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Supporting the Professional Learning of School Leaders and Teachers

Raspberry Pi and Astro Pi

Session 3

Skills Workshop

OIDE and ESERO

Session Overview

PART 1. Getting started with the Camera

PART 2. GPIO and PIR Sensors

PART 3. Mini Project - parent detector / cookie jar security

PART 4. Reflection

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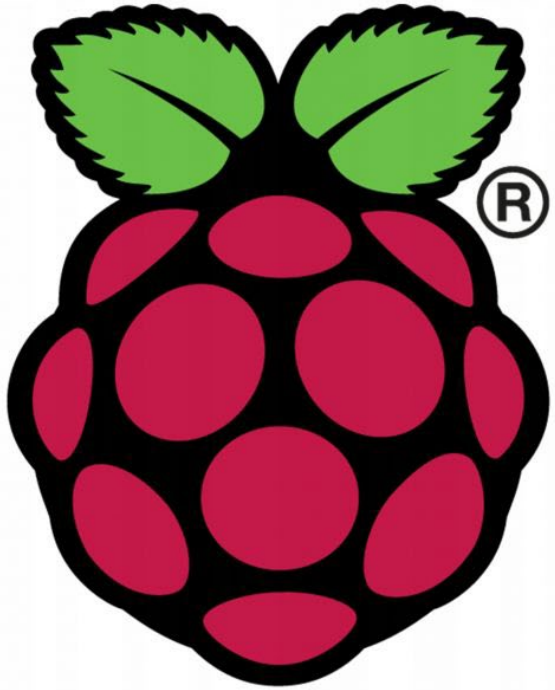
Supporting the Professional Learning of School Leaders and Teachers

The Raspberry Pi and Astro Pi

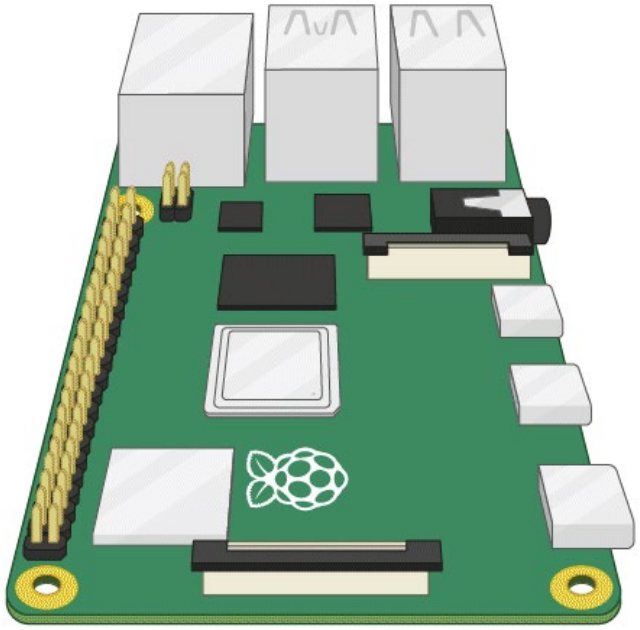
PART 1

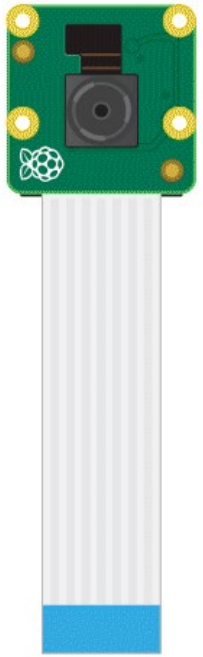
Getting started with the Camera



Raspberry Pi

Camera Module –Say Cheese!
Step 1 - Attach the Camera Module

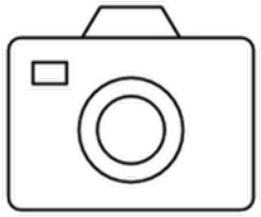




Turn off
RPi first !

