

★ Beginner ⌚ 10 minutes

Your first breadboard circuit

A practice project to discover how a breadboard works. You build an LED with a resistor on the breadboard. First you make it light up with the 5V strip, without code. Then you make it blink with pin 13.

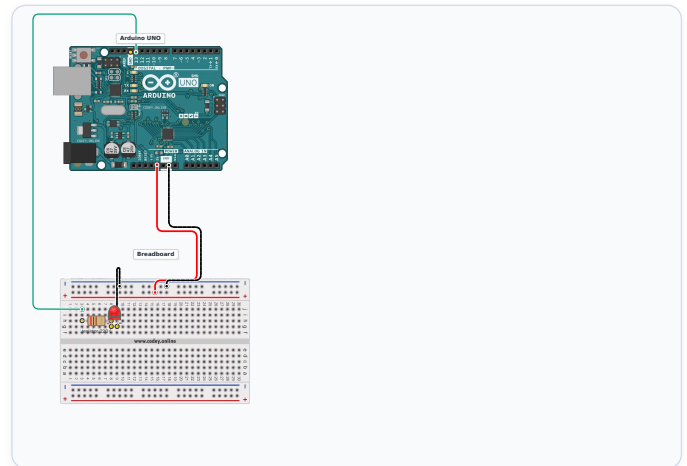
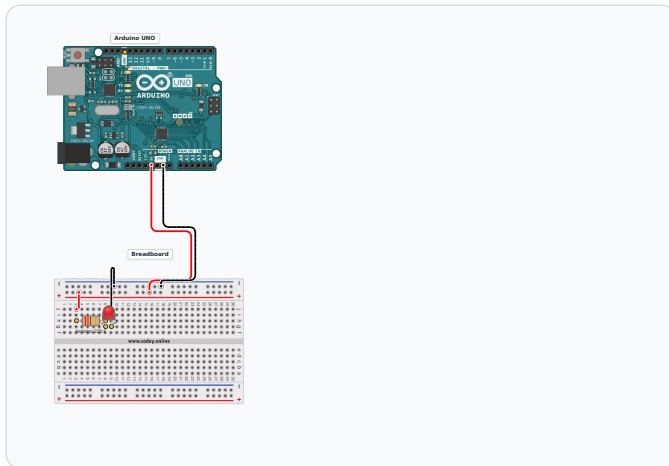
Wiring diagram

Step A: make the LED light up (without code)

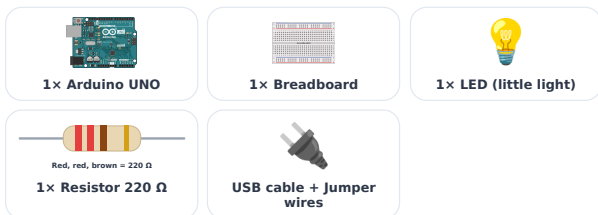
The red wire goes from the + strip to row 3. The current then flows like this: 5V → + strip → resistor → LED → - strip → GND. Is the LED on? Then you used the breadboard well!

Step B: make the LED blink with pin 13

Remove the red wire between the + strip and row 3. Put a wire in its place from pin 13 to row 3. Now the Arduino decides when the LED gets power.



What do you need?



This is how you build it

1. Connect 5V on the Arduino to the + strip at the top of the breadboard (red wire).
2. Connect GND on the Arduino to the - strip next to it (black wire). Now you have two power strips.
3. Put the 220 Ω resistor from hole H3 to hole H8. It is then in two different rows.
4. Put the long leg of the LED in G8 (same row as the resistor) and the short leg in G9.
5. Connect hole J9 to the - strip (black wire). This lets the current go back to GND.
6. Step A: connect the + strip to hole J3 (red wire). The LED lights up!
7. Step B: remove that red wire and connect pin 13 to hole J3 (green wire).
8. Let Codey make the code: click MAKE THIS, or type this yourself in the chat: "Make the LED on pin 13 blink every second." Then click Compile & Upload to board.

The code

```
// Your first breadboard circuit
// The LED on the breadboard turns on and off. It gets power from pin 13.

const int LED_PIN = 13; // The green wire goes from pin 13 to the breadboard

void setup() {
  pinMode(LED_PIN, OUTPUT); // Pin 13 is an output: it gives power
}

void loop() {
  digitalWrite(LED_PIN, HIGH); // LED on
  delay(1000); // wait 1 second
  digitalWrite(LED_PIN, LOW); // LED off
  delay(1000); // wait 1 second
}
```

What does the code do?

- Pin 13 is an output. With `HIGH` it gives 5V, with `LOW` it gives nothing.
- In `loop()` we turn the LED on, wait 1 second, turn it off, and wait again.
- The current flows through the breadboard: pin 13 → row 3 → resistor → row 8 → LED → row 9 → - strip → GND.

Try this...

- Make the LED blink twice as fast
- Add a second LED on the breadboard that blinks in turns
- Make the LED blink three short times and then stay off for a bit

🚀 Build this project with Codey: open codey.online/starter-kits/uno/projects/breadboard-led and click MAKE THIS. Then the code and the wiring diagram are ready right away.