Elective Virtual Learning

6th Grade Intro to Gateways
Intro to Cryptology Through Micro:it
May 14, 2020

7th & 8th Grade Multimedia
Lesson: May 14, 2020

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

Warm-Up

Quick Write
Did you write some encrypted ciphers from last lesson?

Was anyone able to crack your codes?

Did you understand any of the textual commands in the Caesar Cipher that was in JavaScript?

Lesson Introduction/Background Information:

To understand the Importance of encryption & Cryptography in your life, watch the following video if you did not watch it in the previous lesson.

Practice:

Let's break down the various codes used in the Javascript document & on yesterday's Caesar Cipher.

The first line has the word **Var -** which means Variable.

```
1    var alphabet = "abcdefghijklmnopqrstuvwxyz";
```

Variables are:
- Containers for storing data values.
- Find an example of a variable. What do you think it does?

Find go back to the Caesar Cipher (https://codepen.io/MattCK/pen/OyQyxE)
Selection allows a decision to be made in a program-- Below is an example of selection. What do you think this does?

```
if(index == -1){
    cipherFinish += letter;
} else {
    index = ((index + cipherOffset) + alphabet.length);
```

Practice:

Let's break down the various codes used in the Javascript document & on yesterday's Caesar Cipher.

Functions are:
- A small section of code.
- Performs a specific task, then returns a value.
- Can be used repeatedly
- in a program

Study the code in the image or on the Caesar Cipher site.
Find an example of a function. (you can circle it here or write it below)
What do you think it does?

```javascript
function runCipher(){
  var cipherText = $('#cypher').val();
  var cipherOffset = $('#offset').val();
  cipherOffset = (cipherOffset % alphabet.length);
  var cipherFinish = '';

  for(i=0; i<cipherText.length; i++){
    var letter = cipherText[i];
    var upper = (letter == letter.toUpperCase());
    letter = letter.toLowerCase();

    var index = alphabet.indexOf(letter);
    if(index == -1){
      cipherFinish += letter;
    } else {
      index = ((index + cipherOffset) + alphabet.length);
      var nextLetter = fullAlphabet[index];
      if(upper) nextLetter = nextLetter.toUpperCase();
      cipherFinish += nextLetter;
    }
  }
}
```
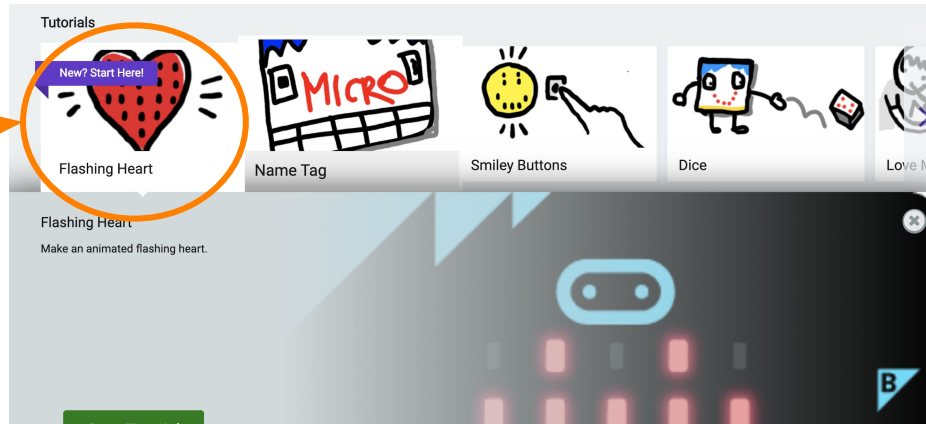
Practice:

Now that You have worked hard to learn about Cryptology,
Let's rewards ourselves with some coding!

Go to https://makecode.microbit.org/

Click on the Flashing Heart to get started. This is a starter program just to understand Makecode & the micro:bit. For those of you that have cdoned the circuit playground coding, you will notice some things the same and others that are different.

Start here →

After you code the heart, take a look at the JavaScript Code you generated!

Continued Practice:

How can you modify what your heart does? Try some of the other codes with the heart.

Self-Assessment:

❏ What did you create? Share it with someone in your house

Email your teacher if you have questions

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