



Blink

1

- Get to know the Arduino, some of its components, and the IDE
- Make an LED flash on and off

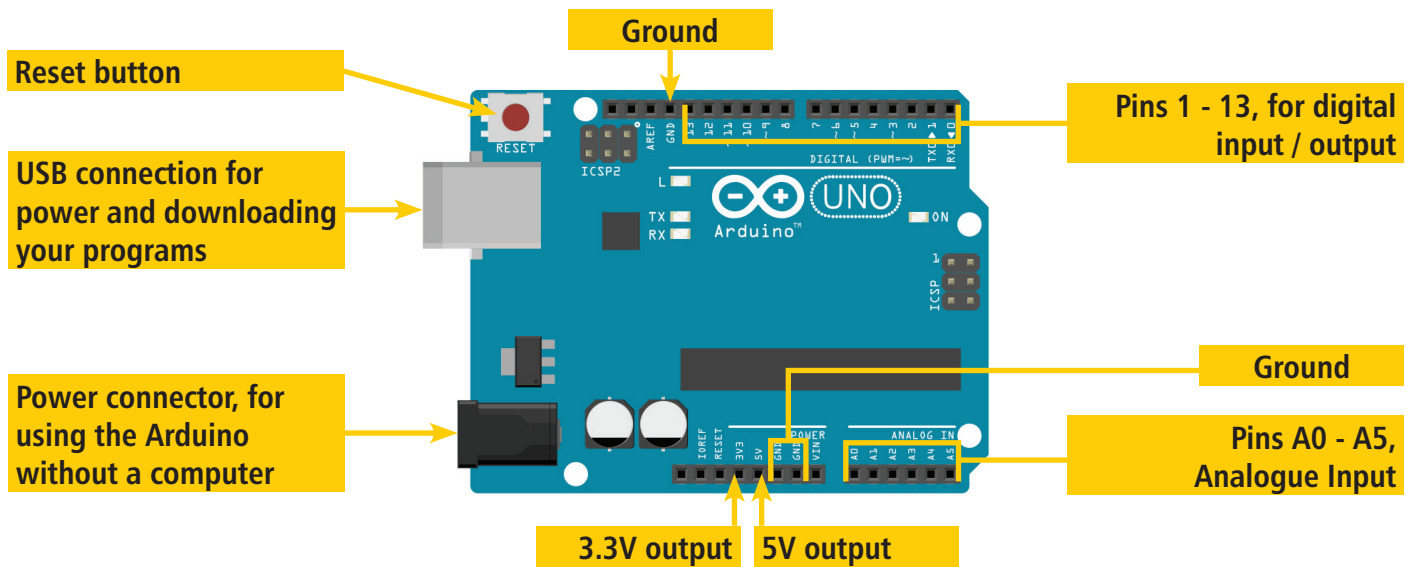


30 mins

1. Introduction to components

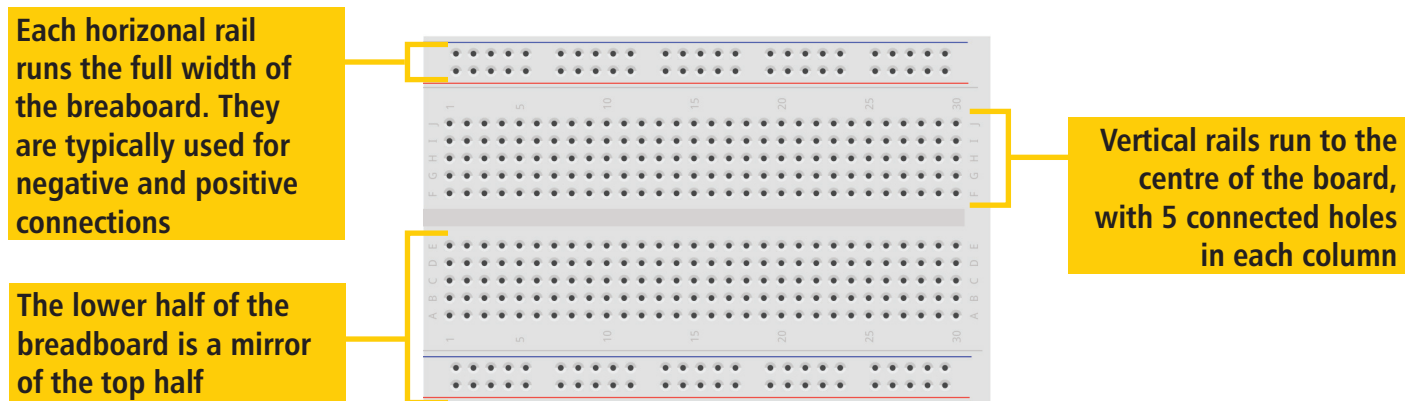
The Arduino Uno

The Arduino Uno is a microcontroller board which you will program to control various electronic components.



