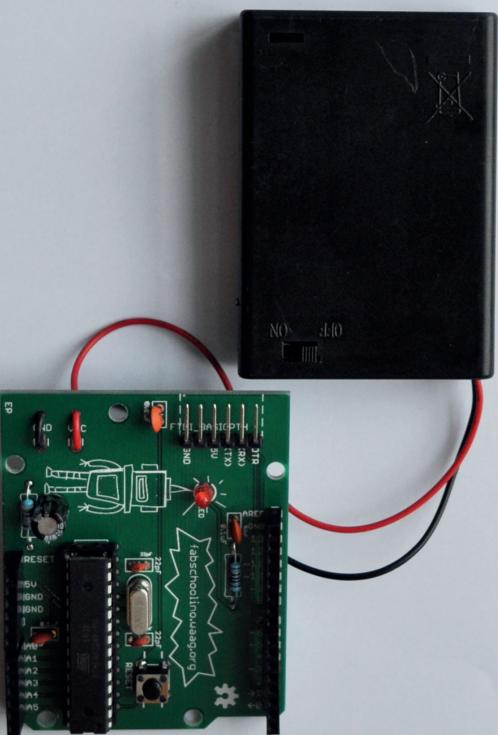


Benodigdheden

Programmeer kabel



Fabschoolino



USB connector



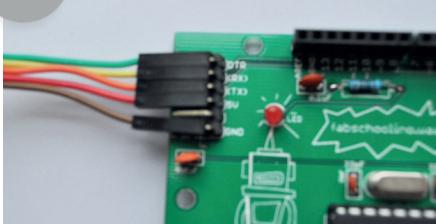
Dit is een overzicht van alle componenten uit zakje 2 plus de Fabschoolino uit de Fabschoolino basiskit van Waag Society. Begin je net aan de Instructable? Check dan voor alle zekerheid of je alle bovenstaande benodigde materialen hebt.

1



Bevestig de programmeer kabel aan de USB connector. Plaats de kleuren zoals het plaatje hierboven. Bruin/gnd, geen kabel bij de CTS, rood/5v, oranje/TXD, geel/RXD en groen/DTR

2



Bevestig de andere kant van de programmeer kabel aan de Fabschoolino FTDI zoals het plaatje hierboven. Bruin/gnd, Sla een pin over, rood/5v, oranje/TX, geel/RX en groen/DTR

3



Zorg dat de Batterij van je Fabschoolino uit staan. Steek vervolgens de USB in de laptop waar je op gaat programmeren. Het lampje van de USB connector gaat nu branden.

4

A screenshot of the Arduino website at https://www.arduino.cc/en/Main/Software. The page features the Arduino and Genuino logos. It includes a search bar and navigation links for Home, Buy, Download, Products, Learning, Forum, Support, and Blog. A language dropdown shows English. Below the header, there's a section titled "Download the Arduino Software". On the left is a large image of the Arduino logo. To the right, there's a summary of the software: "ARDUINO 1.6.12", "The open-source Arduino Software (IDE) makes it easy to write code and upload it to the board. It runs on Windows, Mac OS X, and Linux. The environment is written in Java and based on Processing and other open-source software. This software can be used with any Arduino board. Refer to the Getting Started page for Installation Instructions." An orange arrow points to the "Windows Installer" link. Other download options listed include "Windows ZIP file for non admin install", "Mac OS X 10.7 Lion or newer", "Linux 32 bits", "Linux 64 bits", "Linux ARM (experimental)", "Release Notes", "Source Code", and "Checksums (sha512)".

Om te kunnen programmeren heb je een zogenaamde "comiler" nodig. Je kunt de compiler downloaden op <https://www.arduino.cc/en/Main/Software>. Om de Windows versie te downloaden klik je op de link die op de afbeelding hierboven is aangegeven met een rode pijl.

fabschoolino Fabschoolino programmeren

CODE / HACK / PLAY

5

The screenshot shows the Arduino Software donation page. At the top, there's a navigation bar with links for Buy, Download, Products, Learning, Forum, Support, and Blog. Below the navigation bar, a heading says "Support the Arduino Software". A sub-headline encourages users to contribute to its development, noting that it has been downloaded 10,612,395 times. There are five circular buttons for contribution amounts: \$3, \$5, \$10, \$25, and \$50. A red arrow points to the "JUST DOWNLOAD" button, which is located next to a "CONTRIBUTE & DOWNLOAD" button. A "Share" button is visible in the top right corner of the main content area.