Setting up the Camera

Step 2 - Enable camera



Preferences, Raspberry Pi configuration, Interfaces, enable & reboot

Step 3 - Test Connection (via terminal window)

Using Python to control camera

```
from picamera import PiCamera

from time import sleep


camera = PiCamera()

camera.start_preview()

sleep(5)

camera.stop_preview()
```

Using Python to control camera

Oide

```
from picamera import PiCamera

from time import sleep


camera = PiCamera()

camera.start_preview()

sleep(5)

camera.capture('photo_001.jpg')

camera.stop_preview()
```

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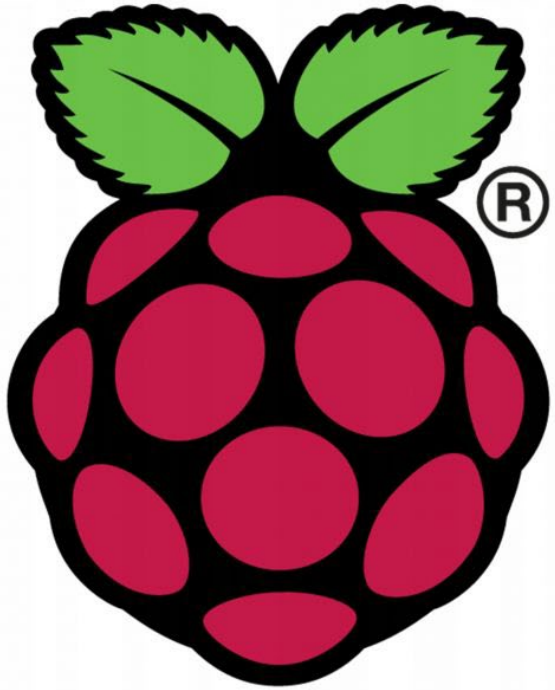
The Raspberry Pi and Astro Pi

