

# Variables Mini-Lesson Plan

## Summary

In this lesson, students will explore the concept of variables within MakeCode: Arcade before using this knowledge to create their own video games.

## Background

Variables: In coding, variables are a way of collecting and storing information. They are commonly used for things like: tracking points, lives, lists and databases. In block code, variables can be used to help create new blocks to help the program understand things we want it to do. Learning to control variables allows students to create more advanced artifacts.

## Overview

1. Introduction - (5 minutes)
2. What is a Variable? – (8 minutes)
3. Types of variables: (2 minutes)
4. When can we use variables? (5 minutes)
5. Activity: Using variables in a video game (10 – 15 minutes)

## Materials

- Google Slide Deck:  
<https://docs.google.com/presentation/d/1r8o86WjTQwAlmtxa5wbth3WDxdZmR5y4gQFmRJSJij4/edit?usp=sharing>
- Chromebooks

## Lesson

### Introduction: (5 Minutes)

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Brainstorm:

What is a variable?

Test students' knowledge; they may have heard this term in math. Remember, IDK (I don't know) is a valid answer!

## What is a variable? (8 Minutes)

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Ask for a student volunteer and you will write a poem about that person.

This student <name> you should meet

Coding with them is such a treat!

Repeat with a few more students - what would be an easier way to write a poem for every person? Using a variable of a placeholder

Review information on the variable slide:

- Used to hold information about something
- It's like a bucket or a basket (or even a locker)
- Helps the computer make decisions on when to use that information

What information could be stored inside the "Weather" variable?

Discuss with students: answers could be sun, rain, snow, sleet, wind, temperature, etc.

What information could be stored inside the "Sports" variable?

Discuss with students: answers could be hockey, soccer, gymnastics, pickleball, rock climbing etc.

## Types of Variables: (2 Minutes)

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Let's take a look at some variables we've already used in MakeCode Arcade  
These 3 pictures on the slide are actually variables – what do they do?

The first 2 students should be familiar with – change score (score is the variable), and player sprite (the sprite is the variable). The last example might be unfamiliar as it is a custom variable made in MCA to create a special mode when NPCs are talking

We have already used many different variables in MakeCode Arcade including score and character sprites. Can you think of others?

- Int variables are numbers (whole, not decimal)

- String variables are a string of text or characters
- Boolean variables are true/false

## When can we use variables? (5 Minutes)

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Take a look at the examples of how we can add new variables in MakeCode to do new things. Does this give you any ideas for your own games?

- Turn things on and off – walk through the code on the slide. It says if dialogue-mode is true then the dog character CANNOT move, if dialogue-mode is false, the dog character CAN move
- Count how many times a player has done something – this code counts how many questions the player has answered. Once they answer 4 questions, the player wins!
- Track resources – this code checks to see how many seed resources the player has collected. If they have more than 0 seeds they can plant a tree
- Make your game have levels – this code has a level variable that is used to change the level of the game to be more difficult

## Activity: Use Variables in a game (10-15 minutes)

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Go to the partially made game. Some things are built for you, but you can do the rest! Can you add a new enemy variable to make a second enemy? Next, can you use the created "Change level" block that is disconnected to create a second level for our game?

Afterwards, start working on your own personal game and think about how you can use variables to add more features to your game.