Consider supporting the Arduino Software by contributing to its development. (US tax payers, please note this contribution is not tax deductible). [Learn more on how your contribution will be used.](#)

SINCE MARCH 2015, THE ARDUINO IDE HAS BEEN DOWNLOADED
10,612,395 TIMES. (IMPRESSIVE!) NO LONGER JUST FOR ARDUINO AND GENUINO BOARDS, HUNDREDS OF COMPANIES AROUND THE WORLD ARE USING THE IDE TO PROGRAM THEIR DEVICES, INCLUDING COMPATIBLES, CLONES, AND EVEN COUNTERFEITS. HELP ACCELERATE ITS DEVELOPMENT WITH A SMALL CONTRIBUTION! REMEMBER: OPEN SOURCE IS LOVE!

\$3 \$5 \$10 \$25 \$50 OTHER

JUST DOWNLOAD CONTRIBUTE & DOWNLOAD

6

The screenshot shows the same donation page as above, but with a download dialog box overlaid. The dialog box is titled "arduino-1.6.12-windows.exe openen" and asks if the user wants to save the file. It specifies that the file is a binary file (84.2 MB) from the URL https://downloads.arduino.cc. A red arrow points to the "Bestand opslaan" (Save File) button in the dialog box. The rest of the page, including the "JUST DOWNLOAD" and "CONTRIBUTE & DOWNLOAD" buttons, is visible below the dialog.

Share

Klik bestand "Bestand opslaan" om verder te kunnen gaan.

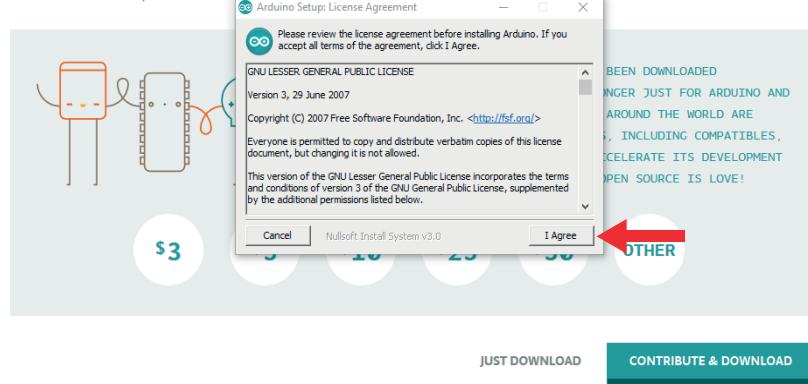
fabschoolino Fabschoolino programmeren

CODE / HACK / PLAY

7

Support the Arduino Software

Consider supporting the Arduino Software by contributing to its development. (US tax payers, please note this contribution is not tax deductible). [Learn more on how your contribution will be used.](#)



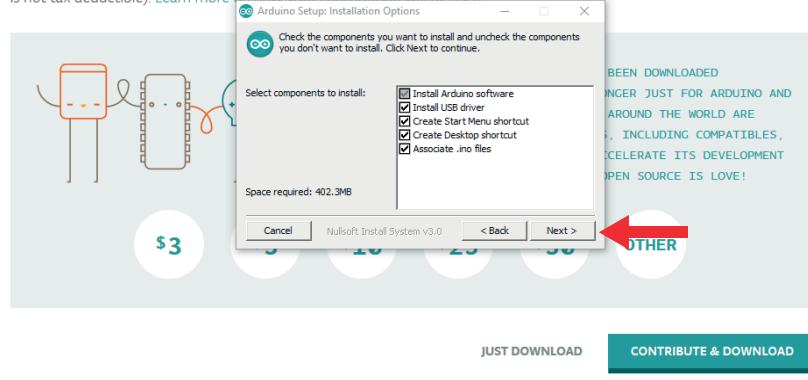
Share

Om verder te kunnen zal je akkoord moeten gaan met License Agreement. Klik "I Agree" om dit te bevestigen. Mocht dit scherm hierboven niet direct in beeld verschijnen. Selecteer dan het bestand "arduino-1.6.12-windows.exe" uit je download map.

8

Support the Arduino Software

Consider supporting the Arduino Software by contributing to its development. (US tax payers, please note this contribution is not tax deductible). [Learn more on how your contribution will be used.](#)



