Elective Virtual Learning

6th Grade Intro to Gateways
Intro to Cryptology Through Micro:it
May 13, 2020

7th & 8th Grade Multimedia
Lesson: May 13, 2020

Objective/Learning Target:
I can develop my understanding of cryptography in programming computers.

Warm-Up

Quick Write
What did you learn about writing an algorithm for a Caesar cipher last lesson?

How did you use logical reasoning to solve problems?

Did you use your Caesar Cipher to create code for someone or Something?

Are you ready to encrypt your own secret box in your room or your computer or device?

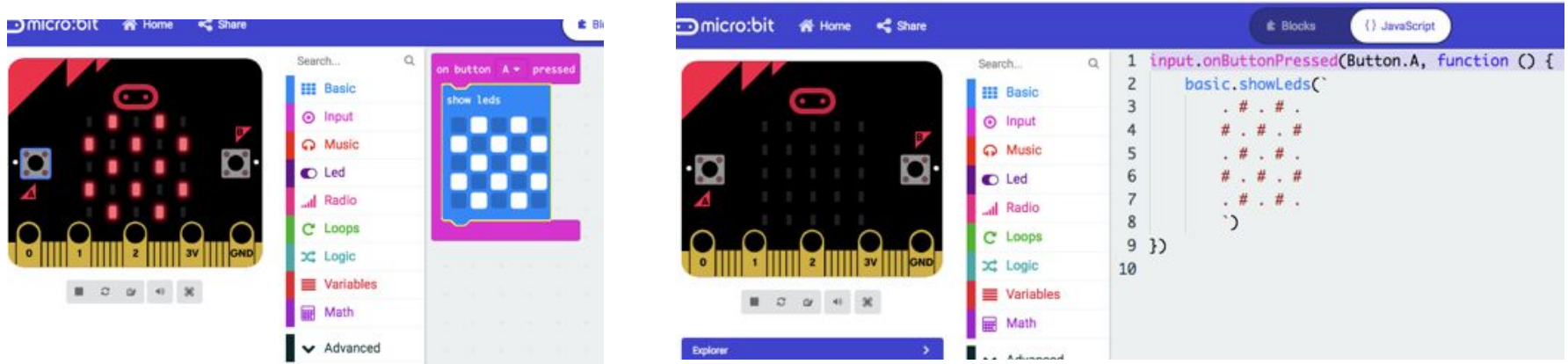# Lesson Introduction/Background Information:

Today you will:
- develop practical understanding of text-based programming
- understand and use selection, variables and functions
- analyse JavaScript code

Graphical and text-based programming

What can you see in the images below? What does it show? Have you seen coding like this before? Where? Did you do the Circuit Playground Lessons in the previous weeks? We used MakeCode to program the Circuit Playground. Below we see the same Makecode, but the microcontroller is different. It is called a Micro:Bit

Also note in the image on the right, the coding is not a block code, but written code. ALL code is written, but with blocks such as on the left make it easier for some to learn how coding works and is structured. The block just covering the text hiding under the hood.
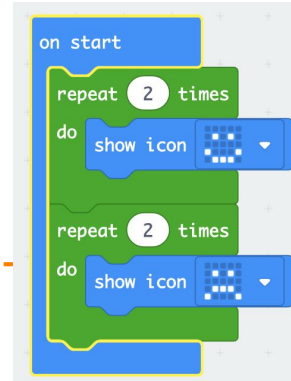
Practice:

Block-based programming

1. What do you already know about block-based programming?
2. Visit MakeCode: https://makecode.microbit.org
3. Click on the +
4. Experiment: create a simple program in the blocks editor
      Here a sample program you can use or create your own.----

Now let's switch to the text-based code

1. Watch this video on how to switch from Block to Text view.---->
2. How does it look in the JavaScript editor
3. Can you change the JavaScript code?
4. What does it do to the program?
5. Some students think this is a good way to learn how to code
   Textually. You can create in the block code, then read the text
   code to figure out what changes could be made.

Textual coding is usually more customizable than the blocks. Learning
Text-based coding is powerful. Want to code you own games or tweak
a game you already play? YEP! You can do this!
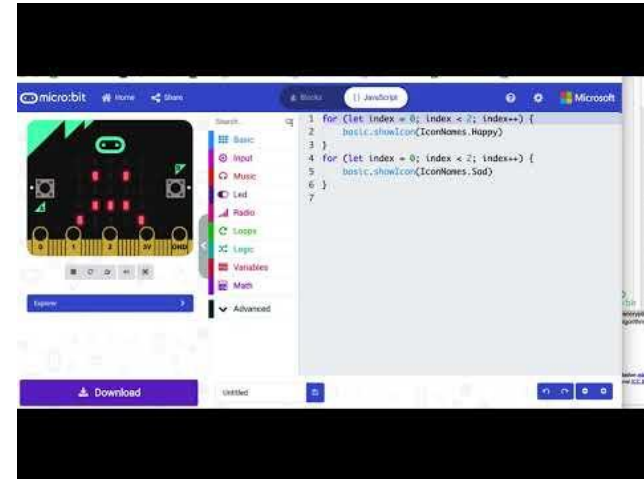
Practice:

JavaScript Caesar cipher
Here is a complete textual coding site with the Caesar Cipher in it.

1. Visit: https://codepen.io/MattCK/pen/OyQyxE
2. You will see 3 columns: html CSS   JS
3. The one with JS is JavaScript - This is the same textual code you saw in MakeCode. It is one of many coding languages
4. Try the Caesar cipher - Under all the code there is a box to write a statement and you can change the shift number which is defaulted to 7.
5. Type a sentence and in the last box it will give you the encrypted code. Change the number of shifts and see how it changes the encryption.
1. Try to decipher the JavaScript code by reading it.
2. Compare it to the code you wrote in MakeCode!

Put the text to cipher in the input

Text:

Offset:

7

Finish:

You will see your encrypted text here!

You can adjust the size of the cipher input window by pulling up in between that window and the text window. See if you can figure that out!

The entire Code looks like this.
We are going to break it down in the next lesson.

Continued Practice:

What kind of things are encrypted & How?

Check it out!

Self-Assessment:

❏   White down some of the codes you generated
❏   Take your paper wheel cypher and have someone else try to decipher your encrypted
       statements

Email your
teacher if you
have questions

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