

# Grade 7

**Concept: Computing Systems (CS)** 7.CS

**D. Subconcept: Devices (D)** 7.CS.D

- 1 Identify some advantages, disadvantages, and consequences with the design of computer devices based on an analysis of how users interact with devices. 7.CS.D.1

**HS. Subconcept: Hardware and Software (HS)** 7.CS.HS

- 1 Design projects that combine hardware and software to collect and exchange data. 7.CS.HS.1

**T. Subconcept: Troubleshooting (T)** 7.CS.T

- 1 Evaluate strategies to fix problems with computing devices and their components within a system. 7.CS.T.1

**Concept: Networks and the Internet (NI)** 7.NI

**C. Subconcept: Cybersecurity (C)** 7.NI.C

- 1 Evaluate multiple methods of encryption for the secure transmission of information. 7.NI.C.1
- 2 Explain how physical and digital security measures protect electronic information. 7.NI.C.2

**NCO. Subconcept: Network, Communication, and Organization (NCO)** 7.NI.NCO

- 1 Compare and contrast models to understand the many protocols used for data transmission. 7.NI.NCO.1

**Concept: Data and Analysis (DA)** 7.DA

**CVT. Subconcept: Collection, Visualization and Transformation (CVT)** 7.DA.CVT

- 1 Collect and analyze data using computational tools to create models that are meaningful and useful. 7.DA.CVT.1

**S. Subconcept: Storage (S)** 7.DA.S

- 1 Use multiple encoding schemes to represent data, including binary and ASCII. 7.DA.S.1

**IM. Subconcept: Inference and Models (IM)** 7.DA.IM

- 1 Use computational models and determine the reliability and validity of data they generate. 7.DA.IM.1

**Concept: Algorithms and Programming (AP)** 7.AP

**A. Subconcept: Algorithms (A)** 7.AP.A

- 1 Use planning strategies, such as flowcharts or pseudocode, to develop algorithms to address complex problems. 7.AP.A.1
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**V. Subconcept: Variables (V)** 7.AP.V

- 1 Compare and contrast variables that represent different data types and perform operations on their values. 7.AP.V.1
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**C. Subconcept: Control (C)** 7.AP.C

- 1 Design and develop programs that combine control structures, including nested loops and compound conditionals. 7.AP.C.1
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**M. Subconcept: Modularity (M)** 7.AP.M

- 1 Decompose problems into parts to facilitate the design, implementation, and review of programs. 7.AP.M.1
  - 2 Use procedures with parameters to organize code and make it easier to reuse. 7.AP.M.2
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**PD. Subconcept: Program Development (PD)** 7.AP.PD

- 1 Seek and incorporate feedback from team members and users to refine a solution that meets user needs. 7.AP.PD.1
  - 2 Incorporate existing code and media into programs, and give attribution. 7.AP.PD.2
  - 3 Systematically test and refine programs using a range of possible inputs. 7.AP.PD.3
  - 4 Distribute and execute tasks while maintaining a project timeline when collaboratively developing computational artifacts. 7.AP.PD.4
  - 5 Document programs to make them easier to follow, test, and debug. 7.AP.PD.5
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**Concept: Impacts of Computing (IC)** 7.IC

**C. Subconcept: Culture (C)** 7.IC.C

- 1 Explain how some of the tradeoffs associated with computing technologies can affect people's everyday activities and career options. 7.IC.C.1
  - 2 Discuss how bias and accessibility issues can impact the functionality of existing technologies. 7.IC.C.2
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**SI. Subconcept: Social Interactions (SI)** 7.IC.SI

- 1 Describe the process for creating a computational product by collaborating with others using digital technologies. 7.IC.SI.1
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**SLE. Subconcept: Safety, Law, and Ethics (SLE)** 7.IC.SLE

- 1 Identify the benefits and risks associated with sharing information digitally. 7.IC.SLE.1