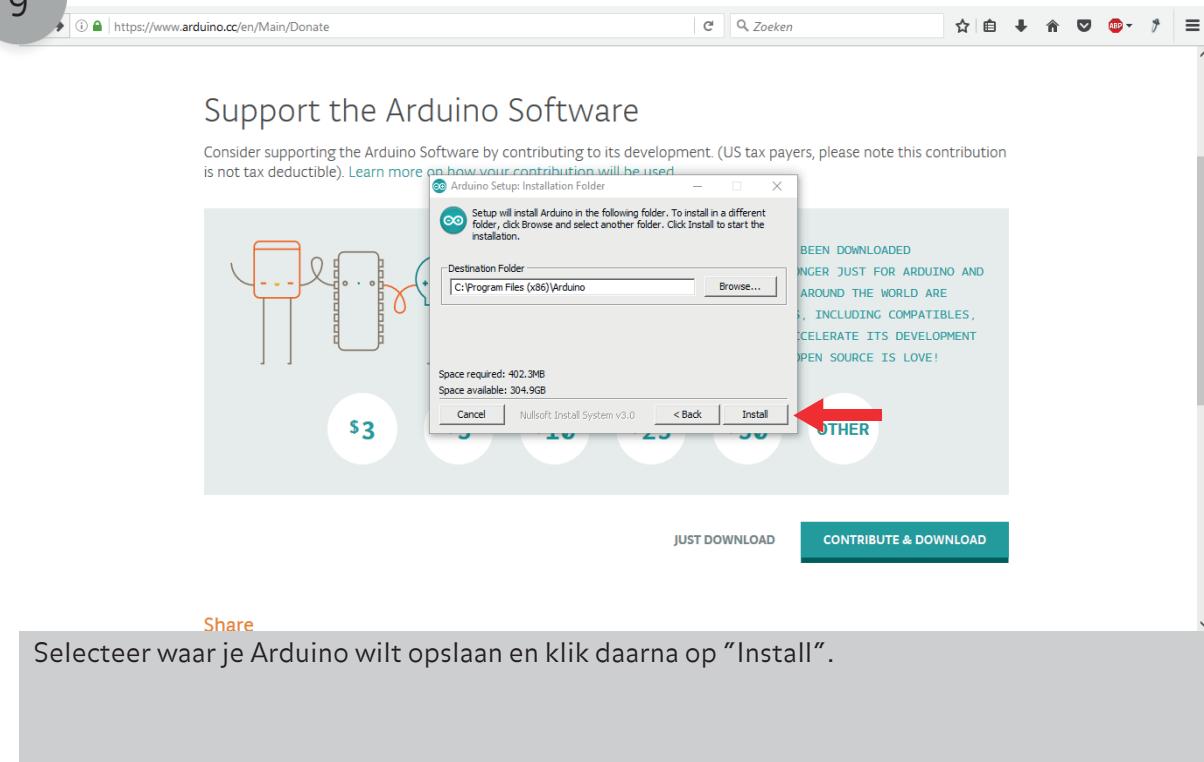
Share

Zorg dat alle vakjes staan aangevinkt en klik op "Next".

