

Sixth – Eighth Grade Computer Science Standards

Introduction to Indiana’s Academic Standards for Computer Science

Indiana’s Academic Standards for Computer Science allows for students to be prepared in the ever-changing computer science areas providing inquiry-based, hands-on experiences based on two components: Concepts and Practices. These standards are to be implemented in the 2016-2017 school year. The expectation is for students to work through the standards in multi-subject areas. As students move through grade levels, they will work with and experience the standards at those grade bands (K-2, 3-5, and 6-8). The standards are based on the five core concepts: Data and Information (DI); Computing Devices and Systems (CD); Programs and Algorithms (PA); Networking and Communication (NC); and Impact and Culture (IC).

Data and Information (DI)
6-8.DI.1 Use the basic steps in algorithmic problem-solving to design solutions (e.g., problem statement and exploration, examination of sample instances, design, implementing a solution, testing, and evaluation).
6-8.DI.2 Describe the process of parallelization as it relates to problem solving.
6-8.DI.3 Represent data in a variety of ways (e.g., text, sounds, pictures, and numbers), and use different visual representations of problems, structures, and data (e.g., graphs, charts, network diagrams, flowcharts).
6-8.DI.4 Understand the notion of hierarchy and abstraction in computing including high-level languages, translation, instruction set, and logic circuits.
6-8.DI.5 Demonstrate interdisciplinary applications of computational thinking and interact with content-specific models and simulations to support learning and research.

Computing Devices and Systems (CD)
6-8.CD.1 Demonstrate an understanding of the relationship between hardware and software.
6-8.CD.2 Apply troubleshooting strategies to identify and solve routine hardware and software problems that occur during everyday computer use.
6-8.CD.3 Describe the major components and functions of computer systems and network.
6-8.CD.4 Describe what distinguishes humans from machines focusing on human intelligence versus machine intelligence and ways we can communicate, as well as ways in which computers use models of intelligent behavior (e.g., robot motion, speech and language understanding, and computer vision).

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Programs and Algorithms (PA)
6-8.PA.1 Select appropriate tools and technology resources to support learning and personal productivity, publish individual products, and design, develop, and publish data, accomplish a variety of tasks, and solve problems.
6-8.PA.2 Implement problem solutions using a programming language that includes looping behavior, conditional statements, logic, expressions, variables, and functions.
6-8.PA.3 Demonstrate dispositions amenable to open-ended problem solving and programming (e.g., comfort with complexity, persistence, brainstorming, adaptability, patience, propensity to tinker, creativity, accepting challenge).

Networking and Communication (NC)
6-8.NC.1 Collaboratively design, develop, publish, and present products (e.g., videos, podcasts, websites) using technology resources that demonstrate and communicate curriculum concepts.
6-8.NC.2 Exhibit dispositions necessary for collaboration: providing useful feedback, integrating feedback, understanding and accepting multiple perspectives, socialization.

Impact and Culture (IC)
6-8.IC.1 Exhibit legal and ethical behaviors when using technology and information and discuss the consequences of misuse.
6-8.IC.2 Analyze the positive and negative impacts of technology on one's personal life, society, and our culture.
6-8.IC.3 Evaluate the accuracy, relevance, appropriateness, comprehensiveness, and biases that occur in electronic information sources.
6-8.IC.4 Describe ethical issues that relate to computers and networks (e.g., security, privacy, ownership, and information sharing), and discuss how unequal distribution of technological resources in a global economy raises issues of equity, access, and power.