G&T Grade 3 Unit 2: Coding and Programming

Content Area: **Gifted & Talented**
Course(s):
Time Period: **MP3**
Length: **30 days**
Status: **Published**

NJSLS

8.1.5.AP.3	Create programs that include sequences, events, loops, and conditionals.
8.1.5.AP.4	Break down problems into smaller, manageable sub-problems to facilitate program development.
8.1.5.AP.5	Modify, remix, or incorporate pieces of existing programs into one's own work to add additional features or create a new program.
8.1.5.AP.6	Develop programs using an iterative process, implement the program design, and test the program to ensure it works as intended.

Rationale and Transfer Goals

In an online coding website, students will use programming "blocks" to design backgrounds, then to select and animate objects and characters to relay an idea or tell a story. Students will also take selections of pre-existing code and modify it for desired results. Students will work independently but they are encouraged to seek and offer help and constructive critique.

Enduring Understandings

Coding is a skill that enhances logical and sequential thinking.

Coding requires a lot of review, testing, and reworking segments until the desired result is achieved.

Offering and seeking constructive critique can enhance learning and desired outcomes.

Learning to code in various programs can lead to careers in the technical industry.

A variety of control structures (blocks) are used to design and change the flow of program execution: sequences, events, loops conditionals.

Programs can be broken down into smaller parts to facilitate their design, implementation, and review.

Programs can also be created by incorporating smaller portions of programs that already exist.

Individuals develop programs using a process that involves design, implementation, testing and review.

Essential Questions

How can I use the various functions or programming “blocks” of a coding program to create something?

Is it possible to write code in “smaller” steps to achieve the same outcome as “many” steps?

What will happen if I add, remove or rearrange any of my code?

How can I test my program?

How can I take pre-existing code and change it for desired outcomes?

How can I save my work for future retrieval?

Content - What will students know?

- Programming involves sequence, grouping and loops.
- Programming is a continuous process of testing and redesign until desired result is reached.
- Different color blocks mean different actions within a program.

Skills - What will students be able to do?

- Create an account on a coding website for use with projects.

- Save and retrieve work on a daily basis.
- Identify and place programming blocks in a sequential and sometimes grouped order to achieve the desired programming outcome.
- Example: Student selects an undersea background (or designs one) and selects (or designs) various characters, sea life and objects. Student uses programming blocks in order to make the objects and characters move to desired effect, with either background sound or individual sound associated with characters or objects.
- Review, rework and test on a daily basis.

Activities - How will we teach the content and skills?

- Introduction to Scratch.com (or other appropriate site)
- Introduction/setting up accounts
- Introduction to programmable coding“blocks” and how they work, Via direct instruction or tutorial videos
- Review of project expectations:
    - At least one “sprite” (character)
    - At least one “sprite” must be animated
    - Sound associated with code within the project
- Students create/complete coding projects

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

- Daily check ins on the projects
- Daily observed conversations between the students
- Evaluation of final project

Key Resources

Chromebooks or other computing device

Various programming sites can be used: Scratch.com and Code.org are currently the two most suited to this unit.

Book: “How to Code” by Max Wainewright.

21st Century Life and Careers

9.2.5.CAP.4	Explain the reasons why some jobs and careers require specific training, skills, and certification (e.g., life guards, child care, medicine, education) and examples of these requirements.

Career Readiness, Life Literacies, & Key Skills

9.4.5.CT.3	Describe how digital tools and technology may be used to solve problems.
9.4.5.DC.4	Model safe, legal, and ethical behavior when using online or offline technology (e.g., 8.1.5.NI.2).
9.4.5.TL.1	Compare the common uses of at least two different digital tools and identify the advantages and disadvantages of using each.

Interdisciplinary Connections/Companion Standards

3-5-ETS1-1	Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
3-5-ETS1-2	Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
3-5-ETS1-3	Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.