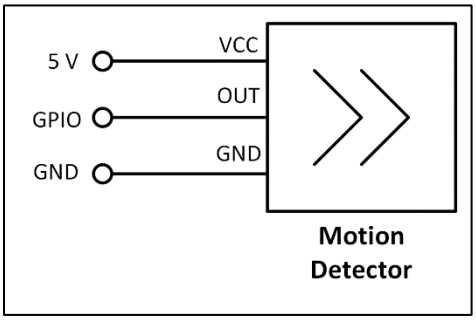
Using the Picademy Parts Kit Motion Sensor

This is a pyroelectric (passive) infrared motion detector of the kind that's used in burglar alarms, motion-activated lights, and similar things. You could use it to light an LED, but you could also use it with a Pi camera or webcam to take a picture when motion is detected. Or something else.

There are several flavors of this gadget. They look alike, but some are wired differently than others. The first thing to do is hold the circuit board firmly by the edges and lift the white plastic lens straight up from the board. It's just held there by friction, so give it a tug. Under the lens are three labels that correspond to the pins on the bottom of the board. They are V_{CC} (power), OUT, and GND. The power pin might be labeled 5V instead of V_{CC}. Carefully note which one is V_{CC}. Maybe even put a little dot on the edge of the board with a magic marker. Press the lens back into place. *Do not rely on the diagrams in this handout, or on the web, to tell you which pin is V_{CC}.*



After you have determined which pin of the motion sensor is VCC, connect GND on the motion sensor to GND on the Raspberry Pi, OUT to a numbered GPIO pin, and V_{CC} to 5V. You will need to adjust your Python code to reflect the GPIO pin number you used; the example below uses GPIO 17.

The motion sensor has adjustments for sensitivity and delay time, and a jumper block for "retriggering." These are described on the next page.

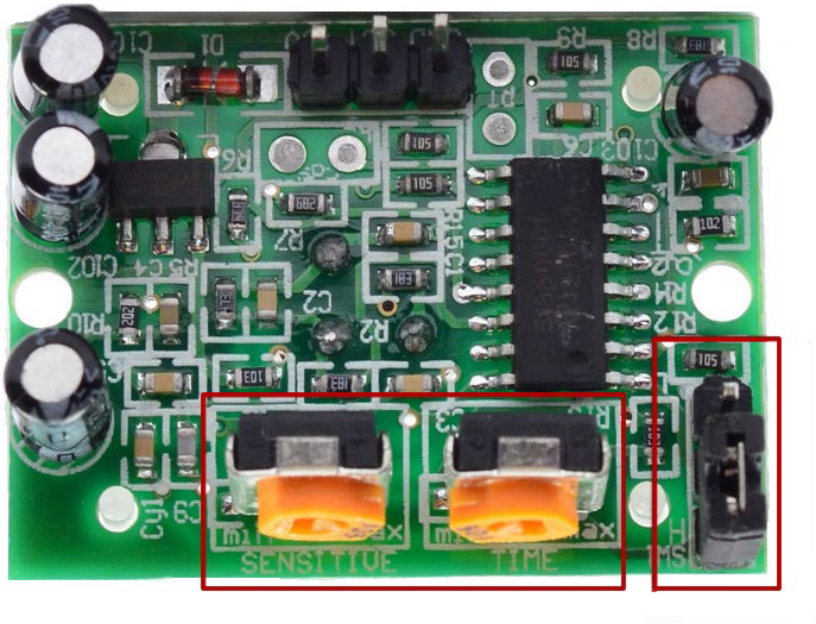
```
# Import the MotionSensor library
from gpiozero import MotionSensor
from time import sleep
pir = MotionSensor(17)
while True:
    pir.wait_for_motion()
    print("Motion detected!")
    pir.wait_for_no_motion()
    print("Went away!")
```

More information about using the motion sensor is here: https://gpiozero.readthedocs.io/en/stable/api_input.html#motionsensor-d-sun-pir

Note: the motion sensor is very sensitive. It may be difficult to get it to stop detecting motion in a crowded classroom.

Adjusting the Motion Sensor

Some adjustments are possible that may make the motion sensor more reliable in your setting.



There are three possible adjustments of the motion sensor, two potentiometers and a jumper. All are on the bottom of the board, *i.e.*, the side opposite the lens and detector. You will need a small screwdriver to adjust the potentiometers.

Retriggering jumper: The retriggering jumper is on the right side of the board in the picture above. It is shown in the H position. In the L position, the output may change from high to low and back as motion is being detected. In the H position, shown, the output should remain high while any motion is detected. In most cases the detector works best with the jumper in the H position.

Sensitivity adjustment: The sensitivity adjustment does what you think it does, controls the sensitivity of the detector. It is the left potentiometer in the image above. Higher sensitivity should detect motion at greater distances. Turning the potentiometer clockwise increases sensitivity; counterclockwise decreases sensitivity.

Time adjustment: The time adjustment potentiometer is located between the sensitivity potentiometer and the retriggering jumper. It controls how long the output remains on when motion is detected. When it is fully counterclockwise the output will remain on for about 2.5 seconds. When fully counterclockwise, output will remain on for up to 250 seconds.

There is a more detailed tutorial about these adjustments here: https://learn.adafruit.com/pir-passive-infrared-proximity-motion-sensor?view=all