

# Grades 6-8

## Computing Systems

### Devices

- 1 Understand the design of computing devices based on an analysis of how users interact with the devices. [68-CS-01](#)
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### Hardware & Software

- 2 Design projects that combine hardware and software components to collect and exchange data. [68-CS-02](#)
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### Troubleshooting

- 3 Systematically identify and fix problems with computing devices and components. [68-CS-03](#)
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## Networks & The Internet

### Network Communication & Organization

- 1 Analyze different ways that data is transferred across a network and the role of protocols in transmitting data. [68-NI-01](#)
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### Cybersecurity

- 2 Explain how physical and digital security measures protect electronic information. [68-NI-02](#)
  - 3 Explain permission and authorizations to access resources to computer systems online. [68-NI-03](#)
  - 4 Apply multiple methods of encryption to model the secure transmission of information. [68-NI-04](#)
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## Data & Analysis

### Storage

- 1 Represent data using multiple encoding schemes. [68-DA-01](#)
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### Collection, Visualization, & Transformation

- 2 Collect data using computational tools. [68-DA-02](#)
  - 3 Transform the collected data to make it more useful and reliable. [68-DA-03](#)
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### Inference & Models

- 4 Refine computational models based on the data they have generated and/or data collected. [68-DA-04](#)
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## Algorithms & Programming

### Algorithms

- 1 Implement flowcharts and/or pseudocode to address complex problems as algorithms. 68-AP-01
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### Variables

- 2 Create clearly named variables that represent different data types. 68-AP-02
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### Control

- 3 Design and iteratively develop programs that combine control structures including nested loops and compound conditionals. 68-AP-03
  - 4 Construct programs that include events. 68-AP-04
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### Modularity

- 5 Organize problems and subproblems into parts. 68-AP-05
  - 6 Explain the design, implementation, and review of programs. 68-AP-06
  - 7 Create procedures with parameters to organize code and make it easier to reuse groups of instructions. 68-AP-07
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### Program Development

- 8 Assess feedback from team members and users to refine a solution that meets user needs. 68-AP-08
  - 9 Incorporate existing code and media into original programs and give attribution. 68-AP-09
  - 10 Systematically test and refine programs using a range of test cases. 68-AP-10
  - 11 Distribute tasks and maintain a project timeline when collaboratively developing computational artifacts. 68-AP-11
  - 12 Document programs in order to make them easier to follow, test, and debug. 68-AP-12
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## Impacts of Computing

### Culture

- 1 Compare tradeoffs associated with computing technologies that affect everyday activities and career options. 68-IC-01
- 2 Describe how equity, access, and influence impact the distribution of computing resources in a global society. 68-IC-02
- 3 Discuss issues of bias and accessibility in the design of existing technologies 68-IC-03
- 4 Collaborate, model, and promote effective research strategies for assessing and evaluating innovative resources. 68-IC-04

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### **Social Interactions**

- 5 Collaborate with many contributors to create a computational artifact. 68-IC-05
- 68-IC-06. Utilize tools and methods for collaboration on a project to increase connectivity of peers. 68-IC-06
- 7 Examine the benefits and drawbacks of a digital footprint and online identity. 68-IC-07
- 8 Understand how online interactions make an impact on the social, emotional, and physical aspect of others. 68-IC-08

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### **Safety, Law, & Ethics**

- 9 Compare tradeoffs between allowing information to be public and keeping information private and secure. 68-IC-09
- 10 Explore how laws and regulations impact the development and use of software. 68-IC-10