NDDPI

NORTH DAKOTA
DEPARTMENT OF PUBLIC INSTRUCTION

Crosswalk Between the 2025 and 2019 Computer Science and Cybersecurity Content Standards K-12

May 2025

Contents

Crosswalk Between the
2025 and 2019 Computer Science and Cybersecurity Standards

Introduction

The Standards Writing Committee has created a crosswalk between the 2025 and 2019 North Dakota Computer Science and Cybersecurity Content Standards. This document shows the changes made between the 2019 standards and the revised 2025 standards. It was developed to help schools implement the revised standards.

General Changes for 2025

- The new standards have been written for individual grade levels K-8 and banded in grades 9-10 and 11-12.
- The standards were written to reflect the proficiency expectations at the end of the grade level or span.
- All "continued growth" standards have been eliminated.
- Standards that are repeated in multiple grade levels increase in rigor through the content used to teach the standard.
- The new standards focus on applying basic computer and cybersecurity skills and knowledge that learners need when they graduate. Learners enrolled in more advanced technology and computer science courses would follow the North Dakota Career and Technical Education (NDCTE) standards. Duplicate standards for the same course would create unnecessary redundancy. The new standards also allow for more specified skills for learners who are moving into technology to receive certifications through those courses.
- The Library Media Content Standards included were limited to those that directly pertain to computer science and cybersecurity.
- The new standards contain goals learners should reach under each concept. The 2019 standards contained descriptors under each sub-concept.
- The new standards increased the focus on cybersecurity and protecting personal and private information.
- The new standards added standards focusing on balancing one's use of technology with other aspects of life and interaction with others.
- Standards regarding artificial intelligence (AI) have been developed.

How to Read This Document

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Computing Devices and Systems *Learners will develop an understanding of how networks, hardware, and software function and interact, fostering adaptable skills for digital environments.*	**Technology Systems**	The new standards added a goal that learners should reach by graduation.
Networks and Internet	**Networks and Internet** *Networks link computers and devices locally and worldwide, allowing people to access and communicate information.*	The organization of the new standards eliminates the need to define the sub-concepts.
2.NI.1 Understand the difference between being online and offline.		This new standard lays the basic understanding required for the following standards.

Standards Number

Sub-Concept
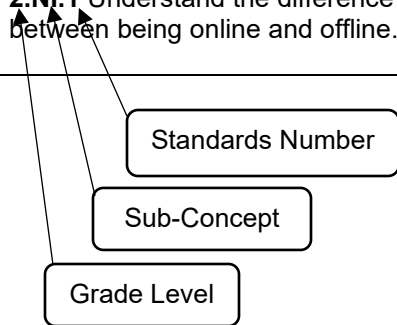
Grade Level

CODING EXAMPLE

2 – Grade Level

NI – Sub-Concept

1 – Standards Number

Crosswalk Between the 2025 and 2019 Computer Science and Cybersecurity Standards

Kindergarten

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Computing Devices and Systems *Learners will develop an understanding of how networks, hardware, and software function and interact, fostering adaptable skills for digital environments.*	**Technology Systems**	The new standards added a goal that learners should reach by graduation.
Networks and Internet	**Networks and Internet** *Networks link computers and devices locally and worldwide, allowing people to access and communicate information.*	The organization of the new standards eliminates the need to define the sub-concepts.
K.NI.1 Identify visual cues indicating if one is online or offline.		This new standard lays the basic understanding required for the following standards.
K.NI.2 Identify examples of devices that can connect to the internet.	**K.NI.1** Recognize that computing devices can be connected.	The new standard focuses on providing examples of devices.
K.NI.3 Understand that while AI may respond like a human, it is a machine.		The new standard includes specific AI understanding.
Hardware and Software	**Hardware and Software** *Devices, hardware, and software work together as a system to accomplish tasks.* **Troubleshooting** *Strategies for solving technology system problems.*	The organization of the new standards eliminates the need to define the sub-concepts.
K.HS.1 Use basic hardware to accomplish simple tasks (e.g., turn the device on/off, use a mouse or touchscreen).	**K.HS.1** Follow directions to use computing devices to perform a variety of appropriate tasks.	The new standard places the focus on performing basic tasks with the computer.
K.HS.2 Identify basic components of a computing device (e.g., mouse, screen, keyboard, power button).	**K.T.1** Understand that technology systems might not work as expected.	The new standard focuses on basic computer components and functions.
K.HS.3 Recognize that digital information can be stored.		The new standard focuses on stored information.

Kindergarten

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Algorithms and Computational Thinking *Learners will develop and apply a basic understanding of algorithms and computational thinking, enhancing problem-solving and critical-thinking skills.*	**Problem Solving and Algorithms**	The new standards added a goal that learners should reach by graduation.
Developing and Designing Algorithms	**Development and Design** *Design processes to create new, helpful, and imaginative solutions to problems.*	The organization of the new standards eliminates the need to define the sub-concepts.
K.DD.1 Identify smaller steps within a task.		The new standard focuses on identifying the smaller steps of a task.
K.DD.2 Create step-by-step directions to complete simple tasks.	**K.DD.1** With guidance, create programs to follow a sequence.	The new standard focuses on sequencing tasks to prepare students to create sequential programs.
K.DD.3 *Standard begins in grade three.*		
Analyzing and Problem Solving	**Problem Solving and Algorithms** *Strategies for understanding and solving problems.* **Data Creation and Analysis** *Data can be collected and presented with computing devices or digital tools.*	The new standards combine the 2019 sub-concepts. The organization of the new standards eliminates the need to define the sub-concepts.
K.AP.1 Collect and sort data and objects based on attributes.	**K.DCA.1** With guidance, conclude and make predictions based on picture graphs or patterns with or without a computing device.	The new standard applies to the data standard from mathematics, which leads to data analysis. This standard is related to Mathematics K.DPS.D.1.
K.AP.2 Identify an error in algorithms and processes.	**K.PSA.1** With guidance, determine if a program works. **K.PSA.2** Use trial and error in an attempt to solve a problem.	The new standard focuses on simplifying multiple standards into one.
K.AP.3 *Standard begins in sixth grade.*		
K.AP.4 *Standard begins in third grade.*		

Kindergarten

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Impacts of Computing *Learners will understand how technology shapes individuals and the world and influences safety, policy, law, and ethics.*	**Impacts of Computing** *Past, present, and possible future impact of technology on society.*	The new standards added a goal that learners should reach by graduation. They use the sub-concept from the 2019 standards that was moved to a concept.
Policies and Laws	**Intellectual Property** *Respect for the rights and obligations of using and sharing intellectual property.*	The new standards focus on the various laws and policies about technology. The organization of the new standards eliminates the need to define the sub-concepts.
K.PL.1 Discuss that creative works have owners. (Library Media K.IP.1)	**K.IP.1** Discuss that creative works have owners (copyright). **K.IP.2** Understand that credit should be given to the creator of creative work.	The new standard uses the Library Media standard, which introduces students to the concept of creative work owners.
K.PL.2 Understand the purpose of and comply with responsible and acceptable use policies. (Library Media K.RU.1)	**K.RU.4** Comply with Acceptable Use Policies.	The new standard uses the Library Media standard, which focuses on compliance and understanding why the policies exist.
K.PL.3 *Standard begins in sixth grade.*		
Ethics	**Safety and Ethics** *When using technology, there are both positive and negative impacts on social and ethical behaviors.*	The new standards do not contain a definition and focus on the ethical behaviors in this sub-concept. The organization of the new standards eliminates the need to define the sub-concepts.
K.E.1 Identify positive uses of technology, including AI.	**K.RU.1** Discuss positive and negative behaviors when using electronic communication.	The new standard focuses on positive uses of technology and includes AI.
K.E.2 With guidance, identify facts and opinions. (Library Media K.E.1)		The new standards use the Library Media standard to identify facts and opinions when using technology.
	K.A.1 With guidance, use a keyword search with a teacher-selected online resource.	The Library Media Content Standards included were limited to those that directly pertain to computer science and cybersecurity.
	K.E.1 Name various information sources.	The Library Media Content Standards included were limited to those that directly pertain to computer science and cybersecurity.
	K.C.1 With guidance, create a digital product.	The Library Media Content Standards included were limited to those that directly pertain to computer science and cybersecurity.
Societal Impacts		New sub-concept
K.S.1 Describe how technology impacts how people live.	**K.IC.1** List different ways in which technologies are used in daily life.	This standard combines the aspects of the 2019 standards on the impacts of computing.
K.S.2 *Standard begins in sixth grade.*		

Kindergarten

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Digital Citizenship *Learners will practice responsible digital consumption, creation, communication, and interaction.*	**Digital Citizenship**	The new standards added a goal that learners should reach by graduation.
Digital Citizenship		
K.DC.1 With guidance, discuss appropriate times to use technology and times to be screen-free. (Library Media K.RU.5)		This new standard uses the Library Media standard that focuses on balancing the use of technology with other activities.
K.DC.2 Identify basic feelings (e.g., happy, sad, frustrated, excited) that may come from using technology or interacting with others online.		The new standard focuses on identifying feelings related to technology use.
K.DC.3 With guidance, recognize inappropriate online behavior and how to report it. (Library Media K.SI.3)	**K.RU.2** With guidance, identify appropriate manners while participating in an online community. **K.SE.1** With guidance, use technology in safe and correct ways.	The new standard focuses on online behavior and how it impacts others.
K.DC.4 With guidance, understand digital identity. (Library Media K.DI.1)		The new standard focuses on understanding how using technology builds a digital identity.

Kindergarten

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Security To protect individuals and organizations, learners will gain a foundational understanding of safe and best practices for data and system security practices, including information, network, and physical security.	**Safety and Ethics** When using technology, there are both positive and negative impacts on social and ethical behaviors.	This new concept builds upon a previous sub-concept and emphasizes the cybersecurity aspect of technology. The new standards add a goal that learners should reach by graduation.
Personally Identifiable Information		New sub-concept
K.PI.1 With guidance, discuss personal information that is public vs. Private. (Library Media K.RU.4)		This new standard distinguishes between private and public information.
Threats and Vulnerability		New sub-concept
K.TV.1 Understand that not all websites and apps are safe. (Library Media K.RU.3)		This new standard provides background information to start discussing cyber threats.
K.TV.2 Understand that apps and devices need updates.		This new standard focuses on developing the understanding that apps and devices need updating.
Security Controls		
K.SC.1 Recognize the importance of a password.		This new standard focuses on the development of passwords.
K.SC.2 With guidance, describe methods to maintain digital privacy and security when accessing technology (e.g., password, PIN, multi-factor authentication). (Library Media K.RU.2)	**K.SE.2** With guidance, use authentication methods to access technology.	The new standard focuses on describing methods to maintain digital privacy and security and is similar to the Library Media standard K.RU.2.

Grade 1

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Computing Devices and Systems *Learners will develop an understanding of how networks, hardware, and software function and interact, fostering adaptable skills for digital environments.*	**Technology Systems**	The new standards added a goal that learners should reach by graduation.
Networks and Internet	**Networks and Internet** *Networks link computers and devices locally and worldwide, allowing people to access and communicate information.*	The organization of the new standards eliminates the need to define the sub-concepts.
1.NI.1. Identify examples of activities that can be done online or offline.		The new standard lays the basic understanding required for the following standards.
1.NI.2. Describe uses of devices that connect to the internet.	**1.NI.1.** Recognize that connecting computing devices allows information sharing.	The new standard establishes a basic understanding of connecting devices to the Internet.
1.NI.3 Provide examples of how AI can be used in everyday life.		The new standard adds an AI component.
Hardware and Software	**Hardware and Software** *Devices, hardware, and software work together as a system to accomplish tasks.* **Troubleshooting** *Strategies for solving technology system problems.*	The organization of the new standards eliminates the need to define the sub-concepts.
1.HS.1 Use basic software to accomplish simple tasks (e.g., open/close tabs, websites, apps, programs).	**1.HS.2** With guidance, use a computing device to perform a variety of tasks.	The new standard places the focus on using devices to complete tasks.
1.HS.2 Identify the components of a computing device and describe how they are used.	**1.HS.1** Use appropriate terminology to identify common computing devices and components. **1.T.1** Understand that technology systems might not work as expected, and with guidance, use appropriate terminology to describe a problem.	The new standard focuses on basic computer components and their use.
1.HS.3 Recognize that digital information can be stored and shared.		The new standard focuses on storing and sharing information.
	1.HS.3 Recognize that users have different technological needs.	This standard is embedded in the other standards in this sub-concept.