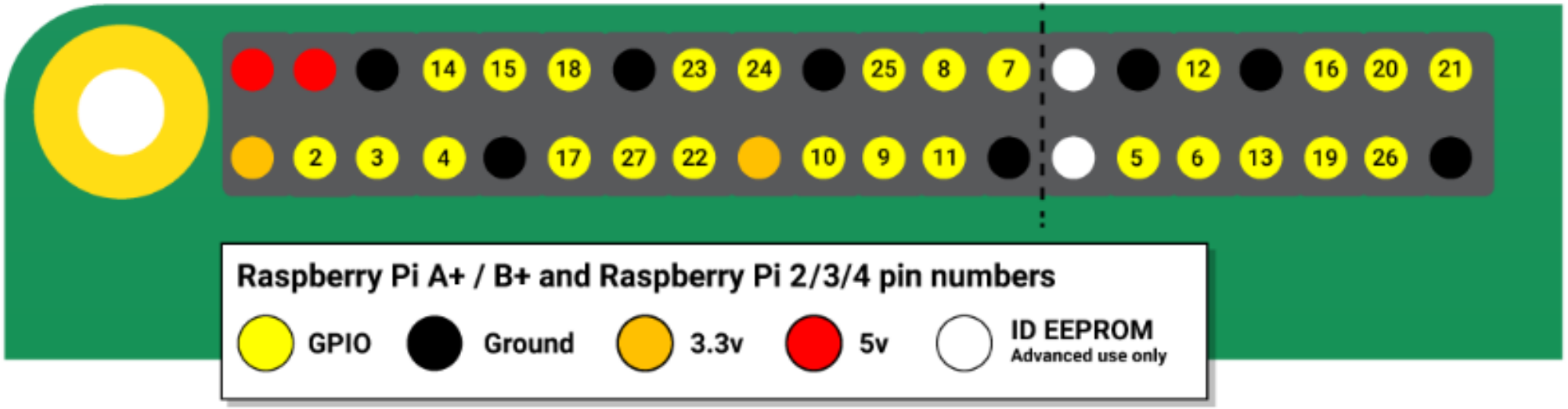
PART 2

GPIO and PIR sensor

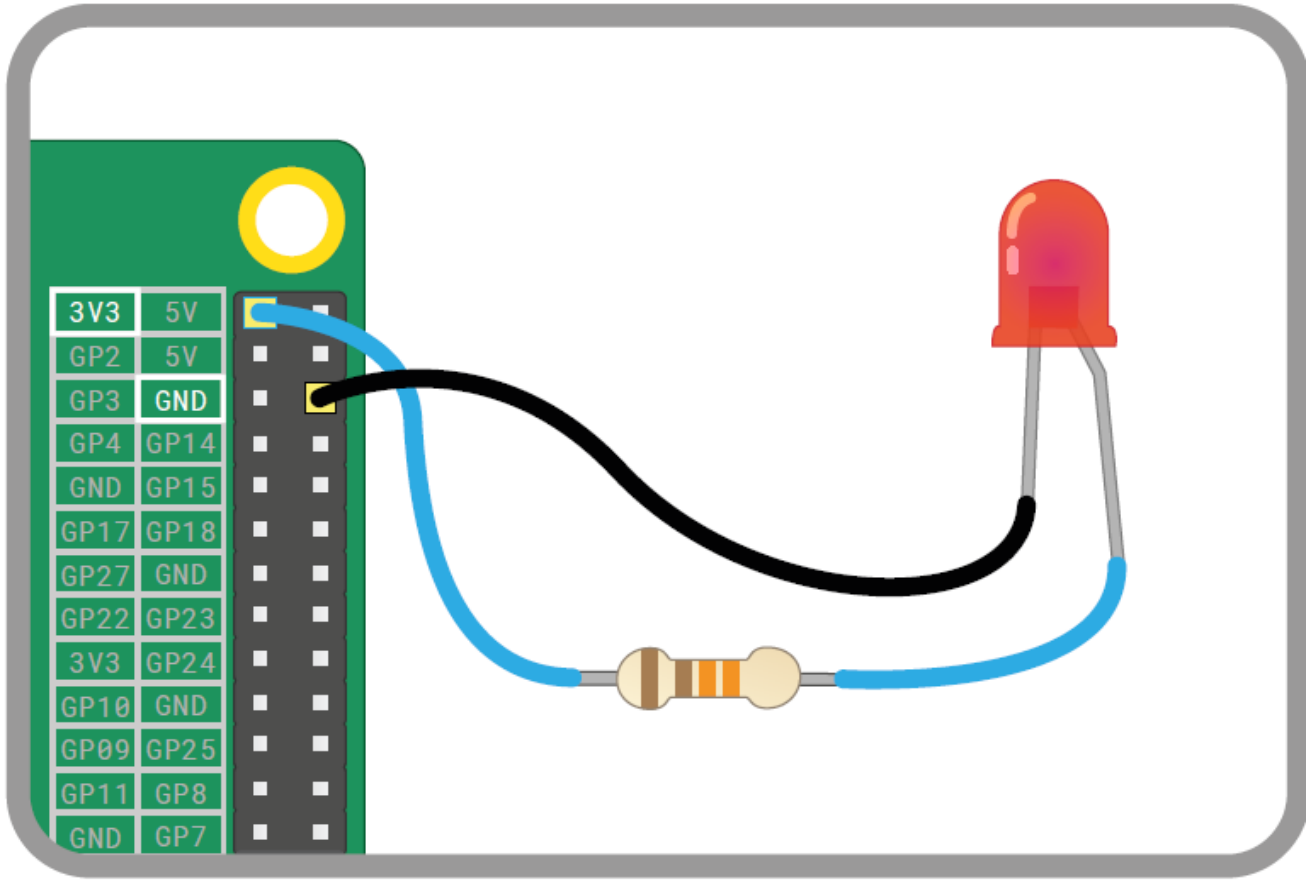


Raspberry Pi

GPIO and the 40-pin header

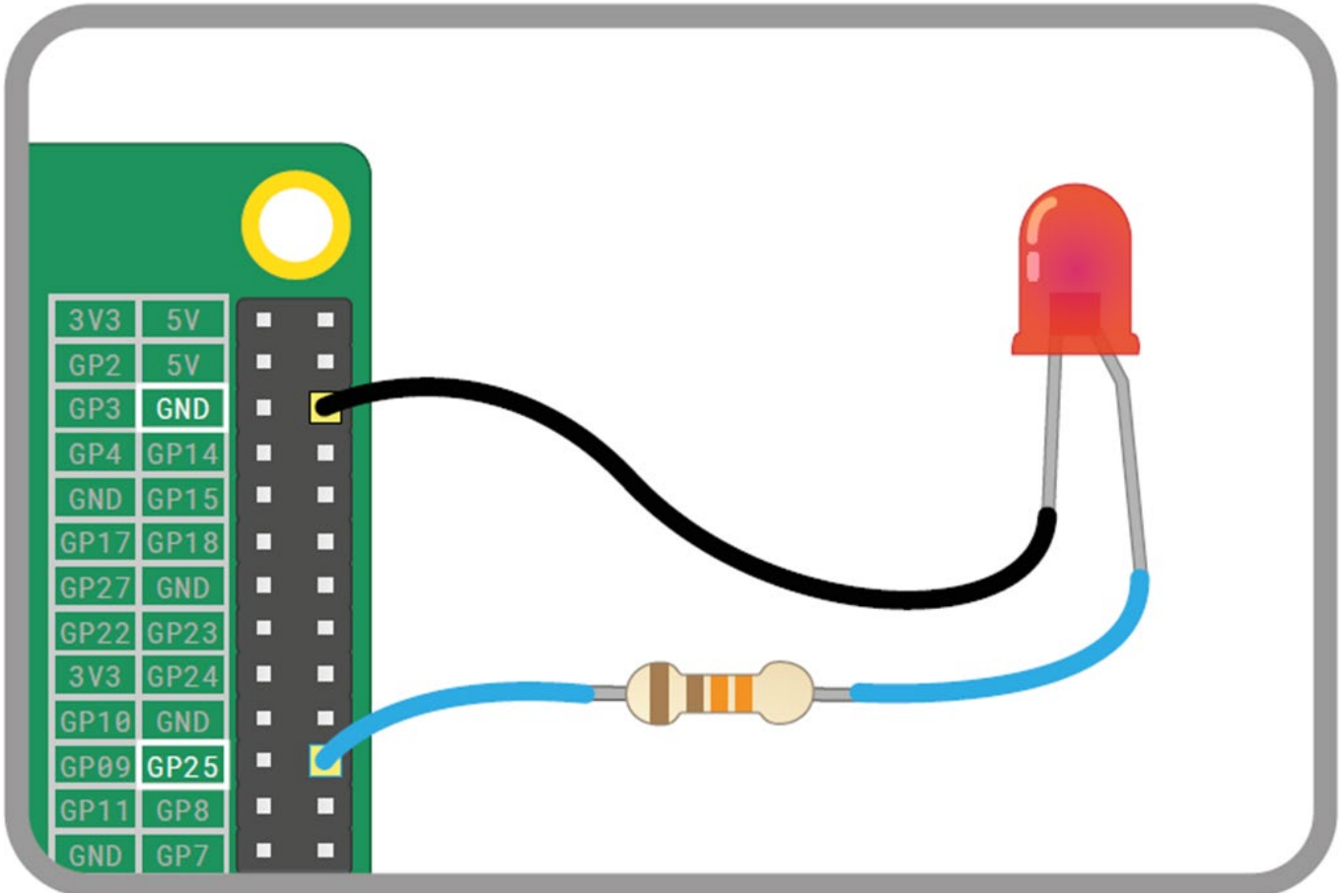


Connecting an LED



Raspberry Pi Beginner's Guide, 4th Edition.pdf - Free download books

GPIO and LEDs



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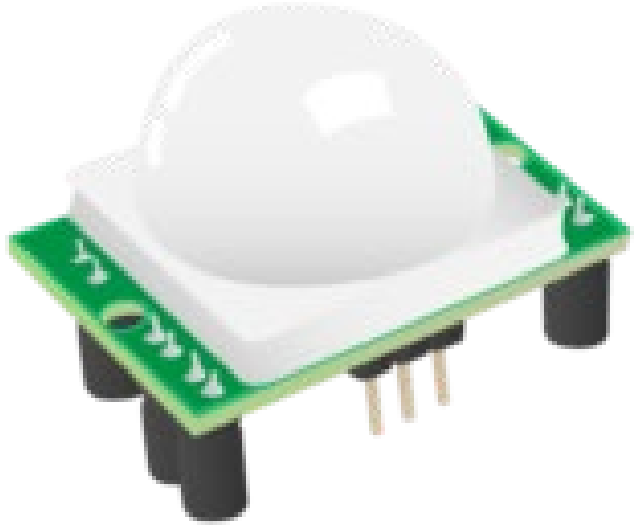
Programming Activity

