

Eleventh and Twelfth Grades: Level 2 (L2)

Computing Systems L2.CS

D. Devices L2.CS.D

- 1 Students will continue to apply the standards and practices from the previous grade levels. L2.CS.D.01
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HS. Hardware & Software L2.CS.HS

- 1 Identify and categorize the roles of a variety of operating system software. L2.CS.HS.01
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T. Troubleshooting L2.CS.T

- 1 Illustrate how understanding the ways hardware components facilitate logic, input, output, and storage in computing systems will support troubleshooting. L2.CS.T.01
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Networks & The Internet L2.NI

NCO. Network Communication & Organization L2.NI.NCO

- 1 Describe the issues that impact network functionality (e.g., bandwidth, load, latency, topology). L2.NI.NCO.01
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CY. Cybersecurity L2.NI.CY

- 1 Compare and refine ways in which software developers protect devices and information from unauthorized access. L2.NI.CY.01
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Data Analysis L2.DA

S. Storage L2.DA.S

- 1 Students will continue to apply the standards and practices from the previous grade levels. L2.DA.S.01
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CVT. Collection, Visualization, & Transformation L2.DA.CVT

- 1 Use data analysis tools and techniques to identify patterns from complex real-world data. L2.DA.CVT.01
 - 2 Generate data sets that use a variety of data collection tools and analysis techniques to support a claim and/or communicate information. L2.DA.CVT.02
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IM. Inference & Models L2.DA.IM

- 1 Use models and simulations to help plan, conduct, and refine investigations. L2.DA.IM.01

A. Algorithms L2.DA.A

- 1 Model and use appropriate terminology to describe how artificial intelligence algorithms drive many software and physical systems (e.g., autonomous robots, pattern recognition, text analysis). L2.DA.A.01
- 2 Develop an artificial intelligence algorithm to play a game against a human opponent or solve a real-world problem. L2.DA.A.02
- 3 Critically examine and trace classic algorithms (e.g., selection sort, insertion sort, binary search, linear search). L2.DA.A.03
- 4 Evaluate algorithms (e.g., sorting, searching) in terms of their efficiency and clarity. L2.DA.A.04

Algorithms & Programming L2.AP**V. Variables** L2.AP.V

- 1 Compare and contrast data structures and their uses (e.g., lists, stacks, queues). L2.AP.V.01

C. Control L2.AP.C

- 1 Model the execution of repetition (e.g., loops, recursion) of an algorithm illustrating output and changes in values of named variables. L2.AP.C.01

M. Modularity L2.AP.M

- 1 Construct solutions to problems using student-created components (e.g., procedures, modules, objects). L2.AP.M.01
- 2 Design or redesign a solution to a large-scale computational problem by identifying generalizable patterns. L2.AP.M.02
- 3 Create programming solutions by reusing existing code (e.g., libraries, Application Programming Interface (APIs), code repositories). L2.AP.M.03

PD. Program Development L2.AP.PD

- 1 Create software that will provide solutions to a variety of users using multiple software development processes. L2.AP.PD.01
- 2 Design software in a project team environment using integrated development environments (IDEs), versioning systems, and collaboration systems. L2.AP.PD.02
- 3 Develop programs for multiple computing platforms. L2.AP.PD.03
- 4 Systematically examine code for correctness, usability, readability, efficiency, portability, and scalability through peer review. L2.AP.PD.04
- 5 Develop and use a series of test cases to verify that a program performs according to its design specifications. L2.AP.PD.05
- 6 Explain security issues that might lead to compromised computer programs. L2.AP.PD.06
- 7 Modify an existing program to add additional functionality and discuss intended and unintended implications (e.g., breaking other functionality). L2.AP.PD.07

Impacts of Computing L2.IC**CU. Culture** L2.IC.CU

- 1 Evaluate the beneficial and harmful effects that computational artifacts and innovations have on society. L2.IC.CU.01
- 2 Evaluate the impact of location and user audience on the distribution of computing resources in a global society. L2.IC.CU.02
- 3 Design and implement a study that evaluates or predicts how creating, testing, and refining computational artifacts has revolutionized an aspect of our culture and how it might evolve (e.g., education, healthcare, art/entertainment, energy). L2.IC.CU.03

SI. Social Interactions L2.IC.SI

- 1 Students will continue to apply the standards and practices from the previous grade levels. L2.IC.SI.01

SLE. Internet Safety, Law, & Ethics L2.IC.SLE

- 1 Debate laws and regulations that impact the development and use of software. L2.IC.SLE.01