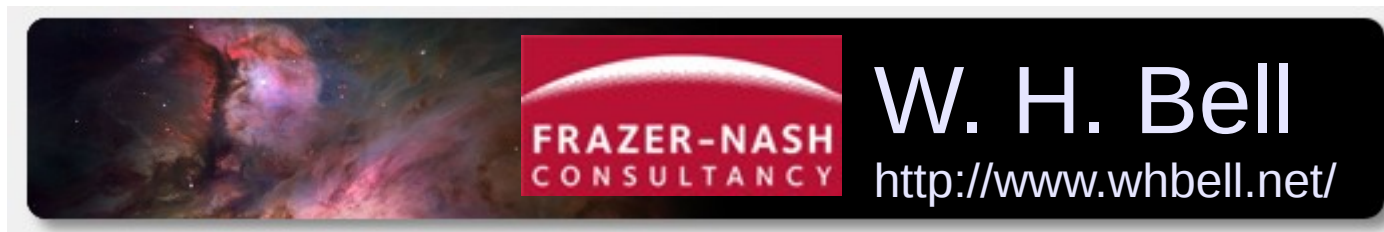


# Raspberry Pi

## Introduction & motivation



<http://www.fnc.co.uk>

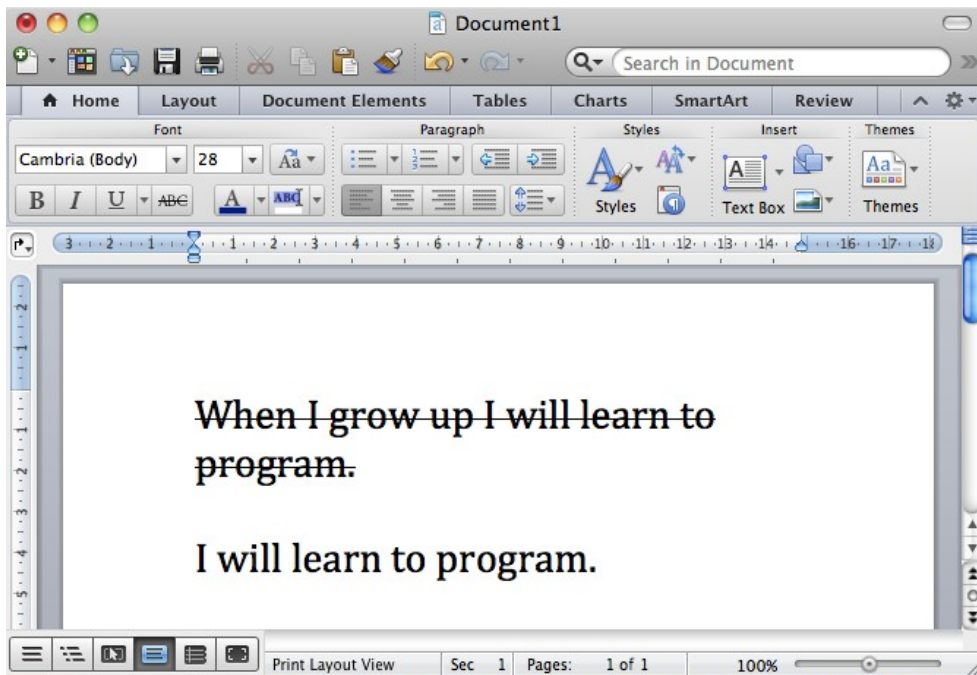
Raspberry Pi Day  
University of Strathclyde  
12/12/2015

# The problem

- Difficult to teach programming at University
  - Students panic, due to lack of experience
- Programming needed for general solutions
  - Stuck when one cannot buy the software needed
  - Students that cannot program miss opportunities

# Education

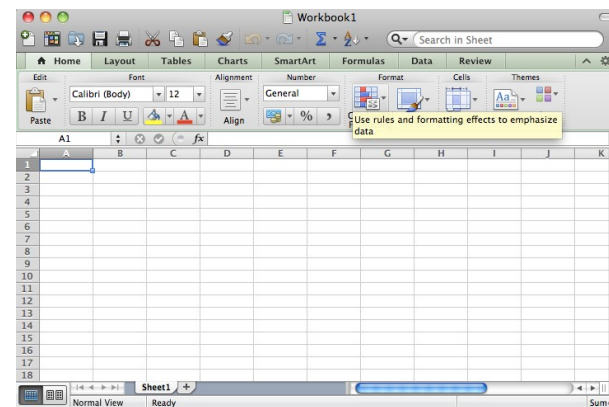
## Word processing



Some Scratch programming

Spreadsheet? HTML?

## Web surfing



# At home

Interesting devices, but locked down.  
Cannot compile source code or use for project.

