

# Computer Science and Digital Fluency Learning Standards



Standards at a Glance

Grades 9-12

## Impacts of Computing



Subconcept	Standard
<b>Society</b>	<b>9-12.IC.1</b> Evaluate the impact of computing technologies on equity, access, and influence in a global society.
	<b>9-12.IC.2</b> Debate laws and regulations that impact the development and use of computing technologies and digital information.
<b>Ethics</b>	<b>9-12.IC.3</b> Debate issues of ethics related to real-world computing technologies.
	<b>9-12.IC.4</b> Assess personal and societal trade-offs related to computing technologies and data privacy.
	<b>9-12.IC.5</b> Describe ways that complex computer systems can be designed for inclusivity and to mitigate unintended consequences.
<b>Accessibility</b>	<b>9-12.IC.6</b> Create accessible computational artifacts that meet standard compliance requirements or otherwise meet the needs of users with disabilities.
<b>Career Paths</b>	<b>9-12.IC.7</b> Investigate the use of computer science in multiple fields.

## Computational Thinking



Subconcept	Standard
<b>Modeling and Simulation</b>	<b>9-12.CT.1</b> Create a simple digital model that makes predictions of outcomes.
<b>Data Analysis and Visualization</b>	<b>9-12.CT.2</b> Collect and evaluate data from multiple sources for use in a computational artifact.
	<b>9-12.CT.3</b> Refine and visualize complex data sets to tell different stories with the same data set.
<b>Abstraction and Decomposition</b>	<b>9-12.CT.4</b> Implement a program using a combination of student-defined and third-party functions to organize the computation.
	<b>9-12.CT.5</b> Modify a function or procedure in a program to perform its computation in a different way over the same inputs, while preserving the result of the overall program.
<b>Algorithms and Programming</b>	<b>9-12.CT.6</b> Demonstrate how at least two classic algorithms work, and analyze the trade-offs related to two or more algorithms for completing the same task.
	<b>9-12.CT.7</b> Design or remix a program that utilizes a data structure to maintain changes to related pieces of data.
	<b>9-12.CT.8</b> Develop a program that effectively uses control structures in order to create a computer program for practical intent, personal expression, or to address a societal issue.
	<b>9-12.CT.9</b> Systematically test and refine programs using a range of test cases, based on anticipating common errors and user behavior.
	<b>9-12.CT.10</b> Collaboratively design and develop a program or computational artifact for a specific audience and create documentation outlining implementation features to inform collaborators and users.

## Networks & System Design



Subconcept	Standard
Hardware and Software	<b>9-12.NSD.1</b> Design a solution to a problem that utilizes embedded systems to automatically gather input from the environment.
	<b>9-12.NSD.2</b> Explain the levels of interaction existing between the application software, system software, and hardware of a computing system.
	<b>9-12.NSD.3</b> Develop and communicate multistep troubleshooting strategies others can use to identify and fix problems with computing devices and their components.
Networks and the Internet	<b>9-12.NSD.4</b> Describe the components and design characteristics that allow data and information to be moved, stored, and referenced over the internet.
	<b>9-12.NSD.5</b> Describe how emerging technologies are impacting networks and how they are used.

## Cybersecurity



Subconcept	Standard
Risks	<b>9-12.CY.1</b> Determine the types of personal and organizational information and digital resources that an individual may have access to that need to be protected.
Safeguards	<b>9-12.CY.2</b> Describe physical, digital, and behavioral safeguards that can be employed to protect the confidentiality, integrity, and accessibility of information.
	<b>9-12.CY.3</b> Explain specific trade-offs when selecting and implementing security recommendations.
	<b>9-12.CY.4</b> Evaluate applications of cryptographic methods.
Response	<b>9-12.CY.5</b> Recommend multiple actions to take prior and in response to various types of digital security breaches.

## Digital Literacy



Subconcept	Standard
Digital Use	<b>9-12.DL.1</b> Type proficiently on a keyboard.
	<b>9-12.DL.2</b> Communicate and work collaboratively with others using digital tools to support individual learning and contribute to the learning of others.
	<b>9-12.DL.3</b> <i>No Standard; mastery reached by Grade 8.</i>
	<b>9-12.DL.4</b> Independently select advanced digital tools and resources to create, revise, and publish complex digital artifacts or collection of artifacts.
	<b>9-12.DL.5</b> Transfer knowledge of technology in order to use new and emerging technologies on multiple platforms.
Digital Citizenship	<b>9-12.DL.6</b> Actively manage digital presence and footprint to reflect an understanding of the permanence and potential consequences of actions in online spaces.
	<b>9-12.DL.7</b> Design and implement strategies that support safety and security of digital information, personal identity, property, and physical and mental health when operating in the digital world.