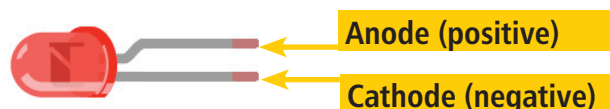
Breadboard

The pins of electronic components are inserted into holes in the breadboard. This allows you to quickly and easily build and change electronic circuits without the need for soldering.



Light emitting diode (LED)

LEDs must **always** be used with a resistor, or they may be damaged. LEDs must be used the correct way around. The short pin (straight leg in diagrams) is the cathode (negative).



Resistor

Reduces current flow in a circuit. Resistance is measured in ohms, and is shown using a code of different coloured stripes. For this project, you need a 220 ohm resistor (red, red, brown).



2. Warning



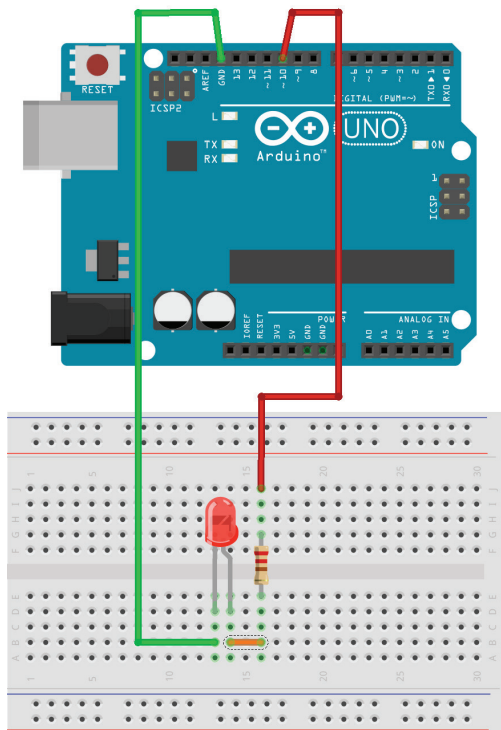
The components may have sharp points or edges. Be careful not to injure yourself when using them.

3. Add the components

Connect your components as shown.

The colour of the wires (called jumpers) is not important.

Remember to check that the LED is inserted the correct way around. Inserting it the wrong way around will not damage it, but it just won't do anything.



4. Starting the Arduino IDE

The Arduino is programmed using a language which is similar to C, a very useful and commonly used language. An Arduino program is called a *Sketch*.

Open the Arduino IDE on your computer and make a new Sketch.

Sketches are in two basic functions: the *setup* and the *loop*.

Code in the `setup()` function will run once to get things started

Code in the `loop()` function will run continuously
Add the code as shown. The comments (in grey) explain what each line does.

```
void setup() {  
  // Initialise pin 10 for output  
  pinMode(10, OUTPUT);  
}  
  
void loop() {  
  // Write to pin 10, high voltage (on)  
  digitalWrite(10, HIGH);  
  // Wait 1 second  
  delay(1000);  
  // Write to pin 10, low voltage (off)  
  digitalWrite(10, LOW);  
  // Wait 1 second  
  delay(1000);  
}
```

5. Upload your Sketch

Verify



Upload

Connect your Arduino to your computer using a USB cable. In the IDE, go to the Tools menu and ensure that the correct type of Arduino is selected in the Board menu, and the correct USB port in the Port menu.

You can check that your program compiles correctly by pressing the Verify button.

Press the Upload button to transfer your Sketch to the Arduino. After a few seconds, your LED should begin blinking.

6. Challenge activity

Congratulations on creating your first electronics project. Can you add another LED which is on when the first one is off, and vice versa?