# 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 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.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 | 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 |
| - Simplified / verbal | - Student restates information | |

| | | |
|---|---|---|
| instructions | - Space for movement or breaks | curriculum |
| - Frequent breaks | - Extra visual and verbal cues and prompts | - Interest-based research |
| | - Preferential seating | - Authentic problem-solving |
| 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 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 |
| | Considerations for Special Education Students 6-12 | Teachers are responsible for implementing designated services and strategies identified on a student's 504 Plan. |
| | National Center on Universal Design for Learning - About UDL | |
| | UDL Checklist | |
| | UDL Key Terms | |

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

Leveled Rubrics

Literature Circles

Multiple Texts

Personal Agendas

Homogeneous Grouping

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

Flexible Grouping

Goal-Setting with Students

Homework Options

Open-Ended Activities

Varied Product Choices

Stations/Centers

Work Alone/Together