems with computing devices.
6.HS.2 With guidance, identify software and hardware problems and apply troubleshooting strategies.
7.HS.2 Identify software and hardware problems and apply troubleshooting strategies.
8.HS.2 Identify software and hardware problems and apply troubleshooting strategies.
9-10.HS.2 Identify software and hardware problems using specific terminology and apply troubleshooting strategies.
11-12.HS.2 Implement systematic troubleshooting strategies to identify and fix errors.
Information Organization, Storage, and Retrieval
K.HS.3 Recognize that digital information can be stored.
1.HS.3 Recognize that digital information can be stored and shared.
2.HS.3 Recognize that digital information can be stored, shared, and retrieved.
3.HS.3 With guidance, organize digital information.
4.HS.3 With guidance, retrieve digital information.
5.HS.3 With guidance, organize, retrieve, and share digital information.
6.HS.3 With guidance, organize, store, retrieve, and share digital information efficiently.
7.HS.3 Organize, store, retrieve, and share digital information efficiently.
8.HS.3 Organize, store, retrieve, and share digital information efficiently.
9-10.HS.3 Compare and contrast a variety of storage options to fit a need.
11-12.HS.3 Develop personal procedures and policies for utilizing storage needs (e.g., local backups, cloud computing).

Algorithms and Computational Thinking *Learners will develop and apply a basic understanding of algorithms and computational thinking, enhancing problem-solving and critical-thinking skills.*
Developing and Designing Algorithms (DD)
Components of Algorithms
K.DD.1 Identify smaller steps within a task.
1.DD.1 Identify patterns within a task.
2.DD.1 Identify smaller steps and patterns within a task.
3.DD.1 Define an algorithm.
4.DD.1 Identify the key components of a simple algorithm (e.g., sequence, loops, conditional statements).
5.DD.1 Identify key components of a simple algorithm (e.g., sequences, loops, conditional statements).
6.DD.1 With guidance, describe the function of the components of an algorithm.
7.DD.1 Describe the function of the components of an algorithm.
8.DD.1 Explain how to find and fix errors in an algorithm to ensure it works as intended.
9-10.DD.1 Solve problems by deconstructing them into their components.
11-12.DD.1 Deconstruct problems into components to create solutions to existing problems.
Design and Use of Algorithms
K.DD.2 Create step-by-step directions to complete simple tasks.
1.DD.2 Create step-by-step directions to solve problems or complete tasks.
2.DD.2 Create step-by-step directions to solve problems or complete tasks.
3.DD.2 Create a simple algorithm using coding patterns (e.g., sequences, loops, or conditionals).
4.DD.2 Create a simple algorithm to solve a problem using coding patterns (e.g., sequences, loops, or conditionals).
5.DD.2 Create a simple algorithm to solve a problem using coding patterns (e.g., loops, conditionals, functions, or variables).
6.DD.2 With guidance, create an algorithm to solve a problem using multiple coding patterns (e.g., loops, conditionals, functions, or variables).
7.DD.2 Create an algorithm to solve a problem using multiple coding patterns (e.g., loops, conditionals, functions, or variables).
8.DD.2 Create an algorithm to solve a problem using multiple coding patterns (e.g., loops, conditionals, functions, or variables).
9-10.DD.2 Recognize, design, and use algorithms or processes across disciplines.
11-12.DD.2 Use and adapt common algorithms to solve computational problems.
Application and Assessment of Algorithms
Standards begin in third grade.
3.DD.3 Test the outcome(s) of algorithms that use coding patterns (e.g., sequences, loops, or conditionals).
4.DD.3 Test the outcome(s) of algorithms that use coding patterns (e.g., sequences, loops, or conditionals).
5.DD.3 Test the outcome(s) of a simple algorithm that uses coding patterns (e.g., loops, conditionals, functions, or variables).
6.DD.3 Test algorithms or processes to determine if the predicted outcome matches the actual results.
7.DD.3 Test algorithms or processes to determine if the predicted outcome matches the actual results.
8.DD.3 Test algorithms or processes to determine if the predicted outcome matches the actual results.
9-10.DD.3 Examine algorithms for potential inconsistencies or inefficiencies.
11-12.DD.3 Evaluate a variety of algorithms that could be used for similar processes in real-world applications.
Analyzing and Problem Solving (AP)
Data Collection and Analysis
K.AP.1 Collect and sort data and objects based on attributes.
1.AP.1 Collect, organize, and represent data using picture and bar graphs.
2.AP.1 Analyze data and interpret the results to solve one-step comparison problems using information from the graphs. (Mathematics 2.DPS.D.3)
3.AP.1 Analyze data and make simple statements to solve one- and two-step problems using information from the graphs. (Mathematics 3.DPS.D.3)
4.AP.1 Use graphs and diagrams to solve problems.
5.AP.1 Utilize graphs and diagrams to represent, analyze, and solve problems.
6.AP.1 With guidance, revise and improve algorithms or processes across disciplines.
7.AP1 Analyze collected data to identify patterns or answer questions.
8.AP.1 Collect, organize, and analyze data to support claims or make informed decisions.
9-10.AP.1 Collect, organize, analyze, and interpret data.
11-12.AP.1 Determine and utilize an effective method to collect and represent complex data.