Grade 1

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Algorithms and Computational Thinking *Learners will develop and apply a basic understanding of algorithms and computational thinking, enhancing problem-solving and critical-thinking skills.*	**Problem Solving and Algorithms**	The new standards added a goal that learners should reach by graduation.
Developing and Designing Algorithms	**Development and Design** *Design processes to create new, helpful, and imaginative solutions to problems.*	The organization of the new standards eliminates the need to define the sub-concepts.
1.DD.1 Identify patterns within a task.	**1.PSA.2** Follow a set of instructions (algorithms) to complete a task.	The new standard focuses on breaking tasks down to identify patterns.
1.DD.2 Create step-by-step directions to solve problems or complete tasks.	**1.DD.1** With guidance, create programs to accomplish a task that includes sequencing or looping.	The new standard focuses on creating step-by-step directions to solve problems or complete tasks, which leads to sequencing.
1.DD.3 *Standard begins in third grade.*		
Analyzing and Problem Solving	**Problem Solving and Algorithms** *Strategies for understanding and solving problems.* **Data Creation and Analysis** *Data can be collected and presented with computing devices or digital tools.*	The new standards combine the 2019 sub-concepts. The organization of the new standards eliminates the need to define the sub-concepts.
1.AP.1 Collect, organize, and represent data using picture and bar graphs.	**1.DCA.1** With guidance, identify and interpret data from a chart or graph to make a prediction with or without a computing device.	The new standard applies to the mathematics standard for organizing and interpreting data. This standard is related to Mathematics 1.DPS.D.1.
1.AP.2 Identify and fix an error in algorithms and processes.	**1.PSA.1** Solve a problem through trial and error using given materials/resources. **1.PSA.3** Define debug. **1.PSA.4** Identify and practice debugging strategies, including "Go back to when it worked."	The new standard focuses on recognizing errors in algorithms or processes.
1.AP.3 *Standard begins in sixth grade.*		
1.AP.4 *Standard begins in third grade.*		

Grade 1

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Impacts of Computing *Learners will understand how technology shapes individuals and the world and influences safety, policy, law, and ethics.*	**Impacts of Computing** *Past, present, and possible future impact of technology on society.*	The new standards added a goal that learners should reach by graduation. They use the sub-concept from the 2019 standards, which was moved to a concept.
Policies and Laws	**Intellectual Property** *Respect for the rights and obligations of using and sharing intellectual property.*	The new standards focus on the various laws and policies about technology. The organization of the new standards eliminates the need to define the sub-concepts.
1.PL.1 Understand that creative works have owners. (Library Media 1.IP.1)	**1.IP.1** Understand that creative works have owners. **1.IP.2** With guidance, give credit to the creator of a creative work.	The new standard uses the Library Media standard, which introduces the concept of copyright.
1.PL.2 Understand the purpose of and comply with responsible and acceptable use policies. (Library Media 1.RU.1)	**1.RU.4** Comply with Acceptable Use Policies.	The new standard uses the Library Media standard, which focuses on compliance and understanding why the policies exist.
1.PL.3 *Standard begins in sixth grade.*		
Ethics	**Safety and Ethics** *When using technology, there are both positive and negative impacts on social and ethical behaviors.*	The new standards do not contain a definition and focus on the ethical behaviors in this sub-concept. The organization of the new standards eliminates the need to define the sub-concepts.
1.E.1 Identify the positive and negative uses of technology, including AI.	**1.RU.1** Discuss positive and negative behaviors when using electronic communication.	The new standard focuses on the uses of technology and includes AI.
1.E.2 With guidance, identify facts and opinions. (Library Media 1.E.1)		The new standards use the Library Media standard to identify facts and opinions when using technology.
	1.A.1 Use a keyword search with a teacher-selected online resource.	The Library Media Content Standards included were limited to those that directly pertain to computer science and cybersecurity.
	1.E.1 With guidance, evaluate information for research purposes.	The Library Media Content Standards included were limited to those that directly pertain to computer science and cybersecurity.
	1.C.1 Independently or with guidance, create a digital product.	The Library Media Content Standards included were limited to those that directly pertain to computer science and cybersecurity.
Societal Impacts		New sub-concept
1.S.1 Describe how technology impacts how people work.	**1.IC.1** Identify how technologies are used in and out of school.	This standard focuses on the impact of technology on work, which could include schoolwork.
1.S.2 *Standard begins in sixth grade.*		

Grade 1

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Digital Citizenship *Learners will practice responsible digital consumption, creation, communication, and interaction.*	**Digital Citizenship**	The new standards added a goal that learners should reach by graduation.
Digital Citizenship		This is a new sub-concept.
1.DC.1 With guidance, identify appropriate times to use technology and times to be screen-free. (Library Media 1.RU.5)		This new standard uses the Library Media standard that focuses on balancing the use of technology with other activities.
1.DC.2 Describe the impact of technology use on one's learning.		This new standard focuses on technology's impact on learning.
1.DC.3 With guidance, recognize inappropriate online behavior and how to report it. (Library Media 1.SI.3)	**1.RU.2** Discuss reporting inappropriate electronic content. **1.SE.1** Identify how to use technology in safe and correct ways.	The new standard focuses on recognizing and reporting inappropriate online behavior.
1.DC.4 With guidance, understand digital identity and recognize that using technology builds one's digital identity. (Library Media 1.DI.1)	**1.DI.1** Recognize that you have a digital identity.	The new standard focuses on understanding how using technology builds a digital identity.
	1.SI.1 With guidance, use technology to share thinking with peers.	This standard was removed as it is covered in the English Language Arts Content Standards.

Grade 1

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Security *To protect individuals and organizations, learners will gain a foundational understanding of safe and best practices for data and system security practices, including information, network, and physical security.*	**Safety and Ethics** *When using technology, there are both positive and negative impacts on social and ethical behaviors.*	This new concept builds upon a previous sub-concept and emphasizes the cybersecurity aspect of technology. The new standards add a goal that learners should reach by graduation.
Personally Identifiable Information		New sub-concept
1.PI.1 With guidance, discuss personal information that is public vs. private. (Library Media 1.RU.4)		This new standard distinguishes between private and public information and focuses on protecting personal information.
Threats and Vulnerability		New sub-concept
1.TV.1 Understand that not all websites and apps are safe. (Library Media 1.RU.3)		This new standard focuses on understanding that some websites and apps are not safe.
1.TV.2 Understand that apps and devices need updates.		This new standard focuses on developing an understanding that apps and devices need updating.
Security Controls		
1.SC.1 Recognize the importance of a password.		This new standard focuses on the development of passwords.
1.SC.2 With guidance, use authentication methods to access technology (e.g., password, PIN, dual authentication). (Library Media 1.RU.2)	**1.SE.2** Understand the differences between username and authentication methods and independently use them to access technology.	The new standard uses the Library Media standard, which describes maintaining digital privacy and security.

Grade 2

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Computing Devices and Systems *Learners will develop an understanding of how networks, hardware, and software function and interact, fostering adaptable skills for digital environments.*	**Technology Systems**	The new standards added a goal that learners should reach by graduation.
Networks and Internet	**Networks and Internet** *Networks link computers and devices locally and worldwide, allowing people to access and communicate information.*	The organization of the new standards eliminates the need to define the sub-concepts.
2.NI.1 Compare the difference between being online and offline.		This new standard lays the basic understanding required for the following standards.
2.NI.2 Explain how people can use internet-connected devices in everyday life.	**2.NI.1** Explain that connecting computing devices allows information sharing.	The new standard focuses on the use of internet-connected devices.
2.NI.3 Provide examples of how AI can be used in everyday life.		The new standard adds an AI component.
Hardware and Software	**Hardware and Software** *Devices, hardware, and software work together as a system to accomplish tasks.* **Troubleshooting** *Strategies for solving technology system problems.*	The organization of the new standards eliminates the need to define the sub-concepts.
2.HS.1 Use basic software and hardware to accomplish a task.	**2.HS.2** Independently use a computing device to perform a variety of tasks.	The new standard focuses on using software to complete tasks.
2.HS.2 With guidance, follow basic step-by-step troubleshooting approaches to identify problems with computing devices.	**2.HS.1** Identify a computer system's components and basic functions. **2.T.1** Understand that technology systems might not work as expected and independently use appropriate terminology to describe a problem.	The new standard focuses on basic computer components and functions, and how to solve basic problems when using them.
2.HS.3 Recognize that digital information can be stored, shared, and retrieved.		The new standard focuses on storing, sharing, and retrieving information.
	2.HS.3 Recognize that users have different technological needs and preferences.	These standards are embedded in the other standards in this sub-concept.

Grade 2

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Algorithms and Computational Thinking *Learners will develop and apply a basic understanding of algorithms and computational thinking, enhancing problem-solving and critical-thinking skills.*	**Problem Solving and Algorithms**	The new standards added a goal that learners should reach by graduation.
Developing and Designing Algorithms	**Development and Design** *Design processes to create new, helpful, and imaginative solutions to problems.*	The organization of the new standards eliminates the need to define the sub-concepts.
2.DD.1 Identify smaller steps and patterns within a task.	**2.PSA.2** Break a task into smaller steps to identify patterns or solve problems.	The new standard focuses on breaking tasks down to identify patterns.
2.DD.2 Create step-by-step directions to solve problems or complete tasks.	**2.DD.1** Independently or collaboratively create programs to accomplish tasks that include sequencing or looping. **2.PSA.3** Define algorithms.	The new standard focuses on using step-by-step directions.
2.DD.3 *Standard begins in third grade.*		
Analyzing and Problem Solving	**Problem Solving and Algorithms** *Strategies for understanding and solving problems.* **Data Creation and Analysis** *Data can be collected and presented with computing devices or digital tools.*	The new standards combine the 2019 sub-concepts. The organization of the new standards eliminates the need to define the sub-concepts.
2.AP.1 Analyze data and interpret the results to solve one-step comparison problems using information from the graphs. (Mathematics 2.DPS.D3)	**2.DCA.1** With guidance, construct and interpret data and present it in a chart or graph to make a prediction with or without a computing device.	The new standard focuses on analyzing data and interpreting results from graphs.
2.AP.2 Use a trial-and-error process to identify and fix errors in algorithms and processes.	**2.PSA.1** Use problem-solving steps: understanding the task, considering various strategies, isolating, and debugging.	The new standard focuses on recognizing errors in the algorithm or process used.
2.AP.3 *Standard begins in sixth grade.*		
2.AP.4 *Standard begins in third grade.*		

Grade 2

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Impacts of Computing *Learners will understand how technology shapes individuals and the world and influences safety, policy, law, and ethics.*	**Impacts of Computing** *Past, present, and possible future impact of technology on society.*	The new standards added a goal that learners should reach by graduation. They use the sub-concept from the 2019 standards that was moved to a concept.
Policies and Laws	**Intellectual Property** *Respect for the rights and obligations of using and sharing intellectual property.*	The new standards focus on the various laws and policies about technology. The organization of the new standards eliminates the need to define the sub-concepts.
2.PL.1 Demonstrate an understanding that creative works are protected by law. (Library Media 2.IP.1)	**2.IP.1** Understand that students own their creative works. **2.IP.2** Continued growth.	The new standard uses the Library Media standard, which emphasizes the legal aspect of copyright for creative works.
2.PL.2 Understand the purpose of and comply with responsible and acceptable use policies. (Library Media 2.RU.1)	**2.RU.4** Comply with Acceptable Use Policies.	The new standard uses the Library Media standard, which focuses on compliance and understanding why the policies exist.
2.PL.3 *Standard begins in sixth grade.*		
Ethics	**Safety and Ethics** *When using technology, there are both positive and negative impacts on social and ethical behaviors.*	The new standards do not contain a definition and focus on the ethical behaviors in this sub-concept. The organization of the new standards eliminates the need to define the sub-concepts.
2.E.1 Describe the positive and negative uses of technology, including AI.	**2.RU.1** Discuss positive and negative behaviors when using electronic communication.	The new standard focuses on the use of information technology and includes an AI component.
2.E.2 Identify facts and opinions. (Library Media 2.E.1)		The new standards use the Library Media standard to identify facts and opinions when using technology.
	2.A.1 Continued growth.	The Library Media Content Standards included were limited to those that directly pertain to computer science and cybersecurity.
	2.E.1 With guidance, determine whether the purpose of the content is to inform or to influence others.	The Library Media Content Standards included were limited to those that directly pertain to computer science and cybersecurity.
	2.C.1 Independently or collaboratively, create a digital product.	The Library Media Content Standards included were limited to those that directly pertain to computer science and cybersecurity.
Societal Impacts		New sub-concept
2.S.1 Identify the positive and negative impacts of technology on how people live, work, and interact.	**2.IC.1** Identify how technologies are used in the workforce.	This standard combines the aspects of the 2019 standards on the impacts of computing.
2.S.2 *Standard begins in sixth grade.*		

Grade 2

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Digital Citizenship *Learners will practice responsible digital consumption, creation, communication, and interaction.*	**Digital Citizenship**	The new standards added a goal that learners should reach by graduation.
Digital Citizenship		
2.DC.1 Identify appropriate times to use technology and times to be screen-free. (Library Media 2.RU.5)		This new standard uses the Library Media standard that focuses on balancing the use of technology with other activities.
2.DC.2 Apply strategies to show care and respect in online communication (e.g., pausing before responding, standing up for others).		This new standard focuses on technology's impact on learning and interpersonal relationships.
2.DC.3 Recognize and report inappropriate online behavior. (Library Media 2.SI.3)	**2.RU.3** Develop a code of conduct, explain and practice appropriate behavior and responsibilities while participating in an online community. **2. SE. 1** Explain how to use technology in safe and correct ways.	The new standard focuses on online behavior and how it impacts others.
2.DC.4 With guidance, understand digital identity and recognize that using technology builds one's digital identity. (Library Media 2.DI.1)	**2.DI.1** Define digital identity.	The new standard focuses on understanding how using technology builds a digital identity.

Grade 2

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Security *To protect individuals and organizations, learners will gain a foundational understanding of safe and best practices for data and system security practices, including information, network, and physical security.*	**Safety and Ethics** *When using technology, there are both positive and negative impacts on social and ethical behaviors.*	This new concept builds upon a previous sub-concept and emphasizes the cybersecurity aspect of technology. The new standards add a goal that learners should reach by graduation.
Personally Identifiable Information		New sub-concept
2.PI.1 Identify personal information that is public vs. private. (Library Media 2.RU.4)		This new standard distinguishes between private and public information.
Threats and Vulnerability		New sub-concept
2.TV.1 Understand that cybersecurity threats exist (e.g., phishing, malware, clickbait). (Library Media 2.RU.3)		This new standard focuses on understanding the existing cybersecurity threats.
2.TV.2 Recognize that trusted updates can change or improve apps and devices.		This new standard focuses on understanding that apps and devices need updating.
Security Controls		
2.SC.1 Describe the concept of a strong password and its importance.		This new standard focuses on the development of strong passwords.
2.SC.2 Describe methods to maintain digital privacy and security when accessing technology (e.g., password, PIN, multi-factor authentication).	**2.SE.2** Identify strategies for protecting authentication methods.	The new standard describes methods for maintaining digital privacy and security when accessing technology. It is similar to Library Media standard 2.RU.2.