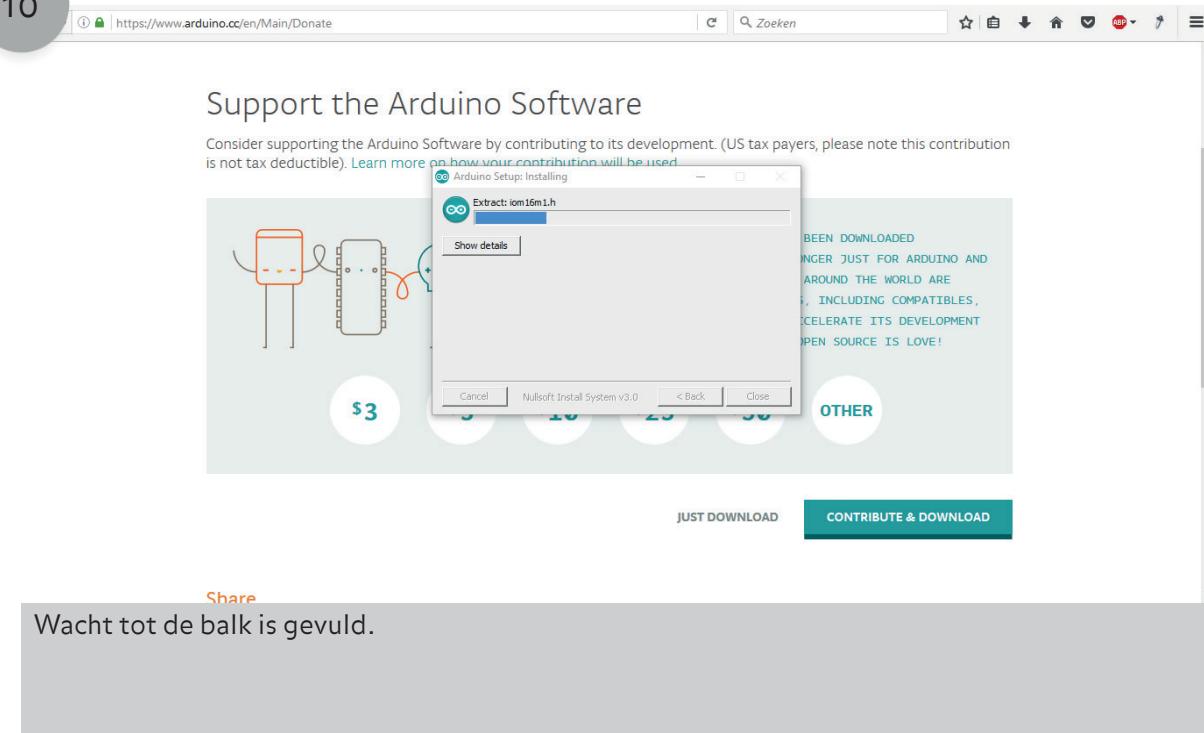
fabschoolino Fabschoolino programmeren

CODE / HACK / PLAY

9



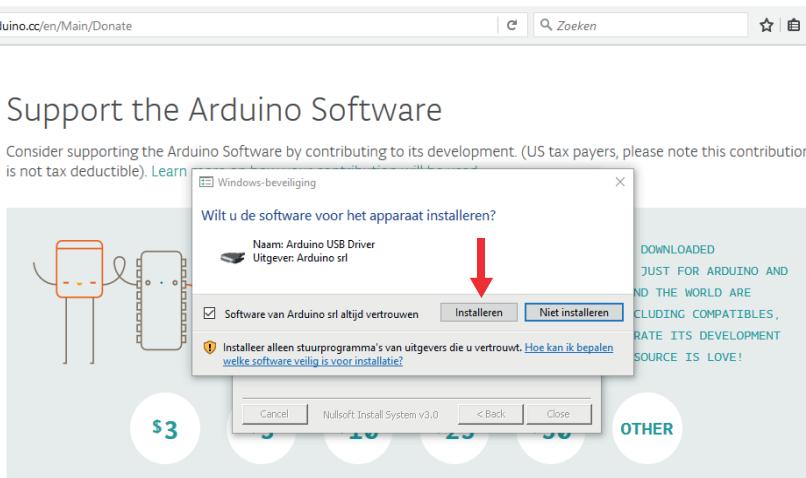
10



fabschoolino Fabschoolino programmeren

CODE / HACK / PLAY

11



The screenshot shows a web browser window with the URL <https://www.arduino.cc/en/Main/Donate>. A modal dialog box from Windows Security is displayed, asking if the user wants to install the "Arduino USB Driver" by "Arduino srl". There are two buttons: "Installeren" (Install) and "Niet installeren" (Do not install). A red arrow points to the "Installeren" button. To the right of the dialog, a sidebar contains the text: "DOWNLOADED JUST FOR ARDUINO AND AROUND THE WORLD ARE INCLUDING COMPATIBLES, ACCELERATE ITS DEVELOPMENT OPEN SOURCE IS LOVE!". Below the dialog, there are three circular buttons labeled "\$3", "10", and "25", and a "OTHER" button. At the bottom of the page are two buttons: "JUST DOWNLOAD" and "CONTRIBUTE & DOWNLOAD".

Support the Arduino Software

Consider supporting the Arduino Software by contributing to its development. (US tax payers, please note this contribution is not tax deductible). [Learn more](#)

Windows-beveiliging

Wilt u de software voor het apparaat installeren?

Naam: Arduino USB Driver
Uitgever: Arduino srl

Software van Arduino srl altijd vertrouwen Installeren Niet installeren

! Installeer alleen stuurprogramma's van uitgevers die u vertrouwt. [Hoe kan ik bepalen welke software veilig is voor installatie?](#)

Cancel Nullsoft Install System v3.0 < Back Close

\$3 10 25 OTHER

JUST DOWNLOAD CONTRIBUTE & DOWNLOAD

[Share](#)

Bevestig dat je de software wilt installeren door op "Installeren" te klikken.

12



The screenshot shows a web browser window with the URL <https://www.arduino.cc/en/Main/Donate>. A modal dialog box titled "Arduino Setup: Completed" is displayed, showing a progress bar at 100% completion. A red arrow points to the progress bar. To the right of the dialog, a sidebar contains the text: "BEEN DOWNLOADED JUST FOR ARDUINO AND AROUND THE WORLD ARE INCLUDING COMPATIBLES, ACCELERATE ITS DEVELOPMENT OPEN SOURCE IS LOVE!". Below the dialog, there are three circular buttons labeled "\$3", "10", and "25", and a "OTHER" button. At the bottom of the page are two buttons: "JUST DOWNLOAD" and "CONTRIBUTE & DOWNLOAD".

