

Kindergarten – Second 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 and not to be formally assessed by the State of Indiana. 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)

K-2.DI.1 Use technology resources to solve age-appropriate problems and communicate thoughts, ideas, or stories in a step-by-step manner.

K-2.DI.2 Understand how to arrange (sort) information into useful order, such as sorting students by birth date, without using a computer.

K-2.DI.3 Recognize that software is created to control computer operations.

Computing Devices and Systems (CD)

K-2.CD.1 Use standard input and output devices to operate computers and other technologies.

Programs and Algorithms (PA)

K-2.PA.1 Use technology and developmentally appropriate multimedia resources to conduct age-appropriate research and support learning across the curriculum.

K-2.PA.2 Create developmentally appropriate multimedia products with support from teachers, family members, or student partners.

K-2.PA.3 Arrange information using concept mapping tools and a set of statements that accomplish a simple task.

Kindergarten – Second Grade Computer Science Standards

Networking and Communication (NC)
K-2.NC.1 Use technology to work cooperatively and collaboratively with peers, teachers, and others.
K-2.NC.2 Gather information and communicate electronically with others with support from teachers, family members, or student partners.

Impact and Culture (IC)
K-2.IC.1 Practice responsible digital citizenship (legal and ethical behaviors) in the use of technology.
K-2.IC.2 Identify positive and negative social and ethical behaviors for using technology.

Third – Fifth 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 and not to be formally assessed by the State of Indiana. 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)
3-5.DI.1 Understand and use the basic steps in algorithmic problem solving (e.g., problem statement and exploration, examination of sample instances, design, implementation, and testing).
3-5.DI.2 Develop a simple understanding of an algorithm (e.g., search, sequence of events, or sorting) using computer-free exercises.
3-5.DI.3 Demonstrate how a string of bits can be used to represent alphanumeric information and how 1's and 0's represent information.
3-5.DI.4 Describe how a simulation can be used to solve a problem.
3-5.DI.5 Understand the connections between computer science and other fields.

Computing Devices and Systems (CD)
3-5.CD.1 Demonstrate proficiency with keyboards and other input and output devices.
3-5.CD.2 Understand the pervasiveness of computers and computing in daily life (e.g., voicemail, downloading videos and audio files, microwave ovens, thermostats, wireless Internet, mobile computing devices, GPS systems).
3-5.CD.3 Apply troubleshooting strategies for identifying simple hardware and software problems that may occur during use.
3-5.CD.4 Recognize that computers model intelligent behavior (as found in robotics, speech and language recognition, and computer animation).

Third – Fifth Grade Computer Science Standards

Programs and Algorithms (PA)

3-5.PA.1 Use technology resources (e.g., calculators, data collection probes, mobile devices, videos, educational software, and web tools) for problem-solving and self-directed learning, and general-purpose productivity tools and peripherals to support personal productivity, remediate skill deficits, facilitate learning, and individual/collaborative writing, communication, and publishing activities.

3-5.PA.2 Use digital tools to gather, manipulate, and modify data for use by a program.

3-5.PA.3 Implement problem solutions using a block-based visual programming language.

Networking and Communication (NC)

3-5.NC.1 Use online resources (e.g., email, online discussions, collaborative web environments) to participate in collaborative problem-solving activities for the purpose of developing solutions or products.

3-5.NC.2 Use productivity technology tools (e.g., word processing, spreadsheet, presentation software) for individual and collaborative writing, communication, and publishing activities.

Impact and Culture (IC)

3-5.IC.1 Discuss basic issues related to responsible use of technology and information, and the consequences of inappropriate use.

3-5.IC.2 Identify the impact of technology (e.g., social networking, cyber bullying, mobile computing and communication, web technologies, cyber security, and virtualization) on personal life and society.

3-5.IC.3 Evaluate the accuracy, relevance, appropriateness, comprehensiveness, and biases that occur in electronic information sources.

3-5.IC.4 Understand ethical issues that relate to computers and networks (e.g., equity of access, security, privacy, copyright, and intellectual property).

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 and not to be formally assessed by the State of Indiana. 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).

Sixth – Eighth Grade Computer Science Standards

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.