



COMPUTING SYSTEM

Lesson Description:

This lesson will focus on teaching the students the physical parts of the computer along with their functionality and with giving them an introduction to some programming principles.

Prerequisite Knowledge:

The students are expected to have operated a computer at a very basic level.

Length of Completion:

50 minutes

Level of Instruction:

This lesson is intended for high school novices. Adaptations will be made if students are advanced.

Applicable First Principles &/or Concepts:

- Abstraction
- Layering

GenCyber First Principles

Domain Separation

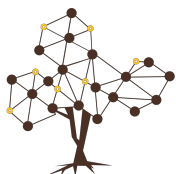
Abstraction

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:

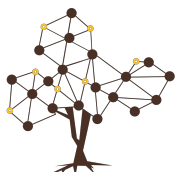
- White board
- Paper
- Pencils

Accommodations Needed: N/A

LEARNING OUTCOMES

LESSON LEARNING OUTCOMES:

Students will be able to identify the parts of a computer. They should be able to describe the function of the parts of a computer. They should be able to contrast output from input, and see how the different parts work together and separately. They should be able to explain basic programming principles.



LESSON DETAILS

Interconnection:

This lesson serves as an introduction to the activity: Micro-bits 101

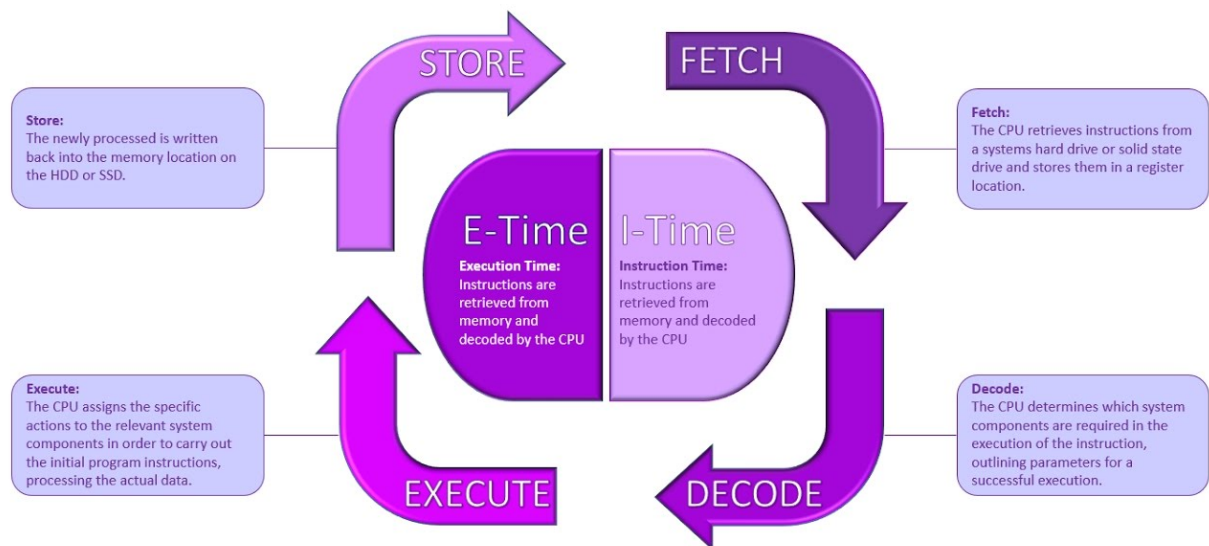
Assessment:

At the end of the day the students will plan and then record a two minute video about the concepts they have learned for the day.

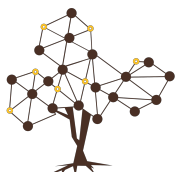
Extension Activities: N/A

Differentiated Learning Opportunities: For advanced students we will give them the challenge of understanding the fetch execute cycle. They will label each part and at the end be able to explain each step with detail.

The Fetch-Execute Cycle



LESSON



Lesson 1 Details:

Warm Up: Students will be asked various questions with regards to the bits and pieces of a computer system.

Lesson: (Verdana, 12 pt., Bold) The lesson material may be an expository or inquiry approach. An expository approach is where the material to be learned is described, defined, explained either in writing or orally. For this type of approach, include the title of the presentation.pptx, if appropriate, video, reading, etc. The inquiry approach may be guided, where the instructor has mapped out a plan for students to follow on their own, and the teacher acts a facilitator while students work through the instructions, lessons and examples that have been planned for them to discover. In contrast, free discovery is providing the materials and allowing students to experiment, and observe, and describe/explain what conclusions they have drawn from their experimentation, and to justify their conclusions, based upon their observations.

If you have any additional instructor notes on files needed throughout the lecture, please include them here. (Verdana, 12 pt.)

We will start with an expository approach by describing the different parts of a computer and their functionalities. We will have various activities to convey these points throughout the lesson.

Activity 1: "Output and Input" Students will identify what parts of a computer provide input and which ones provide output. We will demonstrate on the board how the input is processed and turned into an output. This is a way of abstracting how the computing system operates.

Activity 2: Students will be given a series of inputs matched to their outputs and they have to problem solve what the process in between the input and output was.

Activity 3: Students will be given a series of conditional statements and they will act out what the statement says

