Maryland Computer Science

Grade 8

Computing Systems CS

D. Devices D

1 Develop and implement a process to evaluate existing computing devices and make recommendations for improvements to design based on analysis of user interaction and other lenses. 8.CS.D.01

HS. Hardware & Software HS

1 Design and refine systems where secure hardware and software are combined to collect, store, retrieve, and exchange data and explain why specific components were chosen for optimality. 8.CS.HS.01

T. Troubleshooting T

1 Systematically identify and fix problems with computing devices and their interfaced components by using a structured system such as a troubleshooting flow diagram. 8.CS.T.01

Networks and the Internet NI

NCO. Network Communication & Organization NCO

1 Model and explain how data is sent using protocols to choose the fastest pathway, to deal with missing information, and to deliver data securely. 8.NI.NCO.01

C. Cybersecurity C

1 Evaluate physical and digital security measures that have been developed and implemented to protect electronic information; discuss the impacts of hacking, ransomware, scams, fake scams, and ethical/legal concerns. 8.NI.C.01

Data Analysis DA

S. Storage S

1 Evaluate different schemes of encoding data in order to effectively choose the most appropriate method of representation. 8.DA.S.01

CVT. Collection, Visualization & Transformation CVT

1 Develop and implement a refined process that uses computational tools to transform data to a more useful and reliable state 8.DA.CVT.01

IM. Inference & Models IM

1 Refine existing or develop and implement new computational models based on observed and generated data. 8.DA.IM.01

Algorithms and Programming AP

A. Algorithms A

1 Develop and implement algorithms and pseudocode to solve complex problems. 8.AP.A.01

V. Variables V

1 Create clearly named variables of different data types that utilize naming conventions to improve program readability; perform operations on variable values. 8.AP.V.01

C. Control C

1 Develop secure programs that utilize combinations of nested loops, compound conditionals, procedures with and without parameters, and the manipulation of variables representing different data types. 8.AP.C.01

M. Modularity M

1 Decompose problems and subproblems into parts to facilitate the secure design, implementation, and review of complex programs. 8.AP.M.01

2 Create and use a function with parameters in a program to repeat instructions in order to organize code and make it easier to reuse. 8.AP.M.02

PD. Program Development PD

1 Seek and incorporate feedback from team members and users to refine the solution to a problem that meets the needs of a diverse group of users. 8.AP.PD.01

2 Incorporate existing code, media, and libraries into original programs of increasing complexity, from secure sources, and give appropriate attribution. 8.AP.PD.02

3 Develop a method or implement an existing method to systematically test and refine existing and original programs using user input and secure software development guidance. 8.AP.PD.03

4 Evaluate communication between participants to determine best practices in collaboration when developing computational artifacts. 8.AP.PD.04

5 Document complex programs, using multiple methods, in order to make them easier to understand, test, and debug. 8.AP.PD.05

Impacts of Computing IC

C. Culture and Diversity C

1 Compare the tradeoffs associated with computing concepts (e.g., automation, communication, privacy, cybersecurity), explaining their effects on economics and global societies. 8.IC.C.01

2 Analyze issues of bias and accessibility that occur in the design of everyday computing technologies, the role and responsibility of the designer, and make recommendations for how these issues could be rectified to reduce bias. 8.IC.C.02

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. 8.IC.SI.01

SLE. Safety, Law & Ethics SLE

1 Discuss the social impacts and ethical considerations associated with cybersecurity, including the positive and malicious purposes of hacking. 8.IC.SLE.01