Grade 3

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Computing Devices and Systems *Learners will develop an understanding of how networks, hardware, and software function and interact, fostering adaptable skills for digital environments.*	**Technology Systems**	The new standards added a goal that learners should reach by graduation.
Network	**Networks and Internet** *Networks link computers and devices locally and around the world, allowing people to access and communicate information.*	The organization of the new standards eliminates the need to define the sub-concepts.
3.N.1 Identify examples of ways information is sent and received across wireless paths (e.g., Wi-Fi, Bluetooth).	**3.NI.1** Recognize that information is sent and received over physical or wireless paths.	The new standard focuses on how information is sent and received through technology.
3.N.2 Explain how devices connected to the Internet can be used to share data.	**3.NI.1** Recognize that information is sent and received over physical or wireless paths.	The new standard focuses on how connected devices share information.
3.N.3 Recognize tools or machines that use AI.		The new standard addresses artificial intelligence.
Hardware and Software	**Hardware and Software** *Devices, hardware, and software work together as a system to accomplish tasks.* **Troubleshooting** *Strategies for solving technology system problems.*	The organization of the new standards eliminates the need to define the sub-concepts.
3.HS.1 Use software skills to complete tasks (e.g., typing, copy/paste, drawing) using hardware.	**3.HS.2** Independently use a computing device to perform a variety of tasks.	The new standard focuses on using software-skills to complete tasks.
3.HS.2 With guidance, follow basic step-by-step troubleshooting approaches to identify problems with computing devices.	**3.T.1** With guidance, apply basic troubleshooting strategies.	This new standard focuses on step-by-step explicit guidance to troubleshoot and identify problems with hardware or software.
3.HS.3 With guidance, organize digital information.	**3.HS.1** Identify the components and the basic functions of a computer system, including peripherals and external storage features.	This new standard focuses on applying the skills of organizing information.

Grade 3

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Algorithms and Computational Thinking *Learners will develop and apply a basic understanding of algorithms and computational thinking, enhancing problem-solving and critical-thinking skills.*	**Problem Solving and Algorithms**	The new standards added a goal that learners should reach by graduation.
Developing and Designing Algorithms	**Development and Design** *Design processes to create new, useful, and imaginative solutions to problems.*	The organization of the new standards eliminates the need to define the sub-concepts.
3.DD.1 Define an algorithm.	**3.DD.2** Convert an algorithm into code. **3.PSA.1** Solve a task by breaking it into smaller pieces.	The new standard focuses on defining what an algorithm is.
3.DD.2 Create a simple algorithm to solve a problem using coding patterns (e.g., sequences, loops, or conditionals).	**3.DD.1** Independently or collaboratively create programs that use sequencing and looping.	The new standard focuses on the creation of an algorithm to solve a problem.
3.DD.3 Test the outcome(s) of algorithms that use coding patterns (e.g., sequences, loops, or conditionals).		This new standard focuses on testing algorithms after they've been created.
Analyzing and Problem Solving	**Problem Solving and Algorithms** *Strategies for understanding and solving problems.* **Data Creation and Analysis** *Data can be collected, used, and presented with computing devices or digital tools.*	The new standards combine the 2019 sub-concepts. The organization of the new standards eliminates the need to define the sub-concepts.
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)	**3.DCA.1** Collect and organize data in various visual formats.	This new standard uses a Mathematics standard to focus on one- and two-step problems.
3.AP.2 Review steps in algorithms or processes to identify errors. Use a trial-and-error process to identify and fix errors in algorithms and processes.	**3.PSA.2** Debug a program that includes sequencing.	The new standard focuses on using trial and error to identify errors in algorithms or processes.
3.AP.3 *Standards begin in sixth grade.*		
3.AP.4 With guidance, identify key words to describe a topic, problem or need.		This new standard supports the Library Media standard 3.I.2 and builds the foundational knowledge necessary to create instructions for AI learned in later grades.

Grade 3

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Impacts of Computing *Learners will understand how technology shapes individuals and the world and influences safety, policy, law, and ethics.*	**Impacts of Computing** *Past, present, and possible future impact of technology on society.*	The new standards added a goal that learners should reach by graduation. They use the sub-concept from the 2019 standards that was moved to a concept.
Policies and Laws	**Intellectual Property** *Respect for the rights and obligations of using and sharing intellectual property.*	The new standards focus on the various laws and policies pertaining to technology. The organization of the new standards eliminates the need to define the sub-concepts.
3.PL.1 Define copyright and fair use. (Library Media 3.IP.1)	**3.IP.1** Define copyright. **3.IP.3** Explain piracy and plagiarism. **3.IP.2** With guidance, identify the elements of a citation.	The new standard uses the Library Media standard, emphasizing the legal aspect of copyright and fair use.
3.PL.2 Understand the purpose of and comply with responsible and acceptable use policies. (Library Media 3.RU.1)	**3.RU.4** Comply with Acceptable Use Policies.	The new standard uses the Library Media standard, which focuses on compliance and understanding why policies exist.
3.PL.3 *Standards begin in sixth grade.*		
Ethics	**Safety and Ethics** *There are both positive and negative impacts on social and ethical behaviors for using technology.*	The organization of the new standards eliminates the need to define the sub-concepts.
3.E.1 Identify ethical and unethical uses of technology, including AI.	**3.RU.1** Identify and discuss positive and negative uses of technology and information and their impact. **3.RU.3** Develop a code of conduct, explain, and practice appropriate behavior and responsibilities while participating in an online community.	The new standard focuses on the ethical and unethical uses of technology, including the use of AI.
3.E.2 Identify facts and opinions. (Library Media 3.E.1)		The new standards use the Library Media standard, focusing on identifying fact and opinion when using technology.
	3.A.1 Use basic search strategies with teacher-selected online sources.	The Library Media Content Standards included were limited to those that directly pertain to computer science and cybersecurity.
	3.E.1 With guidance, compare and contrast resources based on content and the author's purpose.	The Library Media Content Standards included were limited to those that directly pertain to computer science and cybersecurity.
	3.C.1 Independently or collaboratively, create a digital product.	These standards are included in the creation of products in other disciplines.
Societal Impacts		New sub-concept
3.S.1 Identify the positive and negative impacts of technology on how people live, work, and interact.	**3.IC.1** Identify technologies that have changed the world.	This new standard focuses on the impact that technology has on life, work, and human interactions.
3.S.2 *Standard begins in sixth grade.*		

Grade 3

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Digital Citizenship *Learners will practice responsible digital consumption, creation, communication, and interaction.*	**Digital Citizenship**	The new standards added a goal that learners should reach by graduation
Digital Citizenship		
3.DC.1 Understand the importance of balancing media and non-media activities. (Library Media 3.RU.5)		This new standard uses the Library Media standard that focuses on balancing the use of technology with other activities.
3.DC.2 Describe ways technology impacts relationships with others (e.g., family, friends).		This new standard focuses on the impact technology has on relationships.
3.DC.3 Identify various forms of cyberbullying (e.g., hacking, harassing, outing, flaming) and reporting strategies. (Library Media 3.SI.3)	**3.RU.2** Recognize similarities and differences between in-person bullying and cyberbullying.	This new standard uses the Library Media standard and focuses on identifying forms of cyberbullying and reporting the behavior.
3.DC.4 Recognize that using technology builds one's digital identity. (Library Media 3.DI.1)	**3.DI.1** Recognize the permanence of their actions in the digital world.	This new standard uses the Library Media standard, which focuses on understanding how technology builds a digital identity.

Grade 3

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
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.*	**Safety and Ethics** *When using technology, there are both positive and negative impacts on social and ethical behaviors.*	This is a new concept that builds upon a previous sub-concept and places more emphasis on the cybersecurity aspect of technology. The new standards added a goal that learners should reach by graduation.
Personally Identifiable Information		New sub-concept
3.PI.1 Identify situations when private information can be shared online. (Library Media 3.RU.4)	**3.SE.3** Recognize that data-collection technology can be used to track navigation online. **3.SE.4** Identify the difference between public and private information.	This new standard uses the Library Media standard, distinguishes between private and public information, and focuses on protecting personal information.
Threats and Vulnerability		New sub-concept
3.TV.1 With guidance, identify cybersecurity threats (e.g., phishing, malware, clickbait). (Library Media 3.RU.3)	**3.SE.1** Identify problems that relate to inappropriate use of computing devices and networks.	This new standard uses the Library Media standard and focuses on explaining the threats of cybersecurity actions to network security.
3.TV.2 Recognize that trusted updates can change or improve apps and devices.		This new standard focuses on understanding why apps and devices need updating and why only trusted updates should be used.
Security Controls		New sub-concept
3.SC.1 Describe the concept of a strong password and its importance.		This new standard focuses on the concept that having strong passwords is important.
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)	**3.SE.2** Keep authentication methods confidential and be proactive if they are compromised.	The new standard uses the Library Media standard, which focuses on methods to maintain digital privacy and security.

Grade 4

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Computing Devices and Systems *Learners will develop an understanding of how networks, hardware, and software function and interact, fostering adaptable skills for digital environments.*	**Technology Systems**	The new standards added a goal that learners should reach by graduation.
Networks and Internet	**Networks and Internet** *Networks link computers and devices locally and around the world, allowing people to access and communicate information.*	The organization of the new standards eliminates the need to define the sub-concepts.
4.NI.1 Recognize that information is sent and received across physical or wireless paths.	**4.NI.1** Recognize that computing devices can be connected in a variety of ways to share information.	The new standard focuses on how information is transmitted through technology.
4.NI.2 Explain how apps and websites collect data (e.g., preferences, activities) when devices are connected to the Internet.	**4.NI.1** Recognize that computing devices can be connected in a variety of ways to share information.	The new standard focuses on how connected devices collect and share information.
4.NI.3 Define generative AI and provide examples, including large language models.		This is a new standard on the basics of AI.
Hardware and Software	**Hardware and Software** *Devices, hardware, and software work together as a system to accomplish tasks.* **Troubleshooting** *Strategies for solving technology system problems.*	The organization of the new standards eliminates the need to define the sub-concepts.
4.HS.1 Explore software features while using hardware.	**4.HS.2** Continued growth. **4.HS.1** Explain the difference between hardware and software.	The new standard focuses on using software skills and interactions with hardware to complete tasks.
4.HS.2 With guidance, follow step-by-step troubleshooting approaches and interpret error messages to identify problems with computing devices.	**4.T.1** Continued growth.	The standard focuses on interpreting error messages and implementing troubleshooting approaches.
4.HS.3 With guidance, retrieve digital information.		The new standard focuses on using search features to locate files saved.

Grade 4

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Algorithms and Computational Thinking *Learners will develop and apply a basic understanding of algorithms and computational thinking, enhancing problem-solving and critical-thinking skills.*	**Problem Solving and Algorithms**	The new standards added a goal that learners should reach by graduation.
Developing and Designing Algorithms	**Development and Design** *Design processes to create new, useful, and imaginative solutions to problems.*	The organization of the new standards eliminates the need to define the sub-concepts.
4.DD.1 Identify the key components of a simple algorithm (e.g., sequences, loops, conditional statements).	**4.PSA.1** Decompose (break down) a large task into smaller, manageable subtasks.	The new standard focuses on understanding how components of algorithms create code.
4.DD.2 Create a simple algorithm to solve a problem using coding patterns (e.g., sequences, loops, or conditionals).	**4.DD.1** Independently and collaboratively create programs that use sequencing, loops, and conditionals.	The new standard focuses on the creation of an algorithm to solve a problem.
4.DD.3 Test the outcome(s) of algorithms that use coding patterns (e.g., sequences, loops, or conditionals).		The new standard focuses on testing algorithms to prepare students for troubleshooting.
Analyzing and Problem Solving	**Problem Solving and Algorithms** *Strategies for understanding and solving problems.* **Data Creation and Analysis** *Data can be collected, used, and presented with computing devices or digital tools.*	The new standards combine the 2019 sub-concepts. The organization of the new standards eliminates the need to define the sub-concepts.
4.AP.1 Utilize graphs and diagrams to solve problems.	**4.DCA.1** Organize and present collected data visually to highlight comparisons.	The new standard focuses on the organization and analysis of data to solve problems. This standard is related to Mathematics 4.DPS.D.3.
4.AP.2 Identify and correct errors in algorithms or processes.	**4.PSA.2** Debug a program that includes sequencing or loops. **4.PSA.3** Identify multiple solutions to a task.	The new standard focuses on identifying and correcting errors in algorithms or processes.
4.AP.3 *Standards begin in sixth grade.*		
4.AP.4 With guidance, create questions based on a topic, problem, or need. (Library Media 4.I.1)		The new standard focuses on preparing students for developing AI prompts.

