

Level 2: Middle School (Grades 6-8)

COMPUTING SYSTEMS 2-CS

- 1 Recommend improvements to the design of computing devices, based on an analysis of how users interact with the devices. 2-CS-01
- 2 Design projects that combine hardware and software components to collect and exchange data. 2-CS-02
- 3 Systematically identify and fix problems with computing devices and their components. 2-CS-03

NETWORKS AND THE INTERNET 2-NI

- 4 Model the role of protocols in transmitting data across networks and the Internet. 2-NI-04
- 5 Explain how physical and digital security measures protect electronic information. 2-NI-05
- 6 Apply multiple methods of encryption to model the secure transmission of information. 2-NI-06

DATA AND ANALYSIS 2-DA

- 7 Represent data using multiple encoding schemes. 2-DA-07
- 8 Collect data using computational tools and transform the data to make it more useful and reliable. 2-DA-08
- 9 Refine computational models based on the data they have generated. 2-DA-09

ALGORITHMS AND PROGRAMMING 2-AP

- 10 Use flowcharts and/or pseudocode to address complex problems as algorithms. 2-AP-10
- 11 Create clearly named variables that represent different data types and perform operations on their values. 2-AP-11
- 12 Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals. 2-AP-12
- 13 Decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs. 2-AP-13

14 Create procedures with parameters to organize code and make it easier to reuse. 2-AP-14

15 Seek and incorporate feedback from team members and users to refine a solution that meets user needs. 2-AP-15

16 Incorporate existing code, media, and libraries into original programs, and give attribution. 2-AP-16

17 Systematically test and refine programs using a range of test cases. 2-AP-17

18 Distribute tasks and maintain a project timeline when collaboratively developing computational artifacts. 2-AP-18

19 Document programs in order to make them easier to follow, test, and debug. 2-AP-19

**IMPACTS OF
COMPUTING** 2-IC

20 Compare tradeoffs associated with computing technologies that affect people's everyday activities and career options. 2-IC-20

21 Discuss issues of bias and accessibility in the design of existing technologies. 2-IC-21

22 Collaborate with many contributors through strategies such as crowdsourcing or surveys when creating a computational artifact. 2-IC-22

23 Describe tradeoffs between allowing information to be public and keeping information private and secure. 2-IC-23