

Second Grade: Computer Science

In Second Grade, students apply computational thinking skills as they identify patterns and create algorithms for comparing objects based on attributes. Students follow the iterative design process, planning, implementing, and evaluating algorithms with events and loops using a block-based programming language. Proficiency is demonstrated in building, testing, and debugging programs. The use of computational thinking is expanded beyond programming and applied through abstraction and manipulation of data to create models and representations. Students define and categorize input and output components, explaining how computing systems acquire input and produce output. Students utilize the Internet to gather information and for collaborative tasks, while demonstrating safe behaviors when interacting with others and using the information. While using online resources, students learn the importance of password usage for privacy.

Algorithms and Programming (AP)

- 2.AP.1 The student will apply computational thinking to identify patterns, and design algorithms to compare and contrast objects based on attributes.**
- a. Compare and contrast multiple ways to sort a set of objects.
 - b. Create a table of features to organize objects.
 - c. Design an algorithm to sort objects into categories based on multiple attributes.
- 2.AP.2 The student will plan and implement algorithms that consists of events and loops using a block-based programming language.**
- a. Plan and create a design document to guide the construction of a program using plain language or pseudocode.
 - b. Identify a section of repeated actions within an algorithm and replace it with a loop.
 - c. Construct step-by-step instructions that include events and repetition.
- 2.AP.3 The student will use the iterative design process to create, test, and debug a program containing events and loops in a block-based programming tool.**
- a. Define program.
 - b. Read and interpret a program expressed in a block-based programming language.
 - c. Analyze and describe the results of a program.
 - d. Create and test a program that uses events and loops.
 - e. Revise and improve a program to produce desired outcomes.

Computing Systems (CSY)

2.CSY.1 The student will describe the characteristics of computing systems including hardware, software, input, and output.

- a. Describe how hardware and software work together to accomplish a task.
- b. Define and categorize components as inputs and outputs.
- c. Describe how a computing system receives input and provides output.
- d. Discuss how computers use binary to communicate and process information.

2.CSY.2 The student will demonstrate an understanding of how to troubleshoot simple hardware and software problems that may occur during use.

- a. Propose solutions to simple hardware and software issues.
- b. Use appropriate steps to perform simple troubleshooting tasks.

Cybersecurity (CYB)

2.CYB.1 The student will model safe and responsible behaviors when using information and computing technologies.

- a. Explain the need for safe and responsible uses of computing technologies.
- b. Create a flowchart to illustrate the process for reporting inappropriate use of technology at school or at home.
- c. Demonstrate and model safe and responsible behaviors when using computing technologies and online communication.

2.CYB.2 The student will explain the importance of using passwords to protect private information.

- a. Identify and classify passwords as strong or weak.
- b. Explain how a strong password helps protect the privacy of information.
- c. Explain the risk of sharing passwords.

Data and Analysis (DA)

2.DA.1 The student will analyze data to make decisions with or without a computing device.

- a. Collect and record numeric and non-numeric data and describe possible patterns.
- b. Create questions that can and cannot be answered by the data.
- c. Analyze data to draw conclusions and make decisions.

2.DA.2 The student will manipulate data, create representations, and evaluate data to solve a problem.

- a. Create charts, graphs, and models using abstraction to represent data.

- b. Analyze data visualizations to draw conclusions.
- c. Propose and evaluate a solution to a problem or question based on data and/or data visualization.

Impacts of Computing (IC)

2.IC.1 The student will examine the positive and negative impacts of how using computing technologies has changed the way people live, work, and interact.

- a. Identify current uses of computing/emerging technologies and discuss how they impact society.
- b. Compare and contrast appropriate and inappropriate online behaviors that apply in the physical environment and the online environment.
- c. Model healthy habits for using computing technologies.

2.IC.2 The student will explain the need to balance screen time and other activities.

- a. Discuss appropriate times and places for screen use.
- b. List and describe alternatives to screen time.

2.IC.3 The student will explain how computing technologies have an impact on the workforce.

- a. Explain how computing technology is used in various careers.
- b. Identify skills needed for careers that use computing technologies.
- c. Discuss how computing technologies have changed the workplace.

Networks and the Internet (NI)

2.NI.1 The student will demonstrate the use of the Internet in gathering information to accomplish a task.

- a. Explore ways information is organized and shared on the Internet.
- b. Gather information from the Internet.
- c. Summarize collected information using own words.