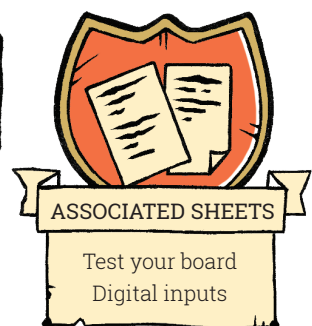# USE A SWITCH
You will be configuring and flipping a switch!

EASY

NECESSARY HARDWARE

– a switch
– a 1000 ohms resistor
– a breadboard
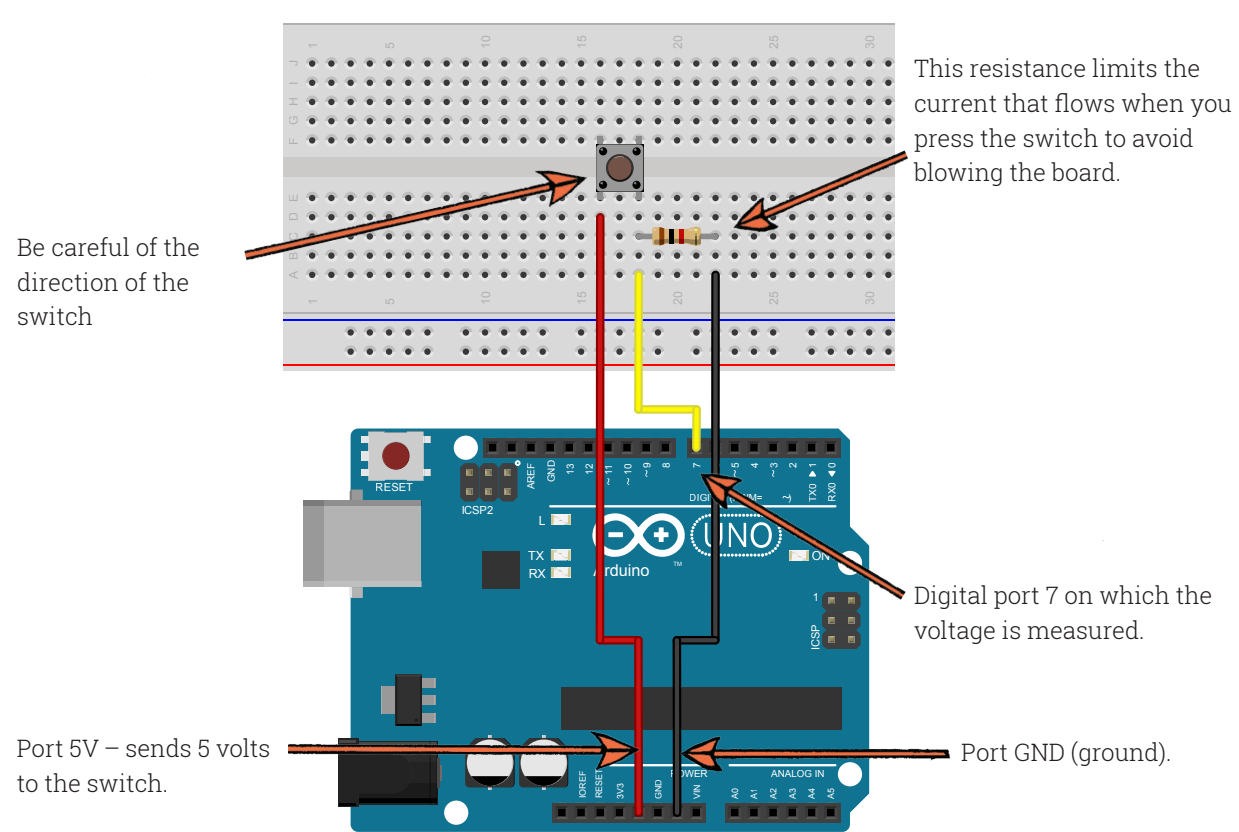– small electrical wires
– possibly a multimeter

COMPLETE THIS ELECTRICAL SETUP

The switch in the basic Arduino kit has four contacts. The two contacts used in the circuit must have zero resistance when you press the switch and an infinite resistance otherwise. If you have a multimeter, use it to check this. If not, follow the assembly guide below and reverse the switch if it does not work.

This resistance limits the current that flows when you press the switch to avoid blowing the board.

Be careful of the direction of the switch

Digital port 7 on which the voltage is measured.

Port 5V – sends 5 volts to the switch.

Port GND (ground).

When you press the switch, the voltage on the yellow wire is 5 volts. When you don't press it, the voltage is zero because of the resistor that connects the yellow wire to the ground. Without this resistor, the voltage would remain undetermined.

COPY THIS PROGRAM

The digitalRead(7) instruction orders the board to read the voltage of port 7. There are two possible results:
HIGH (5 volts) or LOW (0 volts).

```
// setup to initialize the board
void setup() {          // start of setup
  pinMode(7, INPUT) ; // initialize digital port 7 as input
  Serial.begin(9600) ;// initialize serial communication with computer
}                       // end of setup

// this loop will continue indefinitely
void loop() {                       // start of loop
  if (digitalRead(7) == HIGH) { // if one measures 5 V on digital input 7
    Serial.println(" ON ! ") ;   // one sends " ON! " to computer
  }
  else {                          // if one does not measure 5 V
    Serial.println(" Off ... ") ; // one sends " Off ... "  to the computer
  }
  delay(100) ;                    // one sends " Off ... "  to the computer
}                                 // end of loop
```

This instruction asks the board to send a message to the computer through the USB cable.

A similar program is easily accessible through the software menu (File menu, Examples, Basics, program DigitalReadSerial).

UPLOAD

You must read the messages that the board sends to the computer. To do this, use the serial monitor (in the Tools menu of the Arduino software). If strange characters appear, check the connection speed of the serial monitor, which should be the same as the one used to initialize communication in the program (9600 bauds). Now press the switch and watch what happens on the serial monitor.

TAKING IT FURTHER

Swap the black and red wires and observe what happens.

THE ULTIMATE CHALLENGE!

Modify your program so that the test LED on the Arduino board flashes when you press the switch.