Raspberry Pi and a Webcam

**Lesson Description:** In this learning module, the teachers will learn how to setup a webcam and interface it to the Raspberry Pi.

**Prerequisite Knowledge:** None

**Length of Completion**: 60 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), and a webcam. 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 dangers of a webcam
* Explain appropriate precautions with a webcam
* Demonstrate how to use a webcam with a Raspberry Pi

# Lesson Details

**Interconnection:**

**Assessment:** Post exercise discussions, Observations, Walk around.

**Extension Activities:** None

**Differentiated Learning Opportunities:** More exploration on camera uses

# lesson 2.3

**Lesson 2.3 Details:**

**Warm Up:** Discussion on where students see cameras every day and the smallest cameras they have seen.

**Lesson:**

Instructor will demonstrate the setup of a webcam on a Raspberry Pi. Teachers will each setup a webcam on their own Raspberry Pi.

10 minutes for warm up, 20 minutes for slides and lecture, 20 minutes for exercise, and 10 minutes for troubleshooting and questions. The following topics will be discussed:

1. How to setup a Raspberry Pi webcam server

2. Loading and using Raspbian

3. Load the motion software

4. Loading Raspbian Stretch

5. Configuring motion

6. Edit the motion file for video and picture resolution

7. Outputting the video signal

Acknowledgement: Lesson developed by Mike Kwiatkowski.