Grade 4

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Impacts of Computing *Learners will understand how technology shapes individuals and the world and influences safety, policy, law, and ethics.*	**Impacts of Computing** *Past, present, and possible future impact of technology on society.*	The new standards added a goal that learners should reach by graduation. They use the sub-concept from the 2019 standards that was moved to a concept.
Policies and Laws	**Intellectual Property** *Respect for the rights and obligations of using and sharing intellectual property.*	The new standards focus on the various laws and policies pertaining to technology. The organization of the new standards eliminates the need to define the sub-concepts.
4.PL.1 With guidance, demonstrate an understanding of copyright and fair use. (Library Media 4.IP.1)	**4.IP.1** Demonstrate an understanding of copyright and fair use. **4.IP.3** With guidance, use strategies to avoid piracy and plagiarism. **4.IP.2** With guidance, create a citation.	The new standard uses the Library Media standard, emphasizing the legal aspect of copyright and fair use.
4.PL.2 Understand the purpose of and comply with responsible and acceptable use policies. (Library Media 4.RU.1)	**4.RU.4** Comply with Acceptable Use Policies.	The new standard uses the Library Media standard, which focuses on compliance and understanding why policies exist.
4.PL.3 *Standards begin in sixth grade.*		
Ethics	**Safety and Ethics** *There are both positive and negative impacts on social and ethical behaviors for using technology.*	The organization of the new standards eliminates the need to define the sub-concepts.
4.E.1 Explain how technology, including AI, may be used ethically or unethically.	**4.RU.1** Discuss basic issues related to the appropriate use of technology and information and the consequences of inappropriate use. **4.RU.3** Continued growth.	The new standard focuses on the motivation of users of technology and AI.
4.E.2 With guidance, understand that biases exist and distinguish between facts and opinions in various sources. (Library Media 4.E.1)		The new standards use the Library Media standard, focusing on identifying bias and distinguishing between fact and opinion when using technology.
	4.A.1 Use multiple teacher-selected online resources to locate information.	The Library Media Content Standards included were limited to those that directly pertain to computer science and cybersecurity.
	4.E.1 With guidance, use a strategy to evaluate information for research purposes.	The Library Media Content Standards included were limited to those that directly pertain to computer science and cybersecurity.
	4.C.1 Continue growth.	These standards are included in the creation of products in other disciplines.
Societal Impacts		New sub-concept
4.S.1 Explain the positive and negative impacts of technology on how people live, work, and interact.		This standard focuses on the impact that technology has on life, work, and human interactions.
4.S.2 *Standards begin in sixth grade.*		

Grade 4

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Digital Citizenship *Learners will practice responsible digital consumption, creation, communication, and interaction.*	**Digital Citizenship**	The new standards added a goal that learners should reach by graduation
4.DC.1 Evaluate the use of media time. (Library Media 4.RU.5)		The new standards use the Library Media standard that focuses on balancing the use of technology with other activities.
4.DC.2 Describe the personal impact of technology use on one's learning and relationships.		This new standard focuses on the impact technology has on interpersonal relationships.
4.DC.3 Identify cyberbullying prevention and reporting strategies. (Library Media 4.SI.3)	**4.RU.2** Identify strategies for dealing responsibly with cyberbullying and reporting inappropriate behavior.	The new standard from the Library Media Standards focuses on the prevention and reporting of cyberbullying.
4.DC.4 Recognize that using technology builds one's digital identity. (Library Media 4.DI.1)	**4.DI.1** Explain the importance of your digital identity.	The new standards use the Library Media standard, which focuses on understanding how technology builds a digital identity.

Grade 4

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
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.*	**Safety and Ethics** *When using technology, there are both positive and negative impacts on social and ethical behaviors.*	This is a new concept that builds upon a previous sub-concept and emphasizes the cybersecurity aspect of technology. The new standards added a goal that learners should reach by graduation.
Personally Identifiable Information		New sub-concept
4.PI.1 Discuss the risks related to sharing private information online (e.g., identity theft, data collection, and personal safety).	**4.SE.3** Continued growth. **4.SE.4** Recognize when it is safe to share private information online.	This new standard focuses on the risks of sharing private information online. The standard is similar to Library Media Standard 4.RU.4.
Threats and Vulnerability		New sub-concept
4.TV.1 Identify cybersecurity threats (e.g., phishing, malware, clickbait).	**4. SE. 1** Identify and explain issues related to the responsible use of technology and information and describe personal consequences of inappropriate use.	This new standard focuses on identifying cybersecurity threats. It is similar to Library Media standard 4.RU.3.
4.TV.2 Explain the importance of using trusted sources for updating apps and devices.		This new standard focuses on understanding that apps and devices need updating.
Security Controls		New sub-concept
4.SC.1 Define authentication and identify various authentication methods (e.g., passwords, fingerprint or facial recognition, multi-factor authentication).		This new standard focuses on the role that authentication and authorization play in the secure use of technology.
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)	**4.SE.2** Create secure authentication to ensure privacy.	The new standard uses the Library Media standard, which focuses on methods to maintain digital privacy and security.

Grade 5

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Computing Devices and Systems *Learners will develop an understanding of how networks, hardware, and software function and interact, fostering adaptable skills for digital environments.*	**Technology Systems**	The new standards added a goal that learners should reach by graduation.
Networks and Internet	**Networks and Internet** *Networks link computers and devices locally and around the world, allowing people to access and communicate information.*	The organization of the new standards eliminates the need to define the sub-concepts.
5.NI.1 Explain the difference between physical and wireless paths.	**5.NI.1** Understand that information is sent and received across physical or wireless paths. **5.HS.1** Compare and contrast physical and virtual systems.	The new standard places focus on how information is transmitted through technology.
5.NI.2 Explain why data is collected when devices are connected to the internet (e.g., personalize content, improve services).	**5.NI.1** Understand that information is sent and received across physical or wireless paths.	The new standard focuses on how connected devices collect and share information.
5.NI.3 Define generative AI and provide examples, including large language models.		New standard addresses the inclusion of AI in standards
Hardware and Software	**Hardware and Software** *Devices, hardware, and software work together as a system to accomplish tasks.* **Troubleshooting** *Strategies for solving technology system problems.*	The organization of the new standards eliminates the need to define the sub-concepts.
5.HS.1 Use software features and hardware to accomplish a task.	**5.HS.2** Continued growth.	The new standard focuses on using software features to complete tasks.
5.HS.2 With guidance, follow troubleshooting approaches to identify problems with computing devices.	**5.T.1** Continued growth.	The new standard embeds troubleshooting into the hardware and software sub-concept.
5.HS.3 With guidance, organize, retrieve, and share digital information.		The new standard focuses on applying skills of organizing, storing, and retrieving digital information.

Grade 5

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Algorithms and Computational Thinking *Learners will develop and apply a basic understanding of algorithms and computational thinking, enhancing problem-solving and critical-thinking skills.*	**Problem Solving and Algorithms**	The new standards added a goal that learners should reach by graduation.
Developing and Designing Algorithms	**Development and Design** *Design processes to create new, useful, and imaginative solutions to problems.*	The organization of the new standards eliminates the need to define the sub-concepts.
5.DD.1 Identify the key components of a simple algorithm (e.g., sequences, loops, conditional statements).	**5.PSA.1** Create a sequence of instructions from a previous decomposed task.	The new standard focuses on the components of an algorithm.
5.DD.2 Create a simple algorithm to solve a problem using coding patterns (e.g., loops, conditionals, functions, or variables).	**5.DD.1** Continued growth.	The new standard focuses on the creation of an algorithm to solve a problem.
5.DD.3 Test the outcome(s) of a simple algorithm that uses coding patterns (e.g., loops, conditionals, functions, or variables).	**5.DD.2** Create solutions to problems using a design method.	The new standard focuses on testing the components of an algorithm.
Analyzing and Problem Solving	**Problem Solving and Algorithms** *Strategies for understanding and solving problems.* **Data Creation and Analysis** *Data can be collected, used, and presented with computing devices or digital tools.*	The new standards combine the 2019 sub-concepts. The organization of the new standards eliminates the need to define the sub-concepts.
5.AP.1 Utilize graphs and diagrams to represent, analyze, and solve problems.	**5.DCA.1** Organize and present collected data to highlight comparisons and support a claim.	The new standard focuses on the organization of data collected.\n\nThis standard is related to Mathematics 5.DPS.D.2.
5.AP.2 Identify and correct errors in algorithms or processes.	**5.PSA.2** Debug a program that includes sequencing, loops, or conditionals. **5.PSA.3** Work collaboratively to explore multiple solutions to a task.	The new standard focuses on identifying and correcting errors in algorithms or processes.
5.AP.3 *Standards begin in sixth grade.*		
5.AP.4 Create questions from identified key words based on a topic, problem, or need. (Library Media 5.I.1, 5.I.2)		The new standard builds skills for developing AI prompts.

Grade 5

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Impacts of Computing *Learners will understand how technology shapes individuals and the world and influences safety, policy, law, and ethics.*	**Impacts of Computing** *Past, present, and possible future impact of technology on society.*	The new standards added a goal that learners should reach by graduation. They use the sub-concept from the 2019 standards, which was moved to a concept.
Policies and Laws	**Intellectual Property** *Respect for the rights and obligations of using and sharing intellectual property.*	The new standards focus on the various laws and policies pertaining to technology. The organization of the new standards eliminates the need to define the sub-concepts.
5.PL.1 With guidance, demonstrate an understanding of copyright and fair use. (Library Media 5.IP.1)	**5.IP.1** With guidance, demonstrate an understanding of ethical issues in copyright and fair use. **5.IP.2** Continued growth.	The new standard uses the Library Media standard, emphasizing the legal aspect of copyright and fair use.
5.PL.2 Understand the purpose of and comply with responsible and acceptable use policies. (Library Media 5.RU.1)	**5.RU.4** Comply with Acceptable Use Policies.	The new standard uses the Library Media standard, which focuses on compliance and understanding why policies exist.
5.PL.3 *Standards begin in sixth grade.*		
Ethics	**Safety and Ethics** *There are both positive and negative impacts on social and ethical behaviors for using technology.*	The organization of the new standards eliminates the need to define the sub-concepts.
5.E.1 Identify motivations that influence the ethical and unethical use of technology.	**5.RU.1** Demonstrate an understanding of the appropriate use of technology and information and the consequences of inappropriate use. **5.RU.3** Continued growth.	The new standard focuses on the motivation of users of technology.
5.E.2 With guidance, understand that biases exist and distinguish between facts and opinions in various sources. (Library Media 5.E.1)		The new standards use the Library Media standard, focusing on identifying bias and distinguishing between fact and opinion when using technology.
	5.A.1 Refine your keyword search to improve your results.	The Library Media Content Standards included were limited to those that directly pertain to computer science and cybersecurity.
	5.E.1 Continued growth.	The Library Media Content Standards included were limited to those that directly pertain to computer science and cybersecurity.
	5.C.1 Independently or collaboratively create a digital product using two or more tools.	These standards are included in the creation of products in other disciplines.

Grade 5

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Societal Impacts		New sub-concept
5.S.1 Explain the positive and negative impacts of technology on how people live, work, and interact.		This standard focuses on the impact that technology has on life, work, and human interactions.
5.S.2 *Standard begins in sixth grade.*		

Grade 5

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Digital Citizenship *Learners will practice responsible digital consumption, creation, communication, and interaction.*	**Digital Citizenship**	The new standards added a goal that learners should reach by graduation
5.DC.1 Identify strategies for media balance. (Library Media 5.RU.5)		The new standards use the Library Media standard that focuses on balancing the use of technology with other activities.
5.DC.2 Discuss the personal impact of technology use on one's learning and relationships.		This new standard focuses on the impact technology has on learning and interpersonal relationships.
5.DC.3 Discuss examples of cyberbullying, the effects on individuals, and age-appropriate prevention and reporting strategies. (Library Media 5.SI.3)	**5.RU.2** Use strategies that prevent and deal responsibly with cyberbullying and inappropriate behavior.	The new standard not only focuses on preventing and reporting cyberbullying, but also on how it impacts others.
5.DC.4 Give examples of how using technology builds one's digital identity.	**5.DI.1** Continued growth.	The new standard focuses on providing examples of ways technology use builds one's digital identity. It is similar to Library Media standard 5.DI.1.

Grade 5

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
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.*	**Safety and Ethics** *When using technology, there are both positive and negative impacts on social and ethical behaviors.*	This is a new concept that builds upon a previous sub-concept and emphasizes the cybersecurity aspect of technology. The new standards added a goal that learners should reach by graduation.
Personally Identifiable Information		New sub-concept
5.PI.1 Identify the risks of online sharing of private information (e.g., identity theft, data collection, and personal safety). (Library Media 5.RU.4	**5.SE.3** Continued growth. **5.SE.4** Apply strategies to keep your private information safe online.	This new standard distinguishes between private and public information and focuses on protecting personal information.
Threats and Vulnerability		New sub-concept
5.TV.1 Identify cybersecurity threats (e.g., phishing, malware, clickbait). (Library Media 4.RU.3)	**5.SE.1** Recognize that there are real-world cybersecurity problems (i.e., hacking) when interacting online.	This new standard focuses on explaining the threats of cybersecurity actions to network security.
5.TV.2 Explain the importance of using trusted sources for updating apps and devices.		This new standard focuses on understanding that apps and devices need updating.
Security Controls		New sub-concept
5.SC.1 Define authentication and identify various authentication methods (e.g. passwords, fingerprint or facial recognition, multi-factor authentication).		This new standard focuses on the role that authentication and authorization play in the secure use of technology.
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)	**5.SE.2** Continued growth.	The new standard uses the Library Media standard, which focuses on methods to maintain digital privacy and security.

