

Middle School: Discovering Computer Science

Computer Systems and Computational Thinking

- 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).** [CS.DCS.1](#)
- 2 Describe the process of parallelization as it relates to problem-solving.** [CS.DCS.2](#)
- 3 Define an algorithm as a sequence of instructions that can be processed by a computer.** [CS.DCS.3](#)
- 4 Evaluate ways that different algorithms may be used to solve the same problem.** [CS.DCS.4](#)
- 5 Act out searching and sorting algorithms.** [CS.DCS.5](#)
- 6 Describe and analyze a sequence of instructions being followed (e.g., describe a character's behavior in a video game as driven by rules and algorithms).** [CS.DCS.6](#)
- 7 Represent data in a variety of ways including text, sounds, pictures, and numbers.** [CS.DCS.7](#)
- 8 Use visual representations of problem states, structures, and data (e.g., graphs, charts, network diagrams, flowcharts).** [CS.DCS.8](#)
- 9 Interact with content-specific models and simulations (e.g., ecosystems, epidemics, molecular dynamics) to support learning and research.** [CS.DCS.9](#)
- 10 Evaluate what kinds of problems can be solved using modeling and simulation.** [CS.DCS.10](#)
- 11 Analyze the degree to which a computer model accurately represents the real world.** [CS.DCS.11](#)
- 12 Use abstraction to decompose a problem into subproblems.** [CS.DCS.12](#)
- 13 Understand the notion of hierarchy and abstraction in computing including high level languages, translation, instruction set, and logic circuits.** [CS.DCS.13](#)
- 14 Examine connections between elements of mathematics and computer science including binary numbers, logic, sets and functions.** [CS.DCS.14](#)

15 Provide examples of interdisciplinary applications of computational thinking. [CS.DCS.15](#)

Collaboration

16 Apply productivity/multimedia tools and peripherals to group collaboration and support learning throughout the curriculum. [CS.DCS.16](#)

17 Collaboratively design, develop, publish, and present products (e.g., videos, podcasts, websites) using technology resources that demonstrate and communicate curriculum concepts. [CS.DCS.17](#)

18 Use collaborative practices such as pair programming, working in project teams, and participating in group active learning activities. [CS.DCS.18](#)

19 Demonstrate characteristics necessary for collaboration: providing useful feedback, integrating feedback, understanding and accepting multiple perspectives, socialization. [CS.DCS.19](#)

Programming and Algorithms

20 Select appropriate tools and technology resources to accomplish a variety of tasks and solve problems. [CS.DCS.20](#)

21 Use a variety of multimedia tools and peripherals to support personal productivity and learning throughout the curriculum. [CS.DCS.21](#)

22 Design, develop, publish, and present products (e.g., webpages, mobile applications, animations) using technology resources that demonstrate and communicate curriculum concepts. [CS.DCS.22](#)

23 Demonstrate an understanding of algorithms and their practical application. [CS.DCS.23](#)

24 Implement problem solutions using a programming language, including: looping behavior, conditional statements, logic, expressions, variables, and functions. [CS.DCS.24](#)

25 Demonstrate good practices in personal information security, using passwords, encryption, and secure transactions. [CS.DCS.25](#)

26 Identify interdisciplinary careers that are enhanced by computer science. [CS.DCS.26](#)

27 Demonstrate characteristics used in open ended problem-solving and programming (e.g., comfort with complexity, persistence, brainstorming, adaptability, patience, propensity to tinker, creativity, accepting challenge). [CS.DCS.27](#)

28 Collect and analyze data that is output from multiple runs of a computer program. [CS.DCS.28](#)

Computers and Communications Devices

29 Recognize that computers are devices that execute programs. [CS.DCS.29](#)

30 Identify a variety of electronic devices that contain computational processors. [CS.DCS.30](#)

31 Demonstrate an understanding of the relationship between hardware and software. [CS.DCS.31](#)

32 Use developmentally appropriate, accurate terminology when communicating about technology. [CS.DCS.32](#)

33 Apply strategies for identifying and solving routine hardware problems that occur during everyday computer use. [CS.DCS.33](#)

34 Describe the major components and functions of computer systems and networks. [CS.DCS.34](#)

35 Describe what distinguishes humans from machines focusing on human intelligence versus machine intelligence and ways we can communicate. [CS.DCS.35](#)

36 Describe ways in which computers use models of intelligent behavior (e.g., robot motion, speech and language understanding, and computer vision). [CS.DCS.36](#)

Impacts of Computing

37 Demonstrate legal and ethical behaviors when using information and technology and discuss the consequences of misuse. [CS.DCS.37](#)

38 Demonstrate knowledge of changes in information technologies over time and the effects those changes have on education, the workplace, and society. [CS.DCS.38](#)

39 Analyze the positive and negative impacts of computing on human culture. [CS.DCS.39](#)

40 Evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources concerning real-world problems. [CS.DCS.40](#)