

Computer Programming (11.01200) (2018) - Grades 6, 7, 8

Adopted 2018

Demonstrate employability skills required by business and industry and explore, research, and present careers in information technology. **MS-CS-FCP-1**

1. Communicate effectively through writing, speaking, listening, reading, and interpersonal abilities. **MS-CS-FCP-1.1**
2. Demonstrate an understanding of collaborative interactions in the digital world. **MS-CS-FCP-1.2**
3. Model work-readiness traits required for success in the workplace including integrity, honesty, accountability, punctuality, time management, and respect for diversity. **MS-CS-FCP-1.3**
4. Exhibit critical thinking and problem-solving skills to locate, analyze, and apply information in career planning and employment situations. **MS-CS-FCP-1.4**
5. Present a professional image through appearance, behavior and language. **MS-CS-FCP-1.5**
6. Investigate educational requirements, job responsibilities, employment trends, and opportunities within information technology career pathways using credible sources. **MS-CS-FCP-1.6**

Explore and explain the basic components of computers and their relationships to programming. **MS-CS-FCP-2**

1. Identify the basic components of the computer (processor, operating system, memory, storage, ethernet ports) by disassembling and reassembling a demonstration model personal computer (may be done 'virtually' online if demo model is not available). **MS-CS-FCP-2.1**
2. Demonstrate an understanding of key functional components (input/output devices, software applications, wi-fi and/or Ethernet, and IP addresses). **MS-CS-FCP-2.2**
3. Demonstrate an understanding of the fundamental concepts for how computers process programming commands (hex, binary language, sequence of commands, conditional structures, looping structures). **MS-CS-FCP-2.3**

Utilize computational thinking to solve problems. MS-CS-FCP-3

1. Make observations and organize the concepts of modularity, including functions and methods, as it relates to programming code reusability and cloud computing in the software industry. MS-CS-FCP-3.1
2. Develop a working vocabulary of computational thinking including sequences, algorithms, binary, pattern matching, decomposition, abstraction, parallelization, data, automation, data collection, data analysis, Boolean, integer, branches (if...then...else), and iteration {loops (For, While)}. MS-CS-FCP-3.2
3. Analyze the problem-solving process, the input-process-output-storage model of a computer, and how computers help humans solve problems. MS-CS-FCP-3.3
4. Develop an algorithm to decompose a problem of a daily task. MS-CS-FCP-3.4

Design, develop, debug and implement computer programs. MS-CS-FCP-4

1. Develop a working vocabulary of programming including flowcharting and/or storyboarding, coding, debugging, user interfaces, usability, variables, lists, loops, conditionals, programming language, and events. MS-CS-FCP-4.1
2. Utilize the design process to brainstorm, implement, test, and revise an idea. MS-CS-FCP-4.2
3. Cite evidence on how computers represent data and media (sounds, images, video, etc.). MS-CS-FCP-4.3
4. Design a user interface and test with other users using a paper prototype. MS-CS-FCP-4.4
5. Implement a simple algorithm in a computer program. MS-CS-FCP-4.5
6. Develop an event driven program. MS-CS-FCP-4.6
7. Create a program that accepts user and/or sensor input and stores the result in a variable. MS-CS-FCP-4.7
8. Create a computer program that implements a loop. MS-CS-FCP-4.8
9. Develop a program that makes a decision based on data or user input. MS-CS-FCP-4.9
10. Debug a program with an error. MS-CS-FCP-4.10

Explore the relationship between computer hardware and software. MS-CS-FCP-5

1. Develop a working vocabulary of embedded computing including digital, analog, events, microcontrollers, sensors, light emitting diodes (LED), switches, servos, cloud computing, and internet of things. MS-CS-FCP-5.1
2. Investigate how software interacts with hardware in the boot process. MS-CS-FCP-5.2

3. Analyze and explain how computers communicate information with simple hardware inputs and outputs. MS-CS-FCP-5.3

4. Create a product that analyzes how simple computer hardware can be used to develop innovative new products that interact with the physical world. MS-CS-FCP-5.4

5. Design a computer program that senses something in the real world and changes an output based on the input. MS-CS-FCP-5.5

Create digital artifacts to address a current issue requiring resolution. MS-CS-FCP-6

1. Summarize ethical, privacy, and legal issues of a digital world using current case studies. MS-CS-FCP-6.1

2. Collaborate as a team to develop an artifact that represents multiple perspectives regarding a global crisis. MS-CS-FCP-6.2

3. Analyze and explain the functionality and suitability (or appropriateness) of a computational artifact. MS-CS-FCP-6.3

4. Develop a program for creative expression or to satisfy personal curiosity which may have visual, audible, and/or tactile results. MS-CS-FCP-6.4

5. Develop a program specifically with the goal of solving a problem, creating new knowledge, or helping people, organizations, or society. MS-CS-FCP-6.5