

Third Grade: Computer Science

In Third Grade, students delve into computational thinking, creating algorithms to tackle problems with a block-based programming language and the iterative design process. They develop skills in strategizing, constructing, executing, and testing algorithms incorporating loops, events, and conditional control structures. Students will create and evaluate data representations, using computing devices to model physical objects or processes, and assessing the societal impacts of widespread computing technology use. Students gain insights into inner workings of computing devices within a system, employing accurate terminology to address issues with malfunctioning systems. They adopt secure practices for protecting private information, understanding the correlation between passwords and security risks. Additionally, students apply the data cycle, acquiring skills to collect, store, and organize data for trend evaluation and pattern identification. Students will familiarize themselves with computing technology careers, understanding societal implications, and use of information created by others with proper permissions.

Algorithms and Programming (AP)

3.AP.1 The student will apply computational thinking to design algorithms to extend patterns, processes, or components of a problem.

- a. Identify a pattern in an algorithm, process, or a problem.
- b. Decompose a problem or task into a subset of smaller problems.
- c. Design an algorithm to extend either a pattern, process, or component of a problem.

3.AP.2 The student will plan and implement algorithms that consist of events and conditional control structures using a block-based programming language.

- a. Describe the concept of a conditional control structure.
- b. Create a design document to plan an algorithm using plain language, pseudocode, or diagrams.

3.AP.3 The student will use the iterative design process to create, test, and debug programs containing events, loops, and conditional structures in a block-based programming tool.

- a. Create and test programs that consist of events, loops, and conditional structures.
- b. Analyze and describe program results to assess validity of outcome.
- c. Revise and improve programs to resolve errors or produce desired outcome.

Computing Systems (CSY)

- 3.CSY.1 The student will model how computing devices within a computing system work.**
- a. Describe the role of a processor in a computing system.
 - b. Explain the relationship between the inputs, processors, and outputs.
 - c. Discuss various types of input data a computer can accept and use.
 - d. Model how a computing system works including input and output, processors, and sensors.
- 3.CSY.2 The student will use accurate terminology when troubleshooting problems when a computing system is not working as expected.**
- a. Identify common troubleshooting strategies used to address a variety of hardware and software problems.
 - b. Explain and apply troubleshooting strategies related to simple hardware and software problems.

Cybersecurity (CYB)

- 3.CYB.1 The student will apply safe practices to protect private information.**
- a. Identify and distinguish personal information that should be private.
 - b. Describe the importance of using a strong password.
 - c. Create and use strong passwords to protect private information.
- 3.CYB.2 The student will identify the relationship between passwords and security risk.**
- a. Describe how authentication and authorization protect private information.
 - b. Identify multiple authentication methods.
 - c. Discuss the security risk posed by not having a strong password.
- 3.CYB.3 The student will define and explain cybersecurity.**
- a. Define cybersecurity.
 - b. Research and identify problems and consequences related to inappropriate use of computing devices and networks.
 - c. Model safe and responsible behaviors when using computing technologies and online communication.

Data and Analysis (DA)

- 3.DA.1 The student will gather, store, and organize data to evaluate trends and identify patterns using a computing device.**
- a. Formulate questions that require the collection or acquisition of data.
 - b. Gather, organize, sort, and store data.
 - c. Examine a labeled dataset to identify potential problems within the data.
 - d. Discuss how data discrepancies or problems impact predictions and results.
 - e. Draw conclusions and make predictions based on observed data.
- 3.DA.2 The student will create and evaluate data representations and conclusions.**
- a. Create charts and graphs based on data collection.
 - b. Analyze data to identify patterns, draw conclusions, and make predictions.
- 3.DA.3 The student will create models that can represent a physical object or process.**
- a. Create a model to represent a physical object or process.
 - b. Identify how computing devices are used to create models.
 - c. Discuss the advantages and disadvantages of using computing devices to create models.

Impacts of Computing (IC)

- 3.IC.1 The student will identify and examine the positive and negative impacts of the prevalence of computing technologies.**
- a. Identify computing technologies that have changed the world.
 - b. Examine and explain how computing technologies influence and are influenced by culture.
 - c. Identify social and ethical issues related to the use of computing technologies.
- 3.IC.2 The student will discuss and describe strategies to manage screen time.**
- a. Define and describe screen time.
 - b. Explain the importance of responsible screen time management.
 - c. Discuss how screen time choices affect one's personal health and interactions with others.
- 3.IC.3 The student will identify and describe computing technology careers and their impact on society.**
- a. Research computing technology careers.
 - b. Describe the impact careers in computing technology have on society.

3.IC.4 The student will demonstrate how to use information created by others with permission.

- a. Discuss copyright, piracy, and plagiarism.
- b. Demonstrate how to use information created by others.

Networks and the Internet (NI)

3.NI.1 The student will describe computing networks.

- a. Differentiate between a network and the Internet.
- b. Identify the components of a computing network.
- c. Describe how a computing device connects to a network.
- d. Identify ways networks are used to transmit information.