JavaScript and Graphics

Content Area: **Math**
Course(s): **Introduction to Computer Science**
Time Period: **Marking Period 2**
Length: **2 - 3 Weeks**
Status: **Published**

Unit Overview

This unit teaches students some of the basics in programming, including how to build, display and move graphics.

Enduring Understandings

Objectives / Topics Covered

- Variables
- User Input
- Arithmetic Expressions
- Graphics
- Pair Programming
- Solving large and more complex problems using graphics

Essential Questions

- How are variables used and introduced in programming?
- How is user input requested, stored and manipulated?
- How are some fundamental shapes created, moved and displayed using Javascript?

New Jersey Student Learning Standards (No CCS)

8.1.8.CS.1: Recommend improvements to computing devices in order to improve the ways users interact with the devices.

8.1.8.AP.1: Design and illustrate algorithms that solve complex problems using flowcharts and/or pseudocode.

8.1.8.AP.3: Design and iteratively develop programs that combine control structures, including nested loops

and compound conditionals.

8.1.8.AP.4: Decompose problems and sub-problems into parts to facilitate the design, implementation, and review of programs.

8.1.8.AP.6: Refine a solution that meets users' needs by incorporating feedback from team members and users.

8.1.8.AP.7: Design programs, incorporating existing code, media, and libraries, and give attribution.

8.1.8.AP.8: Systematically test and refine programs using a range of test cases and users.

8.1.8.AP.9: Document programs in order to make them easier to follow, test, and debug.

Technology Standards

TECH.8.1.12	Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
TECH.8.1.12.A.3	Collaborate in online courses, learning communities, social networks or virtual worlds to discuss a resolution to a problem or issue.
TECH.8.1.12.A.CS1	Understand and use technology systems.
TECH.8.1.12.A.CS2	Select and use applications effectively and productively.
TECH.8.1.12.B.2	Apply previous content knowledge by creating and piloting a digital learning game or tutorial.
TECH.8.1.12.B.CS1	Apply existing knowledge to generate new ideas, products, or processes.
TECH.8.1.12.B.CS2	Create original works as a means of personal or group expression.
TECH.8.1.12.C.CS4	Contribute to project teams to produce original works or solve problems.
TECH.8.2.12.C.CS1	The attributes of design.
TECH.8.2.12.E.1	Demonstrate an understanding of the problem-solving capacity of computers in our world.
TECH.8.2.12.E.3	Use a programming language to solve problems or accomplish a task (e.g., robotic functions, website designs, applications, and games).
TECH.8.2.12.E.CS1	Computational thinking and computer programming as tools used in design and engineering.

21st Century Themes/Careers

CAEP.9.2.12.C.3	Identify transferable career skills and design alternate career plans.
CAEP.9.2.12.C.5	Research career opportunities in the United States and abroad that require knowledge of world languages and diverse cultures.

Instructional Strategies & Learning Activities

● 7 JavaScript & graphics programming exercises in total

● Using variables and getting user input using JavaScript

○ Example Exercise: Dinner Plans Prompt the user for their name, then ask them what time you should meet for dinner. Greet them by name and tell them you will meet them at the time they specified!

● 3 graphics challenges to tie everything learned in the JavaScript & Graphics module together

○ Example Exercise: Ghost Write a program to draw a ghost on the screen. You must do this by using the constant values given (this will allow us to easily alter the size or color of the ghost.)

Formative Assessments

Quick Friday Quizzes - (2- 3 MC / Short answer questions as well as a programming task).

Summative Assessment

End of Unit Code HS MC Test

Programming Task

Alternate Assessments

Extension exercies and Challenges