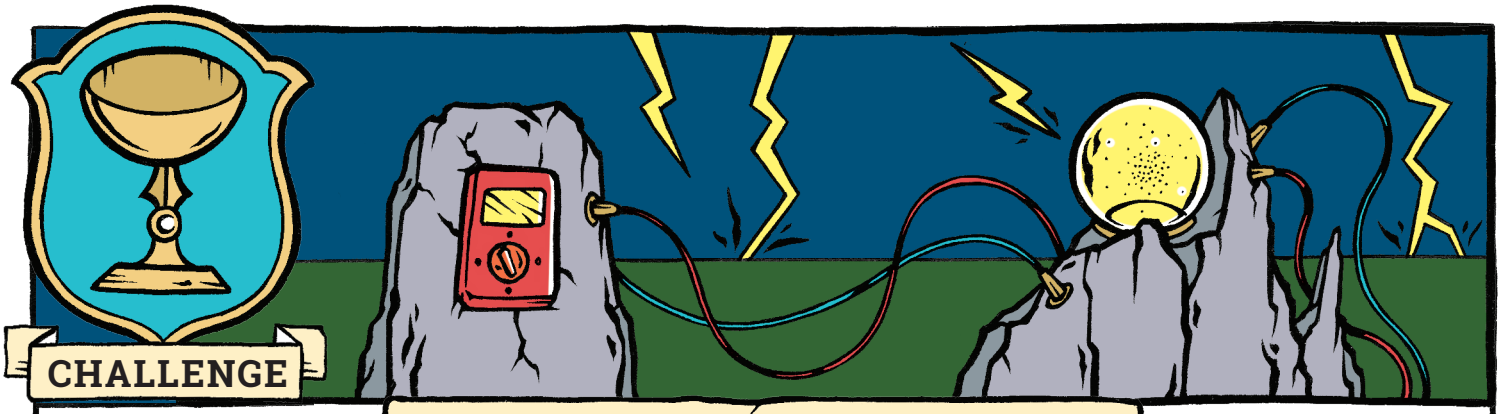


MEASURE VOLTAGE

You will measure voltage with your board!

EASY

NECESSARY HARDWARE

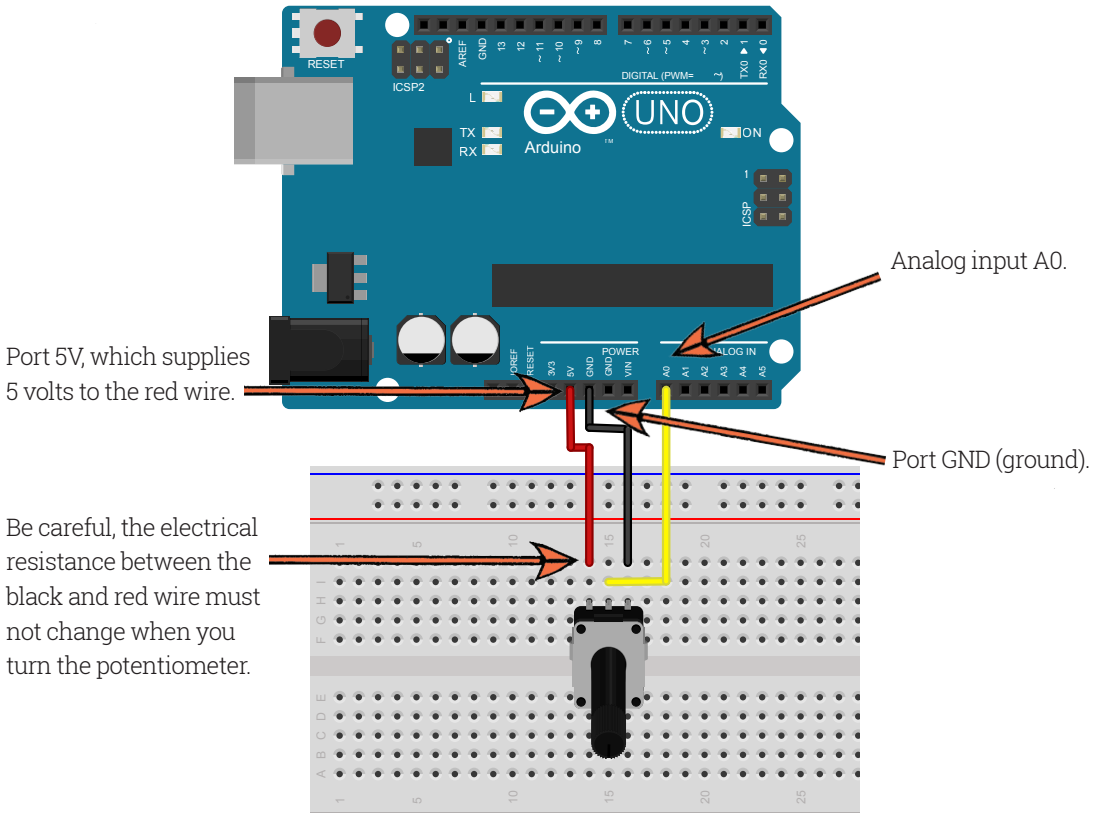
– a potentiometer of 10 000 ohms
– a breadboard
– small electrical wires
– possibly a multimeter

ASSOCIATED SHEETS

Test your board
Analog inputs

COMPLETE THIS ELECTRICAL SETUP

A potentiometer has three contacts. The electrical resistance between two of these contacts does not vary when you turn the potentiometer: it is these two contacts that must be connected to port 5V and to port GND. (If you have a multimeter, you can check where these contacts are located, if not, trust in the setup below.)



COPY THIS PROGRAM

```
int MeasuredVoltage ;              // one defines the MeasuredVoltage variable
                                   // this variable can store values

// setup to initialise the board
void setup() {                     // start of setup
  Serial.begin(9600) ;             // initialize serial communication with the computer
}                                  // end of setup

// this loop will continue indefinitely
void loop() {                                  // beginning of loop
  MeasuredVoltage = analogRead(A0) ;           // one measures the voltage on port A0
                                               // and attributes the MeasuredVoltage variable
  Serial.println(MeasuredVoltage) ;            // one sends the measured value to the computer
  delay(100) ;                                 // wait 0.1 seconds (100 milliseconds)
}                                              // end of loop
```

A variable allows you to store a value in a program. You have to declare them before using them: int is the type of variable (an integer), MeasuredVoltage is the name of the variable.

Short waiting time between two consecutive measurements

This instruction triggers the voltage measurement on port A0

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

UPLOAD

The Arduino board will measure the voltage on the A0 port then send the results to the computer. To read it directly through a computer, 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 must be the same as that used to initialise communication in the program (in this case 9600 bauds).

Turn the potentiometer and see what happens to the serial monitor!

TAKING IT FURTHER

Connect the red wire to port 3V3 and see what happens (this port delivers 3.3 volts). Find the relationship that allows you to transform what shows in the serial monitor into volts.

THE ULTIMATE CHALLENGE

Modify your program so that the test LED on the Arduino board lights up when the voltage measured exceeds 3.3 V (you will have to use "if... else....")