Computer Science and Digital Fluency Learning Standards

Standards at a Glance   Grades 9-12

Impacts of Computing

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

Computational Thinking

Subconcept	Standard
Modeling and Simulation	**9-12.CT.1** Create a simple digital model that makes predictions of outcomes.
Data Analysis and Visualization	**9-12.CT.2** Collect and evaluate data from multiple sources for use in a computational artifact.
	9-12.CT.3 Refine and visualize complex data sets to tell different stories with the same data set.
Abstraction and Decomposition	**9-12.CT.4** Implement a program using a combination of student-defined and third-party functions to organize the computation.
	9-12.CT.5 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.
Algorithms and Programming	**9-12.CT.6** Demonstrate how at least two classic algorithms work, and analyze the trade-offs related to two or more algorithms for completing the same task.
	9-12.CT.7 Design or remix a program that utilizes a data structure to maintain changes to related pieces of data.
	9-12.CT.8 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.
	9-12.CT.9 Systematically test and refine programs using a range of test cases, based on anticipating common errors and user behavior.
	9-12.CT.10 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	**9-12.NSD.1** Design a solution to a problem that utilizes em-bedded systems to automatically gather input from the environment.
	9-12.NSD.2 Explain the levels of interaction existing between the application software, system software, and hardware of a computing system.
	9-12.NSD.3 Develop and communicate multistep troubleshooting strategies others can use to identify and fix problems with computing devices and their components.
Networks and the Internet	**9-12.NSD.4** Describe the components and design characteristics that allow data and information to be moved, stored, and referenced over the internet.
	9-12.NSD.5 Describe how emerging technologies are impacting networks and how they are used.

Cybersecurity

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

Digital Literacy

Subconcept	Standard
Digital Use	**9-12.DL.1** Type proficiently on a keyboard.
	9-12.DL.2 Communicate and work collaboratively with others using digital tools to support individual learning and contribute to the learning of others.
	9-12.DL.3 *No Standard; mastery reached by Grade 8.*
	9-12.DL.4 Independently select advanced digital tools and resources to create, revise, and publish complex digital artifacts or collection of artifacts.
	9-12.DL.5 Transfer knowledge of technology in order to use new and emerging technologies on multiple platforms.
Digital Citizenship	**9-12.DL.6** Actively manage digital presence and footprint to reflect an understanding of the permanence and potential consequences of actions in online spaces.
	9-12.DL.7 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.