Support the Arduino Software

Consider supporting the Arduino Software by contributing to its development. (US tax payers, please note this contribution is not tax deductible). [Learn more](#) on how your contribution will be used

Arduino Setup: Completed

Completed

Show details

Cancel Nullsoft Install System v3.0 < Back Close

\$3 10 25 OTHER

JUST DOWNLOAD CONTRIBUTE & DOWNLOAD

[Share](#)

Wacht opnieuw tot de balk vol is. Hierna is de Installatie voltooid.

fabschoolino Fabschoolino programmeren

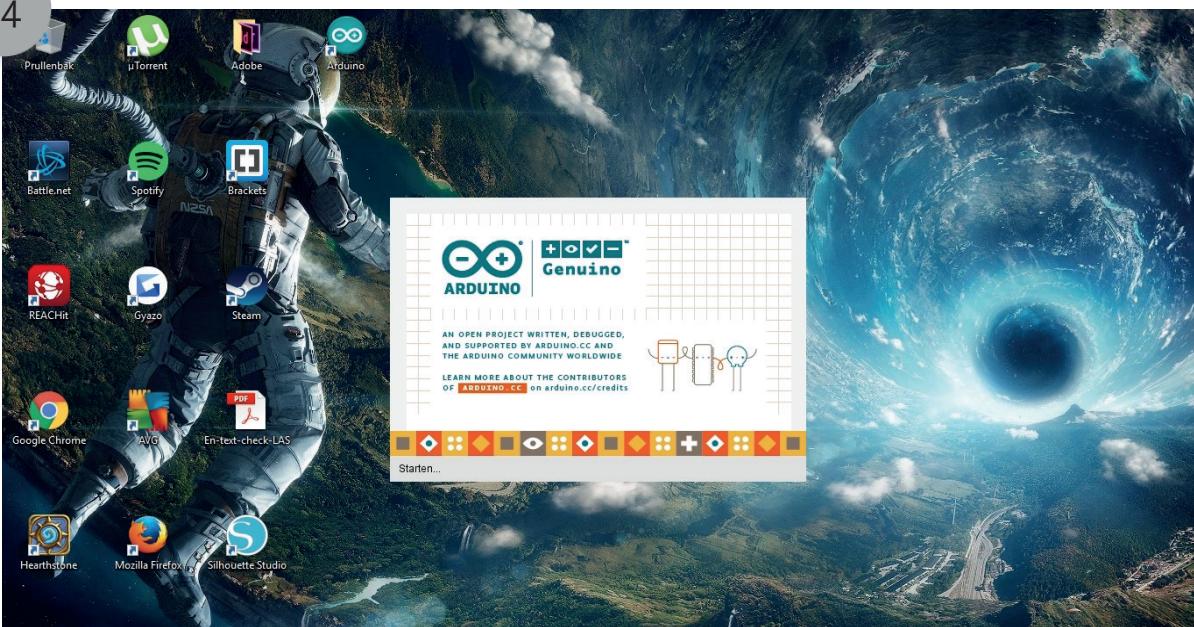
CODE / HACK / PLAY

13



Je kunt nu de Arduino vinden op je bureaublad/Desktop. Dubbelklik om te starten.

14

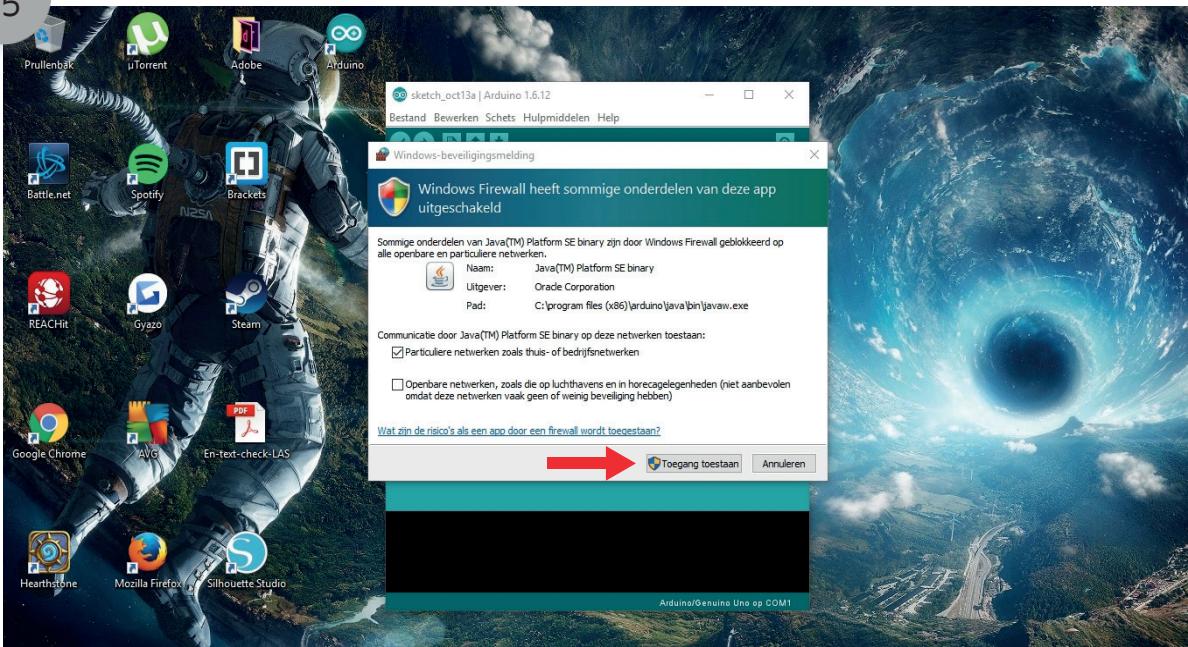


Arduino is bezig met opstarten. Wacht heel even.

