

# Constantly Variable

Professor Bob Brown

College of Computing and Software Engineering

Kennesaw State University

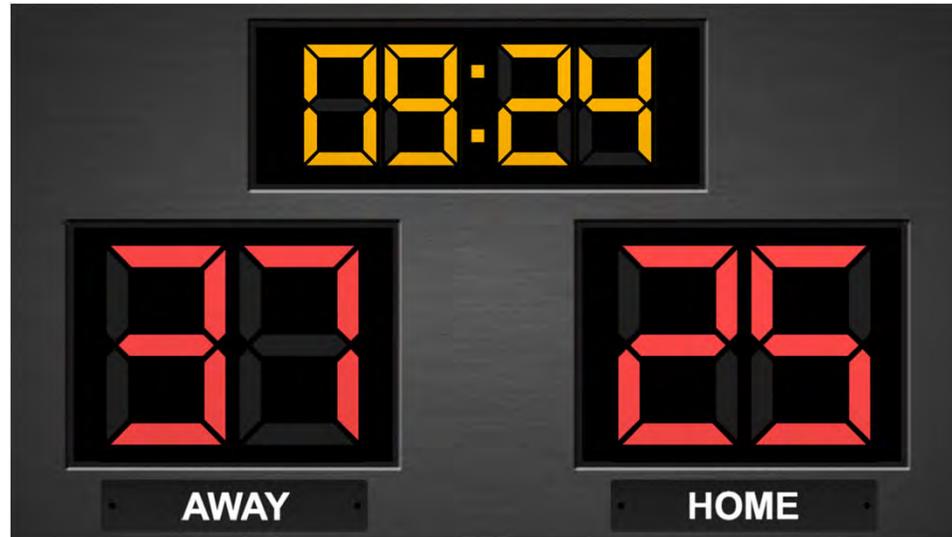
Bob.Brown@Kennesaw.edu

# A Link to Remember

[drbrown.link/mcnair](http://drbrown.link/mcnair)

All of the material for this class is available on line.

# “Variables” Change in Value



# What is a Variable ?

- In math, a variable is a letter that stands in for some value.
- In computing, a variable is a *named area of memory that holds a value*.
- So, variables have a *name* and a *value*.



# “Constants” are Constant

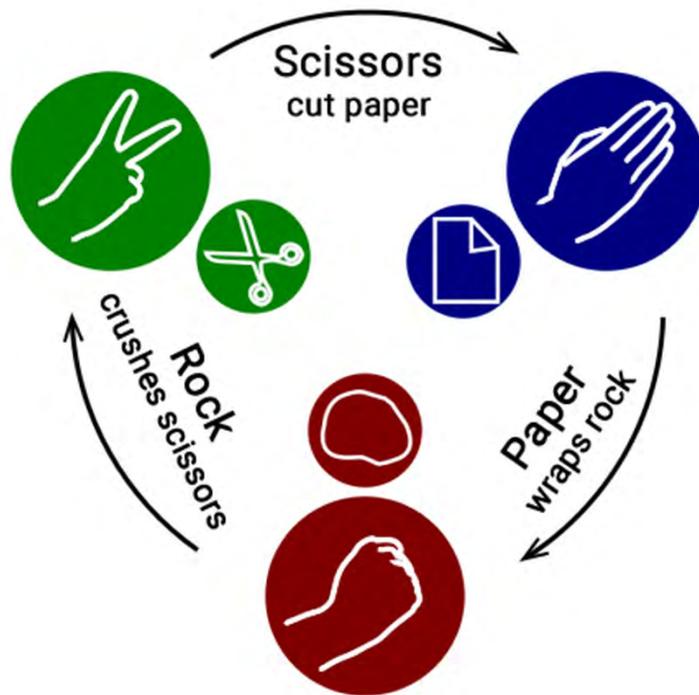
*Constants* cannot change while a program is running.

“playerA” is a *variable*;  
it can change.



“1” is a *constant*; it  
can't change.

