Ohio’s Learning Standards

Computer Science, Grade 7

ADOPTED 2022

Ohio | Department of Education

Grade 7 Standards

COMPUTING SYSTEMS

Devices

CS.D.7.a Develop and implement a process to evaluate existing computing devices capabilities based on personal interaction with the device.

Hardware and Software

CS.HS.7.a Evaluate hardware and software combinations used to accomplish a task.

Troubleshooting

CS.T.7.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.

NETWORKS AND THE INTERNET

Networking

NI.N.7.a Explain the role of hardware components and diagram the infrastructure of networks and the internet (including cloud servers).

NI.N.7.b Explain the protocols (i.e., rules) and why they are used to transmit data across networks and the internet.

Cybersecurity

NI.C.7.a Identify and apply introductory methods of encryption to model the secure transmission of information.

NI.C.7.b Describe the types of malware to show how malware affects information.

NI.C.7.c Identify cybersecurity concerns and measures needed to protect electronic information.

Internet of Things (IoT)

NI.IOT.7.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.

DATA AND ANALYSIS

Data Collection and Storage

DA.DCS.7.a Compare and contrast digital data collection tools to make them more useful and reliable.

DA.DCS.7.b Evaluate various file formats to understand data storage capabilities.

DA.DCS.7.c Create a logical file structure to organize data to support individual and collaborative work.

Visualization and Communication

DA.VC.7.a Communicate relations between data sets to interpret results.

DA.VC.7.b Create a spreadsheet utilizing formulas, functions and graphs to represent and analyze data.

Inference and Modeling

DA.IM.7.a Create and analyze models and simulations to accurately hypothesize a real-world situation.

ALGORITHMIC THINKING AND PROGRAMMING

Algorithms

ATP.A.7.a Select and modify pseudocode for a multi-step process to solve a problem.

Variables and Data Representation

ATP.VDR.7.a Use test cases to trace variable values to determine the result.

Control Structures

ATP.CS.7.a Use and apply decisions and loops in a program to solve a problem.

Modularity

ATP.M.7.a Decompose problems into parts to facilitate the design, implementation and review of increasingly complex programs.

Program Development

ATP.PD.7.a Write code that utilizes algorithms, variables and control structures to solve problems or as a creative expression.

ATP.PD.7.b Test, trace and debug to refine code.

ATP.PD.7.c Identify procedures that utilize parameters.

ARTIFICIAL INTELLIGENCE

Perception

AI.P.7.a Give examples of how intelligent agents combine information from multiple sensors to react to an input.

AI.P.7.b Describe how edge detectors can be composed to form more complex feature detectors, e.g., for letters or shapes.

AI.P.7.c Illustrate the concept of feature extraction from images by simulating an edge detector.

Representation & Reasoning

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

Machine Learning

AI.ML.7.a Model how unsupervised learning finds patterns in unlabeled data to identify how machine learning takes place.

AI.ML.7.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.

Natural Interactions

AI.NI.7.a Curate a dataset to train a language-processing algorithm to create a program that incorporates voice commands.

AI.NI.7.b Identify the components of a chatbot and explain how each component contributes to the chatbot's human-like responses.

Societal Impacts

AI.SI.7.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.b Identify and explain the problems of classification in the supervised artificial intelligence context to create data sets that are inclusive and accurate.

IMPACTS OF COMPUTING

Culture

IC.Cu.7.a Compare current technologies from the present to the past to evaluate the effect on people's everyday activities.

IC.Cu.7.b Evaluate various technologies to identify issues of bias and accessibility.

IC.Cu.7.c Identify and explore careers related to the field of computer science.

IC.Cu.7.d Explain how computing impacts innovation in other fields.

Social Interactions

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

Safety, Law and Ethics

IC.SLE.7.a Describe tradeoffs between allowing information to be public and keeping information private and secure to inform decision-making.

IC.SLE.7.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.c Evaluate the development of new technologies in communication, entertainment and business to understand the impact.

IC.SLE.7.d Provide appropriate credit when using resources or artifacts that are not our own.

IC.SLE.7.e Explain the connection between the longevity of data on the internet, personal online identity and personal privacy.