Revising Algorithms and Processes
K.AP.2 Identify an error in algorithms and processes.
1.AP.2 Identify and fix an error in algorithms and processes.
2.AP.2 Use a trial-and-error process to identify and fix errors in algorithms and processes.
3.AP.2 Use a trial-and-error process to identify and fix errors in algorithms and processes.
4.AP.2 Identify and correct errors in algorithms and processes.
5.AP.2 Identify and correct errors in algorithms or processes.
6.AP.2 With guidance, revise and improve algorithms or processes across disciplines.
7.AP.2 With guidance, revise and improve algorithms or processes across disciplines.
8.AP.2 Revise and improve algorithms or processes across disciplines.
9-10.AP.2 Revise and improve algorithms or processes across disciplines.
11-12.AP.2 Revise and improve algorithms or processes across disciplines.
Collaborative Problem Solving
Standard begins in sixth grade.
6.AP.3 With guidance, ask for and use feedback from others to improve an algorithm or process.
7.AP.3 Ask for and use feedback from others to improve an algorithm or process.
8.AP.3 Work collaboratively to test algorithms or processes to identify issues and improve.
9-10.AP.3 Work collaboratively to generate multiple solutions to a task, discuss each solution's potential benefits and drawbacks, and determine an effective approach.
11-12.AP.3 Work collaboratively to analyze complex problems, develop multiple solutions, evaluate the effectiveness of each solution, and justify the reasoning behind the chosen approach.
Creating Instructions for Artificial Intelligence (AI)
Standards begin in third grade.
3.AP.4 With guidance, identify key words to describe a topic, problem, or need.
4.AP.4 With guidance, create questions based on a topic, problem, or need. (Library Media 4.I.1)
5.AP.4 Create questions from identified keywords based on a topic, problem, or need. (Library Media 5.I.1, 5.I.2)
6.AP.4 Use keywords and phrases to create prompts that help digital tools or AI generate relevant information or responses.
7.AP.4 Compare how different word choices or question formats in AI prompts can change the results or quality of the response.
8.AP.4 Test and revise AI prompts to improve the accuracy, clarity, or usefulness of the responses.
9-10.AP.4 Evaluate how different sets of instructions given to an AI impact its output.
11-12.AP.4 Evaluate how comprehensively AI outputs address the given task or problem.

