MONDAY PM: MICROBIT 101

Lesson Description: Encapsulates general computer science principles, such as: variables, conditional statements, loops, and block programming along with general micro:bit functionalities such as input, LED and radio.

Prerequisite Knowledge: Students are expected to know how to open and close a web browser, download files through a web browser and maneuver through a file system.

Length of Completion: This activity should take 50 minutes max.

Level of Instruction: This lesson is intended for high school and middle school students. This lesson is intended for beginners since it is a crash course on micro:bits.

Applicable First Principles &/or Concepts:

A. Keep it simple: it shows that with simple Computer Science principles we can do a lot of harm/good in the cyber world.

GenCyber First Principles

Domain Separation	Abstraction
Process Isolation	Data Hiding
Resource Encapsulation	Layering
Modularity	Simplicity
Least Privilege	Minimization

GenCyber Cybersecurity Concepts
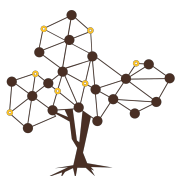
Defense in Depth

Availability

Confidentiality

Think Like an Adversary

Integrity

Keep it Simple

Resources that are Needed:

1. Computer
2. Micro:bit
3. Paper & Pencil

Accommodations Needed: N/A

LESSON LEARNING OUTCOMES

- Design/Built, Test/Defend, Compare/Contrast, Apply/Use, Explain/Discuss, Identify/Describe. Students should be able to apply Computer Science principles to write simple code using the micro-bits. They will also be able to test their code with a simple activity at the end of the day. They will also be able to compare their individual projects to their fellow students projects and discuss how different solutions to the same project can have the same outcome.

LESSON DETAILS

Interconnection:

1. Password Cracking
2. Beacon

Assessment: We will have them write a brief summary of what they have learned during this lesson as well as record a video of what they have learned throughout the day.
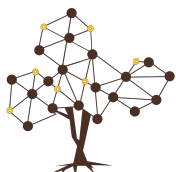
Extension Activities: N/A

Differentiated Learning Opportunities: At the end of the lesson we will require the students to construct code related to sending a radio signal to another microbit.

<div style="background-color:orange; text-align:center">LESSON</div>

Lesson 1 Details: For lesson 1, please describe:

Warm Up:
We will ask questions as a warm up, to gage where students are in terms of their knowledge of computer science principles.
  a. Who has used a micro:bit before?
  b. Who has coded before?

Lesson: We will start with an expository approach by defining the principles: variables, conditional statements, and loops. We will also describe the functionality of the microbits by emphasizing the radio. We will describe the activity which is: write a program that sends a message to a receiver on a given channel. They will have a few minutes to plan their program. They can work individually or groups of up to three people.