Oklahoma Computer Science

Ninth and Tenth Grades: Level 1 (L1)

Computing Systems L1.CS

D. Devices L1.CS.D

1 Model how abstractions hide the underlying implementation details of computing systems embedded in everyday objects. L1.CS.D.01

HS. Hardware & Software L1.CS.HS

1 Analyze the levels of abstraction and interactions between application software, system software, and hardware. L1.CS.HS.01

T. Troubleshooting L1.CS.T

1 Develop and apply criteria for the systematic discovery of errors and systematic strategies for the correction of errors in computing systems. L1.CS.T.01

Networks & The Internet L1.NI

NCO. Network Communication & Organization L1.NI.NCO

1 Evaluate the scalability and reliability of networks by identifying and illustrating the basic components of computer networks (e.g., routers, switches, servers, etc.) and network protocols (e.g., IP, DNS). L1.NI.NCO.01

CY. Cybersecurity L1.NI.CY

1 Compare physical and cybersecurity measures by evaluating trade-offs between the usability and security of a computing system and the risks of an attack. L1.NI.CY.01

2 Recommend security measures to address various scenarios based on information security principles. L1.NI.CY.02

3 Explain trade-offs when selecting and implementing cybersecurity recommendations from multiple perspectives, such as the user, enterprise, and government. L1.NI.CY.03

Data Analysis L1.DA

S. Storage L1.DA.S

1 Convert and compare different bit representations of data types, such as characters, numbers, and images. L1.DA.S.01

2 Evaluate the trade-offs in how data is organized and stored digitally. L1.DA.S.02

CVT. Collection, Visualization, & Transformation L1.DA.CVT

1. Use tools and techniques to locate, collect, and create visualizations of small and largescale data sets (e.g., paper surveys and online data sets). L1.DA.CVT.01
2. Students will continue to apply the standards and practices from the previous grade levels. Additional standards and practices for this subconcept begin in High School Level 2. L1.DA.CVT.02

IM. Inference & Models L1.DA.IM

1. Illustrate and explain the relationships between collected data elements using computational models. L1.DA.IM.01

Algorithms & Programming L1.AP

A. Algorithms L1.AP.A

1. Create a prototype that uses algorithms (e. g., searching, sorting, finding shortest distance) to provide a possible solution for a realworld problem. L1.AP.A.01
2. Additional standards and practices for this subconcept begin in High School Level 2. L1.AP.A.02

V. Variables L1.AP.V

1. Demonstrate the use of lists (e.g., arrays) to simplify solutions, generalizing computational problems instead of repeatedly using simple variables. L1.AP.V.01

C. Control L1.AP.C

1. Justify the selection of specific control structures (e.g., sequence, conditionals, repetition, procedures) considering program efficiencies such as readability, performance, and memory usage. L1.AP.C.01

M. Modularity L1.AP.M

1. Decompose problems into procedures using systematic analysis and design. L1.AP.M.01
2. Create computational artifacts by systematically organizing, manipulating and/or processing data. L1.AP.M.02
3. Additional standards and practices for this subconcept begin in High School Level 2. L1.AP.M.03

PD. Program Development L1.AP.PD

2 Evaluate a variety of software licensing schemes (e.g., open source, freeware, commercial) and discuss the advantages and disadvantages of each scheme in software development. L1.AP.PD.02

1 Create software that will provide solutions to a variety of users using a software development process. L1.AP.PD.01

3 While working in a team, develop, test, and refine eventbased programs that solve practical problems or allow self-expression. L1.AP.PD.03

4 Using visual aids and documentation, illustrate the design elements and data flow (e.g., flowcharts, pseudocode) of the development of a complex program. L1.AP.PD.04

5 Evaluate and refine computational artifacts to make them more user-friendly, efficient and/or accessible. L1.AP.PD.05

6 Additional standards and practices for this subconcept begin in High School Level 2. L1.AP.PD.06

Impacts of Computing L1.IC

CU. Culture L1.IC.CU

1 Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices. L1.IC.CU.01

2 Test and refine computational artifacts to ensure access to a variety of user audiences. L1.IC.CU.02

3 Demonstrate ways a given algorithm can help solve computational problems across disciplines. L1.IC.CU.03

SI. Social Interactions L1.IC.SI

1 Demonstrate and debate how computing increases and decreases connectivity and communication among people of various cultures. L1.IC.SI.01

SLE. Internet Safety, Law, & Ethics (SLE) L1.IC.SLE

1 Describe the beneficial and harmful effects that intellectual property laws can have on innovation. L1.IC.SLE.01

2 Describe and discuss the privacy concerns related to the large-scale collection and analysis of information about individuals (e.g., how websites collect and uses data) that may not be evident to users. L1.IC.SLE.02

3 Evaluate the social and economic consequences of how law and ethics interact with digital aspects of privacy, data, property, information, and identity. L1.IC.SLE.03