Impacts of Computing *Learners will understand how technology shapes individuals and the world and influences safety, policy, law, and ethics.*
Policies and Laws (PL)
Copyright and Fair Use
K.PL.1 Discuss that creative works have owners. (Library Media K.IP.1)
1.PL.1 Understand that creative works have owners. (Library Media 1.IP.1)
2.PL.1 Demonstrate an understanding that creative works are protected by law. (Library Media 2.IP.1)
3.PL.1 Define copyright and fair use. (Library Media 3.IP.1)
4.PL.1 With guidance, demonstrate an understanding of copyright and fair use. (Library Media 4.IP.1)
5.PL.1 With guidance, demonstrate an understanding of copyright and fair use. (Library Media 5.IP.1)
6.PL.1 With guidance, properly use copyrighted works, works in the Creative Commons, and works in the public domain, demonstrating an understanding of fair use guidelines.
7.PL.1 With guidance, properly use copyrighted works, works in the Creative Commons, and works in the public domain, demonstrating an understanding of fair use guidelines.
8.PL.1 Properly use copyrighted works, works in the Creative Commons, and works in the public domain by applying fair use guidelines.
9-10.PL.1 Properly use copyrighted works, works in the Creative Commons, and works in the public domain by applying fair use guidelines.
11-12.PL.1 Explain the beneficial and harmful effects of intellectual property laws on innovation, creativity, and collaboration.
Responsible and Acceptable Use Policies
K.PL.2 Understand the purpose of and comply with responsible and acceptable use policies. (Library Media K.RU.1)
1.PL.2 Understand the purpose of and comply with responsible and acceptable use policies. (Library Media 1.RU.1)
2.PL.2 Understand the purpose of and comply with responsible and acceptable use policies. (Library Media 2.RU.1)
3.PL.2 Understand the purpose of and comply with responsible and acceptable use policies. (Library Media 3.RU.1)
4.PL.2 Understand the purpose of and comply with responsible and acceptable use policies. (Library Media 4.RU.1)
5.PL.2 Understand the purpose of and comply with responsible and acceptable use policies. (Library Media 5.RU.1)
6.PL.2 Understand the purpose of and comply with responsible and acceptable use policies. (Library Media 6.RU.1)
7.PL.2 Understand the purpose of and comply with responsible and acceptable use policies. (Library Media 7.RU.1)
8.PL.2 Understand the purpose of and comply with responsible and acceptable use policies. (Library Media 8.RU.1)
9-10.PL.2 Understand the purpose of and comply with responsible and acceptable use policies. (Library Media 10.RU.1)
11-12.PL.2 Understand the purpose of and comply with responsible and acceptable use policies. (Library Media 12.RU.1)
Policies and Laws (PL)
Laws and User Agreements
Standard begins in sixth grade.
6.PL.3 Understand the purpose of specific federal, state, and local laws related to cybersecurity and privacy (e.g., FERPA, CIPA, COPPA, CFAA, HIPAA).
7.PL.3 Understand the purpose of specific federal, state, and local laws related to cybersecurity and privacy (e.g., FERPA, CIPA, COPPA, CFAA, HIPAA).
8.PL.3 Understand the purpose of specific federal, state, and local laws related to cybersecurity and privacy (e.g., FERPA, CIPA, COPPA, CFAA, HIPAA).
9-10.PL.3 Explain the importance of understanding specific laws and user agreements about technology.
11-12.PL.3 Explain the importance of understanding specific laws and user agreements about technology.

Ethics (E)
Ethical Use of Technology
K.E.1 Identify positive uses of technology, including AI.
1.E.1 Identify positive and negative uses of technology, including AI.
2.E.1 Describe the positive and negative uses of technology, including AI.
3.E.1 Identify ethical and unethical uses of technology, including AI.
4.E.1 Explain how technology, including AI, may be used ethically or unethically.
5.E.1 Identify motivations that influence the ethical and unethical use of technology, including AI.
6.E.1 Describe the motivations that influence the ethical and unethical use of technology, including AI.
7.E.1 Understand the effect of unethical uses of technology, including AI, on the security, privacy, and intellectual property of self and others.
8.E.1 Describe the consequences of unethical use of technology, including AI, on the security, privacy, and intellectual property of self and others.
9-10.E.1 Identify and navigate ethical issues related to technology use (e.g., AI, privacy, location sharing, intellectual property) and the responsibility of users and creators.
11-12.E.1 Analyze complex ethical dilemmas related to emerging technologies (e.g., AI, data privacy, intellectual property, surveillance) and evaluate the responsibilities of users, developers, and policymakers.
Evaluation of Information
K.E.2 With guidance, identify facts and opinions. (Library Media K.E.1)
1.E.2 With guidance, identify facts and opinions. (Library Media 1.E.1)
2.E.2 Identify facts and opinions. (Library Media 2.E.1)
3.E.2 Identify facts and opinions. (Library Media 3.E.1)
4.E.2 With guidance, understand that biases exist and distinguish between facts and opinions in various sources. (Library Media 4.E.1)
5.E.2 With guidance, understand that biases exist and distinguish between facts and opinions in various sources. (Library Media 5.E.1)
6.E.2 With guidance, evaluate information sources to identify bias and determine reliability.
7.E.2 With guidance, evaluate information sources to identify bias and determine reliability.
8.E.2 Evaluate information sources to identify bias and determine reliability.
9-10.E.2 Evaluate the accuracy, perspective, credibility, and relevance of information, media, AI-generated content, or other resources.
11-12.E.2 Justify source selection based on accuracy, perspective, credibility, and relevance of information, media, AI-generated content, or other resources.
Societal Impacts (S)
Technological Impacts on Society and Daily Life
K.S.1 Describe how technology impacts how people live.
1.S.1 Describe how technology impacts how people work.
2.S.1 Identify the positive and negative impacts of technology on how people live, work, and interact.
3.S.1 Identify the positive and negative impacts of technology on how people live, work, and interact.
4.S.1 Explain the positive and negative impacts of technology on how people live, work, and interact.
5.S.1 Explain the positive and negative impacts of technology on how people live, work, and interact.
6.S.1 Examine the positive and negative impacts of current and emerging technology on how people live, work, and interact.
7.S.1 Examine the positive and negative impacts of equitable access to technology on how people live, work, and interact.
8.S.1 Examine how current and emerging technology is changing the way people live, work, and interact.
9-10.S.1 Make predictions on how current and emerging technology (e.g., driverless cars, large language AI models, remote work, digital personal assistants) may impact the workplace and personal lives.
11-12.S.1 Explain how current and emerging technology (e.g., driverless cars, large language AI models, remote work, digital personal assistants) may change cultural and environmental aspects of society.
Impacts of Artificial Intelligence (AI)
Standards begin in sixth grade.
6.S.2 Identify the benefits and challenges of using generative AI, such as accuracy, bias, or privacy concerns.
7.S.2 Discuss how using AI can raise ethical questions about fairness, truthfulness, and how personal data is used.
8.S.2 Explain how ethical concerns like bias, misinformation, and misuse of personal data can affect individuals and society when using AI.
9-10.S.2 Evaluate AI outputs to identify limitations, inaccuracies, biases, misinformation, and privacy concerns.
11-12.S.2 Identify and explain the ethical considerations of using AI, including the awareness of biases, misinformation, resource consumption, and security risks.

