Wyoming Computer Science

Grades 9–12

Computing Systems

Devices (D), Hardware & Software (HS), and Troubleshooting (T)

1 Explain the interactions between application software, system software, and hardware layers. [Practice 4.1 Developing and Using Abstractions] L1.CS.HS.01

The Proficient student:

a Identifies the interactions between application software, system software, and hardware layers.

b Defines the interactions between application software, system software, and hardware layers.

c Explains the interactions between application software, system software, and hardware layers. For example, text editing software interacts with the operating system to receive input from the keyboard, convert the input to bits for storage, and interpret the bits as readable text to display on the monitor.

Network & The Internet

Network, Communication, & Organization (NCO) and Cybersecurity (C)

1 Compare various security measures, considering trade-offs between the usability and security of a computing system. [Practice 6.3 Testing and Refining Computational Artifacts] L1.NI.C.03

The Proficient student compares two or more security measures, considering trade-offs between the usability and security of a computing system.

Data Analysis

Storage (S), Collection, Visualization, & Transformation (CVT), and Inference & Models (IM)

1 Create interactive data representations using software tools to help others better understand real-world phenomena (e.g., paper surveys and online data sets). [Practice 4.4 Developing and Using Abstractions] L1.DA.CVT.01

The Proficient student creates appropriate interactive data representations using software tools to help others better understand real-world phenomena.

Algorithms & Programming

Algorithms (A), Variables (V), Control (C), Modularity (M), and Program Development (PD)

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1 Create a prototype that uses algorithms (e.g., searching, sorting, finding shortest distance) to provide a possible solution for a real-world problem relevant to the student. [Practice 5.2 Creating Computational Artifacts] L1.AP.A.01

   The Proficient student creates a prototype that uses appropriate algorithms (e.g., searching, sorting, finding shortest distance) to provide a possible solution for a real-world problem relevant to the student.

2 Describe how artificial intelligence algorithms drive many software and physical systems. [Practice 7.2 Communicating About Computing] L1.AP.A.02

   The Proficient student describes how artificial intelligence algorithms drive many software and physical systems.

3 Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using events to initiate instructions. [Practice 5.2 Creating Computational Artifacts] L1.AP.C.03

   The Proficient student:

   a Designs and iteratively develops a computational artifact that uses events to initiate instructions for:

      i Practical intent,

      ii Personal expression, or

      iii Societal issues.

4 Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects. [Practice 3.2 Recognizing and Defining Computational Problems] L1.AP.M.01

   The Proficient student decomposes problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.

5 Plan and develop programs by analyzing a problem and/or process, developing and documenting a solution, testing outcomes, and adapting the program for a variety of users. [Practice 5.1 Creating Computational Artifacts] L1.AP.PD.01

   The Proficient student plans and develops programs by:

   a Analyzing a problem and/or process.

   b Developing and documenting a solution.

   c Testing outcomes.

   d Adapting the program for a variety of users.

6 Design and develop computational artifacts, working in team roles, using collaborative tools. [Practice 2.4 Collaborating Around Computing] L1.AP.PD.04

   The Proficient student designs and develops computational artifacts while working in teams and using collaborative tools.

Im **ılture (C), Social Interactions (SI), and Safety, Law, and Ethics (SLE)**

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1. Evaluate the social and economic implications of privacy in the context of safety, law, or ethics. [Practice 7.3 Communicating About Computing] L1.IC.SLE.03

   The Proficient student evaluates the following implications of privacy in the context of safety, law, or ethics:

   a. Social implications
   b. Economic implications

2. Using grade level appropriate content and complexity, discuss the legal, social, and ethical impacts associated with software development and use, including both positive and malicious intent. [Practice 1.1 Fostering an Inclusive Computing Culture] [Practice 7.2 Communicating About Computing] L1.IC.SLE.04

   The Proficient student, when considering both positive and malicious intent regarding software development and use, discusses the:

   a. Legal impacts
   b. Social impacts
   c. Ethical impacts