Alaska Computer Science

High School Level 1

Computing Systems

Devices

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

Hardware and Software

1 Explain the interactions between application software, system software, and hardware. L1.CS.HS.01

Troubleshooting

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

Network and the Internet

Network Communication and Organization

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

Cybersecurity

1 Compare various security measures by evaluating tradeoffs between the usability and security of a computing system. L1.NI.C.01

2 Illustrate how sensitive data can be affected by attacks. L1.NI.C.02

3 Recommend security measures to address various scenarios based on the principles of information security. L1.NI.C.03

4 Explain tradeoffs when selecting and implementing cybersecurity recommendations from multiple perspectives such as the user, enterprise, and government. L1.NI.C.04

Data Analysis

Storage

1 Translate and compare different bit representations of real-world phenomena, such as characters, numbers, and images. L1.DA.S.01

2 Review different database types. L1.DA.S.02

Collection, Visualization and Transformation

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Use tools and techniques to locate, collect and create visualizations of small and large-scale data sets (e.g., paper surveys, online data sets, etc.). L1.DA.CVT.01

Inference and Models

1 Use computational models such as data analysis, pattern recognition, and/or simulations to show the relationships between collected data elements. L1.DA.IM.01

Algorithms and Programming

Algorithms

1 Use algorithms (e.g., sequencing, selection, iteration, recursion, etc.) to create a prototype to provide a possible solution for a common problem. L1.AP.A.01

Variables

1 Demonstrate the use of lists to simplify solutions and to generalize computation problems instead of repeatedly using simple variables. L1.AP.V.01

Control

1 Justify the selection of specific control structures when trade-offs involve implementation, readability, and program performance. L1.AP.C.01

2 Develop an event-based program that will solve a practical problem, or allow self-expression. L1.AP.C.02

Modularity

1 Using systematic analysis and design, break down a solution into basic elements such as procedures, functions, or methods. L1.AP.M.01

2 Create computational artifacts by using common structures to organize, manipulate and/or process data. L1.AP.M.02

Program Development

1 Create software by analyzing a problem and/or process, developing a solution, testing outcomes, debug, documenting, and adapting the program for a variety of users. L1.AP.PD.01

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

3 Evaluate and refine computational artifacts to make them more user- friendly, efficient and/or accessible. L1.AP.PD.03

4 Design and develop a computational artifact while working in a team. L1.AP.PD.04

5 Using visual aids and documentation, illustrate the design elements and data flow of the development of a complex program (e.g. flowcharts, pseudocode, etc.). L1.AP.PD.05

Community, Global and Eth[illegible]

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Culture

Test and refine computational artifacts to reduce bias and equity deficits. L1.CGEI.C.01

2 Demonstrate how a given algorithm applies to problems across disciplines. L1.CGEI.C.02

Social Interactions

1 Demonstrate how computing increases connectivity to people in various cultures. L1.CGEI.SI.01

Safety, Law and Ethics

1 Explain the beneficial and harmful effects that intellectual property laws can have on innovation. L1.CGEI.SLE.1

2 Explain the privacy concerns related to the collection and large scale analysis of information about individuals that may not be evident to users (e.g., how businesses, social media, and the government collects and uses data). L1.CGEI.SLE.2

3 Evaluate the social and economic implications as related to privacy, data, property, information, and identity in the context of safety, law, or ethics. L1.CGEI.SLE.3

4 Describe the beneficial and intrusive aspects of advancing and emerging technologies (e.g., artificial intelligent agents, IoT, robotics). L1.CGEI.SLE.4

5 Discuss diverse careers that are influenced by computer science and its availability to all regardless of background. L1.CGEI.SLE.5