Digital Citizenship *Learners will practice responsible digital consumption, creation, communication, and interaction.*
Digital Citizenship (DC)
Balancing Media Usage
K.DC.1 With guidance, discuss appropriate times to use technology and times to be screen-free. (Library Media K.RU.5)
1.DC.1 With guidance, discuss appropriate times to use technology and times to be screen-free. (Library Media K.RU.5)
2.DC.1 Identify appropriate times to use technology and times to be screen-free. (Library Media 2.RU.5)
3.DC.1 Understand the importance of balancing media and non-media activities. (Library Media 3.RU.5)
4.DC.1 Evaluate the use of media time. (Library Media 4.RU.5)
5.DC.1 Identify strategies for media balance. (Library Media 5.RU.5)
6.DC.1 Compare and contrast strategies for personal media balance. (Library Media 6.RU.5)
7.DC.1 Evaluate personal media usage and apply strategies to create media balance. (Library Media 7.RU.5)
8.DC.1 Evaluate personal media usage and apply strategies to create media balance. (Library Media 8.RU.5)
9-10.DC.1 Evaluate personal media usage and apply strategies to create media balance. (Library Media 10.RU.5)
11-12.DC.1 Evaluate personal media usage and apply strategies to create media balance. (Library Media 12.RU.5)
Impacts of Technology Use on Self and Others
K.DC.2 Explain basic feelings (e.g., happy, sad, frustrated, excited) that may come from using technology or interacting with others online.
1.DC.2 Describe the impact of technology on one's learning.
2.DC.2 Apply strategies to show care and respect in online communication (e.g., pausing before responding, standing up for others).
3.DC.2 Describe ways technology impacts relationships with others (e.g., family, friends).
4.DC.2 Describe the personal impacts of technology on one's learning and relationships.
5.DC.2 Describe the personal impact of technology use on one's learning and relationships.
6.DC.2 Identify the positive and negative impacts online activities may have on relationships.
7.DC.2 Identify the potential impact social media use may have on self-identity, overall wellness, and relationships.
8.DC.2 Discuss the potential impact social media use may have on self-identity, overall wellness, and relationships.
9-10.DC.2 Evaluate the potential benefits and harms that social media use may have on self-identity and overall wellness.
11-12.DC.2 Propose strategies for maintaining a healthy balance in social media usage.
Online Behavior
K.DC.3 With guidance, recognize inappropriate online behavior and how to report it. (Library Media K.SI.3)
1.DC.3 With guidance, recognize inappropriate online behavior and how to report it. (Library Media 1.SI.3)
2.DC.3 Recognize and report inappropriate online behavior. (Library Media 2.SI.3)
3.DC.3 Identify various forms of cyberbullying (e.g., hacking, harassing, outing, flaming) and reporting strategies. (Library Media 3.SI.3)
4.DC.3 Identify cyberbullying prevention and reporting strategies. (Library Media 4.SI.3)
5.DC.3 Demonstrate cyberbullying prevention and reporting strategies. (Library Media 5.SI.3)
6.DC.3 Identify strategies for responding to positive and negative online situations and discuss the impact of responses on individuals.
7.DC.3 Identify strategies for responding to positive and negative online situations and discuss the impact of responses on individuals.
8.DC.3 Identify strategies for responding to positive and negative online situations and discuss the impact of responses on individuals.
9-10.DC.3 Demonstrate respect and integrity online. (Library Media 10.SI.3)
11-12.DC.3 Demonstrate respect and integrity online. (Library Media 12.SI.3)