# Let's Play Rock-Paper-Scissors



Game 1		
	Win	Tie
Mary		
Doug		

Game 2		
	Win	Tie
Mary		
Doug		

Keep score; identify variables, names, and constants.

# A Silly Riddle

What's your favorite variable?

I don't know... it keeps changing!

# Numbers as Variables

- “Set” defines a variable, sets value
- Numbers: A Scratch 'set' block with a red background and a yellow border. The text 'set' is on the left, 'aliceScore' is in a dropdown menu with a downward arrow, 'to' is in the middle, and '0' is in a white circle on the right.
  - Whole numbers (integers): 123
  - Numbers with fractions (floats): 3.14
- All MakeCode variables start as numbers; a second step is needed for strings or Booleans

# Other Kinds of Data

- **Strings:**



```
set hello to "Hello from Micro:Bit"
```

- **Booleans:**



```
set ready to true
```

- **Arrays:**



```
set items to array of "rock" "paper" "scissors"
```

- **Sprites:**



```
set mySprite to create sprite at x: 2 y: 2
```

- **We will use these data types later.**

# Score-Keeping Program

## Algorithm

- Set scores to zero at start.
- When Button A is pressed
  - Add one to player A's score
  - Display an A in the LEDs
- When Button B is pressed
  - Add one to player B's score
  - Display an B in the LEDs
- When both are pressed, display scores.

# Start a New Program

- Open a browser and go here:  
<https://makecode.microbit.org/>
- Click the purple “New Project” box.
- Raise your hand when you’re there.
- Give your project a name: Remove “untitled” and type “keepscore” in the box.

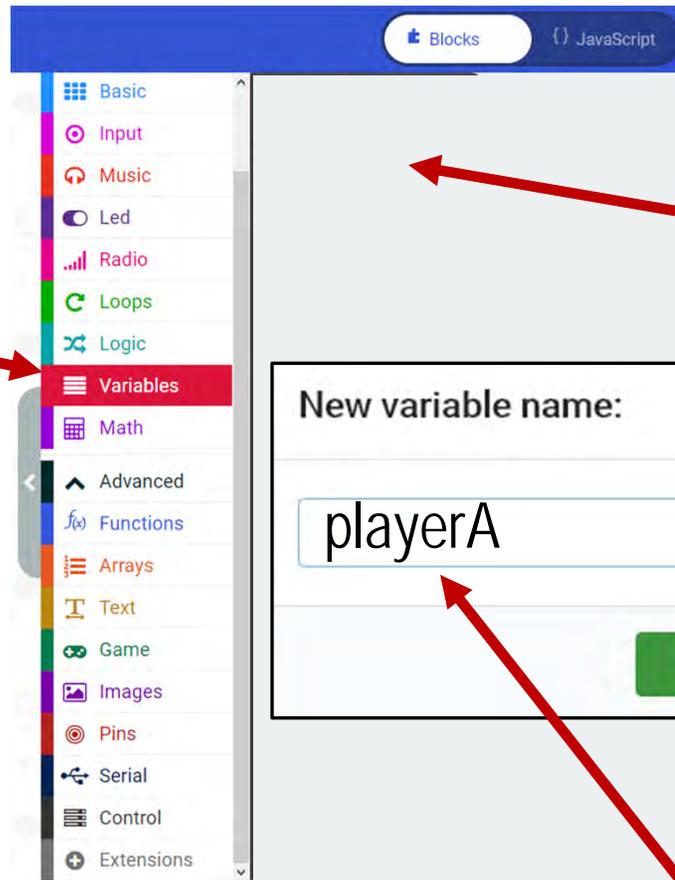


# Clear the Workspace

- Drag anything *except* “on start” to the left until a trashcan appears.
- Drag the item into the trashcan.
- Raise your hand when you’re there.