Grade 6

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Computing Devices and Systems *Learners will develop an understanding of how networks, hardware, and software function and interact, fostering adaptable skills for digital environments.*	**Technology Systems**	The new standards added a goal that learners should reach by graduation.
Networks and Internet	**Networks and Internet** *Networks link computers and devices locally and around the world, allowing people to access and communicate information.*	The organization of the new standards eliminates the need to define the sub-concepts.
6.NI.1 Identify network connection types (e.g., Wi-Fi, mobile data, Ethernet).	**6.NI.1** Explain how data is sent across networks.	The new standard focuses on different types of connections and how information is transmitted.
6.NI.2 Identify the risks and benefits of the Internet of Things (IoT).		The new standard focuses on the risks and benefits of devices with sensors that connect and exchange data.
6.NI.3 Explore how generative AI creates text, images, or other content based on patterns it has learned from data.		The new standard focuses on how AI uses data patterns to create content.
Hardware and Software	**Hardware and Software** *Devices, hardware, and software work together as a system to accomplish tasks.* **Troubleshooting** *Strategies for solving technology system problems.*	The organization of the new standards eliminates the need to define the sub-concepts.
6.HS.1 Select and use software features and hardware to accomplish a task.	**6.HS.1** Use hardware and/or software to complete a task. **6.HS.2** Use software features to accomplish a goal.	The new standard focuses on selecting software features and hardware that meet task-specific needs.
6.HS.2 With guidance, identify software and hardware problems and apply troubleshooting strategies.	**6.T.1** Apply basic troubleshooting strategies.	The new standard focuses on identifying problems as well as troubleshooting.
6.HS.3 With guidance, organize, store, retrieve, and share digital information efficiently.	**6.HS.3** Organize, store, and retrieve digital information with guidance.	The standard is similar to the 2019 standard, with the inclusion of sharing digital information.

Grade 6

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Algorithms and Computational Thinking *Learners will develop and apply a basic understanding of algorithms and computational thinking, enhancing problem-solving and critical-thinking skills.*	**Problem Solving and Algorithms**	The new standards added a goal that learners should reach by graduation.
Developing and Designing Algorithms	**Development and Design** *Design processes to create new, useful, and imaginative solutions to problems.*	The organization of the new standards eliminates the need to define the sub-concepts.
6.DD.1 With guidance, describe the function of the components of an algorithm.	**6.DD.1** Use programs that utilize combinations of loops, conditionals, and the manipulation of variables representing different data types.	The standard now focuses on understanding the components of an algorithm.
6.DD.2 With guidance, create an algorithm to solve a problem using multiple coding patterns (e.g., loops, conditionals, functions, or variables).		The new standard focuses on creating an algorithm using various components.
6.DD.3 Test algorithms or processes to determine if the predicted outcome matches the actual results.	**6.PSA.1** Identify and test an algorithm to solve a problem.	The standard now focuses on predicting results from the algorithm or process.
Analyzing and Problem Solving	**Problem Solving and Algorithms** *Strategies for understanding and solving problems.* **Data Creation and Analysis** *Data can be collected, used, and presented with computing devices or digital tools.*	The new standards combine the 2019 sub-concepts. The organization of the new standards eliminates the need to define the sub-concepts.
6.AP.1 With guidance, analyze collected data to identify patterns or answer questions.	**6.DCA.1** Collect and analyze data to support a claim.	The standard now focuses on analyzing the results to identify patterns or answer questions.
6.AP.2 With guidance, revise and improve algorithms or processes across disciplines.	**6.PSA.1** Identify and test an algorithm to solve a problem. **6.PSA.2** Debug a program that includes sequencing, loops, or conditionals.	The standard focuses on revising and improving algorithms and processes across disciplines.
6.AP.3 With guidance, ask for and use feedback from others to improve an algorithm or process.		The new standard focuses on using feedback to improve an algorithm or process.
6.AP.4 Use keywords and phrases to create prompts that help digital tools or AI generate relevant information or responses.		The new standard focuses on creating prompts to generate relevant information or responses.

Grade 6

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Impacts of Computing *Learners will understand how technology shapes individuals and the world and influences safety, policy, law, and ethics.*	**Impacts of Computing** *Past, present, and possible future impact of technology on society.*	The new standards added a goal that learners should reach by graduation. They use the sub-concept from the 2019 standards, which was moved to a concept.
Policies and Laws	**Intellectual Property** *Respect for the rights and obligations of using and sharing intellectual property.*	The new standards focus on the various laws and policies pertaining to technology. The organization of the new standards eliminates the need to define the sub-concepts.
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.	**6.IP.1** With guidance, properly use copyrighted works, works in the Creative Commons, and works in the public domain. **6.IP.3** Describe the negative consequences of piracy and plagiarism. **6.IP.2** Cite a variety of sources using the appropriate format.	The standard is similar to Library Media standards 6.IP.1a and b, emphasizing the legal aspects of copyright and fair use.
6.PL.2 Understand the purpose of and comply with responsible & acceptable use policies. (Library Media 6.RU.1)	**6.RU.4** Understand the purpose of and comply with Acceptable Use Policies.	The standard uses the Library Media standard, which focuses on compliance and understanding why policies exist.
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).		The new standard focuses on federal, state, and local laws impacting privacy and cybersecurity.
Ethics	**Safety and Ethics** *There are both positive and negative impacts on social and ethical behaviors from using technology.*	The organization of the new standards eliminates the need to define the sub-concepts.
6.E.1 Describe motivations that influence the ethical and unethical use of technology, including AI.		The new standard focuses on the ethical and unethical use of technology and AI.
6.E.2 With guidance, evaluate information sources to identify bias and determine reliability.	**6.E.1** Evaluate information and its sources.	The standard focuses on evaluating information and evaluating bias.
	6.A.1 Use a variety of search strategies to refine and revise search results.	This standard was eliminated. They are included in the Library Media Content Standards.
	6.C.1 Repurpose or remix original works following fair use guidelines.	This standard was eliminated since these tasks would be completed in other disciplines (e.g., fine arts).

Grade 6

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Societal Impacts		New sub-concept
6.S.1 Examine the positive and negative impacts of current and emerging technology on how people live, work, and interact.	**6.IC.1** Identify the positive and negative impacts of past, present, and future technology, including bias and accessibility.	This standard focuses on how technology impacts people positively and negatively.
6.S.2 Identify some of the benefits and challenges of using generative AI, such as accuracy, bias, or privacy concerns.		This new standard focuses on the benefits and challenges of AI.

Grade 6

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Digital Citizenship *Learners will practice responsible digital consumption, creation, communication, and interaction.*	**Digital Citizenship**	The new standards added a goal that learners should reach by graduation.
Digital Citizenship		This is a new sub-concept.
6.DC.1 Compare and contrast strategies for personal media balance. (Library Media 6.RU.5)		The new standard uses the Library Media standard that focuses on balancing the use of technology with other activities.
6.DC.2 Identify the positive and negative impacts online activities may have on relationships.	**6.RU.3** Use appropriate digital etiquette in a variety of situations.	This standard focuses on the impact of online activities on relationships.
6.DC.3 Identify strategies for responding to positive and negative online situations and discuss the impact of responses on individuals.	**6.RU.1** Identify different forms of cyberbullying. **6.RU.2** Identify strategies to stop cyberbullying. **6.SE.1** Identify steps for responding to uncomfortable situations when interacting online.	The standard focuses on identifying positive and negative online situations. It is similar to Library Media standard 6.SI.3.
6.DC.4 Reflect on online activities and determine how they impact one's digital identity online and offline. (Library Media 6.DI.1)	**6.DI.1** Describe personal online usage and determine how it affects identity on and offline. **6.SI.2** Identify how social interactions can impact a person's self-image.	The standard uses the Library Media standard, which focuses on digital identity.
	6.SI.1 Use collaborative technology.	Students gain the experience of working collaboratively through learning activities in other disciplines.

Grade 6

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Security *To protect individuals and organizations, learners will gain a foundational understanding of safe and best practices for data and system security practices, including information, network, and physical security.*	**Safety and Ethics** *When using technology, there are both positive and negative impacts on social and ethical behaviors.*	This is a new concept that builds upon a previous sub-concept and emphasizes the cybersecurity aspect of technology. The new standards add a goal that learners should reach by graduation.
Personally Identifiable Information		New sub-concept
6.PI.1 Discuss the benefits vs. risks of sharing personal information online (e.g., identity theft, data collection, and personal safety). (Library Media 6.RU.4)	**6.SE.3** Recognize that data-collection technology can be used to track navigation online. **6.SE.4** Identify threats to personal cybersecurity.	This standard weighs the risks and benefits of sharing private information online.
Threats and Vulnerability		New sub-concept
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)	**6.HS.4** Identify threats to technology systems. **6.HS.5** Identify security measures to protect technology systems.	The standard uses the Library Media standard, which focuses on preventing cybersecurity threats.
6.TV.2 Identify the different types of app and device updates.		This new standard focuses on app and device updates.
Security Controls		New sub-concept
6.SC.1 Explain how authentication and authorization methods can protect users.		This new standard focuses on the role that authentication and authorization play in the secure use of technology.
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)	**6.SE.2** Identify basic methods to maintain digital privacy and security.	The standard uses the Library Media standard, which focuses on methods to maintain digital privacy and security.

Grade 7

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Computing Devices and Systems *Learners will develop an understanding of how networks, hardware, and software function and interact, fostering adaptable skills for digital environments.*	**Technology Systems**	The new standards added a goal that learners should reach by graduation.
Networks and Internet	**Networks and Internet** *Networks link computers and devices locally and around the world, allowing people to access and communicate information.*	The organization of the new standards eliminates the need to define the sub-concepts.
7.NI.1 Describe network connection types (e.g., Wi-Fi, mobile data, ethernet).	**7.NI.1** Model how data is sent from one computer to another across networks.	The standard now focuses on different types of connections and how information is transmitted.
7.NI.2 Describe the risks and benefits of the Internet of Things (IoT).		The new standard focuses on the risks and benefits of devices with sensors that connect and exchange data.
7.NI.3 Describe how generative AI creates text, images, or other content based on patterns it has learned from data.		The new standard focuses on acquiring knowledge about AI.
Hardware and Software	**Hardware and Software** *Devices, hardware, and software work together as a system to accomplish tasks.* **Troubleshooting** *Strategies for solving technology system problems.*	The organization of the new standards eliminates the need to define the sub-concepts.
7.HS.1 Select and use software features and hardware to accomplish a task.	**7.HS.1** Compare and contrast hardware and/or software options to complete a task. **7.HS.2** Continued growth.	The standard now focuses on selecting software features and hardware that meet task-specific needs.
7.HS.2 Identify software and hardware problems and apply troubleshooting strategies.	**7.T.1** Continued growth.	The standard now identifies some of the troubleshooting strategies that may be used.
7.HS.3 Organize, store, retrieve, and share digital information efficiently.	**7.HS.3** Organize, store, and retrieve digital information with minimal guidance.	The standard is similar to the original standard.

Grade 7

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Algorithms and Computational Thinking *Learners will develop and apply a basic understanding of algorithms and computational thinking, enhancing problem-solving and critical-thinking skills.*	**Problem Solving and Algorithms**	The new standards added a goal that learners should reach by graduation.
Developing and Designing Algorithms	**Development and Design** *Design processes to create new, useful, and imaginative solutions to problems.*	The organization of the new standards eliminates the need to define the sub-concepts.
7.DD.1 Describe the functions of the components of an algorithm.	**7.DD.1** Modify programs that utilize combinations of loops, conditionals, and the manipulation of variables representing different data types.	The standard now focuses on understanding functions of the components of an algorithm.
7.DD.2 Create an algorithm to solve a problem using multiple coding patterns (e.g., loops, conditionals, functions, or variables).		The new standard focuses on creating an algorithm using coding patterns.
7.DD.3 Test algorithms or processes to determine if the predicted outcome matches the actual results.	**7.PSA.1** Modify and test an algorithm to solve a problem.	The standard now focuses on testing an algorithm or process.
Analyzing and Problem Solving	**Problem Solving and Algorithms** *Strategies for understanding and solving problems.* **Data Creation and Analysis** *Data can be collected, used, and presented with computing devices or digital tools.*	The new standards combine the 2019 sub-concepts. The organization of the new standards eliminates the need to define the sub-concepts.
7.AP.1 Analyze collected data to identify patterns or answer questions.	**7.DCA.1** Represent data in more than one way to defend your claim.	The standard now focuses on data analysis.
7.AP.2 With guidance, revise and improve algorithms or processes across disciplines.	**7.PSA.1** Modify and test an algorithm to solve a problem. **7.PSA.2** Continued growth.	The standard now focuses on revising and improving algorithms or processes to correct errors.
7.AP.3 Ask for and use feedback from others to improve an algorithm or process.		The new standard focuses on seeking feedback to improve algorithms or processes.
7.AP.4 Compare how different word choices or question formats in AI prompts can change the results or quality of the response.		The new standard focuses on effective use of AI.

Grade 7

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Impacts of Computing *Learners will understand how technology shapes individuals and the world and influences safety, policy, law, and ethics.*	**Impacts of Computing** *Past, present, and possible future impact of technology on society.*	The new standards added a goal that learners should reach by graduation. They use the sub-concept from the 2019 standards, which was moved to a concept.
Policies and Laws	**Intellectual Property** *Respect for the rights and obligations of using and sharing intellectual property.*	The new standards focus on the various laws and policies pertaining to technology. The organization of the new standards eliminates the need to define the sub-concepts.
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.	**7.IP.1** With minimal guidance, properly use copyrighted works, works in the Creative Commons, and works in the public domain. **7.IP.3** Identify strategies to prevent personal works and works of others from being pirated and plagiarized. **7.IP.2** Continued growth.	The standard is similar to Library Media standards 7.IP.1a and b, emphasizing the legal aspects of copyright and fair use.
7.PL.2 Understand the purpose of and comply with responsible and acceptable use policies. (Library Media 7.RU.1)	**7.RU.4** Understand the purpose of and comply with Acceptable Use Policies.	The standard uses the Library Media standard, which focuses on compliance and understanding why policies exist.
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).		The new standard focuses on federal, state, and local laws impacting privacy and cybersecurity.
Ethics	**Safety and Ethics** *There are both positive and negative impacts in social and ethical behaviors for using technology.*	The organization of the new standards eliminates the need to define the sub-concepts.
7.E.1 Understand the effect of unethical uses of technology, including AI, on security, privacy, and intellectual property on self and others.	**7.RU.3** Continued growth.	The standard now focuses on the unethical use of technology tools. Information use is included in standards **5.PL.1** and **5.PL.2**.
7.E.2 With guidance, evaluate information sources to identify bias and determine reliability.	**7.E.1** Independently, evaluate information and its sources using student-selected processes and strategies.	The standard's focus is now similar to Library Media standard 7.E.1, which considers multiple perspectives and identifies bias in sources.
	7.A.1 Continued growth.	These standards were eliminated. They are included in the Library Media Content Standards.
	7.C.1 Continue growth.	These standards were eliminated since these tasks would be completed in other disciplines (e.g., fine arts).