Digital Identity and Digital Footprint
K.DC.4 With guidance, understand digital identity. (Library Media K.DI.1)
1.DC.4 With guidance, understand digital identity and recognize that using technology builds one's digital identity. (Library Media 1.DI.1).
2.DC.4 With guidance, understand digital identity and recognize that using technology builds one's digital identity. (Library Media 2.DI.1).
3.DC.4 Recognize that using technology builds one's digital identity. (Library Media 3.DI.1)
4.DC.4 Recognize that using technology builds one's digital identity. (Library Media 4.DI.1)
5.DC.4 Give examples of how using technology builds one's digital identity.
6.DC.4 Reflect on online activities and determine how they impact one's digital identity online and offline. (Library Media 6.DI.1)
7.DC.4 Evaluate one's digital identity and its impact online and offline. (Library Media 7.DI.1)
8.DC.4 Evaluate one's digital identity and its impact online and offline. (Library Media 8.DI.1)
9-10.DC.4 Evaluate one's digital identity and recognize the potential future impact of one's actions in the digital world.
11-12.DC.4 Assess and refine one's digital identity and footprint to maintain a positive online presence.

Security *To protect individuals and organizations, learners will gain a foundational understanding of safe and best practices for data and system security, including information, network, and physical security.*
Personally Identifiable Information (PI)
Sharing and Managing Personal Information
K.PI.1 With guidance, discuss personal information that is public vs. private. (Library Media K.RU.4)
1.PI.1 With guidance, discuss personal information that is public vs. private. (Library Media 1.RU.4)
2.PI.1 Identify personal information that is public vs. private. (Library Media 2.RU.4)
3.PI. 1 Identify situations where private information can be shared online. (Library Media 3.RU.4)
4.PI.1 Discuss the risks related to sharing private information online (e.g., identity theft, data collection, and personal safety).
5.PI.1 Identify risks of online sharing of private information (e.g., identity theft, data collection, and personal safety). (Library Media 5.RU.4)
6.PI.1 Discuss the benefits versus risks of sharing personal information online (e.g., identity theft, data collection, and personal safety). (Library Media 6.RU.4)
7.PI.1 Evaluate the benefits versus risks of sharing personal information online (e.g., identity theft, data collection, and personal safety). (Library Media 7.RU.4)
8.PI.1 Evaluate the benefits versus risks of sharing personal information online (e.g., identity theft, data collection, and personal safety). (Library Media 8.RU.4)
9-10.PI.1 Monitor and manage information personally shared online about oneself and others.
11-12.PI.1 Monitor and manage information personally shared online about oneself and others.
Threats and Vulnerability (TV)
Cybersecurity Threats
K.TV.1 Understand that not all websites and apps are safe. (Library Media K.RU.3)
1.TV.1 Understand that not all websites and apps are safe. (Library Media 1.RU.3)
2.TV.1 Understand that cybersecurity threats exist (e.g., phishing, malware, clickbait). (Library Media 2.RU.3)
3.TV.1 With guidance, identify cybersecurity threats (e.g., phishing, malware, clickbait). (Library Media 3.RU.3)
4.TV.1 Identify cybersecurity threats (e.g., phishing, malware, clickbait).
5.TV.1 Identify strategies to prevent cybersecurity threats (e.g., phishing, malware, clickbait). (Library Media 5.RU.3)
6.TV.1 With guidance, use strategies to prevent cybersecurity threats (e.g., phishing, malware, clickbait, data collection, and identity theft). (Library Media 6.RU.3)
7.TV.1 Use strategies to prevent cybersecurity threats (e.g., phishing, malware, clickbait, data collection, and identity theft). (Library Media 7.RU.3)
8.TV.1 Use strategies to prevent cybersecurity threats (e.g., phishing, malware, clickbait, data collection, and identity theft). (Library Media 8.RU.3)
9-10.TV.1 Develop strategies to help resolve issues arising from cybersecurity threats.
11-12.TV.1 Develop a sense of self-efficacy that allows one to act on and resolve issues arising from cybersecurity threats.
Updating Apps and Devices
K.TV.2 Understand that apps and devices need updates.
1.TV.2 Understand that apps and devices need updates.
2.TV.2 Recognize that trusted updates can change or improve apps and devices.
3.TV.2 Recognize that trusted updates can change or improve apps and devices.
4.TV.2 Explain the importance of using trusted sources for updating apps and devices.
5.TV.2 Explain the importance of using trusted sources of updating apps and devices.
6.TV.2 Identify the different types of app and device updates.
7.TV.2 Describe how updates maintain the performance and security of apps and devices.
8.TV.2 Describe the benefits of updates and the risks of not updating apps and devices.
9-10.TV.2 Differentiate between security updates and feature updates and explain their purposes.
11-12.TV.2 Analyze and evaluate the urgency of installing updates, considering the differences between security and feature updates.

