## Lab Parts

### Barebones

1. [Raspberry Pi 2](https://www.raspberrypi.org/). With no sensors or [Explorer HAT Pro](http://shop.pimoroni.com/products/explorer-hat) attached the Raspberry Pi can publish memory usage data – enough to get you started and publishing data ☺

### Ideal Hardware

This lab is built around the [Explorer HAT Pro](http://shop.pimoroni.com/products/explorer-hat) as it has a four channel ADC, capacitive touch pads, four coloured LEDs, two H-bridge motor drivers, 5V input and output.

1. [Raspberry Pi 2](https://www.raspberrypi.org/)
2. [Explorer Pro HAT](http://shop.pimoroni.com/products/explorer-hat)
3. [Light Dependent Resistor](https://en.wikipedia.org/wiki/Photoresistor)
4. [Analogue Temperature Sensor](http://au.rs-online.com/web/p/temperature-humidity-sensors/0403838/)

### Optional Extras

1. [Adafruit Mini 8x8 LED Matrix](http://tronixlabs.com/display/led/matrix/adafruit-small-1-2-8x8-led-matrix-w-i2c-backpack-red/)

Explorer HAT Pro [Notes](https://github.com/pimoroni/explorer-hat):

1. The 4 outputs on Explorer HAT can sink 5V, but not source. This means you need to connect your load to one of the 5V pins, and then to the output. When you turn the output on it will connect your circuit to ground, allowing current to flow and your load to turn on. This is the opposite of using a bare Pi GPIO pin, where you might connect to the pin and then to ground; keep this in mind!

### Network Connectivity

#### Ethernet

Connecting multiple Raspberry Pi 2s to the internet is most easily achieved via Ethernet and Windows Internet Connection Sharing. This provides a fast link, great for app deployment to the device, a great debugging experience and shares the PC internet connection with the Raspberry Pi. ICS is also useful as it hides the devices from the network and isolates its use just to the local developer.

1. Ethernet Cable
2. USB Ethernet Dongle if you lack an Ethernet connection on you PC

#### Wi-Fi

There is great Wi-Fi support on the Raspberry Pi running Windows 10 IoT Core. However, in a lab environment where there are multiple development machines and Raspberry Pi 2s the setup is more complex as you need a way to isolate and provide a link between each Raspberry Pis and their corresponding PC.

This can be achieved by

1. Setting the Raspberry Pi address in Visual Studio remote client configuration.
2. Rename each Raspberry Pi and use that unique name in the Visual Studio remote client configuration.
3. If you want to use a consistent Raspberry Pi name then you could map the Raspberry Pi IP address in the PC Host file.

#### Raspberry Wi-Fi compatible dongles

See <http://ms-iot.github.io/content/en-US/win10/SupportedInterfaces.htm>