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	
- Simplified / verbal instructions	- Student restates information	- Pre assess to condense curriculum
- Frequent breaks	- Space for movement or breaks	- Interest-based research
	- Extra visual and verbal cues and prompts	- Authentic problem-solving
	- Preferential seating	
WIDA Can Do Descriptors for Grade 9-12	- Follow a routine/schedule	- Homogeneous grouping opportunities
	- Rest breaks	
WIDA Essential Actions Handbook	- Verbal and visual cues regarding directions and staying on task	Knowledge and Skill Standards in Gifted Education for All Teachers
FABRIC Paradigm	- Checklists	
Wall Township ESL Grading Protocol	- Immediate feedback	Pre-K-Grade 12 Gifted Programming Standards
		Gifted Programming

*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](#)

[Glossary of 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	Independent Research & Projects	Jigsaw
Choice Boards	Multiple Intelligence Options	Think-Tac-Toe
Games and Tournaments	Project-Based Learning	Cubing Activities
Group Investigations	Varied Supplemental Activities	Exploration by Interest
Learning Contracts	Varied Journal Prompts	Flexible Grouping
Leveled Rubrics	Tiered Activities/Assignments	Goal-Setting with Students
Literature Circles	Tiered Products	Homework Options
Multiple Texts	Graphic Organizers	Open-Ended Activities
Personal Agendas	Choice of Activities	Varied Product Choices
Homogeneous Grouping	Mini-Workshops to Reteach or Extend	Stations/Centers
	Think-Pair-Share by readiness or interest	Work Alone/Together
	Use of Collaboration of Various Activities	