Grade 1 Technology Unit 4: Coding

Content Area: **Technology**
Course(s): **Technology Grade 1**
Time Period: **MP4**
Length: **7 days**
Status: **Published**

NJSLS - Computer Science and Design Thinking

CS.K-2.8.1.2.AP.1	Model daily processes by creating and following algorithms to complete tasks.
CS.K-2.8.1.2.AP.2	Model the way programs store and manipulate data by using numbers or other symbols to represent information.
CS.K-2.8.1.2.AP.3	Create programs with sequences and simple loops to accomplish tasks.
CS.K-2.8.1.2.AP.4	Break down a task into a sequence of steps.
CS.K-2.8.1.2.AP.5	Describe a program's sequence of events, goals, and expected outcomes.
CS.K-2.8.1.2.AP.6	Debug errors in an algorithm or program that includes sequences and simple loops.

Rationale and Transfer Goals

Students will learn the basics of computer science using a unit of study developed by code.org. They will learn coding and problem solving through solving various coding puzzles. This unit of study will help students understand the basics of how many digital apps, games and programs are created and could inspire them to further their knowledge of the subject as they get older. This unit will allow students to develop their critical thinking and problem solving skills, as well as their collaboration skills on challenging problems.

Enduring Understandings

Computers can be used to quickly solve problems, but they require people to think creatively and be the driving force behind the problem solving.

Essential Questions

How can I program a computer to complete a task?

How do computers process information differently than people?

Content - What will students know?

- Definition of “algorithm” and “program”.
- Cardinal directions.
- Sequential steps in a program.
- Debugging an existing algorithm.
- Sequential order.
- Sequential order with repetition.
- Geometric shapes.

Skills - What will students be able to do?

- Begin to list steps to guide a character from one location to another.
- Create a sequential algorithm to solve a problem.
- Discover where a program will fail and adjust the algorithm.
- Arrange events in a sequential and logical order.
- Use loops to move characters through a maze.
- Create algorithms to draw various geometric shapes.

Activities - How will we teach the content and skills?

- Large group instruction, demonstration of how to move characters using 4 cardinal directions.
- Whole class problem solving on smartboard, programming the teacher to move from point to point around the classroom.
- Follow prepared algorithms for completing a simple task (for example, drawing a stick figure) and finding out where the algorithm went wrong.
- Whole group collaboration on the steps necessary to direct the teacher from one point in the classroom

to another.

- Solve problems and search for patterns within the algorithm that can be converted into loops.
- Whole class collaboration to create a shape, and developing an algorithm to repeat the process.

Evidence/Assessments - How will we know what students have learned?

- Completion of “Flurbs” assessment where students will give directions to help characters travel to an endpoint.
- Completion of Sequencing With Angry Birds module on code.org.
- Completion of Programming with Angry Birds module on code.org.
- Whole group activity, directing the teacher through a classroom maze.
- Completion of Loops with Harvester and Loops with Laurel modules on code.org.
- Completion of Drawing Gardens with Loops module on code.org.

Spiraling for Mastery

Content or Skill for this Unit	Spiral Focus from Previous Unit	Instructional Activity
How to combine movement and actions in algorithms.	Sequential steps in a program	Whole class discussion of how to program a robot to move throughout the class and pushchairs in, followed by using the combination of movements and actions to move characters through a maze.

Key Resources

Code.org Course B

BrainPop Jr. (Loops)

21st Century Life and Careers

WRK.9.1.2.CAP.1	Make a list of different types of jobs and describe the skills associated with each job.

Career Readiness, Life Literacies, & Key Skills

TECH.9.4.2.DC.3	Explain how to be safe online and follow safe practices when using the internet (e.g., 8.1.2.NI.3, 8.1.2.NI.4).
TECH.9.4.2.DC.4	Compare information that should be kept private to information that might be made public.
TECH.9.4.2.TL.1	Identify the basic features of a digital tool and explain the purpose of the tool (e.g., 8.2.2.ED.1).
TECH.9.4.2.TL.4	Navigate a virtual space to build context and describe the visual content.
TECH.9.4.2.TL.5	Describe the difference between real and virtual experiences.

Interdisciplinary Connections/Companion Standards

Literacy and language arts in the technology context: posters, letter recognition, word recognition, and connections to GUIs

Science: understanding of computers and electricity, operations of touchscreens and other user devices

Social Studies: Computers in the context of society; our relationships to computers as a tool

Health: Limits to screen time and healthy relationships with technology, online technologies

Math: concepts of logic in coding, counting and cardinality, number sense

SCI.K-2-ETS1-1	Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.