# Make a Number Variable

Click "Variables"



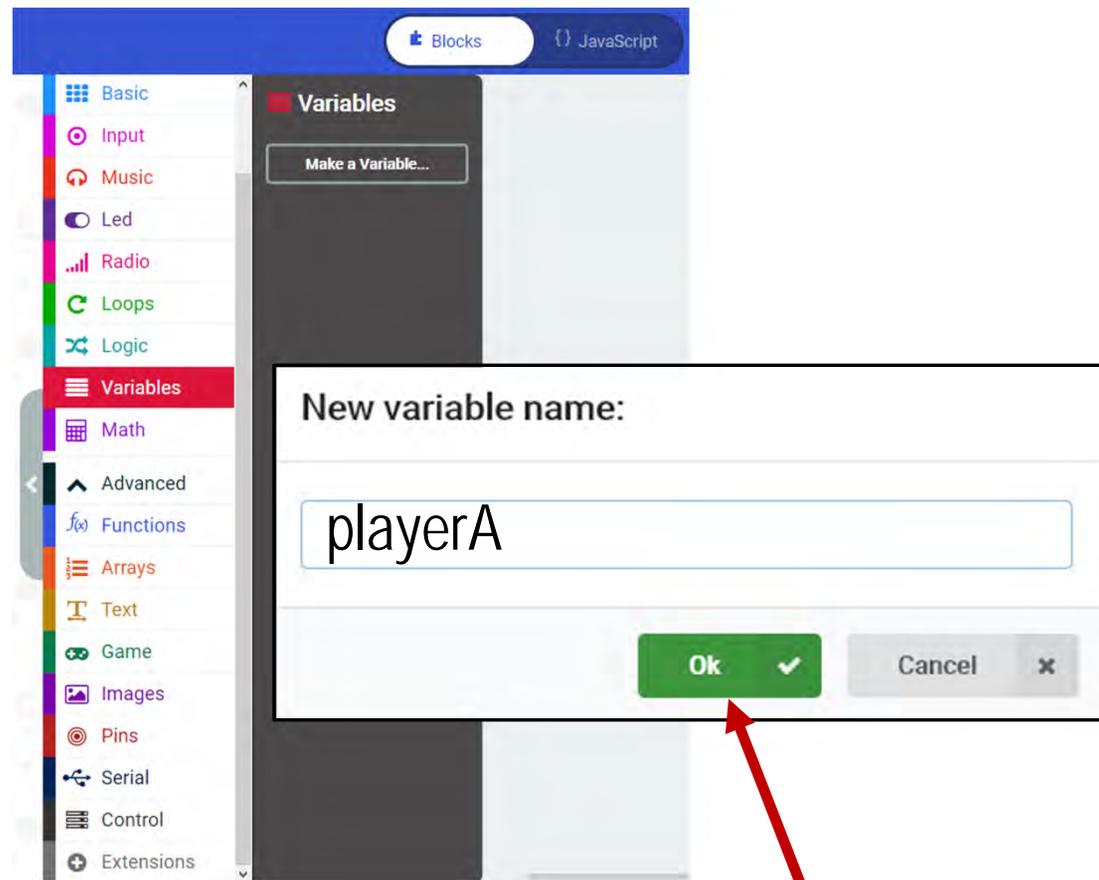
Click "Make a Variable"



Give your variable a name.

