West Virginia Technology and Computer Science

Middle School: Discovering Computer Science

Computer Systems and Computational Thinking

1 Use the basic steps in algorithmic problem-solving to design solutions (e.g., problem statement and exploration, examination of sample instances, design, implementing a solution, testing, and evaluation). CS.DCS.1

2 Describe the process of parallelization as it relates to problem-solving. CS.DCS.2

3 Define an algorithm as a sequence of instructions that canbe processed by a computer. CS.DCS.3

4 Evaluate ways that different algorithms may be used to solve the same problem. CS.DCS.4

5 Act out searching and sorting algorithms. CS.DCS.5

6 Describe and analyze a sequence of instructions being followed (e.g., describe a character's behavior in a video game as driven by rules and algorithms). CS.DCS.6

7 Represent data in a variety of ways including text, sounds, pictures, and numbers. CS.DCS.7

8 Use visual representations of problem states, structures, and data (e.g., graphs, charts, network diagrams, flowcharts). CS.DCS.8

9 Interact with content-specific models and simulations (e.g., ecosystems, epidemics, molecular dynamics) to support learning and research. CS.DCS.9

10 Evaluate what kinds of problems can be solved using modeling and simulation. CS.DCS.10

11 Analyze the degree to which a computer model accurately represents the real world. CS.DCS.11

12 Use abstraction to decompose a problem into subproblems. CS.DCS.12

13 Understand the notion of hierarchy and abstraction in computing including high level languages, translation, instruction set, and logic circuits. CS.DCS.13

14 Examine connections between elements of mathematics and computer science including binary numbers, logic, sets and functions. CS.DCS.14

	15	**Provide examples of interdisciplinary applications of computational thinking.** CS.DCS.15
Collaboration	16	**Apply productivity/multimedia tools and peripherals to group collaboration and support learning throughout the curriculum.** CS.DCS.16
	17	**Collaboratively design, develop, publish, and present products (e.g., videos, podcasts, websites) using technology resources that demonstrate and communicate curriculum concepts.** CS.DCS.17
	18	**Use collaborative practices such as pair programming, working in project teams, and participating in group active learning activities.** CS.DCS.18
	19	**Demonstrate characteristics necessary for collaboration: providing useful feedback, integrating feedback, understanding and accepting multiple perspectives, socialization.** CS.DCS.19
Programming and Algorithms	20	**Select appropriate tools and technology resources to accomplish a variety of tasks and solve problems.** CS.DCS.20
	21	**Use a variety of multimedia tools and peripherals to support personal productivity and learning throughout the curriculum.** CS.DCS.21
	22	**Design, develop, publish, and present products (e.g., webpages, mobile applications, animations) using technology resources that demonstrate and communicate curriculum concepts.** CS.DCS.22
	23	**Demonstrate an understanding of algorithms and their practical application.** CS.DCS.23
	24	**Implement problem solutions using a programming language, including: looping behavior, conditional statements, logic, expressions, variables, and functions.** CS.DCS.24
	25	**Demonstrate good practices in personal information security, using passwords, encryption, and secure transactions.** CS.DCS.25
	26	**Identify interdisciplinary careers that are enhanced by computer science.** CS.DCS.26
	27	**Demonstrate characteristics used in open ended problem-solving and programming (e.g., comfort with complexity, persistence, brainstorming, adaptability, patience, propensity to tinker, creativity, accepting challenge).** CS.DCS.27
	28	**Collect and analyze data that is output from multiple runs of a computer program.** CS.DCS.28

Computers and Communications Devices	29	**Recognize that computers are devices that execute programs.** CS.DCS.29
	30	**Identify a variety of electronic devices that contain computational processors.** CS.DCS.30
	31	**Demonstrate an understanding of the relationship between hardware and software.** CS.DCS.31
	32	**Use developmentally appropriate, accurate terminology when communicating about technology.** CS.DCS.32
	33	**Apply strategies for identifying and solving routine hardware problems that occur during everyday computer use.** CS.DCS.33
	34	**Describe the major components and functions of computer systems and networks.** CS.DCS.34
	35	**Describe what distinguishes humans from machines focusing on human intelligence versus machine intelligence and ways we can communicate.** CS.DCS.35
	36	**Describe ways in which computers use models of intelligent behavior (e.g., robot motion, speech and language understanding, and computer vision).** CS.DCS.36
Impacts of Computing	37	**Demonstrate legal and ethical behaviors when using information and technology and discuss the consequences of misuse.** CS.DCS.37
	38	**Demonstrate knowledge of changes in information technologies over time and the effects those changes have on education, the workplace, and society.** CS.DCS.38
	39	**Analyze the positive and negative impacts of computing on human culture.** CS.DCS.39
	40	**Evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources concerning real-world problems.** CS.DCS.40