Grade 7

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Societal Impacts		New sub-concept
7.S.1 Examine the positive and negative impacts of equitable access to current and emerging technology on how people live, work, and interact.	**7.IC.1** Compare and contrast the impacts of technology, including bias and accessibility.	This standard focuses on the impacts of equitable access to technology.
7.S.2 Discuss how the use of AI can raise ethical questions about fairness, truthfulness, and how personal data is used.		The new standard focuses on the ethical use of AI.

Grade 7

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Digital Citizenship *Learners will practice responsible digital consumption, creation, communication, and interaction.*	**Digital Citizenship**	The new standards added a goal that learners should reach by graduation.
Digital Citizenship		This is a new sub-concept.
7.DC.1 Evaluate personal media usage and apply strategies to create media balance. (Library Media 7.RU.5)		The new standard uses the Library Media standard that focuses on balancing the use of technology with other activities.
7.DC.2 Identify the potential impact social media use may have on self-identity, overall wellness, and relationships.	**7.RU.3** Continued growth.	This standard now focuses on the impact social media has on an individual and relationships.
7.DC.3 Identify strategies for responding to positive and negative online situations and discuss the impact of responses on individuals.	**7.RU.1** Describe different forms of cyberbullying and the effects on all parties involved. **7.RU.2** Identify strategies to prevent and stop cyberbullying. **7.SE.1** Continued growth.	The standard focuses on identifying response strategies for positive and negative online situations. It is similar to Library Media standard 7.SI.3.
7.DC.4 Evaluate one's digital identity and its impact online and offline. (Library Media 7.DI.1)	**7.DI.1** Evaluate how digital identity can impact a person now and in the future. **7.SI.2** Continued growth.	The standard now uses the Library Media standard, which focuses on evaluating one's digital identity.
	7.SI.1 Use collaborative technology to gather and share information.	Students gain the experience of working collaboratively through learning activities in other disciplines.

Grade 7

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Security *To protect individuals and organizations, learners will gain a foundational understanding of safe and best practices for data and system security practices, including information, network, and physical security.*	**Safety and Ethics** *When using technology, there are both positive and negative impacts on social and ethical behaviors.*	This is a new concept that builds upon a previous sub-concept and emphasizes the cybersecurity aspect of technology. The new standards add a goal that learners should reach by graduation.
Personally Identifiable Information		New sub-concept
7.PI.1 Evaluate the benefits versus risks of sharing private information online (e.g., identity theft, data collection, and personal safety). (Library Media 7.RU.4)	**7.SE.3** Continued growth. **7.SE.4** Describe how to respond to threats to personal cybersecurity.	The standard now weighs the risks and benefits of sharing private information online.
Threats and Vulnerability		New sub-concept
7.TV.1 Use strategies to prevent cybersecurity threats (e.g., phishing, malware, clickbait, data collection, and identity theft). (Library Media 7.RU.3)	**7.HS.4** Describe threats to technology systems. **7.HS.5** Explain how security measures protect technology systems.	The standard uses the Library Media standard, which focuses on preventing cybersecurity threats.
7.TV.2 Describe how updates maintain the performance and security of apps and devices.		The standard now focuses on the purpose of security updates to apps and devices.
Security Controls		New sub-concept
7.SC.1 Identify the risks of not using authentication and authorization methods for users and organizations.		This new standard focuses on the role that authentication and authorization play in the secure use of technology.
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)	**7.SE.2** Identify a variety of methods to maintain digital privacy and security.	The standard now uses the Library Media standard, which focuses on methods to maintain digital privacy and security.

Grade 8

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Computing Devices and Systems *Learners will develop an understanding of how networks, hardware, and software function and interact, fostering adaptable skills for digital environments.*	**Technology Systems**	The new standards added a goal that learners should reach by graduation.
Networks and Internet	**Networks and Internet** *Networks link computers and devices locally and around the world, allowing people to access and communicate information.*	The organization of the new standards eliminates the need to define the sub-concepts.
8.NI.1 Describe how data is shared over network connection types (e.g., Wi-Fi, mobile data, Ethernet).	**8.NI.1** Investigate how data is sent from one computer to another across networks.	The standard now focuses on different types of connections and how information is transmitted.
8.NI.2 Evaluate the risks and benefits of the Internet of Things (IoT).		The new standard focuses on the risks and benefits of the Internet of Things.
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.		The new standard includes an AI component to explain generative AI.
Hardware and Software	**Hardware and Software** *Devices, hardware, and software work together as a system to accomplish tasks.* **Troubleshooting** *Strategies for solving technology system problems.*	The organization of the new standards eliminates the need to define the sub-concepts.
8.HS.1 Select and use software features and hardware to accomplish a task.	**8.HS.1** Choose the appropriate device/hardware/software to complete a task. **8.HS.2** Continued growth.	The standard now focuses on selecting software features and hardware that meet task-specific needs.
8.HS.2 Identify software and hardware problems and apply troubleshooting strategies.	**8.T.1** Continued growth.	The standard now focuses on troubleshooting.
8.HS.3 Organize, store, retrieve, and share digital information efficiently.	**8.HS.3** Organize, store, and retrieve digital data efficiently.	The standard is the same. The wording changed slightly.

Grade 8

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Algorithms and Computational Thinking *Learners will develop and apply a basic understanding of algorithms and computational thinking, enhancing problem-solving and critical-thinking skills.*	**Problem Solving and Algorithms**	The new standards added a goal that learners should reach by graduation.
Developing and Designing Algorithms	**Development and Design** *Design processes to create new, useful, and imaginative solutions to problems.*	The organization of the new standards eliminates the need to define the sub-concepts.
8.DD.1 Explain how to find and fix errors in an algorithm to ensure it works as intended.	**8.DD.1** Create programs that utilize combinations of loops, conditionals, and the manipulation of variables representing different data types.	The standard now focuses on locating and fixing errors in algorithms.
8.DD.2 Create an algorithm to solve a problem using multiple coding patterns (e.g., loops, conditionals, functions, or variables).		The new standard focuses on creating algorithms to solve problems.
8.DD.3 Test algorithms or processes to determine if the predicted outcome matches the actual results.		The new standard focuses on testing algorithms or processes to determine if the predicted outcomes match the end results.
Analyzing and Problem Solving	**Problem Solving and Algorithms** *Strategies for understanding and solving problems.* **Data Creation and Analysis** *Data can be collected, used, and presented with computing devices or digital tools.*	The new standards combine the 2019 sub-concepts. The organization of the new standards eliminates the need to define the sub-concepts.
8.AP.1 Collect, organize, and analyze data to support claims or make informed decisions.	**8.DCA.1** Represent data from multiple sources in order to defend or refute a claim.	The standard now analyzes data to support claims or make decisions.
8.AP.2 Revise and improve algorithms or processes across disciplines.	**8.PSA.1** Create and test an algorithm to solve problems across disciplines. **8.PSA.2** Continued growth.	The standard now focuses on revising algorithms to determine improvements.
8.AP.3 Work collaboratively to test algorithms or processes to identify issues and improve.		The new standard focuses on working together to improve a process or algorithm.
8.AP.4 Test and revise AI prompts to improve the accuracy, clarity, or usefulness of the responses.		The new standard focuses on AI use and improving prompts to get results.

Grade 8

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Impacts of Computing *Learners will understand how technology shapes individuals and the world and influences safety, policy, law, and ethics.*	**Impacts of Computing** *Past, present, and possible future impact of technology on society.*	The new standards added a goal that learners should reach by graduation. The new standards use the sub-concept from the 2019 standards, which was moved to a concept.
Policies and Laws	**Intellectual Property** *Respect for the rights and obligations of using and sharing intellectual property.*	The new standards focus on the various laws and policies pertaining to technology. The organization of the new standards eliminates the need to define the sub-concepts.
8.PL.1 Properly use copyrighted works, works in the Creative Commons and works in the public domain by applying fair use guidelines. (Library Media 8.IP.1)	**8.IP.1** Properly use copyrighted works, works in the Creative Commons and works in the public domain.	The standard is similar to Library Media standards 8.IP.1a and b, emphasizing the legal aspects of copyright and fair use.
8.PL.2 Understand the purpose of and comply with responsible and acceptable use policies. (Library Media 8.RU.1)	**8.RU.4** Understand the purpose of and comply with Acceptable Use Policies. **8.IP.2** Continued growth.	The standard uses the Library Media standard, which focuses on compliance and understanding why policies exist.
8.PL.3 Understand the purpose of specific federal, state, and local laws as they relate to cybersecurity and privacy (e.g., FERPA, CIPA, COPPA, CFAA, HIPAA).		The new standard focuses on federal, state, and local laws impacting privacy and cybersecurity.
Ethics	**Safety and Ethics** *There are both positive and negative impacts on social and ethical behaviors from using technology.*	The organization of the new standards eliminates the need to define the sub-concepts.
8.E.1 Describe the consequences of unethical use of technology, including AI, on security, privacy, and intellectual property, on self and others.	**8.RU.3** Continued growth.	The standard includes an AI component and focuses on the ethical use of the information.
8.E.2 Evaluate information sources to identify bias and determine reliability.	**8.E.1** Continued Growth.	The standards use the Library Media standard, which focuses on identifying bias and distinguishing between fact and opinion when using technology.
	8.A.1 Use advanced search strategies to locate information online.	This standard was eliminated. They are included in the Library Media Content Standards.
	8.C.1 Continue growth.	This standard was eliminated since these tasks would be completed in other disciplines (e.g., fine arts).
Societal Impacts		New sub-concept
8.S.1 Describe how current and emerging technology is changing the way people live, work, and interact.	**8.IC.1** Explore and create solutions for the negative impacts of technology, including bias and accessibility.	This standard focuses on the impacts of existing and new technology on daily lives.
8.S.2 Explain how ethical concerns like bias, misinformation, and misuse of personal data can affect society and individuals when using AI.	**8.IC.1** Explore and create solutions for the negative impacts of technology, including bias and accessibility.	This standard includes an AI component and focuses on ethical concerns.

Grade 8

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Digital Citizenship *Learners will practice responsible digital consumption, creation, communication, and interaction.*	**Digital Citizenship**	The new standards added a goal that learners should reach by graduation
Digital Citizenship		This is a new sub-concept.
8.DC.1 Evaluate personal media usage and apply strategies to create media balance. (Library Media 8.RU.5)		The new standard uses the Library Media standard that focuses on balancing the use of technology with other activities.
8.DC.2 Discuss the potential impact social media may have on self-identity, overall wellness, and relationships.	**8.SI.2** Continued growth.	This standard focuses on the impact social media has on an individual.
8.DC.3 Identify strategies for responding to positive and negative online situations and discuss the impact of responses on individuals.	**8.RU.1** Continued growth. **8.RU.2** Identify strategies to prevent and stop cyberbullying. **8.SE.1** Continued growth.	The standard discusses strategies for responding to online situations and the impacts of the response on others, expanding the focus of the 2019 standards and combining the cyberbullying standards. It is similar to Library Media standard 8.SI.3.
8.DC.4 Evaluate one's digital identity and its impact online and offline. (Library Media 8.DI.1)	**8.DI.1** Continued growth.	The standard uses the Library Media standard, which focuses on understanding how technology builds a digital identity.
	8.SI.1 Use collaborative technology to communicate information to a specific audience.	These standards were eliminated. They are embedded in the English Language Arts standards for collaboration (C.7).

Grade 8

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Security *To protect individuals and organizations, learners will gain a foundational understanding of safe and best practices for data and system security practices, including information, network, and physical security.*	**Safety and Ethics** *When using technology, there are both positive and negative impacts on social and ethical behaviors.*	This is a new concept that builds upon a previous sub-concept and emphasizes the cybersecurity aspect of technology. The new standards add a goal that learners should reach by graduation.
Personally Identifiable Information		New sub-concept
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)	**8.IP.3** Debate the risks and benefits of sharing personal works online. **8.SE.3** Continued growth. **8.SE.4** Discuss the consequences of identity theft.	This standard weighs the risks and benefits of sharing private information online.
Threats and Vulnerability		New sub-concept
8.TV.1 Use strategies to prevent cybersecurity threats (e.g., phishing, malware, clickbait, data collection, and identity theft). (Library Media 8.RU.3)	**8.HS.4** Describe ways to protect against threats to technology systems. **8.HS.5** Compare, and contrast security measures used to protect technology systems.	The standard uses the Library Media standard, which focuses on preventing cybersecurity threats.
8.TV.2 Discuss the benefits of updates and the risks of not updating apps and devices.		This new standard focuses on understanding the benefits and risks of apps and devices needing updating.
Security Controls		New sub-concept
8.SC.1 Discuss the risks of not using authentication and authorization methods for users and organizations.		This new standard focuses on the role that authentication and authorization play in the secure use of technology.
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)	**8.SE.2** Identify advanced methods to maintain digital privacy and security.	The standard uses the Library Media standard, which focuses on methods to maintain digital privacy and security.

