

Unit 6: JavaScript Control Structures

Content Area: **Technology**
Course(s):
Time Period: **Marking Period 3**
Length: **8 blocks**
Status: **Published**

Course Description & Instructional Notes

Learn how to use control structures such as if/else statements and loops to make more advanced programs in JavaScript.

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

We can use booleans and conditionals in various ways to create a decision tree.

Loops are a way to use repetition to make code more efficient.

Essential Questions

What tools are used for decision making in writing programs?

How do you simplify repeated code?

Student Learning Objectives

Students will be able to:

- Create boolean variables to represent meaningful yes/no values
- Print out the value of a boolean variable
- Describe the meaning and usage of each logical operator: OR (||), AND (&&), and NOT (!)
- Construct logical statements using boolean variables and logical operators
- Explain the meaning of each of the comparison operators (<, <=, >, >=, ==, !=)
- Create programs using the comparison operators to compare values
- Print out the boolean result of comparing values
- Create their own if statements to selective choose which code is executed in their programs
- Create for loops in JavaScript
- Explain the purpose of for loops
- Utilize for loops to avoid typing out repeated code
- Create nested for loops
- Explain why random numbers are a useful part of computer programs
- Create random values in a program
- Utilize the DOCS for the Randomizer class in order to learn how to generate random values
- Create while loops to repeat code while a condition is true
- Utilize while loops to solve new types of problems
- Explain how the loop-and-a-half structure is different from a traditional while loop
- Explain what an infinite loop is
- Explain what the break statement does
- Create programs that use the loop-and-a-half structure to repeat code until a SENTINEL is met, causing the program to break out of the loop

Vocabulary & Learning Experiences

Essential Academic Vocabulary

Boolean, Variable, Logical Operator, Or operator, And operator, Not operator, Negate, Comparison operator, ?Condition, Indentation, If Statement, If Else Statement, Control Structure, Curly Bracket, Loop, For Loop, JavaScript Documentation, Iterate, Increment, DRY Principle, Decrement, Control Structure, Counter, Ransomize, Pseudorandom, Edge Case, Fencepost Problem, Sentinel, Loop-and-a-half, break statement, infinite loop

Planned Learning Experiences

Challenges: Control Structure Problems

Students will synthesize all of the skills and concepts learned in the Control Structures unit to solve increasingly challenging puzzles.

Resources

CodeHS

Code.org

Blown to Bits

Assessments

Formative Assessments

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 Assessments

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.3: Evaluate several models of the same type of product and make recommendations for a new design based on a cost benefit analysis.

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 NJSL Standards

NJSL Standards Copied and Pasted as well as linked.

Interdisciplinary Connections

NJSL Career Readiness, Life Literacies, and Key Skills

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

9.4.12.TL.3: Analyze the effectiveness of the process and quality of collaborative environments.

9.4.12.TL.4: Collaborate in online learning communities or social networks or virtual worlds to analyze and propose a resolution to a real-world problem

Modifications/Accommodations

GENERAL CONSIDERATIONS FOR DIVERSE LEARNERS

English Language Learners

- Personal glossary
- Text-to-speech
- Extended time
- Simplified / verbal

Students Receiving Special Education Services

- Small group/One to one
- Additional time
- Review of directions
- Student restates information

Advanced Learners

- Use of high level academic vocabulary/texts
- Problem-based learning
- Pre assess to condense

- instructions
- Frequent breaks
- Space for movement or breaks
- Extra visual and verbal cues and prompts
- Preferential seating
- Follow a routine/schedule
- Rest breaks
- Verbal and visual cues regarding directions and staying on task
- Checklists
- Immediate feedback
- curriculum
- Interest-based research
- Authentic problem-solving
- Homogeneous grouping opportunities

[WIDA Can Do Descriptors for Grade 9-12](#)

[WIDA Essential Actions Handbook](#)

[FABRIC Paradigm](#)

[Wall Township ESL Grading Protocol](#)

[Knowledge and Skill Standards in Gifted Education for All Teachers](#)

[Pre-K-Grade 12 Gifted Programming Standards](#)

[Gifted Programming 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.

Students with 504 Plan

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

[Considerations for Special Education Students 6-12](#)

[National Center on Universal Design for Learning - About UDL](#)

[UDL Checklist](#)

[UDL Key Terms](#)

At Risk Learners / Differentiation Strategies

Alternative Assessments Independent Research & Projects

Choice Boards Multiple Intelligence Options

Games and Tournaments Project-Based Learning

Group Investigations Varied Supplemental Activities

Jigsaw

Think-Tac-Toe

Cubing 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	