

# Grade 8

**Concept: Computing Systems (CS)** 8.CS

**D. Subconcept: Devices (D)** 8.CS.D

- 1 Improve the design of computing devices based on an analysis of how users interact them, and consider unintended consequences. 8.CS.D.1

**HS. Subconcept: Hardware and Software (HS)** 8.CS.HS

- 1 Design and evaluate projects that combine hardware and software components to collect and exchange data. 8.CS.HS.1

**T. Subconcept: Troubleshooting (T)** 8.CS.T

- 1 Systematically identify and develop strategies to fix problems with computing devices and their components. 8.CS.T.

**Concept: Networks and the Internet (NI)** 8.NI

**C. Subconcept: Cybersecurity (C)** 8.NI.C

- 1 Apply multiple methods of encryption to model the secure transmission of information. 8.NI.C.1
- 2 Evaluate how various physical and digital security measures protect electronic information and how a lack of such measures could lead to vulnerabilities. 8.NI.C.2

**NCO. Subconcept: Network, Communication, and Organization (NCO)** 8.NI.NCO

- 1 Develop models to illustrate the role of protocols in transmitting data across networks and the Internet. 8.NI.NCO.1

**Concept: Data and Analysis (DA)** 8.DA

**CVT. Subconcept: Collection, Visualization and Transformation (CVT)** 8.DA.CVT

- 1 Collect data using computational tools and transform the data to make it more meaningful and useful. 8.DA.CVT.1

**S. Subconcept: Storage (S)** 8.DA.S

- 1 Represent data using multiple encoding schemes including binary and ASCII. 8.DA.S.1

**IM. Subconcept: Inference and Models (IM)** 8.DA.IM

- 1 Design computational models and evaluate them based on the reliability and validity of the data they generate. 8.DA.IM.1

**Concept: Algorithms and Programming (AP)** 8.AP

**A. Subconcept: Algorithms (A)** 8.AP.A

- 1 Develop planning strategies, such as flowcharts or pseudocode, to develop algorithms to address complex problems. 8.AP.A.1
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**V. Subconcept: Variables (V)** 8.AP.V

- 1 Create named variables that represent different data types and perform operations on their values 8.AP.V.1
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**C. Subconcept: Control (C)** 8.AP.C

- 1 Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals. 8.AP.C.1
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**M. Subconcept: Modularity (M)** 8.AP.M

- 1 Decompose problems into parts to facilitate the design, implementation, and review of programs. 8.AP.M.1
  - 2 Create procedures with parameters to organize code and make it easier to reuse. 8.AP.M.2
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**PD. Subconcept: Program Development (PD)** 8.AP.PD

- 1 Seek and incorporate feedback from team members and users to refine a solution that meets user needs. 8.AP.PD.1
  - 2 Incorporate existing code, media, and libraries into original programs, and give attribution. 8.AP.PD.2
  - 3 Systematically test and refine programs using a range of possible inputs. 8.AP.PD.3
  - 4 Distribute and execute tasks while maintaining a project timeline when collaboratively developing computational artifacts. 8.AP.PD.4
  - 5 Document programs to make them easier to follow, test, and debug. 8.AP.PD.5
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**Concept: Impacts of Computing (IC)** 8.IC

**C. Subconcept: Culture (C)** 8.IC.C

- 1 Compare and contrast tradeoffs associated with computing technologies that affect people's everyday activities and career options. 8.IC.C.1
  - 2 Develop a solution to address an issue of bias or accessibility in the design of existing technologies. 8.IC.C.2
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**SI. Subconcept: Social Interactions (SI)** 8.IC.SI

- 1 Collaborate with contributors by using digital technologies when creating a computational product. 8.IC.SI.1
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**SLE. Subconcept: Safety, Law, and Ethics (SLE)** 8.IC.SLE

- 1 Evaluate the benefits and risks associated with sharing information digitally. 8.IC.SLE.1