Grades 9-10

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.

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Computing Devices and Systems *Learners will develop an understanding of how networks, hardware, and software function and interact, fostering adaptable skills for digital environments.*	**Technology Systems**	The new standards added a goal that learners should reach by graduation.
Networks and Internet	**Networks and Internet** *Networks link computers and devices locally and around the world, allowing people to access and communicate information.*	The organization of the new standards eliminates the need to define the sub-concepts.
9-10.NI.1 Identify the advantages and disadvantages of transmitting information over the internet, including speed, reliability, cost, and security.	**9.NI.1** Describe the issues that impact network functionality (e.g., bandwidth, load, delay, topology). **9.NI.2** Understand the implications of accessing publicly available Internet connections. **10.NI.1** Identify and define different network connection types (e.g., Wi-Fi, mobile data, Ethernet). **10.NI.2** Identify networkable devices. **ES.NI.5** Describe the issues that impact network functionality (e.g., bandwidth, load, delay, topography).	The standard now weighs the advantages and disadvantages of transmitting information over the Internet.
9-10.NI.2 Analyze the purpose of the Internet of Things.		The new standard focuses on examining the purpose of devices that connect and exchange data over the internet.
9-10.NI.3 Identify and explain the technological components of AI, including the network and server resources necessary for operation, information databases, and software development.		The new standard focuses on the components of AI.

Grades 9-10

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Hardware and Software	**Hardware and Software** *Devices, hardware, and software work together as a system to accomplish tasks.* **Troubleshooting** *Strategies for solving technology system problems.*	The organization of the new standards eliminates the need to define the sub-concepts.
9-10.HS.1 Compare and contrast appropriate devices, hardware, and software (including cloud software) to complete tasks.	**9.HS.1** Compare and contrast appropriate devices/hardware/software to complete a task. **10.HS.1** Continued growth. **ES.HS.2** Categorize the roles of operating system software.	The standard is the same as the 2019 ninth-grade standard.
9-10.HS.2 Identify software and hardware problems using specific terminology and apply trouble-shooting strategies.	**9.T.1** Describe basic hardware and software problems using appropriate and accurate terminology. **ES.HS.1** Categorize and describe the different functions of operating system software. **10.T.1** Follow appropriate guidelines that convey systematic trouble-shooting techniques to identify and fix errors.	The standard is similar to the 2019 ninth-grade standard.

Grades-10

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Algorithms and Computational Thinking *Learners will develop and apply a basic understanding of algorithms and computational thinking, enhancing problem-solving and critical-thinking skills.*	**Problem Solving and Algorithms**	The new standards added a goal that learners should reach by graduation.
Developing and Designing Algorithms	**Development and Design** *Design processes to create new, useful, and imaginative solutions to problems.*	The organization of the new standards eliminates the need to define the sub-concepts.
9-10.DD.1 Solve problems by deconstructing them into their components.	**9.PSA.1** Identify, recognize, and use an algorithm to solve a complex problem across disciplines. **ES.PD.1** Iteratively evaluate and refine a computational artifact to enhance its performance, reliability, usability, and/or accessibility.	The standard now is the same as the 2019 ninth-grade standard with minor word changes.
9-10.DD.2 Recognize, design, and use algorithms to solve problems across disciplines.	**ES.M.2** Decompose problems into smaller subproblems through systematic analysis. **ES.M.3** Construct solutions to problems using student-created components, such as procedures, modules, and/or objects.	The standard now focuses on breaking problems into their components to help solve them.
9-10.DD.3 Examine algorithms for potential inconsistencies or inefficiencies.	**10.PSA.1** Create and test an algorithm to solve a complex problem across disciplines. **ES.AP.4** Evaluate key qualities of a program through a process, such as code review, program tracing, and/or critical data testing. **ES.AP.5** Demonstrate knowledge of the different types of programming errors. **ES.AP.6** Identify and correct different types of programming errors using a systematic approach. **ES.PD.3** Develop and use a series of test cases to verify that a program performs according to its design specifications.	The standard now focuses on looking for inconsistencies or inefficiencies in algorithms.

Grades 9-10

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Analyzing and Problem Solving	**Problem Solving and Algorithms** *Strategies for understanding and solving problems.* **Data Creation and Analysis** *Data can be collected, used, and presented with computing devices or digital tools.*	The new standards combine the 2019 sub-concepts. The organization of the new standards eliminates the need to define the sub-concepts.
9-10.AP.1 Collect, organize, analyze, and interpret data.	**9.DCA.1** Collect and analyze complex data. **10.DCA.1** Represent complex data in more than one way to support a claim.	The standard has become more rigorous through the addition of organization and interpretation of data.
9-10.AP.2 Revise and improve algorithms or processes across disciplines.	**ES.PD.2** Document decisions made during the design process using text, graphics, presentations, and/or demonstrations in the development of complex programs.	The standard now focuses on using algorithmic processes to solve problems rather than on digital content creation.
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.	**ES.PD.4** Modify an existing program to add additional functionality and discuss intended and unintended implications. **ES.PD.6** Internally document coding structures.	The standard now focuses on the use of a collaborative process to complete a task.
9-10.AP.4 Evaluate how different sets of instructions given to an AI impact its output.		The new standard focuses on effective use of AI tools.

Grades 9-10

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Impacts of Computing *Learners will understand how technology shapes individuals and the world and influences safety, policy, law, and ethics.*	**Impacts of Computing** *Past, present, and possible future impact of technology on society.*	The new standards added a goal learners should reach by graduation. The new standards use the sub-concept from the 2019 standards was moved to a concept.
Policies and Laws	**Intellectual Property** *Respect for the rights and obligations of using and sharing intellectual property.*	The new standards focus on the various laws and policies pertaining to technology. The organization of the new standards eliminates the need to define the sub-concepts.
9-10.PL.1 Properly use copyrighted works, works in the Creative Commons, and works in the public domain by applying fair use guidelines.	**9.IP.1** Properly use copyrighted works, works in the creative commons, and works in the public domain. **9.IP.2** Cite sources in a standard format to ethically reference the intellectual property of others. **10.IP.1** Demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property. **10.IP.2** Continued growth.	The standard is virtually the same as the 2019 ninth-grade standard.
9-10.PL.2 Understand the purpose of and comply with responsible and acceptable use policies. (Library Media 10.RU.1)	**9.RU.4** Understand the purpose of and comply with Acceptable Use Policies. **10.RU.4** Understand the purpose of and comply with Acceptable Use Policies.	The standard now uses both terms (responsible use and acceptable use).
9-10.PL.3 Explain the importance of understanding specific laws and user agreements pertaining to technology.		The new standard focuses on federal, state, and local laws and user agreements impacting technology use. Districts may opt to include international laws.
Ethics	**Safety and Ethics** *There are both positive and negative impacts on social and ethical behaviors for using technology.*	The new standards focus on the ethical behaviors in this sub-concept. The organization of the new standards eliminates the need to define the sub-concepts.
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.	**9.RU.2** Apply safe and ethical behaviors to personal electronic communication and interaction. **10.RU.2** Continued growth.	The standard now focuses more on the ethical issues of technology use rather than ethical behaviors.
9-10.E.2 Evaluate the accuracy, perspective, credibility, and relevance of information, media, AI generated content data, or other resources.	**9.E.1** Evaluate the accuracy, perspective, credibility, and relevance of information, media, data, or other resources. **10.E.1** Gather accurate, credible, and relevant sources of information, media, data, or other resources showing different perspectives.	This standard is similar to the 2019 ninth-grade standard and is derived from the Library Media standard 10.E.2. This standard now explicitly includes AI.

Grades 9-10

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Ethics	**Safety and Ethics** *There are both positive and negative impacts on social and ethical behaviors for using technology.*	The new standards focus on the ethical behaviors in this sub-concept. The organization of the new standards eliminates the need to define the sub-concepts.
	9.A.1 Plan and employ effective research strategies to locate information. **10.A.1** Curate relevant information from digital resources using a variety of tools and methods.	These standards were eliminated. They are included in the Library Media Content Standards and English Language Arts Content Standards.
	9.C.1 Create original works or responsibly repurpose or remix digital resources into new creations to communicate an idea. **10.C.1** Choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.	These standards were eliminated since these tasks would be completed in English Language Arts or fine arts courses.
Societal Impacts		New sub-concept
9-10.S.1 Make predictions on how technology may impact the workplace and personal lives.	**9.IC.1** Evaluate how technology has impacted the workforce positively and negatively. **10.IC.1** Evaluate the social, personal, and economic implications technology has on society and the economy.	This standard now focuses on the future of the impacts of technology on one's daily life.
9-10.S.2 Evaluate AI outputs to identify limitations, inaccuracies, biases, misinformation, and privacy concerns.		The new standard focuses on the effective use of AI tools.

Grades 9-10

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Digital Citizenship *Learners will practice responsible digital consumption, creation, communication, and interaction.*	**Digital Citizenship**	The new standards added a goal that learners should reach by graduation
Digital Citizenship		This is a new sub-concept.
9-10.DC.1 Evaluate media usage and apply strategies to create media balance. (Library Media 10.RU.5)		The new standard uses the Library Media standard, which focuses on balancing technology use with other activities.
9-10.DC.2 Evaluate the potential benefits and harms social media may have on self-identity and overall wellness.	**9.SE.1** Recognize the effects sharing information online can have on others' privacy.	This standard now focuses on the impact social media has on an individual.
9-10.DC.3 Demonstrate respect and integrity online. (Library Media 1.SI.3**)**	**9.RU.1** Apply cyberbullying prevention strategies. **9.RU.2** Apply safe and ethical behaviors to personal electronic communication and interaction. **10.RU.1** Continued growth. **10.RU.2** Continued growth.	The standard now focuses on demonstrating appropriate and ethical online behaviors.
9-10.DC.4 Evaluate one's digital identity and recognize the potential future impact of one's actions in the digital world.	**9.DC.1** Manage a digital identity and be aware of the permanence of actions in the digital world. **10.SE.2** Recognize the importance of monitoring your private data.	The standard now focuses on taking ownership of one's own digital identity and the impact one's technological use may have in the future.

Grades 9-10

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
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.*	**Safety and Ethics** *When using technology, there are both positive and negative impacts on social and ethical behaviors.*	This is a new concept that builds upon a previous sub-concept and places more emphasis on the cybersecurity aspect of technology. The new standards added a goal that learners should reach by graduation.
Personally Identifiable Information		New sub-concept
9-10.PI.1 Monitor and manage information personally shared online about oneself and others.	**9.SE.1** Recognize the effects sharing information online can have on others' privacy. **9.SE.2** Know how to modify account settings to protect privacy and security. **10.SE.1** Implement best practices to secure personal information. **10.SE.3** Manage personal data to maintain digital privacy and security and be aware of data collection technology used to track online behaviors. **10.SE.4** Identify if their private data has been altered and can react appropriately.	This standard now encompasses monitoring and managing personal information that is shared online.
Threats and Vulnerability		New sub-concept
9-10.TV.1 Develop strategies to help resolve issues arising from cybersecurity threats.	**9.SE.3** Recognize that data collection technology can be used to track navigation online. **9.SE.4** Describe ways to prevent identity theft. **10.SE.3** Manage personal data to maintain digital privacy and security and be aware of data collection technology used to track online behaviors. **ES.NI.4** Give examples to illustrate how sensitive data can be affected by malware and other attacks. **ES.PD.5** Explain security issues that might lead to compromised computer programs.	This standard now focuses on resolving issues created by cyber threats.
9-10.TV.2 Differentiate between security updates and feature updates and explain their purposes.	**9.HS.2** Define software and security patches/updates. **10.HS.2** Recognize the importance of and effectively perform software and security patches/updates. **ES.NI.6** Compare ways software developers protect devices and information from unauthorized access.	This standard now focuses on the types and purposes of security and feature updates.

Grades 9-10

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Security Controls		New sub-concept
9-10.SC.1 Evaluate the advantages and disadvantages of authentication and authorization methods.	**10.SE.1** Implement best practices to secure personal information.	This standard now focuses on evaluating authentication and authorization methods to select the ones most appropriate for current needs.
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)	**10.SE.1** Implement best practices to secure personal information.	The standard now uses the Library Media standard, focusing on the use of methods to maintain digital privacy and security.

Grades 11-12

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

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Computing Devices and Systems *Learners will develop an understanding of how networks, hardware, and software function and interact, fostering adaptable skills for digital environments.*	**Technology Systems**	The new standards added a goal that learners should reach by graduation.
Networks and Internet	**Networks and Internet** *Networks link computers and devices locally and around the world, allowing people to access and communicate information.*	The organization of the new standards eliminates the need to define the sub-concepts. The new standards utilize a glossary for definitions.
11-12.NI.1 Choose an appropriate connection to transmit information based on speed, reliability, cost, and security.	**11.NI.1** Compare and contrast different network connection types (e.g., Wi-Fi, mobile data, Ethernet). **12.NI.1** Choose an appropriate network connection given a scenario or situation. **ES.NI.1** Examine the scalability and reliability of networks by describing the relationship between routers, switches, servers, topography, and addressing. **ES.NI.2** Explain how the characteristics of the Internet influence the systems developed on it.	The standard now focuses on selecting a connection that best meets one's needs.
11-12.NI.2 Compare and contrast the benefits and security risks of the Internet of Things.	**11.NI.2** Understand the global impact of networkable devices. **12.NI.2** Compare and contrast the benefits and security risks of networkable devices.	The standard now focuses on weighing the benefits and security risks of devices that connect and exchange data over the internet.
11-12.NI.3 Identify and explain the technological components of AI including the network and server resources necessary for operation, information databases, and software development.		The new standard focuses on the components of AI.

