Rhode Island Computer Science

Grades 9–12

Computational Thinking & Programming

Algorithms

1 Create computational artifacts that use algorithms to solve computational problems by leveraging prior knowledge and personal interests. 3-CT-A-1

Variables

1 Explain the role of a variable within a program, and the scope in which its name and value can be used. 3-CT-V-1

Data Structures and Data Types

1 Create a program that processes a collection of data. 3-CT-D-1

Control Structures

1 Create and justify the selection of specific control structures when tradeoffs involve code organization, readability, and program performance and explain the benefits and drawbacks of choices made. 3-CT-C-1

Modularity

1 Identify existing computational artifacts that can be used for the subtasks of a decomposed problem. 3-CT-M-1

2 Create computational artifacts by incorporating pre-defined procedures, self-defined procedures and external artifacts. 3-CT-M-2

Computational Design

1 Systematically design and implement computational artifacts for targeted audiences by incorporating feedback from users. 3-CT-CD-1

2 Systematically test and refine programs using a range of test cases. 3-CT-CD-2

3 Document computational artifacts in order to make them easier to follow, test, and debug. 3-CT-CD-3

Computing Systems & Networks

Human-Computer Interfaces

1 Analyze a computing system and explain how abstractions simplify the underlying implementation details embedded in everyday objects. 3-CSN-H-1

Hardware and Software

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Compare levels of abstraction and interactions between application software, system software, and hardware layers. 3-CSN-HS-1

Troubleshooting

1 Develop and communicate troubleshooting strategies others can use to identify and fix errors. 3-CSN-T-1

Networks and the Internet

1 Identify the various elements of a network and describe how they function and interact to transfer information. 3-CSN-N-1

Cybersecurity

Risks

1 Explain the privacy concerns related to the collection and generation of data through automated processes that may not be evident to users. 3-CY-R-1

2 Analyze an existing or proposed application to identify the potential ways it could be used to obtain sensitive information. 3-CY-R-2

3 Explain how the digital security of an organization may be affected by the actions of its employees. 3-CY-R-3

Safeguards

1 Recommend security measures to address various scenarios based on factors such as efficiency, feasibility, and ethical impacts. 3-CY-S-1

2 Explain tradeoffs when selecting and implementing cybersecurity recommendations. 3-CY-S-2

Response

1 Describe the appropriate actions to take in response to detected security breaches. 3-CY-RP-1

Data & Analysis

Collection, Visualization, Transformation

1 Select appropriate data-collection tools and presentation techniques for different types of data. 3-DA-CVT-1

Inferences and Models

1 Create computational models that represent the relationships among different elements of data collected from a phenomenon or process. 3-DA-IM-1

2 Discuss potential hidden biases that could be introduced while collecting a dataset and how these biases could affect analysis conclusions. 3-DA-IM-2

3 Evaluate the ability of models and simulations to test and support the refinement of hypotheses. 3-DA-IM-3

Storage

1 Explain tradeoffs between storing data locally or in central, cloud-based systems. 3-DA-ST-1

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2 Translate data for various real-world phenomena, such as characters, numbers, and images, into bits. 3-DA-ST-2

Digital Literacy

Creation and Use

1 Select appropriate software tools or resources to create a complex artifact or solve a problem. 3-DL-CU-1

Searching Digital Information

1 Decompose a complex problem into multiple questions, identify which can be explored through digital sources, and synthesize query results using a variety of software tools. 3-DL-SDI-1

Understanding Software Tools

1 Describe different kinds of computations that software tools perform to tailor a system to individual users. 3-DL-US-1

Responsible Computing & Society

Culture

1 Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices. 3-RC-CU-1

2 Design and analyze computational artifacts to reduce bias and equity deficits. 3-RC-CU-2

3 Evaluate the impact of equity, access, and influence on the distribution of computing resources in a global society. 3-RC-CU-3

Safety, Law & Ethics

1 Evaluate the impact of intellectual property laws on the use of digital information 3-RC-SLE-1

2 Evaluate the social and economic implications of privacy and free speech in the context of safety, law, or ethics. 3-RC-SLE-2

Social Interactions

1 Use tools and methods for collaboration on a project to increase connectivity between people in different cultures and career fields. 3-RC-SI-1