

High School: Computer Science in the Modern World

Computer Systems and Computational Thinking

- 1 Use predefined functions and parameters, classes and methods to divide a complex problem into simpler parts. [CS.MW.1](#)

- 2 Describe a software development process used to solve software problems (e.g., design, coding, testing, verification). [CS.MW.2](#)

- 3 Explain how sequence, selection, iteration, and recursion are building blocks of algorithms. [CS.MW.3](#)

- 4 Compare techniques for analyzing massive data collections. [CS.MW.4](#)

- 5 Describe the relationship between binary and hexadecimal representations. [CS.MW.5](#)

- 6 Analyze the representation and trade-offs among various forms of digital information. [CS.MW.6](#)

- 7 Describe how various types of data are stored in a computer system. [CS.MW.7](#)

- 8 Use modeling and simulation to represent and understand natural phenomena. [CS.MW.8](#)

- 9 Discuss the value of abstraction to manage problem complexity. [CS.MW.9](#)

- 10 Describe the concept of parallel processing as a strategy to solve large problems. [CS.MW.10](#)

- 11 Describe how computation shares features with art and music by translating human intention into an artifact. [CS.MW.11](#)

Collaboration

- 12 Work in a team to design and develop a software artifact. [CS.MW.12](#)

- 13 Use collaborative tools to communicate with project team members (e.g., discussion threads, wikis, blogs, version control, etc.). [CS.MW.13](#)

- 14 Describe how computing enhances traditional forms and enables new forms of experience, expression, communication, and collaboration. [CS.MW.14](#)

15 Identify how collaboration influences the design and development of software products. [CS.MW.15](#)

Programming and Algorithms

16 Create and organize Web pages through the use of a variety of web programming design tools. [CS.MW.16](#)

17 Use mobile devices/emulators to design, develop, and implement mobile computing applications. [CS.MW.17](#)

18 Use various debugging and testing methods to ensure program correctness (e.g., test cases, unit testing, white box, black box, integration testing). [CS.MW.18](#)

19 Apply analysis, design, and implementation techniques to solve problems (e.g., use one or more software lifecycle models). [CS.MW.19](#)

20 Use Application Program Interfaces (APIs) and libraries to facilitate programming solutions. [CS.MW.20](#)

21 Select appropriate file formats for various types and uses of data. [CS.MW.21](#)

22 Describe a variety of programming languages available to solve problems and develop systems. [CS.MW.22](#)

23 Explain the program execution process. [CS.MW.23](#)

24 Explain the principles of security by examining encryption, cryptography, and authentication techniques. [CS.MW.24](#)

25 Explore a variety of careers to which computing is central. [CS.MW.25](#)

26 Describe techniques for locating and collecting small and large-scale data sets. [CS.MW.26](#)

27 Describe how mathematical and statistical functions, sets, and logic are used in computation. [CS.MW.27](#)

Computers and Communication Devices

28 Describe the unique features of computers embedded in mobile devices and vehicles (e.g., cell phones, automobiles, airplanes). [CS.MW.28](#)

29 Develop criteria for purchasing or upgrading computer system hardware. [CS.MW.29](#)

30 Describe the principal components of computer organization (e.g., input, output, processing, and storage). [CS.MW.30](#)

31 Compare various forms of input and output. [CS.MW.31](#)

32 Explain the multiple levels of hardware and software that support program execution (e.g., compilers, interpreters, operating systems, networks). [CS.MW.32](#)

33 Apply strategies for identifying and solving routine hardware and software problems that occur in everyday life. [CS.MW.33](#)

34 Compare and contrast client-server and peer-to-peer network strategies. [CS.MW.34](#)

35 Explain the basic components of computer networks (e.g., servers, file protection, routing, spoolers and queues, shared resources, and fault-tolerance). [CS.MW.35](#)

36 Describe how the Internet facilitates global communication. [CS.MW.36](#)

37 Describe the major applications of artificial intelligence and robotics. [CS.MW.37](#)

Impacts of Computing

38 Compare appropriate and inappropriate social networking behaviors. [CS.MW.38](#)

39 Discuss the impact of computing technology on business and commerce (e.g., automated tracking of goods, automated financial transactions, e-commerce, cloud computing). [CS.MW.39](#)

40 Describe the role that adaptive technology can play in the lives of people with special needs. [CS.MW.40](#)

41 Compare the positive and negative impacts of technology on culture (e.g., social networking, delivery of news and other public media, and intercultural communication). [CS.MW.41](#)

42 Describe strategies for determining the reliability of information found on the Internet. [CS.MW.42](#)

43 Differentiate between information access and information distribution rights. [CS.MW.43](#)

44 Describe how different kinds of software licenses can be used to share and protect intellectual property. [CS.MW.44](#)

45 Discuss the social and economic implications associated with hacking and software piracy. [CS.MW.45](#)

46 Describe different ways in which software is created and shared and their benefits and drawbacks (commercial software, public domain software, open source development). [CS.MW.46](#)

47 Describe security and privacy issues that relate to computer networks. [CS.MW.47](#)

48 Explain the impact of the digital divide on access to critical information. [CS.MW.48](#)