1. Connect the PIR sensor to your Raspberry Pi.
2. You can use any 5V Pin and GND Pin but for GPIO, use GPIO4
3. Write a program to detect movement

Motion Sensor



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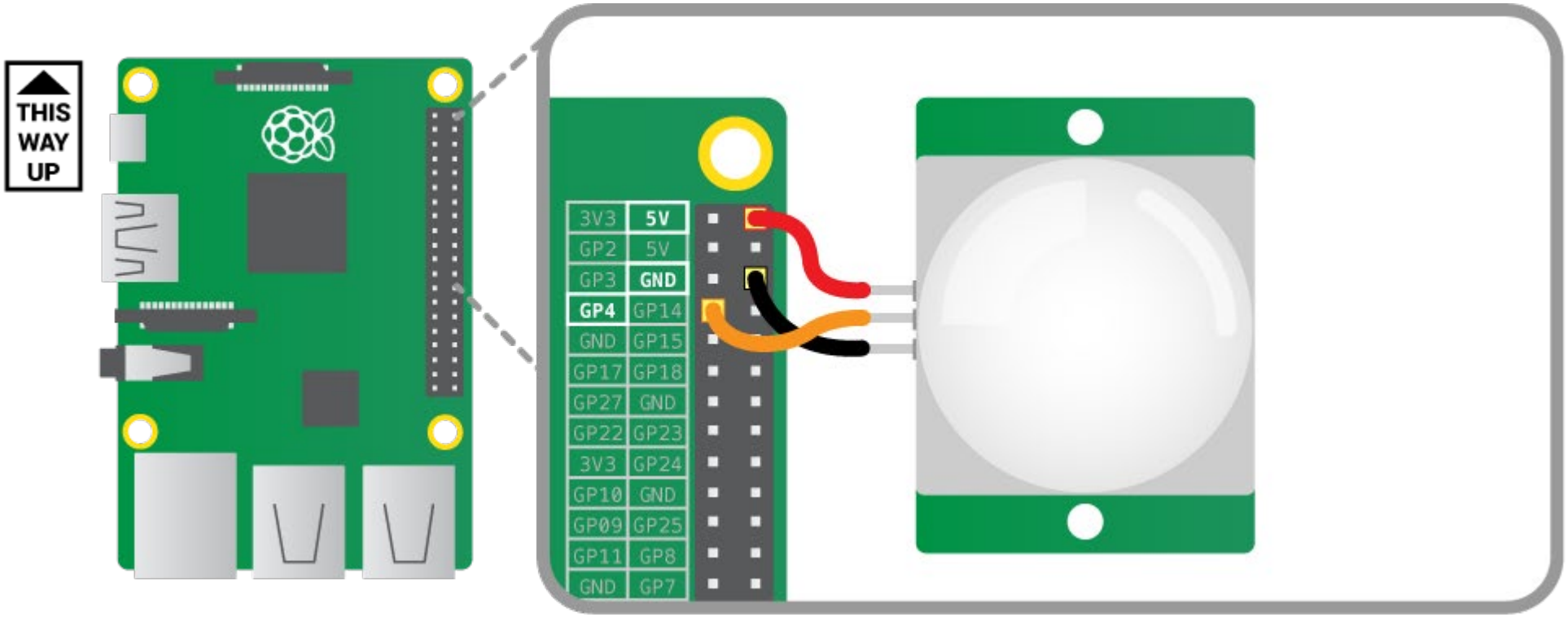
GPIO and PIR Motion Sensor

