Ohio Computer Science

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

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

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

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

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

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

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

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

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

ALGORITHMIC THINKING AND PROGRAMMING ATP

A. Algorithms ATP.A

a Construct and refine an algorithm to accomplish a given task. ATP.A.4.A

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

CS. Control Structures ATP.CS

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

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

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

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

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

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

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

SI. Societal Impacts AI.SI

- a Give examples of bias to demonstrate how it can affect specific groups of people. AI.SI.4.A

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

Social Interactions

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

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