fabschoolino Fabschoolino programmeren

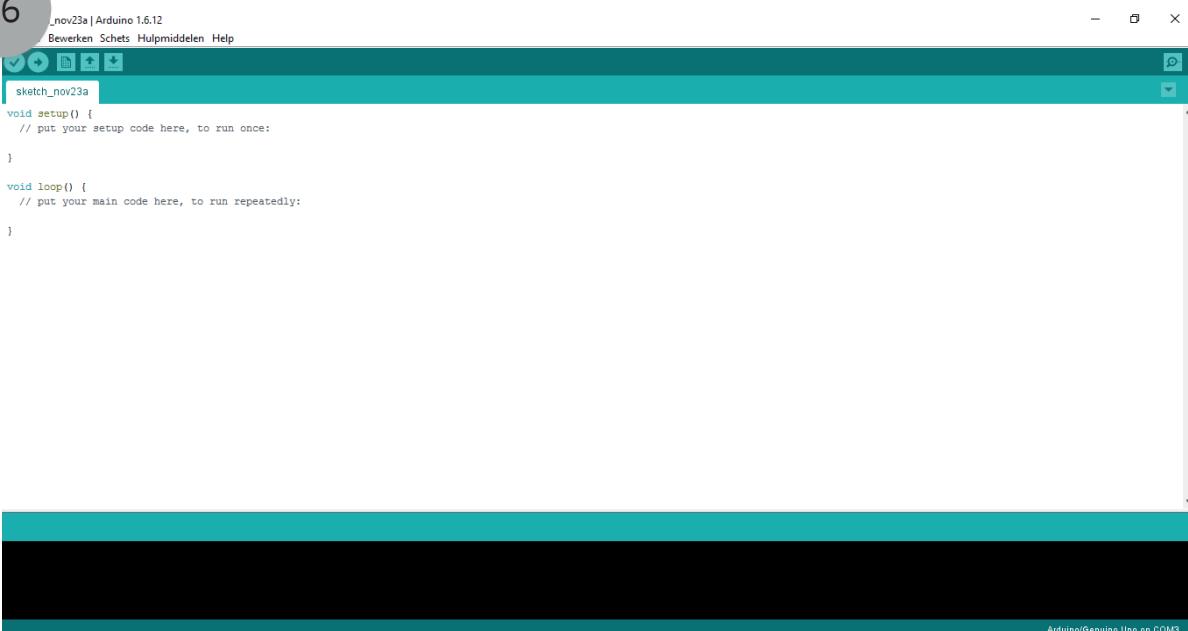
CODE / HACK / PLAY

15



Het is mogelijk dat je Firewall een aantal onderdelen blokkeert. Klik op "Toegang toestaan" om verder te gaan.

