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

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	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

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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