

Middle School

Foundational Concepts MS.FC

- 1 Analyze the advantages and limitations of existing computing devices to improve user experience. MS.FC.1**
- 2 Demonstrate skills in identifying and solving hardware and software problems that can occur during regular usage. MS.FC.2**
- 3 Apply computational thinking to a variety of problems across multiple disciplines. MS.FC.3**
- 4 Understand how collaboration is essential to computer science and apply collaborative skills to develop computational solutions. MS.FC.4**

Algorithmic Thinking MS.AT

- 1 Use clearly named variables of various data types to create generalized algorithms. MS.AT.1**
- 2 Create algorithms which include methods of controlling the flow of computation using “if...then... else” type conditional statements to perform different operations depending on the values of inputs. MS.AT.2**
- 3 Identify algorithms that make use of sequencing, selection, or iteration. MS.AT.3**
- 4 Describe how algorithmic processes and automation increase efficiency. MS.AT.4**

Data Analysis MS.DA

- 1 Represent data using multiple encoding schemes, such as decimal, binary, Unicode, Morse code, Shorthand, student-created codes. MS.DA.1**
- 2 Refine computational models based on the data they have generated. MS.DA.2**
- 3 Collect, analyze, transform, and refine computational data to make it more useful and reliable. MS.DA.3**

Networking and the Internet MS.NI

- 1 Identify and employ appropriate troubleshooting techniques used to solve computing or connectivity issues. MS.NI.1**
- 2 Differentiate between secure and non-secure websites and applications including how they affect and use personal data. MS.NI.2**
- 3 Describe the causes and effects of intellectual property as it relates to print and digital media, considering copyright, fair use, licensing, sharing, and attribution. MS.NI.3**

4 Compare and contrast common methods of securing data and cybersecurity. MS.NI.4

5 Analyze different modes of social engineering and their effectiveness. MS.NI.5

**Programming
Concepts** MS.PC

1 Decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs. MS.PC.1

2 Create procedures with parameters that hide the complexity of a task and can be reused to solve similar tasks. MS.PC.2

3 Seek and incorporate feedback from team members and users to refine a solution that meets user needs. MS.PC.3

4 Provide proper attribution when incorporating existing code, media, and libraries into original programs. MS.PC.4

5 Use the iterative design process to systematically test and refine programs to improve performance and eliminate errors. MS.PC.5

6 Document programs using comments and/or README files to make them easier to follow, test, and debug. MS.PC.6

7 Design a function using a programming language. MS.PC.7

**Impacts of
Computing** MS.IC

1 Identify and evaluate the impacts computer science innovations have had on our society. MS.IC.1

2 Identify how computational systems are being used to collect and analyze information both public and private and understand the benefits and disadvantages of these systems for the user and developer. MS.IC.2

3 Cite evidence of the positive and negative effects of data permanence on personal and professional digital identity. MS.IC.3

4 Discuss digital globalization and Internet censorship. MS.IC.4

5 Investigate a variety of education pathways and career options that utilize computational thinking and/or computer science skills across the state of Tennessee and the world. MS.IC.5