Unit 5: JavaScript and Graphics

Content Area: **Technology**
Course(s):
Time Period: **Marking Period 3**
Length: **10 blocks**
Status: **Published**

Course Description & Instructional Notes

This unit introduces you to the basics of JavaScript, including variables, user input, mathematics, and basic graphics.

Prior Knowledge
Retained knowledge from previous units

Instructional Notes
The course utilizes a blended classroom approach. The content is fully web-based, with students writing and running code in the browser. Teachers utilize tools and resources provided by CodeHS to leverage time in the classroom and give focused 1-on-1 attention to students. Each unit of the course is broken down into lessons. Lessons consist of video tutorials, short quizzes, example programs to explore, and written programming exercises.

Technology Integration
Computer Science naturally integrates technology on a daily basis.

Enduring Understandings

Programmers should consider graphical space and color when manipulating on-screen graphics.

Programmers use different types of variables to store different types of data.

Essential Questions

What are some elements to consider when programming graphics?

How do programmers store data?

Student Learning Objectives

Students will be able to:

- Write a JavaScript program by typing commands with proper syntax in the start function
- Write a program that prints out a message to the user
- Explain what variables are and what they are used for
- Create their own variables
- Print out the values stored in variables
- Create programs that ask the user for input
- Store user input in variables and print it back to the user
- Choose the proper input function to use depending on the type of information needed
- Describe the different mathematical operators we can use in programs
- Create programs that use basic math to compute useful things
- Create programs that take in user input, do simple computations with the input, and produce useful output
- Create graphical JavaScript programs that draw shapes on the canvas
- Locate points on the graphics canvas using (x, y) coordinates

Vocabulary & Learning Experiences

Vocabulary

Hello World, println, Boolean, Declare a Variable, Variable, Integer, String, Initialize a Variable, Float, readLine, readInt, readFloat, Constant, Magic Number, Parentheses, Increment, Decrement, Canvas, Coordinate System, getWidth(), getHeight(), Radius

Planned Learning Experiences

Challenge: Graphics Problems

Students will learn what pair programming is, why it is used, and the appropriate behaviors of a driver and navigator. They will do this while they synthesize all of the skills and concepts learned in the JavaScript and Graphics unit to solve increasingly challenging puzzles.

Resources

CodeHS

Code.org

Blown to Bits

Assessments

Formative
Think like a Computer Scientist Journal:
Students complete at least five journal entries based on teacher provided prompts that could include major topics, key points, vocabulary, syntax, and/or flowcharts/programming planning.
Quizzes embedded in CodeHS Modules and Code Review

Summative
Unit Quizzes (multiple choice only)
Student Choice Unit Project

NJSLS Standards

NJSLS Standards Copied and Pasted as well as linked.

NJSLS Computer Science and Design Thinking

8.2.12.ED.1: Use research to design and create a product or system that addresses a problem and make modifications based on input from potential consumers.

8.2.12.ED.2: Create scaled engineering drawings for a new product or system and make modification to increase optimization based on feedback.
8.2.12.ED.4: Design a product or system that addresses a global problem and document decisions made based on research, constraints, trade-offs, and aesthetic and ethical considerations and share this information with an appropriate audience.
8.2.12.NT.2: Redesign an existing product to improve form or function.

Additional NJSLS Standards

NJSLS Standards Copied and Pasted as well as linked.

Interdisciplinary Connections

NJSLS Career Readiness, Life Literacies, and Key Skills

NJSLS Companion Standards Grades 9-12 (Reading & Writing in Science & Technical Subjects)

9.4.12.CI.1: Demonstrate the ability to reflect, analyze, and use creative skills and ideas

9.4.12.CI.2: Identify career pathways that highlight personal talents, skills, and abilities

9.4.12.CT.1: Identify problem-solving strategies used in the development of an innovative product or practice

Modifications/Accommodations

GENERAL CONSIDERATIONS FOR DIVERSE LEARNERS

English Language Learners	Students Receiving Special Education Services	Advanced Learners
- Personal glossary	- Small group/One to one	- Use of high level academic vocabulary/texts
- Text-to-speech	- Additional time	- Problem-based learning
- Extended time	- Review of directions	- Pre assess to condense curriculum
- Simplified / verbal instructions	- Student restates information	- Interest-based research
- Frequent breaks	- Space for movement or breaks	- Authentic problem-solving
WIDA Can Do Descriptors for Grade 9-12	- Extra visual and verbal cues and prompts	- Homogeneous grouping opportunities
WIDA Essential Actions Handbook	- Preferential seating	Knowledge and Skill Standards in Gifted Education for All Teachers
FABRIC Paradigm	- Follow a routine/schedule	Pre-K-Grade 12 Gifted Programming Standards
Wall Township ESL Grading Protocol	- Rest breaks	Gifted Programming
	- Verbal and visual cues regarding directions and staying on task	
	- Checklists	
	- Immediate feedback	

Glossary of Terms

*Use WIDA Can Do Descriptors in coordination with Student Language Portraits (SLPs).

Students receiving Special Education programming have specific goals and objectives, as well as accommodations and modifications outlined within their Individualized Education Plans (IEP) due to an identified disability and/or diagnosis. In addition to exposure to the general education curriculum, instruction is differentiated based upon the student's needs. The IEP acts as a supplemental curriculum guide inclusive of instructional strategies that support each learner.

Considerations for Special Education Students 6-12

National Center on Universal Design for Learning - About UDL

UDL Checklist

UDL Key Terms

Students with 504 Plan

Teachers are responsible for implementing designated services and strategies identified on a student's 504 Plan.

At Risk Learners / Differentiation Strategies

Alternative Assessments

Choice Boards

Games and Tournaments

Group Investigations

Learning Contracts

Leveled Rubrics

Literature Circles

Multiple Texts

Personal Agendas

Homogeneous Grouping

Independent Research & Projects

Multiple Intelligence Options

Project-Based Learning

Varied Supplemental Activities

Varied Journal Prompts

Tiered Activities/Assignments

Tiered Products

Graphic Organizers

Choice of Activities

Mini-Workshops to Reteach or Extend

Think-Pair-Share by readiness or interest

Use of Collaboration of Various Activities

Jigsaw

Think-Tac-Toe

Cubing Activities

Exploration by Interest

Flexible Grouping

Goal-Setting with Students

Homework Options

Open-Ended Activities

Varied Product Choices

Stations/Centers

Work Alone/Together