16

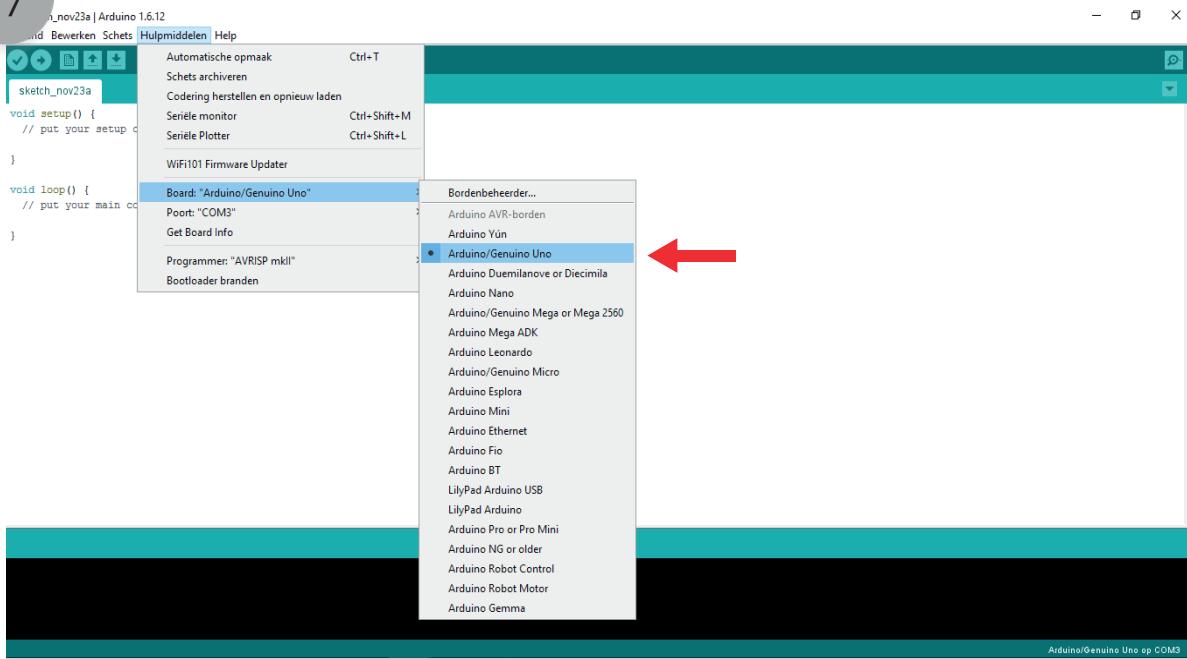


Dit is het eerst scherm dat je zal zien als Arduino is opgestart. In het witte gedeelte komt straks de code waarmee jij de fabschoolino gaat programmeren.

fabschoolino Fabschoolino programmeren

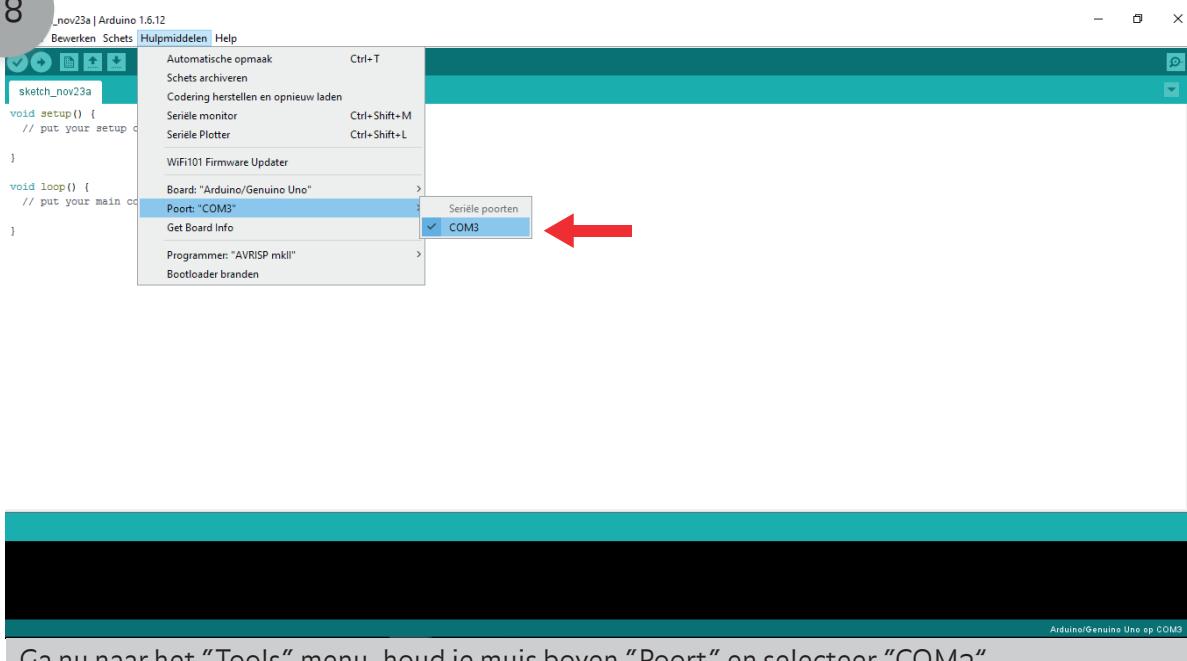
CODE / HACK / PLAY

17



Ga vervolgens naar het "Tools"menu bovenaan je scherm. Hou je muis boven "Board: Arduino/Genuino Uno" en selecteer in het menu wat tevoorschijn komt "Arduino/Genuino Uno". Hiermee maak je verbinden met je Fabschoolino.

