

Fundamentals of Computing offers a focused curriculum designed around foundational computer science concepts, including computer systems, programming, networks, and data management. The course also introduces students to foundational computer science skills such as coding, troubleshooting, and being a responsible digital citizen.

Course topics include the history and impact of computers; careers in computer science; computing laws and ethics; bias and equity issues in computing; algorithms and coding; data storage, organization, and analysis; hardware and software; robotics; networks and the internet; cybersecurity and online safety; website design; and the use of abstraction in computing. Students discover new concepts through guided instruction and confirm their understanding in an interactive, feedback-rich environment.

A variety of activities encourage students to explore different aspects of computer science. Lab activities guide students through coding their own programs. Project and Explore activities reinforce critical thinking, research, writing, and communication skills. In addition, Project activities guide students through the development of different types of computer artifacts. In Discussions, students conduct research on current computing topics and then exchange ideas with their peers. Practice activities provide additional opportunities for students to apply learned concepts and practice their writing, reasoning, and computer literacy skills.

This course is built to state standards.

Length: Two Semesters

### Unit 1: Computers and Society

- The Bedrock of Computer Science
- Using Computers to Collaborate
- Computers and Society Wrap-Up

### Unit 2: Programming

- Algorithms
- Programming with MakeCode Arcade
- Programming Concepts
- Design Your Own Game
- Programming Wrap-Up

### Unit 3: Digital Information

- Data
- Collecting, Visualizing, and Analyzing Data
- Digital Information Wrap-Up

### Unit 4: Developing Programs for Everyone

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- The Impact of Algorithms on the World
  - Revising Your Game for a Larger Audience
  - Developing Programs for Everyone Wrap-Up

### **Unit 5: Semester Wrap-Up**

### **Unit 6: Computing Systems**

- The Computer
- Hardware and Software
- Robotics and Troubleshooting
- Computing Systems Wrap-Up

### **Unit 7: The Internet**

- Structure of the Internet
- Cybersecurity
- Fundamentals of Web Design
- The Internet Wrap-Up

### **Unit 8: Your Digital Responsibility**

- Safety, Law, and Ethics
- Emerging Technologies
- Social Media
- Your Digital Responsibility Wrap-Up

### **Unit 9: Semester Wrap-Up**