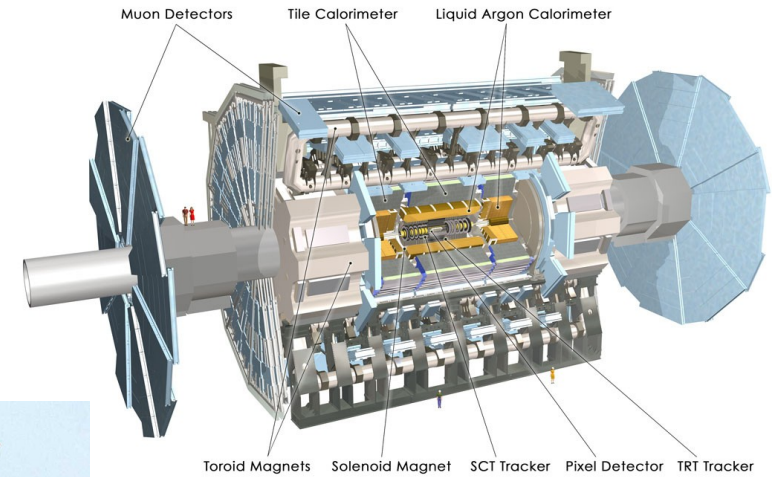
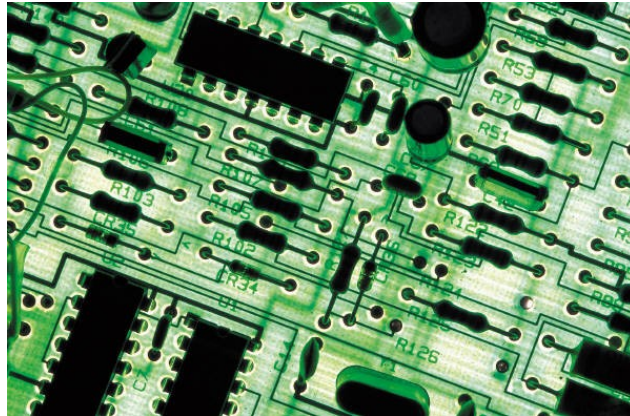


Home PCs used for photo collection, not for experimentation.  
Not enough money to buy many standard PCs for many projects.



# Programming

Used in many applications



# Gaining IT competency

- Need to experiment in a safe environment
  - Need easy I/O connections to connect to other devices.
- Different projects on different computers
  - Deploy computers in remote locations, with battery power or solar cells.
- Experiment with technologies
  - Web servers, file servers, parallel computing, networking, cryptography



# Project ideas

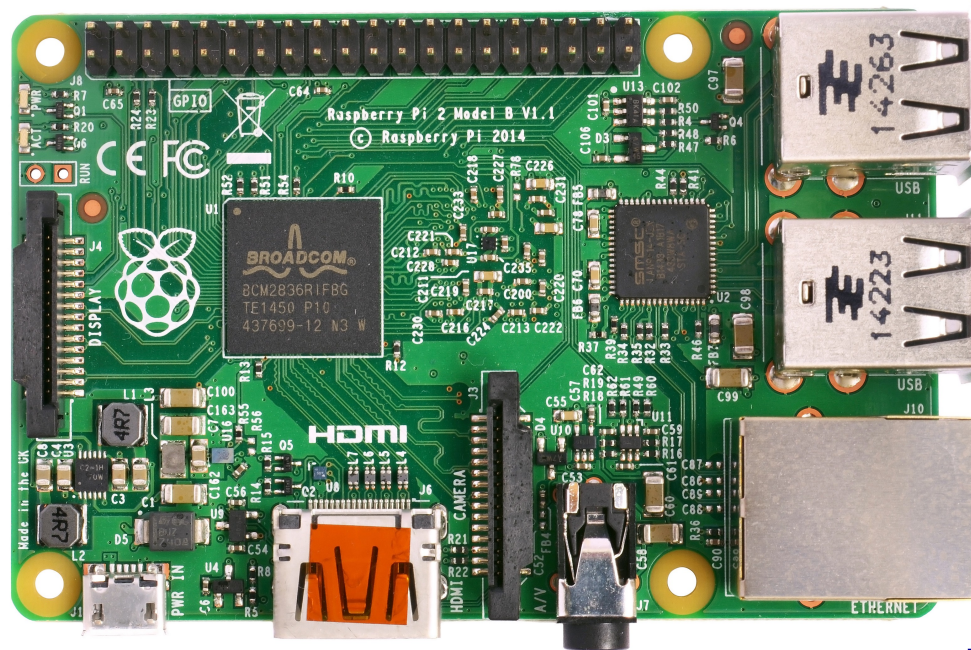
Submarine      Oscilloscope

Robotics

Web server

Weather station

WiFi access point



Spacecraft

File server

Home automation

# GPIO Header & OS

	Pin 1	Pin 2		Pin 39	Pin 40
+3V3			+5V		
GPIO2 / SDA1			+5V		
GPIO3 / SCL1			GND		
GPIO4			TXD0 / GPIO 14		
GND			RXD0 / GPIO 15		
GPIO17			GPIO 18		
GPIO27			GND		
GPIO22			GPIO 23		
+3V3			GPIO 24		
GPIO10 / MOSI			GND		
GPIO9 / MISO			GPIO 25		
GPIO11 / SCLK			CE0# / GPIO8		
GND			CE1# / GPIO7		
GPIO0 / ID_SD			ID_SC / GPIO1		
GPIO5			GND		
GPIO6			GPIO12		
GPIO13			GND		
GPIO19 / MISO			CE2# / GPIO16		
GPIO26			MOSI / GPIO20		
GND			SCLK / GPIO21		



Raspbian



OSMC



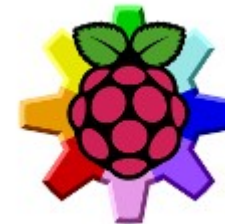
Ubuntu Snappy



Ubuntu Mate



OpenELEC



RiscOS



Windows 10 IoT



# Summary

- Need to improve IT competency
  - Programming, interfacing, other skill sets
- Often difficult to experiment with computers at school or at home
  - Can improve at school and at home
- The Raspberry Pi provides a flexible solution
  - Allowing experimentation
  - Open OS & standard programming tools