Security Controls (SC)
Authentication and Authorization
K.SC.1 Recognize the importance of a password.
1.SC.1 Recognize the importance of a password.
2.SC.1 Describe the concept of a strong password and its importance.
3.SC.1 Describe the concept of a strong password and its importance.
4.SC.1 Define authentication and identify various authentication methods (e.g., passwords, fingerprint or facial recognition, multi-factor authentication).
5.SC.1 Define authentication and identify various authentication methods (e.g., passwords, fingerprint or facial recognition, multi-factor authentication).
6.SC.1 Explain how authentication and authorization methods can protect users.
7.SC.1 Identify the risks of not using authentication and authorization methods for users and organizations.
8.SC.1 Discuss the risks of not using authentication and authorization methods for users and organizations.
9-10.SC.1 Evaluate the advantages and disadvantages of authentication and authorization methods.
11-12.SC.1 Implement best practices associated with authentication and authorization methods.
Digital Privacy and Security
K.SC.2 With guidance, describe methods to maintain digital privacy and security when accessing technology (e.g., password, PIN, multi-factor authentication).
1.SC.2 With guidance, use authentication methods to access technology. (e.g., password, PIN, dual authentication). (Library Media 1.RU.2)
2.SC.2 Describe methods to maintain digital privacy and security when accessing technology (e.g., password, PIN, multi-factor authentication).
3.SC.2 Use methods to maintain digital privacy and security when accessing technology (e.g., password, PIN, multi-factor authentication). (Library Media 3.RU.2)
4.SC.2 Use methods to maintain digital privacy and security when accessing technology (e.g., password, PIN, multi-factor authentication). (Library Media 4.RU.2)
5.SC.2 Use methods to maintain digital privacy and security when accessing technology (e.g., password, PIN, multi-factor authentication). (Library Media 5.RU.2)
6.SC.2 Use methods to maintain digital privacy and security when accessing technology (e.g., password, PIN, multi-factor authentication). (Library Media 6.RU.2)
7.SC.2 Use methods to maintain digital privacy and security when accessing technology (e.g., password, PIN, multi-factor authentication). (Library Media 7.RU.2)
8.SC.2 Use methods to maintain digital privacy and security when accessing technology (e.g., password, PIN, multi-factor authentication). (Library Media 8.RU.2)
9-10.SC.2 Implement best practices to secure personal information when accessing technology (e.g., password, PIN, multi-factor authentication). (Library Media 10.RU.2)
11-12.SC.2 Implement best practices to secure personal information when accessing technology (e.g., password, PIN, multi-factor authentication). (Library Media 12.RU.2)

Glossary

Acceptable/responsible use policy: a written document approved by an organization outlining user terms and conditions

