

Grades 6-8

Computing Systems CS

D. Devices D

- 1 Develop and implement a process to evaluate existing computing devices and recommend improvements to design based on analysis of how other users interact with the device. MG.CS.D.01

HS. Hardware and Software HS

- 1 Model a computing system involving multiple considerations and potential tradeoffs of software and hardware, such as functionality, cost, size, speed, accessibility, and aesthetics MG.CS.HS.01

IO. Input and Output IO

- 1 Know and apply grade-level appropriate skills with input and output devices. MG.CS.IO.01

T. Troubleshooting T

- 1 Systematically identify, fix, and document increasingly complex software and hardware problems with computing devices and their components. MG.CS.T.01

Networks & the Internet NI

NCO. Network Communication & Organization NCO

- 1 Explain protocols and their importance to data transmission; model how packets are broken down into smaller pieces and how they are delivered. MG.NI.NCO.01

C. Cybersecurity C

- 1 Evaluate physical and digital procedures that could be implemented to protect electronic data/information; explain the impacts of hacking, ransomware, scams, fake scans, and ethical/legal concerns. MG.NI.C.01
- 2 Compare the advantages and disadvantages of multiple methods of encryption to model the secure transmission of information. MG.NI.C.02

Data Analysis DA

S. Storage S

- 1 Analyze multiple methods of representing data and choose the most appropriate method for representing data. MG.DA.S.01

C. Collection C

- 1 Develop, implement, and refine a process that utilizes computational tools to collect meaningful data. [MG.DA.C.01](#)

CVT. Visualization & Transformation [CVT](#)

- 1 Develop, implement, and refine a process to make data more useful and reliable. [MG.DA.CVT.01](#)

IM. Inference and Models [IM](#)

- 1 Refine computational models based on the data generated by the models. [MG.DA.IM.01](#)

Algorithms and Programming [AP](#)**A. Algorithms** [A](#)

- 1 Design algorithms in natural language, flow and control diagrams, comments within code, and/or pseudocode to solve complex problems. [MG.AP.A.01](#)

V. Variables [V](#)

- 1 Create programs using variables with purposeful and thoughtful naming conventions for identifiers to improve program readability. [MG.AP.V.01](#)

C. Control [C](#)

- 1 Develop programs that utilize combinations of nested repetition, compound conditionals, procedures without parameters, and the manipulation of variables representing different data types. [MG.AP.C.01](#)

M. Modularity [M](#)

- 1 Decompose problems and subproblems into parts to facilitate the design, implementation, and review of complex programs. [MG.AP.M.01](#)

PD. Program Development [PD](#)

- 1 Seek and incorporate feedback from team members and users to refine a solution to a problem that meets the needs of diverse users. [MG.AP.PD.01](#)
- 2 Incorporate existing code, media, and libraries into original programs of increasing complexity and give attribution. [MG.AP.PD.02](#)
- 3 Systematically test and refine programs using a range of student created inputs. [MG.AP.PD.03](#)
- 4 Explain how effective communication between participants is required for successful collaboration when developing computational artifacts. [MG.AP.PD.04](#)
- 5 Document text-based programs of increasing complexity in order to make them easier to follow, test, and debug. [MG.AP.PD.05](#)

Impacts of Computing [IC](#)**C. Culture** [C](#)

- 1 Describe the trade-offs associated with computing technologies (e.g. automation), explaining their effects on economies and global societies, and explore careers related to the field of computer science. [MG.IC.C.01](#)

- 2 Evaluate and improve the design of existing technologies to meet the needs of diverse users and increase accessibility and usability. **MG.IC.C.02**
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SI. Social Interactions **SI**

- 1 Communicate and publish key ideas and details individually or collaboratively in a way that informs, persuades, and/or entertains using a variety of digital tools and media-rich resources. Describe and use safe, appropriate, and responsible practices (netiquette) when participating in online communities (e.g., discussion groups, blogs, social networking sites). **MG.IC.SI.01**
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H. History **H**

- 1 Identify and describe how the prominent figures in computer science have impacted and/or progressed the field. **MG.IC.H.01**
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SLE. Safety, Law, & Ethics **SLE**

- 1 Discuss the social impacts and ethical considerations associated with cybersecurity, including the positive and malicious purposes of hacking. **MG.IC.SLE.01**
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CP. Community Partnerships **CP**

- 1 Formulate a computer-science based solution for a problem or issue by gathering input from local / regional industry members. **MG.IC.CP.01**