

Middle School Elective

Adopted 2017

6, 9, and 18-Week Module

Algorithms and Programming

1. The student will design and iteratively develop programs that combine control structures, including loops and conditionals. [MSCSE.1](#)
2. The student will investigate variables and data types, including simple operations on strings. [MSCSE.2](#)
3. The student will implement a program that accepts input values, stores them in appropriately named variables, and produces output. [MSCSE.3](#)
4. The student will document programs in order to make them easier to trace, test, and debug. [MSCSE.4](#)

Impacts of Computing

5. The student will discuss issues of bias and accessibility in the design of existing technologies. [MSCSE.5](#)
6. The student will describe and explain the history of computer science, including naming significant historical figures and describing their impact on the field. [MSCSE.6](#)

Algorithms and Programming

7. The student will use flowcharts and/or pseudo code to address complex problems as algorithms. [MSCSE.7](#)
8. The student will incorporate existing code, media, and libraries into original programs, and give attribution. [MSCSE.8](#)
9. The student will systematically test and refine programs using a range of test cases. [MSCSE.9](#)

Networks and the Internet

10. The student will model the role of protocols in transmitting data across networks and the Internet. [MSCSE.10](#)

Cybersecurity

11. The student will apply multiple methods of encryption to model the secure transmission of information. [MSCSE.11](#)
12. The student will explain how physical and digital security measures protect electronic information. [MSCSE.12](#)

Data and Analysis

- 13. The student will collect data using computational tools and transform the data to make it more useful and reliable. [MSCSE .13](#)
- 14. The student will refine computational models based on the data they have generated. [MSCSE .14](#)
- 15. The student will represent data using multiple encoding schemes. [MSCSE .15](#)

Impacts of Computing

- 16. The student will discuss issues of bias and accessibility in the design of existing technologies. [MSCSE .16](#)
- 17. The student will compare tradeoffs associated with computing technologies that affect people's everyday activities and career options. [MSCSE .17](#)
- 18. The student will collaborate with many contributors through strategies such as crowdsourcing or surveys when creating a computational artifact or visualization. [MSCSE .18](#)
- 19. The student will describe tradeoffs between allowing information to be public and keeping information private and secure. [MSCSE .19](#)

Computing Systems

- 20. The student will systematically identify and correct problems with computing devices and their components. [MSCSE .20](#)
- 21. The student will explore the relationship between hardware and software using the Internet of Things. [MSCSE .21](#)

36-Week Module

Algorithms and Programming

- 22. The student will [MSCSE .22](#)
 - a. work in a team to distribute tasks; [MSCSE .22 .A](#)
 - b. maintain a timeline; and [MSCSE .22 .B](#)
 - c. use iterative design to solve problems, including peer review and feedback. [MSCSE .22 .C](#)
- 23. The student will decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs. [MSCSE .23](#)
- 24. The student will create procedures with parameters to organize code and make it easier to reuse. [MSCSE .24](#)

Computing Systems

- 25. The student will recommend improvements to the design of computing devices, based on an analysis of how users interact with the devices. [MSCSE .25](#)
- 26. The student will design projects that combine hardware and software components to collect and exchange data. [MSCSE .26](#)