

# Grade 7

Adopted 2017

## Algorithms and Programming

- 1. The student will construct programs to accomplish a task as a means of creative expression or scientific exploration using a block based or text based programming language, both independently and collaboratively, 7.1**
  - a. combining control structures such as if-statements and loops including compound conditionals; and 7.1.A
  - b. creating clearly named variables that represent different data types, including numeric and non-numeric data, and perform operations on their values. 7.1.B

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- 2. The student will document programs to make them easier to follow, test, and debug. 7.2**

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- 3. The student will distribute tasks and maintain a project timeline when collaboratively developing computational artifacts. 7.3**

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- 4. The student will decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs. 7.4**

## Computing Systems

- 5. The student will describe how the Internet connects devices and networks all over the world. Exclusion: Specific devices used to implement the Internet are beyond the scope of these standards. 7.5**

## Cybersecurity

- 6. The student will explain how physical and digital security measures protect electronic information. 7.6**

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- 7. The student will identify existing cybersecurity concerns associated with Internet use and Internet-based systems and potential options to address these issues. 7.7**

## Data and Analysis

- 8. The student will discuss the correctness of a model representing a system by comparing the model's generated results with data that were observed in the system being modeled. 7.8**

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- 9. The student will refine computational models based on the data they have generated. 7.9**

## Impacts of Computing

- 10. The student will explain how advances in technology have contributed to Virginia's prosperity and role in the global economy. 7.10**

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**11. The student will describe the development of new technologies in communication, entertainment, and business and their impact on American life. 7.11**

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**12. The student will explore careers related to the Internet. 7.12**

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**Networking and the Internet**

**13. The student will outline the advantages and disadvantages of transmitting information over the Internet, including speed, reliability, cost and security. 7.13**

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**14. The student will explain why protocols are necessary in data transmission. Model the role of protocols in transmitting data across networks and the Internet. 7.14**

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**15. The student will model how information is broken down into smaller pieces, transmitted as packets through multiple devices over networks and the Internet, and reassembled at the destination. 7.15**