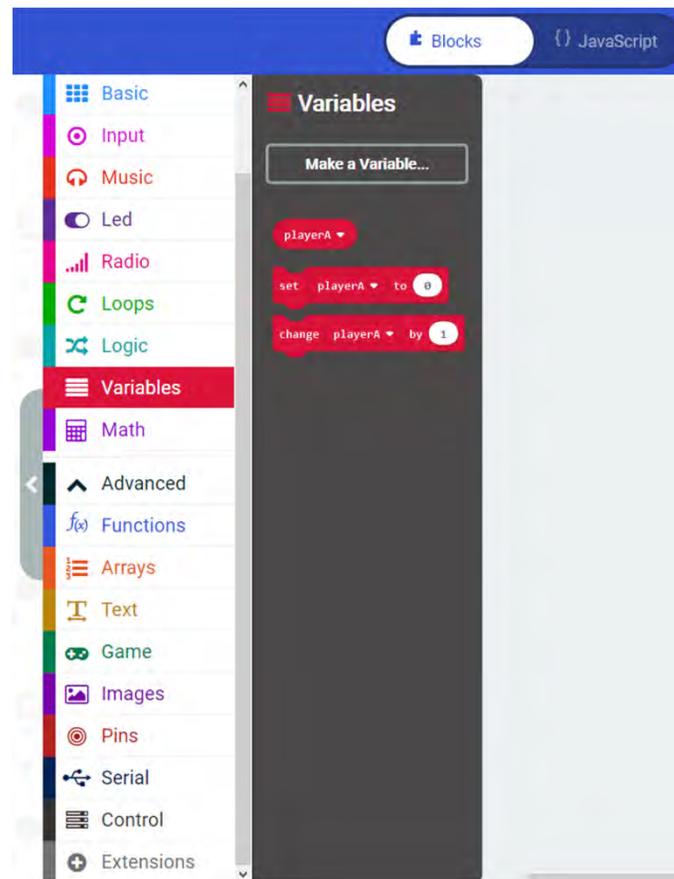


# Make a Number Variable



Click OK

# Make a Number Variable



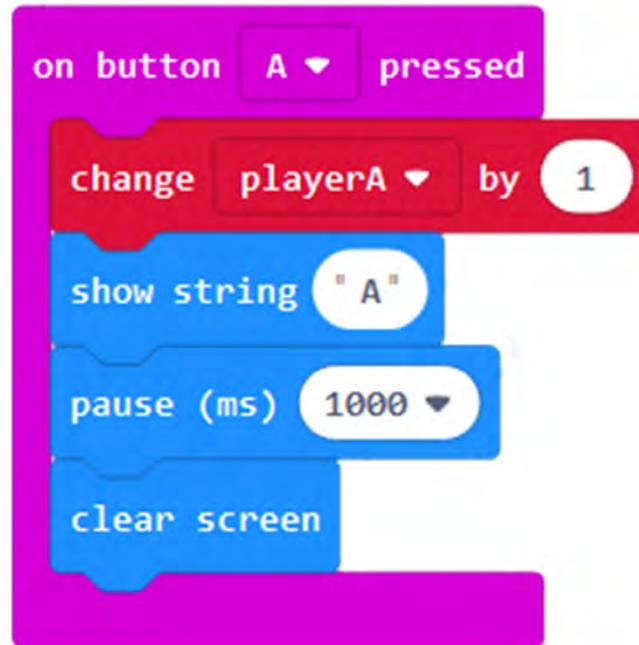
Make a variable for playerB the same way.

# Set Scores to Zero



Use the arrows to select playerA or playerB

# Buttons A and B



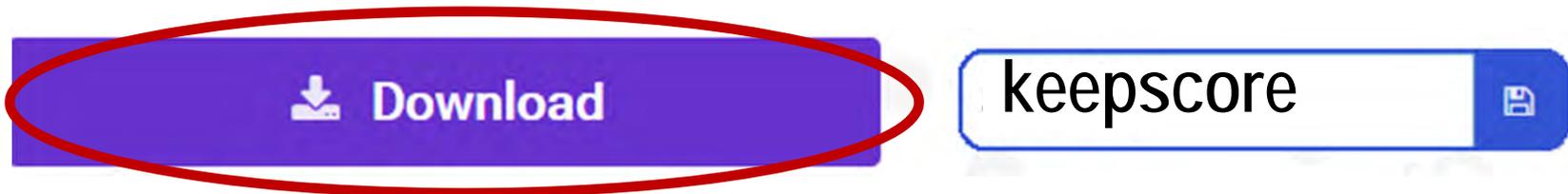
Make another button block for button B.  
Shortcut: Right-click, select “duplicate.”

