



Integration Opportunities

Math 2.MG.3 Create a block-based program that generates plane figures—such as circles, triangles, squares, and rectangles—with at least one line of symmetry.

History 2.13a Given a block based program sorting natural, capital, and human resources students will analyze and describe the results of the program.

Physical Education 2.1c,d In small groups, plan and create step-by-step instructions to demonstrate at least two critical elements of various eye-hand and eye-foot coordination skills. Have students test and revise their instructions to ensure completion of a desired task or outcome.

2.AP.3 Algorithms and Programming

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.

Understanding the Standard

The practice of reviewing work should be taught early and can be applied across disciplines, including computer science. Students should check that the sequence of steps that compose an algorithm works as intended. That is the only way to determine if the algorithm appropriately reflects the steps that must occur to complete a task. This process can be conducted for both computer programs and unplugged activities. If the algorithm does not work as intended, the students should determine the changes to make in the algorithm in order to complete the task. These changes may include adding, deleting, rearranging, or changing a step in order to obtain the intended outcome. The process of revising a program so that it works as intended is called debugging.

Term	Definition
Sequence	An ordered set of instructions
Loop	A set of actions repeated until a condition is met
Event	Something that causes a portion of a program to run (e.g., a mouse click)
Debug	Find and fix problems in a program.

Prerequisite Knowledge

Students should approach this standard with some experience with composing programs that include simple loops and a single event. They build on this knowledge in second grade by writing more complex programs with additional loops and events that make the program more interactive.

Summary of a Lesson

In this lesson, students will improve algorithms (with errors or missing steps) using ScratchJr. Students will add, delete, or change blocks and work in groups to identify and correct errors. Encourage students to use sequencing, loops, and multiple events to improve the program's functionality. Have students "speak the code aloud" by explaining what each command will make the sprite to in plain language, block by block. They will test the program to ensure it works correctly. In the end, the students will share their corrected and improved algorithms with the class.

