

# 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