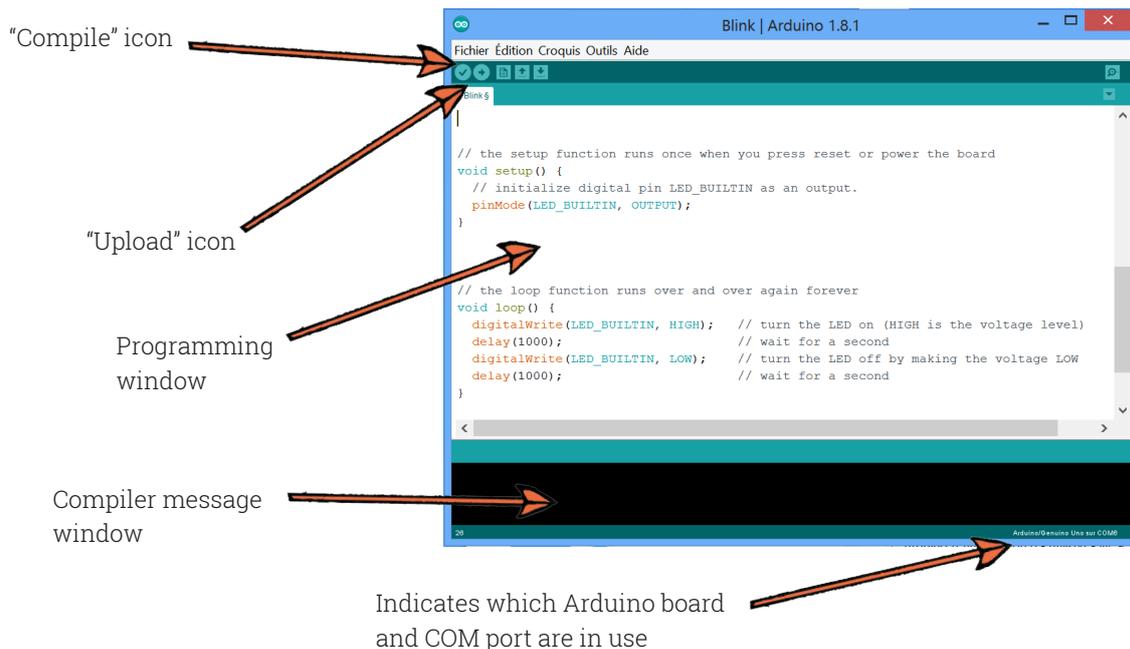


ARDUINO IDE SOFTWARE

Indispensable to be able to program your board

The behavior of the microcontroller is determined by its program. In practice, the user writes this program using software (IDE) installed on a computer. This program is then compiled and uploaded into the microcontroller via a USB cable. Many different types of software can be used as IDE although here, we use the Arduino software that can be downloaded on the reference site www.arduino.cc (see the "Test your board" Challenge sheet to install the software).



This software is open and free. The screenshots are out of date, no doubt, as the software is constantly evolving. You will, nonetheless, find these main elements:

Menus to access different settings (File, Edit ...).

Icons allowing shortcuts. The icon "upload" is particularly important as it sends the program to the Arduino board.

A programming window: it is here for you to write the program that will control the Arduino board once it is uploaded.

A message window: when messages in orange appear, it's because there is a problem! In general it is due to a badly written program but sometimes it is due to a faulty connection with the board.

You just have to type the code into the programming window, compile it and upload it to the program on the Arduino board by clicking on the corresponding icons.

Compile: The program is transformed into comprehensible language by the microcontroller: programming errors are indicated at this step.

Upload: The program is sent to the board, which must be connected to the computer using a USB cable (the serial communication lights should blink).

The program is thus installed on the microcontroller and executes (see the “Programming” sheet for information on the different ways of writing a program). If an external power supply is connected to the board, the USB cable can be disconnected.

Useful tools

Here are some functionalities of this software that are useful to know:

Tools menu, Board type: the type of board selected must correspond to your board. If it is not the case, the compilation will not be adapted.

Tools menu, Port: the port selected must correspond to the one to which your board is connected. If it is not the case, uploading will not be possible.

File menu, Examples: many examples are available. Study them and get inspired!

Tools menu, Serial monitor: allows one to receive messages that the Arduino board sends to the serial port. Useful for debugging programs.

Minimum programming requirements

The programs of the Arduino boards must always contain two particular procedures:

- The `setup()` procedure, which is executed once at the beginning of the program;
- The `loop()` procedure which is executed continuously afterwards.

Here is the minimum program that the Arduino board can accept::

```
void setup() { // beginning of setup. The text after // is ignored
               // This procedure is executed only once
               // The user can insert commands
}              // end of setup

void loop() { // start of loop
              // This loop will execute for ever
              // after the execution of setup
}            // end of loop
```

This program does not give any instructions to the microcontroller. The programming sheet provides the most useful instructions but the site www.arduino.cc provides all the instructions that the board can understand as well as numerous examples (“Reference” tab on the site). We advise you to consult this site in case of need.