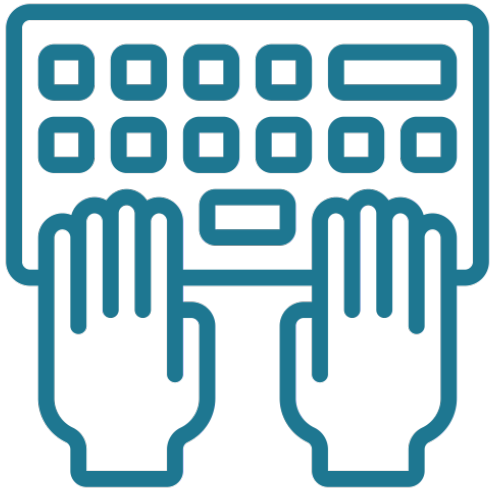


https://projects.raspberrypi.org/en/projects/parent-detector/1

Programming Activity

Task:

Write a program that detects movement



Code Along:

```
from gpiozero import MotionSensor
pir = MotionSensor(4)
while True:
        pir.wait_for_motion()
        print("You moved")
        pir.wait_for_no_motion()
```

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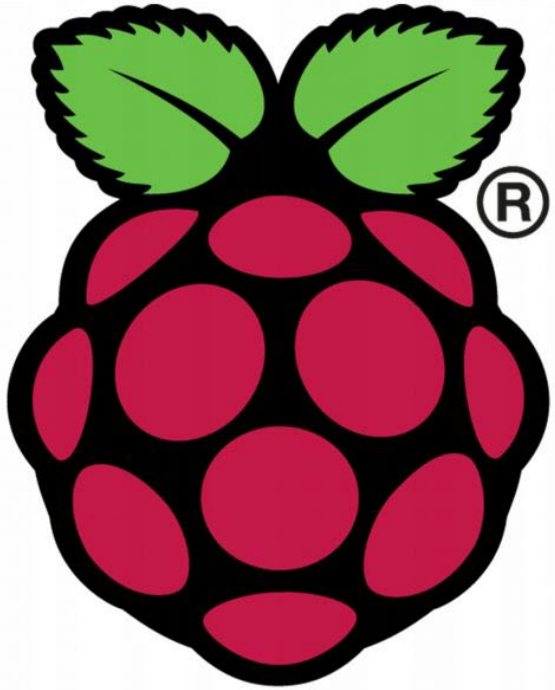
PART 3

Project/Task



Raspberry Pi

Programming Activity

Task:

Write a program that takes a photograph when it detects movement

https://projects.raspberrypi.org/en/projects/parent-detector/0

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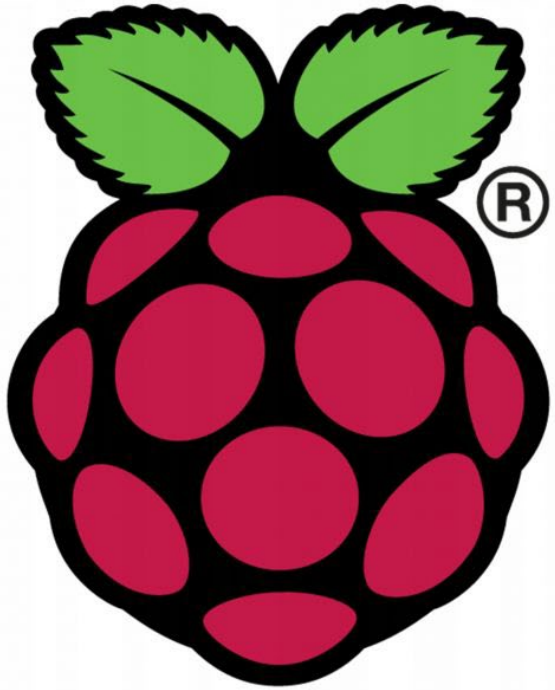
PART 4

Final Reflection



Raspberry Pi

Reflection

- What was your biggest challenge and opportunity?
- How will what you have learned in this session be used in the classroom?
- What aspects of the Leaving Cert Computer curriculum might be addressed by this session?
- What challenges do you foresee when setting up RPI environment in the classroom? E.g.
  - Enabling ease of access for students
  - Safety and security of the machines
  - Working in a traditional computer room – set-up, take-down and storage

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Department of Education