Fundamentals of Computing is a two-semester course designed to introduce students to foundational computer science concepts, including computer systems, programming, networks, and data management. Students will examine the history and impact of computers; computing laws and ethics; bias and equity issues in computing; and careers in computer science, with a particular focus on algorithms, data storage and analysis, hardware and software, robotics, cybersecurity, and the use of abstraction in computing. They will also explore networks, the internet, website design, and responsible digital citizenship. In unit activities, students will code their own programs through lab activities and develop a variety of computational artifacts through guided project work. Students will also conduct research on current computing topics, exchange ideas with peers, and apply critical thinking, writing, and communication skills across a range of activities. They will practice reasoning and computer literacy skills through additional activities that reinforce and extend their understanding of core computer science concepts.

There are no required materials for this course.

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
- Training Data, Reasoning Models, and Data-Driven Constraints
- Digital Information Wrap-Up

Unit 4: Developing Programs for Everyone

- 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

- Semester Wrap-Up

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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

- Semester Wrap-Up

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