

CLASSROOM HANDOUT

Raspberry Pi GPIO in one page

Keep this beside the Pi. The card on the header says the same thing.

Name _____ Class _____

What the 40 pins are

The row of 40 pins on a Raspberry Pi is called the GPIO header. GPIO means General Purpose Input/Output: each pin can be switched on or off by your program, or read to see whether something outside has switched it on or off. Some of the 40 are not general purpose at all - they are fixed power and ground pins, and a few are reserved.

2 pins give 5 V

Pins 2 and 4. Power out only - never connect 5 V back into a GPIO.

2 pins give 3.3 V

Pins 1 and 17. This is the voltage the Pi's logic runs at.

8 pins are ground

6, 9, 14, 20, 25, 30, 34, 39. Every circuit needs one.

The mistake almost everyone makes once

Pin 12 is not GPIO 12.

There are two ways of counting. Physical pin 12 carries GPIO 18. GPIO 12 is over on physical pin 32. Check which one your code is using before you blame the wiring.

Colour tells you the job

COLOUR KEY

- | | |
|-----------------|---------------------------------------|
| ● 5V power | ● UART TXD / RXD |
| ● 3.3V power | ● SPI0 MOSI / MISO / SCLK / CE0 / CE1 |
| ● Ground | ● Hardware PWM |
| ● I2C SDA / SCL | |

The rule that protects the Pi

3.3 V logic only - not 5 V tolerant

A GPIO pin expects 3.3 V. Putting 5 V on one can destroy the chip, and it cannot be repaired. Many sensors and modules output 5 V. Check the datasheet before you connect anything. If a part only works at 5 V, use a level shifter or a voltage divider - ask before wiring it. Pins 2 and 4 hand out 5 V. That is the Pi giving power, not the Pi accepting it.

Try it

1. Put the card on the header with pin 1 over pin 1. Which end of the Pi is pin 1 nearest?
2. Find a ground pin without counting. Which colour did you look for?
3. You need I2C. Write down the two physical pin numbers and the two GPIO numbers.
4. Your module says it outputs 5 V on its signal pin. What do you do, and why?
5. Turn the card over. Name one pin that is blank on the back, and say what that means.