

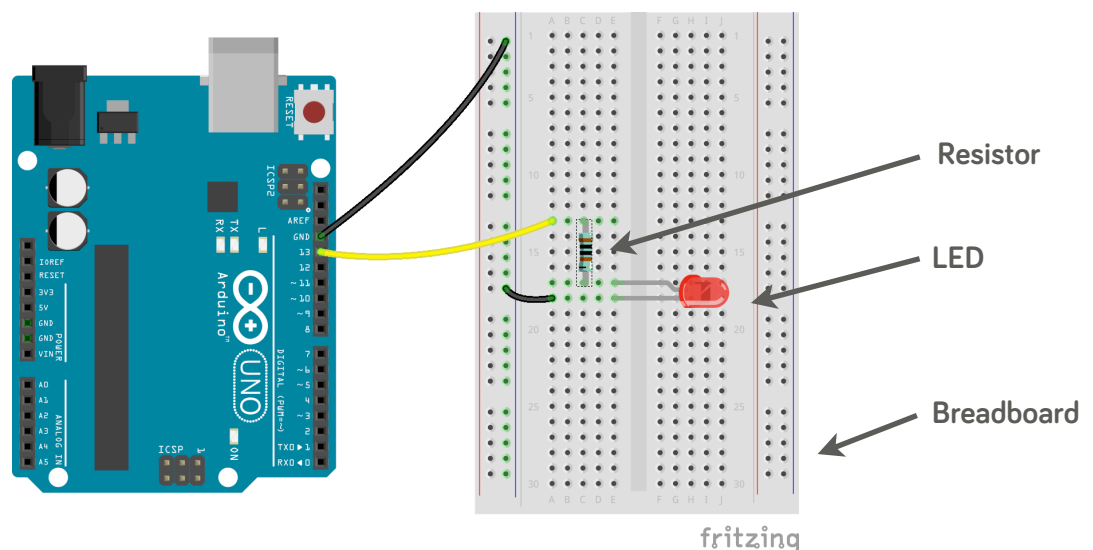
Arduino - Making Your First Circuit

In this tutorial, we will extend the “Getting Started” task to make an external LED light up rather than using the on-board LED. This will give you your first chance to build a circuit!

Step 1: Let’s build the circuit. For this you will need the following in addition to your Arduino board:

- Two wires.
- An LED of your favourite colour.
- A 1K Resistor. These should be labelled, but if not the bands on the resistor will be coloured (Brown, Black, Red, Gold) in that order. You can find more about resistors on our “Guide to Resistors” activity sheet.
- A breadboard - is a small board which you can push components into to make circuits. Under the plastic the holes are connected together. The green lines in the diagram below show how they are connected.

Step 2: We will build the following circuit (note that pins may be located in different places on your Arduino):



That is:

1. Connect a wire into digital pin “13” on your Arduino, and then into a row of the breadboard.
2. Connect a wire from pin “GND” on your Arduino, and the other end somewhere into the “-” column of the breadboard.
3. Connect one end of the resistor into the same row as the wire from PIN 13, and the other end into a spare socket on the breadboard itself - so that the resistor is vertical. You will need to bend the legs of the resistor to do this
4. Connect the long arm of the LED into the socket directly on the right (next along) of where you have just connected your resistor. Then connect the short leg of the LED into a socket in the row below the long leg of your LED.
5. Connect a wire into the same row as the short leg of your LED and the other into “-” column.

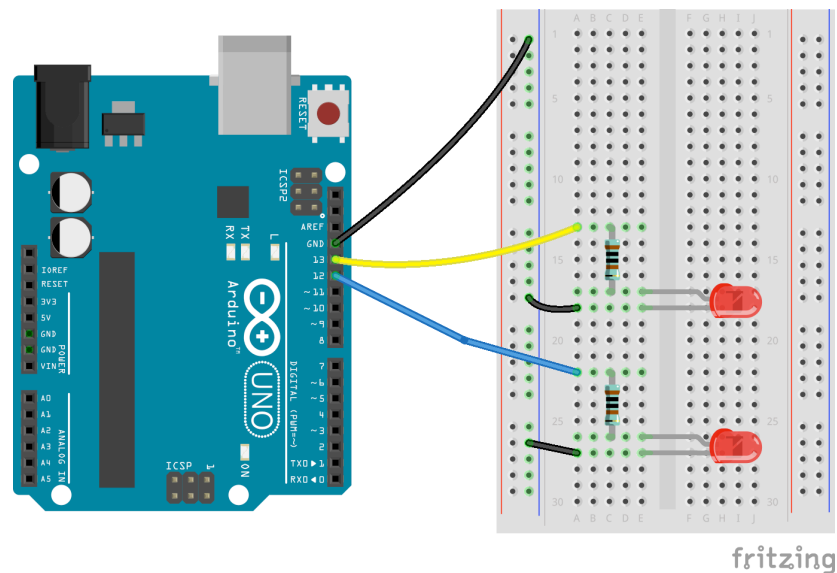
Step 3: Edit the program from our “Getting Started” task sheet so that it now sends signals to pin 13, your program should now look something like the following:

```
void setup() {  
  // put your setup code here, to run once:  
  pinMode(13, OUTPUT)  
}  
  
void loop() {  
  // put your main code here, to run repeatedly:  
  digitalWrite(13, HIGH);  
  delay(100);  
  digitalWrite(13, LOW);  
  delay(100)  
}
```

Note that any lines beginning with “//” are comment lines that do not effect how the program runs, but help people reading the code to understand it.

Step 4: Upload you program to your Arduino and watch the LED blink!

Challenge: Connect a second LED to pin “12”, and make that blink in an alternative pattern to the LED connected to pin “13”. Hints: you will only need one more wire, another resistor and an LED, as you can connect the second LED’s to the same common ground, i.e. the “-” column on the breadboard. You will also need to think about how to change your code!



If you have problems during this process, please see the troubleshooting guide at:

<https://www.arduino.cc/en/Guide/Troubleshooting>

Find more activities at:

<http://www.swansea.ac.uk/compsci/undergraduate/openandvisitdays/>