Grades 11-12

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Hardware and Software	**Hardware and Software** *Devices, hardware, and software work together as a system to accomplish tasks.* **Troubleshooting** *Strategies for solving technology system problems.*	The new standards utilize a glossary for definitions. The organization of the new standards eliminates the need to define the sub-concepts.
11-12.HS.1 Choose appropriate devices, hardware, and/or software (including cloud software and AI integrated tools) to complete tasks and justify the choice made.	**11.HS.1** Continued growth. **11.HS.2** Identify and choose hardware and software to help protect a system. **12.HS.1** Continued growth. **12.HS.1** Continued growth.	The majority of the standard has not changed; the original 2019 standard continued growth was based on 9.HS.1. AI was included to add focus to current technologies.
11-12.HS.2 Implement systematic troubleshooting strategies to identify and fix errors.	**11.T.1** Continued growth. **12.T.1** Implement systematic troubleshooting strategies to identify and fix errors. **ES.T.1** Continued growth.	The standard is the same as the 2019 twelfth-grade standard.
11-12.HS.3 Develop personal procedures and policies for utilizing storage needs (e.g., local backups, cloud computing).	**11.HS.3** Identify different options for redundancy (e.g., cloud storage, external, duplicate devices). **12.HS.3** Implement redundancy.	The standard now focuses on developing one's policies and procedures regarding storing and backing up information.

Grades 11-12

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Algorithms and Computational Thinking *Learners will develop and apply a basic understanding of algorithms and computational thinking, enhancing problem-solving and critical-thinking skills.*	**Problem Solving and Algorithms**	The new standards added a goal that learners should reach by graduation.
Developing and Designing Algorithms	**Development and Design** *Design processes to create new, useful, and imaginative solutions to problems.*	The new standards utilize a glossary for definitions. The organization of the new standards eliminates the need to define the sub-concepts.
11-12.DD.1 Deconstruct problems into components to create solutions for existing problems.	**12.PSA.1** Use and adapt common algorithms to solve computational problems.	The standard has not changed.
11-12.DD.2 Use and adapt common algorithms to solve computational problems.	**ES.M.1** Analyze a large-scale computational problem and identify generalizable patterns or problem components that can be applied to a solution. **ES.M.4** Demonstrate code reuse by creating programming solutions using libraries or APIs.	The standard now focuses on breaking problems into their components to find new ways to solve existing problems.
11-12.DD.3 Evaluate a variety of algorithms that could be used for similar processes in real-world applications.	**11.PSA.1** Demonstrate ways a given algorithm applies to problems across disciplines and explain the benefits and drawbacks of choices made. **ES.AP.3** Evaluate algorithms in terms of their efficiency. **ES.PD.3** Develop and use a series of test cases to verify that a program performs according to its design specifications.	The standard now focuses on assessing a variety of algorithms for similar processes within a real-world context.
Analyzing and Problem Solving	**Problem Solving and Algorithms** *Strategies for understanding and solving problems.* **Data Creation and Analysis** *Data can be collected, used, and presented with computing devices or digital tools.*	The new standards combine the 2019 sub-concepts. The organization of the new standards eliminates the need to define the sub-concepts.
11-12.AP.1 Determine and utilize an effective method to collect and represent complex data.	**11.DCA.1** Represent complex data in multiple ways to defend a student-generated claim. **12.DCA.1** Represent complex data using interactive data visualizations or computational models. **ES.V.1** Use data structures to represent information. **ES.V.2** Compare and contrast fundamental data structures and their uses.	The standard now focuses on determining and utilizing collection and representation methods. It also includes choosing the most effective method.

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Grades 11-12

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Analyzing and Problem Solving	**Problem Solving and Algorithms** *Strategies for understanding and solving problems.* **Data Creation and Analysis** *Data can be collected, used, and presented with computing devices or digital tools.*	The new standards combine the 2019 sub-concepts. The organization of the new standards eliminates the need to define the sub-concepts.
11-12.AP.1 Determine and utilize an effective method to collect and represent complex data.	**11.DCA.1** Represent complex data in multiple ways to defend a student-generated claim. **12.DCA.1** Represent complex data using interactive data visualizations or computational models. **ES.V.1** Use data structures to represent information. **ES.V.2** Compare and contrast fundamental data structures and their uses.	The standard now focuses on determining and utilizing collection and representation methods. It also includes choosing the most effective method.
11-12.AP.2 Revise and improve algorithms or processes across disciplines.	**ES.HS.3** Demonstrate familiarity and knowledge of the programming environment. **ES.AP.1** Design algorithms to solve computational problems using a combination of original and existing algorithms. **ES.CS.1** Design computational artifacts using single and multi-way conditional statements. **ES.CS.2** Design computational artifacts using pretest and/or posttest repetitions. **ES.CS.3** Design computational artifacts using fixed and/or variable length repetitions.	The standard now focuses on developing algorithms to solve problems in other disciplines (e.g., math, science, social studies).

Grades 11-12

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Analyzing and Problem Solving	**Problem Solving and Algorithms** *Strategies for understanding and solving problems.* **Data Creation and Analysis** *Data can be collected, used, and presented with computing devices or digital tools.*	The new standards combine the 2019 sub-concepts. The organization of the new standards eliminates the need to define the sub-concepts.
11-12.AP.3 Work collaboratively to analyze problems, develop multiple solutions, evaluate the effectiveness of each solution, and justify the reasoning behind the chosen approach.	**ES.AP.2** Implement searching and sorting algorithms to solve computational problems. **ES.CS.4** Iteratively design and develop computational artifacts for practical intent, personal expression, or to address a societal issue. **ES.CS.5** Justify the selection of specific control structures by identifying tradeoffs associated with implementation, readability, and performance. **ES.CS.6** Demonstrate the flow of execution of a recursive algorithm. **ES.PD.4** Modify an existing program to add additional functionality and discuss intended and unintended implications. **ES.C.1** Evaluate the ability of models and simulations to test and support hypotheses.	The standard now focuses on working collaboratively to find solutions to problems.
11-12.AP.4 Evaluate how comprehensively AI outputs address the given task or problem.		The new standard focuses on the effective use of AI tools.

Grades 11-12

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Impacts of Computing *Learners will understand how technology shapes individuals and the world and influences safety, policy, law, and ethics.*	**Impacts of Computing** *Past, present, and possible future impact of technology on society.*	The new standards added a goal that learners should reach by graduation. The new standards use the sub-concept from the 2019 standards was moved to a concept.
Policies and Laws	**Intellectual Property** *Respect for the rights and obligations of using and sharing intellectual property.*	The new standards focus on the various laws and policies pertaining to technology. The organization of the new standards eliminates the need to define the sub-concepts.
11-12.PL.1 Explain intellectual property laws' beneficial and harmful effects on innovation, creativity, and collaboration.	**11.IP.1** Explain the beneficial and harmful effects that intellectual property laws can have on innovation, creativity, and collaboration. **11.IP.3** Evaluate the social and economic implications of piracy and plagiarism in the context of safety, law, or ethics. **12.IP.3** Continued growth.	The standard is the same as the 2019 eleventh-grade standard.
11-12.PL.2 Understand the purpose of and comply with responsible and acceptable use policies. (Library Media 12.RU.1)	**11.RU.4** Understand the purpose of and comply with Acceptable Use Policies. **12.RU.4** Understand the purpose of and comply with Acceptable Use Policies. **11.IP.2** Continued growth. **12.IP.2** Continued growth.	The standard now includes both terms (acceptable and responsible use).
11-12.PL.3 Explain the importance of understanding specific laws and user agreements about technology.	**12.IP.1** Debate laws and regulations that impact the development and use of software.	The standard now focuses on federal, state, and local laws and user agreements impacting technology use.
Ethics	**Safety and Ethics** *There are both positive and negative impacts on social and ethical behaviors for using technology.*	The new standards focus on the ethical behaviors in this sub-concept. The organization of the new standards eliminates the need to define the sub-concepts.
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 policy-makers.	**11.RU.2** Continued growth. **12.RU.2** Continued growth.	The standard now focuses on the use of personal judgment in using technology ethically.
11-12.E.2 Justify source selection based on accuracy, perspective, credibility, and relevance of information, media, AI-generated content, or other resources.	**11.E.1** Use accurate, credible, and relevant sources of information, media, data, or other resources showing different perspectives. **12.E.1** Explain source selection based on accuracy, perspective, credibility, and relevance of information, media, data, or other resources. **ES.E.1** Continued growth.	This standard is similar to the 2019 twelfth-grade standard and is derived from to the Library Media standard 10.E.2. This standard now explicitly includes AI.

Grades 11-12

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Ethics	**Safety and Ethics** *There are both positive and negative impacts on social and ethical behaviors for using technology.*	The new standards focus on the ethical behaviors in this sub-concept. The organization of the new standards eliminates the need to define the sub-concepts.
	11.A.1 Devise new search strategies based on information gaps and new understanding. **12.A.1** Build knowledge by actively exploring real-world issues and problems, developing ideas and theories, and pursuing answers and solutions. **ES.A.1** Continued growth.	These standards were eliminated. They are included in the Library Media Content Standards and English Language Arts Content Standards.
	11.C.1 Publish or present content that customizes the message and medium for their intended audiences to communicate their idea. **12.C.1** Exhibit perseverance, a tolerance for ambiguity, and the capacity to work with open-ended problems in the design and creation process.	These standards were eliminated since these tasks would be completed in English Language Arts or fine arts courses.
Societal Impacts		New sub-concept
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.	**11.IC.1** Explain how computing may change cultural aspects of society. **12.IC.1** Predict how computing may impact the workplace and personal lives. **ES.IC.1** Continued growth.	This standard is similar to the eleventh- and twelfth-grade standards in 2019. AI was included to emphasize current technologies.
11-12.S.2 Identify and explain the ethical considerations of using AI, including the awareness of biases, misinformation, resource consumption, and security risks.	**11.NI.2** Understand the global impact of networkable devices. **11.SI.1** Investigate ways to maximize the benefits and minimize the harmful effects technology can have on society. **12.SI.1** Evaluate the impact of equity, bias, access, and influence on the availability of computing resources in a global society. **ES.SI.1** Continued growth. **ES.SLE.1** Evaluate computational artifacts to maximize their beneficial effects and minimize harmful effects on society.	This standard is similar to the 2019 twelfth-grade standard. AI was included to add focus to current technologies.

Grades 11-12

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
Digital Citizenship *Learners will practice responsible digital consumption, creation, communication, and interaction.*	**Digital Citizenship**	The new standards added a goal that learners should reach by graduation
Digital Citizenship		This is a new sub-concept.
11-12.DC.1 Evaluate personal media usage and apply strategies to create media balance. (Library Media 12.RU.5)		The new standard uses the Library Media standard that focuses on balancing the use of technology with other activities.
11-12.DC.2 Propose strategies for maintaining a healthy balance in social media usage.		The new standard focuses on maintaining a balance in one's use of social media and other activities.
11-12.DC.3 Demonstrate respect and integrity online. (Library Media 12.SI.3)	**11.RU.1** Continued growth. **11.RU.2** Continued growth. **12.RU.1** Continued growth. **12.RU.2** Continued growth. **ES.RU.1** Continued growth.	The standard now focuses on using technology ethically when online.
11-12.DC.4 Assess and refine one's digital identity and footprint to maintain a positive online presence.	**11.DI.1** Continued growth. **12.DI.1** Continued growth.	The standard now focuses on evaluating one's digital identity and footprint.

Grades 11-12

2025 Computer Science and Cybersecurity Standards	2019 Computer Science and Cybersecurity Standards	Changes
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.*	**Safety and Ethics** *When using technology, there are both positive and negative impacts on social and ethical behaviors.*	This is a new concept that builds upon a previous sub-concept and emphasizes the cybersecurity aspect of technology. The new standards added a goal that learners should reach by graduation.
Personally Identifiable Information		New sub-concept
11-12.PI.1 Monitor and manage personal information shared online about oneself and others.	**11.SE.2** Explain privacy concerns related to the collection and generation of data through automated processes. **12.SE.2** Illustrate how sensitive data can be affected by malware and other attacks. **ES.P.1** Continued growth.	This standard now focuses on monitoring personal information that is shared online.
Threats and Vulnerability		New sub-concept
11-12.TV.1 Develop a sense of self-efficacy that allows one to act on and resolve issues arising from cybersecurity threats.	**11.SE.3** Develop a plan to recover from an incident that was tied to unauthorized access. **12.SE.3** Continued growth. **ES.NI.3** Develop solutions to security threats.	This standard now focuses on acting on and resolving threats created by cyber threats.
11-12.TV. 2 Analyze and evaluate the urgency of installing updates, considering the differences between security and feature updates.		The new standard focuses on determining the urgency of updates.
Security Controls		New sub-concept
11-12.SC.1 Implement best practices associated with authentication and authorization methods.	**11.SE.1** Understand encryption and how it is used to protect data. **12.SE.1** Continued growth.	This standard now focuses on using best practices in authentication and authorization methods.
11-12.SC.2 Implement best practices to secure personal information when accessing technology (e.g., password, PIN, multi-factor authentication). (Library Media 8.RU.2)	**11.SE.2** Explain privacy concerns related to the collection and generation of data through automated processes. **12.SE.2** Illustrate how sensitive data can be affected by malware and other attacks.	The standard now uses the Library Media standard, which focuses on methods to maintain digital privacy and security.