Unit 3: Conditional Statements: Programming and Video Game Design

Content Area: **Computer Science**
Course(s):
Time Period: **Marking Period 1**
Length: **11 days**
Status: **Published**

BRIEF SUMMARY OF UNIT

In this unit, students will learn what conditional statements are and how they are used within a computer program. Students will identify how conditional statements are used in computer programs that they presently use and how we can use conditional statements in real life. Students will use conditional statements in their final game project.

STANDARDS

CS.6-8.8.1.8.AP.3	Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals.
CS.6-8.8.1.8.AP.4	Decompose problems and sub-problems into parts to facilitate the design, implementation, and review of programs.
CS.6-8.8.1.8.AP.5	Create procedures with parameters to organize code and make it easier to reuse.
CS.6-8.8.1.8.AP.6	Refine a solution that meets users' needs by incorporating feedback from team members and users.
CS.6-8.8.1.8.AP.7	Design programs, incorporating existing code, media, and libraries, and give attribution.
CS.6-8.8.1.8.AP.8	Systematically test and refine programs using a range of test cases and users.
CS.6-8.8.1.8.AP.9	Document programs in order to make them easier to follow, test, and debug.
CS.6-8.AP	Algorithms & Programming
MA.9-12.1.2.12prof.Cn	Connecting
MA.9-12.1.2.12prof.Cr	Creating
MA.9-12.1.2.12prof.Pr	Producing
MA.9-12.1.2.12prof.Re	Responding
MA.9-12.1.2.12prof.Cr2	Organizing and developing ideas.
MA.9-12.1.2.12prof.Re9	Applying criteria to evaluate products.
MA.9-12.1.2.12prof.Cn11	Relating artistic ideas and works within societal, cultural and historical contexts to deepen understanding.
SCI.MS.ETS1.B	Developing Possible Solutions
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SCI.MS-ETS1-2	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
SCI.MS-ETS1-3	Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new

	solution to better meet the criteria for success.
WRK.K-12.P.5	Utilize critical thinking to make sense of problems and persevere in solving them.
WRK.K-12.P.8	Use technology to enhance productivity increase collaboration and communicate effectively.
TECH.9.4.8.CI.2	Repurpose an existing resource in an innovative way (e.g., 8.2.8.NT.3).
TECH.9.4.8.CI.3	Examine challenges that may exist in the adoption of new ideas (e.g., 2.1.8.SSH, 6.1.8.CivicsPD.2).
TECH.9.4.8.TL.6	Collaborate to develop and publish work that provides perspectives on a real-world problem.
	Asking questions and defining problems in grades 6–8 builds on K–5 experiences and progresses to specifying relationships between variables and clarifying arguments and models.
	Control structures are selected and combined in programs to solve more complex problems.
	Multiple solutions often exist to solve a problem.
	Gathering and evaluating knowledge and information from a variety of sources, including global perspectives, fosters creativity and innovative thinking.
	Programs use procedures to organize code and hide implementation details. Procedures can be repurposed in new programs. Defining parameters for procedures can generalize behavior and increase reusability.

TRANSFER

- Apply logic to real life situations and other subjects of study.
- Write code for if statements, if/then, and if/else statements in various computer programming languages.
- Create programs that require user interactions.

ESSENTIAL QUESTIONS

- How can the conditional statement code be debugged?
- Does my program need a conditional statement code?
- Does the conditional statement code serve its purpose?
- How can adding user interactions to your program can change the final results?
- How will the conditional statement code be designed to serve its purpose?
- What is the purpose of the conditional statement code?
- What type of conditional statement code does my program require?

ESSENTIAL UNDERSTANDINGS

- Conditional statement codes make computers perform a different calculation based on some condition.

- Conditional statement codes make the computer do something entirely different based on condition the user inputs.
- The user creates conditional statement codes by creating a set of conditions and the computer does what it's supposed to based on the condition.

STUDENTS WILL KNOW

- Conditional statements (If commands) are used in the Selection structure.
- How to add user interactions to their program.
- Running code in response to a question or input is called Selection.
- Selection is one of the three basic logic structures in computer programming.
- The reason for using a conditional statement command.

STUDENTS WILL BE SKILLED AT

- How to use if and else commands in various computer languages.
- Adding user interactions.
- Determining the need for if and else commands.
- How to debug if and else commands.

EVIDENCE/PERFORMANCE TASKS

Assessments

- Formative: Daily assessments using examples from class notes and CodeHS.com
- Summative: Teacher-created assessments/projects and CodeHS Computer Science Projects
- Benchmark: Check for understanding benchmark assessments on CodeHS
- Alternative Assessments: Student-centered activities such as a doorbell coding project, game design projects, and other activities involving real world applications
- Activities/Assessments Folder

Core instructional materials: Core Book List

Supplemental materials: Khan Academy

- Students will use If commands to create games.
- Students will complete coding exercises/projects in Khan Academy, Codehs, Scratch and other coding platforms.
- Students will create a program that will change based on different user interaction.
- Students will use if and else commands to create programs that can change based on different factors in their code.

LEARNING PLAN

- In groups students will develop a list of daily tasks that can be described using a series of if and if - else commands.
- Use if and if-else commands in programs.
- Have students write a program that has multiple outcomes depending on the user interaction.

MATERIALS

Core instructional materials: Core Book List

Supplemental materials: CodeHS

https://codehs.com/

https://codehs.com/uploads/4f269865fb15b6c2019aca33391b7464

https://www.khanacademy.org/computing/computer-programming

- Codehs.com

SUGGESTED STRATEGIES FOR MODIFICATIONS

https://docs.google.com/spreadsheets/d/1vYMnvzfcj-MbasIiUC38xuHWyiyDFxOFXTBcccADZy8/edit?usp=sharing