Algorithm: a process or set of rules to be followed in calculations or other problem-solving operations, especially by computer

Artificial Intelligence (AI): technology focused on creating systems that perform tasks requiring human-like thought, such as learning, reasoning, and perception

Application (app): see software

Authentication: the process or action of verifying the identity of a user

Authorization: the process of granting or denying access to specific resources or actions based on the identity of a user

Bias: preconceived opinions in favor of or against one thing, person, or group compared with another, usually in a way considered to be unfair

Clickbait: (on the Internet) content whose primary purpose is to attract attention and encourage visitors to click on a link to a particular web page

Cloud computing: delivering computing services—including storage, processing power, databases, networking, software, and analytics—over the Internet ("the cloud") instead of on personal devices

Computational thinking: a problem-solving method that uses computer science concepts to design systems, solve problems, and understand human behavior

Computer Science: the study of computers and algorithmic processes, including their principles, hardware and software designs, implementation, and societal impact

Computing device: a machine that can process, store, and transmit electronic information (i.e., computer, Chromebook, iPad, smartphone)

Conditionals: programming language constructs that allow a computer to perform different actions or return different values based on the value of a Boolean expression or condition

Copyright: legal protection that creators have over the things they create

Creative Commons: a set of various licenses that allow people to share their copyrighted work, be copied, edited, built upon, etc., while retaining the copyright to the original work

Cyberbullying: using digital devices, sites, and apps to intimidate, harm repeatedly, and upset someone

Cybersecurity: a framework used to protect the integrity of networks, programs, and data from attack, damage, or unauthorized access

Data: quantities, characters, or symbols that are the inputs and outputs of computer programs

Digital citizenship: navigating the digital world safely, responsibly, and ethically

Digital footprint: the trail of information a person leaves behind online, including data from cookies, search history, and online activity logs

Digital identity: online representation of a person, encompassing all the information about them that exists digitally, including their social profiles, online activity, and personal details shared online. It creates a picture of who they are in the digital world

Emerging technology: innovative and rapidly developing technologies that are in the early stages of adoption but have the potential to significantly impact industries, societies, or the way people live and work. These technologies are often characterized by novelty, uncertainty, and the potential for transformative change

Ethics: moral principles that guide a person's behavior or how an activity is conducted

Fair use: the ability to use copyrighted work without permission, but only in certain ways and specific situations

Function: a reusable block of code that performs a specific task and can be called with inputs to produce an output

Generative AI: a type of AI that can generate new content such as text, images, videos, and audio

Hardware: the physical components of a computing system, computer, or computing device

Information technology: the study or use of systems (especially computers and telecommunications) for storing, retrieving, and sending information

Internet of Things (IoT): the interconnection via the Internet of computing devices embedded in everyday objects, enabling them to send and receive data

Large Language Model: a subclass of generative AI that produces human-like responses, typically in the form of text, from a user-provided prompt

Loop: a programming structure that repeats a sequence of instructions

Malware: software specifically designed to disrupt, damage, or gain unauthorized access to a computer system (e.g., viruses)

Network: a group of computing devices (personal computers, phones, servers, switches, routers, etc.) connected by cables or wireless media to exchange information and resources

Offline: a state where a device, system, or user is not connected to a network and cannot communicate or interact with other devices, systems, or users in real time

Online: refers to a state where a device, system, or user is connected to a network, typically the Internet, and can communicate or interact with other devices, systems, or users in real time

Patterns: a recurring, recognizable structure or approach used to solve a problem

Phishing: the fraudulent practice of sending emails or other messages purporting to be from reputable companies to induce individuals to reveal personal information, such as passwords and credit card numbers

Process: a series of actions or steps to achieve a particular end

Public domain: all the creative work to which no exclusive intellectual property rights apply

Sequence: a set of logical steps carried out in order

Software: programs that run on a computing system, computer, or other computing device

Technology: the methods, systems, and devices resulting from scientific knowledge used for practical purposes

Troubleshooting: a systematic problem-solving approach to finding and resolving a problem, error, or fault within software or a computing system

Updates: essential for maintaining software and systems' security, functionality, and performance, protecting against new threats, ensuring compatibility with other technologies, and improving overall user experience

Variable: a placeholder used to keep track of a variable that can change while a program is running. The value can be a number, text, or a logical value