

# Grade 4

**Concept: Computing Systems (CS)** 4.CS

**D. Subconcept: Devices (D)** 4.CS.D

- 1 With teacher guidance, model how internal and external parts of computing connect multiple devices in a computing system. 4.CS.D.1

**HS. Subconcept: Hardware and Software (HS)** 4.CS.HS

- 1 Recognize that bits serve as the basic unit of data in computing systems and can represent a variety of information. 4.CS.HS.1
- 2 Recognize that a single piece of hardware can accomplish different tasks depending on its software. 4.CS.HS.2

**T. Subconcept: Troubleshooting (T)** 4.CS.T

- 1 Develop and apply simple troubleshooting strategies to solve simple hardware and software problems. 4.CS.T.1

**Concept: Networks and the Internet (NI)** 4.NI

**C. Subconcept: Cybersecurity (C)** 4.NI.C

- 1 Discuss real-world cybersecurity problems and how personal information can be protected. 4.NI.C.1

**NCO. Subconcept: Network, Communication, and Organization (NCO)** 4.NI.NCO

- 1 Model how information is decomposed, transmitted as packets through multiple devices over networks and reassembled at the destination. 4.NI.NCO.1

**Concept: Data and Analysis (DA)** 4.DA

**CVT. Subconcept: Collection, Visualization and Transformation (CVT)** 4.DA.CVT

- 1 Select tools to collect, organize, and present data visually to highlight relationships and support a claim. 4.DA.CVT.1

**S. Subconcept: Storage (S)** 4.DA.S

- 1 Recognize different file extensions and the different amounts of storage required for each type. 4.DA.S.1

**IM. Subconcept: Inference and Models (IM)** 4.DA.IM

- 1 Use a computational tool to manipulate data to draw conclusions, make predictions, and answer questions. 4.DA.IM.1

## Concept: Algorithms and Programming (AP) 4.AP

### A. Subconcept: Algorithms (A) 4.AP.A

- 1 Compare and refine multiple algorithms for the same task and determine which is the most effective. 4.AP.A.1
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### V. Subconcept: Variables (V) 4.AP.V

- 1 Create programs that use variables to store and modify data 4.AP.V.1
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### C. Subconcept: Control (C) 4.AP.C

- 1 Create programs that include sequences, events, loops, and/or conditionals. 4.AP.C.1
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### M. Subconcept: Modularity (M) 4.AP.M

- 1 Decompose problems into smaller, manageable subproblems to facilitate the program development process. 4.AP.M.1
  - 2 Modify, remix, or incorporate portions of an existing program into one's own work to add more advanced features. 4.AP.M.2
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### PD. Subconcept: Program Development (PD) 4.AP.PD

- 1 Use an iterative process to plan the development of a program by including others' perspectives and considering user preferences. 4.AP.PD.1
  - 2 Observe intellectual property rights and give appropriate attribution when creating or remixing programs. 4.AP.PD.2
  - 3 Test and debug (identify and fix errors) a program/app or algorithm to ensure it runs as intended. 4.AP.PD.3
  - 4 With teacher guidance, students take on varying roles when collaborating with peers during the design, implementation, and review stages of program development. 4.AP.PD.4
  - 5 Describe choices made during program development using code comments, presentations, and/or demonstrations. 4.AP.PD.5
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## Concept: Impacts of Computing (IC) 4.IC

### C. Subconcept: Culture (C) 4.IC.C

- 1 Identify and discuss computing technologies that have changed the world. 4.IC.C.1
  - 2 Brainstorm ways to improve the accessibility and usability of technology products for the diverse needs and wants of users. 4.IC.C.2
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### SI. Subconcept: Social Interactions (SI) 4.IC.SI

- 1 Seek opportunities for local and nationally collaboration to facilitate communication and innovation. 4.IC.SI.1
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### SLE. Subconcept: Safety, Law, and Ethics (SLE) 4.IC.SLE

- 1 Use material that is publicly available and/or permissible to use. 4.IC.SLE.1