Raspberry Pi Operating System

**Lesson Description:** In this learning module, the teachers will learn the purpose of an operating system for the Raspberry Pi. The teachers will learn the difference between Linux and Windows operating systems. The teachers will load the O/S, then create user accounts within the system.

**Prerequisite Knowledge:** Basic understanding of Raspberry Pi hardware.

**Length of Completion**: 20 minutes

**Level of Instruction:** High School or Middle school introductory level.

**Applicable First Principles &/or Concepts:**

**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:** A new Raspberry Pi kit, external monitor (HDMI input), external keyboard, and external mouse (USB connectors). A PC computer is also required.

**Accommodations Needed:** May need someone to read items that are on the screens if there is a visually impaired participant.

# learning outcomes

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* Explain the purpose of an operating system
* Explain the various functions of an operating system (high level)
* Explain several difference between Linux and Windows

# Lesson Details

**Interconnection:** Lays out foundations of networking which will be referenced in remaining lessons of the day, as well as lessons on Thursday of this week. 4.1 Connecting Raspberry Pi to the Network.

**Assessment:** Operational abilities of the Pi.

**Extension Activities:** None

**Differentiated Learning Opportunities:** None

# lesson 2.2

**Lesson 2.2 Details:**

**Warm Up:** Instructor asks the teachers about their experience with different operating systems over the years. Instructor engages teachers about their knowledge regarding computers they use at home and at work (32 or 64, Windows or Mac or Linux, if Windows: which version).

**Lesson:**

Instructor will demonstrate how to run OS updates on the laptops and Raspberry Pi computers. Teachers will then run updates on their laptop and Raspberry-Pi. Teachers will also create a non-admin/root account.

15 minutes for warm up, 15 minutes for slides and lecture, 10 minutes for exercise. The following topics will be discussed:

1. Operating System

a. Why do we need an OS

b. How does an OS work

2. OS Security

a. How does an OS protect itself and data

b. How does an OS protect users from themselves

c. Accounts

3. Kernel Panic and/or Blue Screen of Death and/or Iron Curtain

Acknowledgement: Lesson developed by Mike Kwiatkowski.