Unit 1: Variables: 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 a variable is and what they can be used for within a computer program. Students will identify how variables are used in computer programs that they presently use and how we can use variables in real life to solve problems. Students will practice creating and using variables in a variety of programs. Students will use variables in their final game project.

STANDARDS

Diversity and Inclusion: Students will focus on equity, inclusion, and tolerance when analyzing the comparison of various quantities regarding characteristics of people. Equality will also be highlighted through the topic of citizenship. This can be associated with treating people fairly and equally.

MA.9-12.1.2.12prof.Cr	Creating
MA.K-2.1.2.2.Cr	Creating
MA.K-2.1.2.2.Cr2	Organizing and developing ideas.
MA.K-2.1.2.2.Cr3	Refining and completing products.
LA.K-12.NJSLSA.L4	Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.
LA.K-12.NJSLSA.L5	Demonstrate understanding of word relationships and nuances in word meanings.
LA.K-12.NJSLSA.L6	Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when encountering an unknown term important to comprehension or expression.
MA.9-12.1.2.12prof.Cn10	Synthesizing and relating knowledge and personal experiences to create products.
MA.K-2.1.2.2.Cn10	Synthesizing and relating knowledge and personal experiences to create products.
MA.K-2.1.2.2.Cn10a	Use personal experiences, interests, information and models in creating media artworks.
MA.K-2.1.2.2.Cn10b	Share and discuss experiences of media artworks, describing their meaning and purpose.
MA.9-12.1.2.12prof.Cn11	Relating artistic ideas and works within societal, cultural and historical contexts to deepen understanding.
MA.K-2.1.2.2.Cn11a	Discuss and demonstrate how media artworks, messages environments and ideas relate to everyday and cultural life, such as daily activities, popular media, connections with family and friends.

MA.K-2.1.2.2.Cn11b	Interact appropriately with media arts tools and environments considering safety, rules and fairness.
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.
SCI.MS.ETS1.B	Developing Possible Solutions
CS.6-8.8.1.8.AP.2	Create clearly named variables that represent different data types and perform operations on their values.
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.7	Design programs, incorporating existing code, media, and libraries, and give attribution.
CS.6-8.8.2.8.ED.2	Identify the steps in the design process that could be used to solve a problem.
CS.6-8.AP	Algorithms & Programming
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.
	Multiple solutions often exist to solve a problem.

TRANSFER

- Create variables in computer programming languages.
- Use a variable expression to describe a real world situation where one or more quantities has an unknown value or can change in value.

ESSENTIAL QUESTIONS

- Does the variable serve its purpose?
- How can the variable be debugged?
- How will the variable be designed to meet its purpose?
- Is a variable needed for the program?
- What is the purpose of the variable?

ESSENTIAL UNDERSTANDINGS

- Variable designs change depending on the need of the program.
- Variables are useful in computer programming for real life situations.

STUDENTS WILL KNOW

- The formal definitions of the word, "variable" and "computer variable".
- Unlike normal numbers, variables can change their value when something happens.
- Variables are a way that computer programs store pieces of data or information.

STUDENTS WILL BE SKILLED AT

- Changing variable values.
- Creating variables and giving them a value.

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

- Create a variable to store information for a given problem.
- Students will complete coding exercises/projects in Khan Academy, Codehs, Scratch and other coding platforms.
- Use variables to change values given a series of instructions.

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