# Display the Score



# Save and Load Your Program

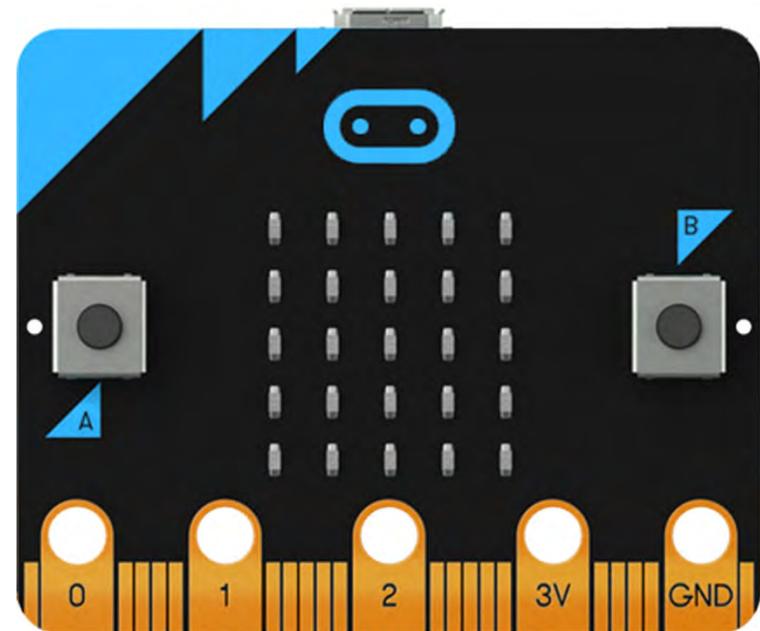
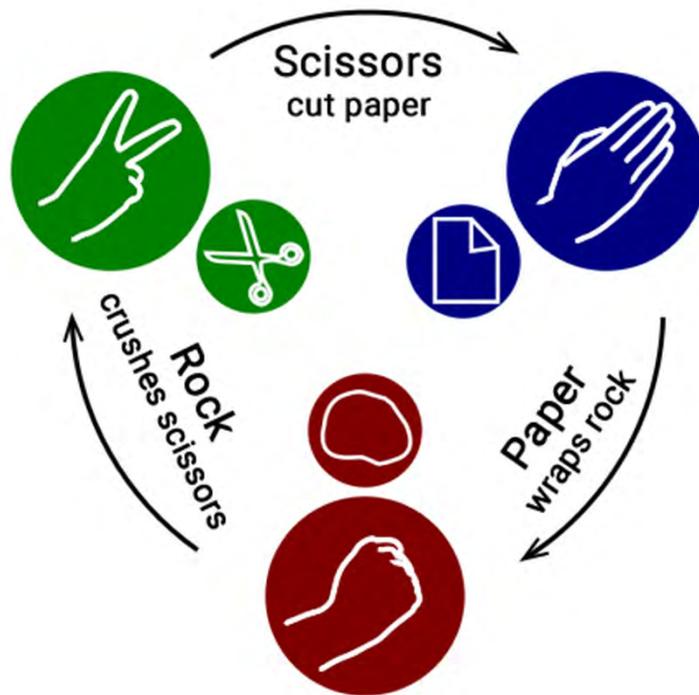
- Click the “Download” button.



- Save the file on the desktop.
- Open the “Computer” folder and drag the file to the Micro:Bit drive.



# Play Another Game



Keep score with the Micro:Bit.

# Improving the Program

- Could you have used your own names instead of playerA and playerB as the variable names?
- Try it and see...
- Go to the “Variables” area
- Right-click “playerA”
- What happens?

# Improving the Program

- What happens if you start a new game after pressing A+B?
- Try it and see.
- How can we fix it?

*Hint:* What are the values of the “player” variables after the scores are displayed?

*Hint:* What *should* the values of the “player” variables be if we start over?

