

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
