

# Grade 4

## COMPUTING SYSTEMS CS

### D. Devices CS.D

- a Explore external components (i.e., parts) of a computing system and their function to understand and describe the role they play in a computer system. CS.D.4.A
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### HS. Hardware and Software CS.HS

- a Select and use digital learning tools/devices to support planning, implementing and reflecting upon a defined task. CS.HS.4.A
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### T. Troubleshooting CS.T

- a Diagnose problems and select an appropriate solution from a list of problems and solutions to resolve hardware and software issues. CS.T.4.A
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## NETWORKS AND THE INTERNET NI

### N. Networking NI.N

- a Describe how information is broken down to be transmitted over a network to help students gain a better understanding of the internet and networks. NI.N.4.A
  - b Describe network addresses, names and rules (i.e., protocols) to share or receive information from the global community NI.N.4.B
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### C. Cybersecurity NI.C

- a Describe what information should be protected and the importance of a secure password to protect information. NI.C.4.A
  - b Describe and explain safe usage of various online services such as web, email, video, gaming, cloud services and networked drives. NI.C.4.B
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### IOT. Internet of Things (IoT) NI.IOT

- a Explore how information is transferred to the internet from smart and intelligent devices to recognize how the internet and networks operate. NI.IOT.4.A
  - b Describe how transferred information is tagged using identifiers to transmit information about the user so students begin to learn that no information on the internet is anonymous. NI.IOT.4.B
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## DATA AND ANALYSIS DA

### DCS. Data Collection and Storage DA.DCS

- a Gather and organize multiple quantitative data elements using a tool to perform various tasks. DA.DCS.4.A
  - b Identify techniques and formats to store, process and retrieve different types of information. DA.DCS.4.B
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### VC. Visualization and Communication DA.VC

- a Organize data into subsets to provide different views or commonalities and present insights gained using visual or other types of representations. DA.VC.4.A
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### IM. Inference and Modeling DA.IM

- a Utilize data to make predictions and discuss whether there is adequate data to make reliable predictions. DA.IM.4.A
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## ALGORITHMIC THINKING AND PROGRAMMING ATP

### A. Algorithms ATP.A

- a Construct and refine an algorithm to accomplish a given task. ATP.A.4.A
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### VDR. Variables and Data Representation ATP.VDR

- a Identify and use a variable, a placeholder for storing a value, to understand how it works in a multi-step process (i.e., algorithm). ATP.VDR.4.A
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### CS. Control Structures ATP.CS

- a Create a program using sequences, events, loops and conditionals to solve a problem. ATP.CS.4.A
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### M. Modularity ATP.M

- a Decompose (i.e., break down) the steps needed or not needed (i.e., abstraction) into precise sequences of instructions to design an algorithm. ATP.M.4.A
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### PD. Program Development ATP.PD

- a Use a design process to plan and develop a program that addresses a multi-step problem. ATP.PD.4.A
  - b Using guided questions, work through a program to identify errors and discuss possible solutions to repair the program. ATP.PD.4.B
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## ARTIFICIAL INTELLIGENCE AI

### P. Perception AI.P

- a Describe the difference between analog and digital signals to understand their uses. AI.P.4.A
- b Give examples of computer perception to understand how it is affected by the environment. AI.P.4.B

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**RR. Representation & Reasoning** AI.RR

- a Create a classification system using a tree structure to understand binary solutions. AI.RR.4.A
  - b Describe how AI represents knowledge to make a reasonable answer. AI.RR.4.B
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**ML. Machine Learning** AI.ML

- a Explain three different machine learning approaches to choose which may be best for a given situation. AI.ML.4.A
  - b Explain how machine learning can create a bias to understand how computers can be biased. AI.ML.4.B
  - c Describe tasks where AI outperforms human tasks and when it does not to describe how humans rely on AI. AI.ML.4.C
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**NI. Natural Interactions** AI.NI

- a Use AI systems that are designed to be inclusive and describe how they affect the humans who use them. AI.NI.4.A
  - b Give examples of bias to demonstrate how it can affect decision-making. AI.NI.4.B
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**SI. Societal Impacts** AI.SI

- a Give examples of bias to demonstrate how it can affect specific groups of people. AI.SI.4.A
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**IMPACTS OF  
COMPUTING** IC**Cu. Culture** IC.CU

- a List examples of computing technologies that have changed the global community to express how those technologies influenced and are influenced by cultural practice. IC.CU.4.A
  - b Identify and anticipate diverse user needs to increase accessibility to all users. IC.CU.4.B
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**Social Interactions**

- a Collaborate and consider diverse perspectives to improve digital artifacts. IC.SI.4.A

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**SLE. Safety, Law and Ethics** IC.SLE

- a Use public domain or Creative Commons media, and refrain from copying or using material created by others without permission. IC.SLE.4.A
- b Explain why information should be shared or kept private to protect student identity. IC.SLE.4.B
- c Communicate the importance of protecting your digital footprint. IC.SLE.4.C
- d Describe tradeoffs between allowing information to be public and keeping information private and secure. IC.SLE.4.D
- e Explain the effect of cyber bullying and who to tell if this is happening. IC.SLE.4.E