

# Grade 7

## COMPUTING SYSTEMS CS

### D. Devices CS.D

- a Develop and implement a process to evaluate existing computing devices capabilities based on personal interaction with the device. CS.D.7.A
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### HS. Hardware and Software CS.HS

- a Evaluate hardware and software combinations used to accomplish a task. CS.HS.7.A
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### T. Troubleshooting CS.T

- a Use a systematic process to identify and evaluate the source of a routine computing problem. Select the best solution to solve the computing problem and communicate the solution to others. CS.T.7.A
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## NETWORKS AND THE INTERNET NI

### N. Networking NI.N

- a Explain the role of hardware components and diagram the infrastructure of networks and the internet (including cloud servers). NI.N.7.A
  - b Explain the protocols (i.e., rules) and why they are used to transmit data across networks and the internet. NI.N.7.B
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### C. Cybersecurity NI.C

- a Identify and apply introductory methods of encryption to model the secure transmission of information. NI.C.7.A
  - b Describe the types of malware to show how malware affects information. NI.C.7.B
  - c Identify cybersecurity concerns and measures needed to protect electronic information. NI.C.7.C
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### IOT. Internet of Things (IoT) NI.IOT

- a Explain the positive and negative impacts of IoT as it applies to daily life and create ways to mitigate the negative impacts on society. NI.IOT.7.A
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## DATA AND ANALYSIS DA

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

- a Compare and contrast digital data collection tools to make them more useful and reliable. DA.DCS.7.A
  - b Evaluate various file formats to understand data storage capabilities. DA.DCS.7.B
  - c Create a logical file structure to organize data to support individual and collaborative work. DA.DCS.7.C
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### VC. Visualization and Communication DA.VC

- a Communicate relations between data sets to interpret results. DA.VC.7.A
  - b Create a spreadsheet utilizing formulas, functions and graphs to represent and analyze data. DA.VC.7.B
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### IM. Inference and Modeling DA.IM

- a Create and analyze models and simulations to accurately hypothesize a real-world situation. DA.IM.7.A
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## ALGORITHMIC THINKING AND PROGRAMMING ATP

### A. Algorithms ATP.A

- a Select and modify pseudocode for a multi-step process to solve a problem. ATP.A.7.A
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### VDR. Variables and Data Representation ATP.VDR

- a Use test cases to trace variable values to determine the result. ATP.VDR.7.A
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### CS. Control Structures ATP.CS

- a Use and apply decisions and loops in a program to solve a problem. ATP.CS.7.A
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### M. Modularity ATP.M

- a Decompose problems into parts to facilitate the design, implementation and review of increasingly complex programs. ATP.M.7.A
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### PD. Program Development ATP.PD

- a Write code that utilizes algorithms, variables and control structures to solve problems or as a creative expression. ATP.PD.7.A
- b Test, trace and debug to refine code. ATP.PD.7.B
- c Identify procedures that utilize parameters. ATP.PD.7.C

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**P. Perception** AI.P

- a Give examples of how intelligent agents combine information from multiple sensors to react to an input. AI.P.7.A
- b Describe how edge detectors can be composed to form more complex feature detectors, e.g., for letters or shapes. AI.P.7.B
- c Illustrate the concept of feature extraction from images by simulating an edge detector. AI.P.7.C

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

- a Compare several algorithms that could be used to solve a specific type of reasoning problem. AI.RR.7.A

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**ML. Machine Learning** AI.ML

- a Model how unsupervised learning finds patterns in unlabeled data to identify how machine learning takes place. AI.ML.7.A
- b Create a dataset for training a decision tree classifier or predictor to explore the impact that different feature encodings have on the decision tree. AI.ML.7.B

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**NI. Natural Interactions** AI.NI

- a Curate a dataset to train a language-processing algorithm to create a program that incorporates voice commands. AI.NI.7.A
- b Identify the components of a chatbot and explain how each component contributes to the chatbot's human-like responses. AI.NI.7.B

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**SI. Societal Impacts** AI.SI

- a Identify and explain the effect training data has on the accuracy of an artificial intelligence system to uncover bias in training data. AI.SI.7.A
- b Identify and explain the problems of classification in the supervised artificial intelligence context to create data sets that are inclusive and accurate. AI.SI.7.B

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**IMPACTS OF  
COMPUTING** IC**Cu. Culture** IC.CU

- a Compare current technologies from the present to the past to evaluate the effect on people's everyday activities. IC.CU.7.A
- b Evaluate various technologies to identify issues of bias and accessibility. IC.CU.7.B
- c Identify and explore careers related to the field of computer science. IC.CU.7.C
- d Explain how computing impacts innovation in other fields. IC.CU.7.D

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**SI. Social Interactions** IC.SI

- a Analyze and present beneficial and harmful effects of electronic communications to understand their impacts on interpersonal, global, economic, political, business and cultural interactions. IC.SI.7.A

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

- a Describe tradeoffs between allowing information to be public and keeping information private and secure to inform decision-making. IC.SLE.7.A
- b Identify the social and economic implications of privacy in the context of safety, law or ethics to understand how privacy impacts these areas. IC.SLE.7.B
- c Evaluate the development of new technologies in communication, entertainment and business to understand the impact. IC.SLE.7.C
- d Provide appropriate credit when using resources or artifacts that are not our own. IC.SLE.7.D
- e Explain the connection between the longevity of data on the internet, personal online identity and personal privacy. IC.SLE.7.E