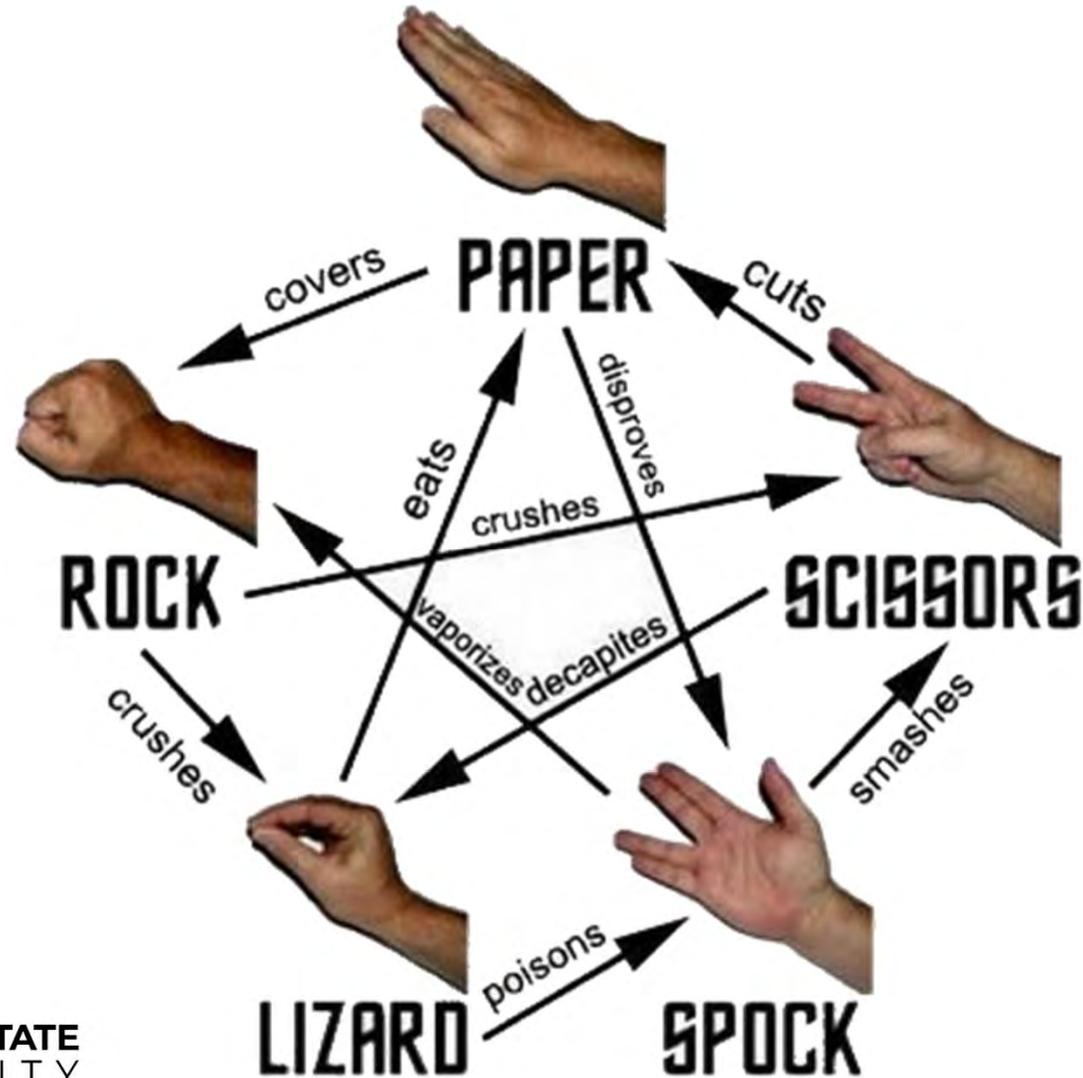
# More Silliness

No videos in PDF files, right?

You can find it here:

<https://www.youtube.com/watch?v=iSHPVCBsnLw>

# More Silliness



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