18

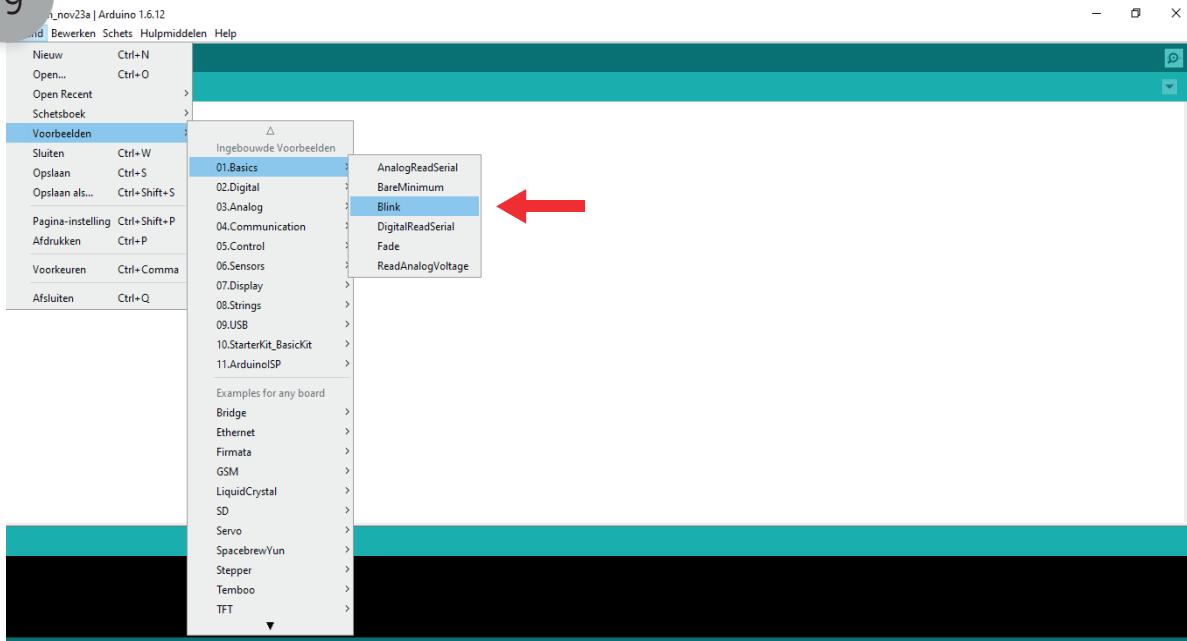


Ga nu naar het "Tools" menu. houd je muis boven "Poort" en selecteer "COM3".

fabschoolino Fabschoolino programmeren

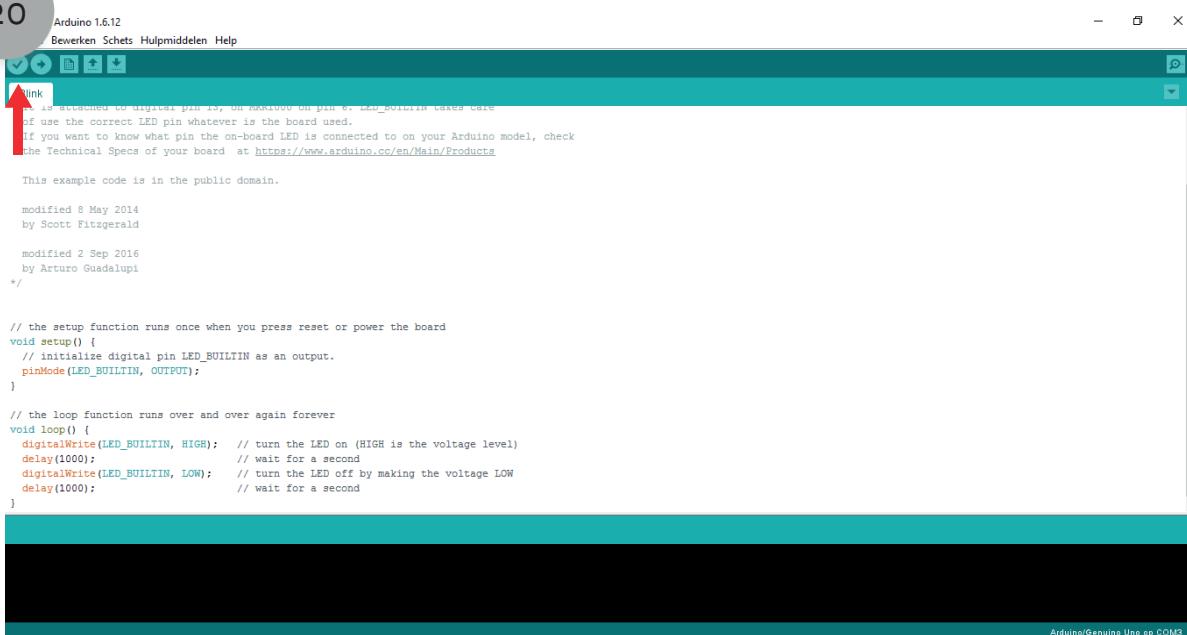
CODE / HACK / PLAY

19



Het is nu tijd om te testen of het werkt. Ga naar: Bestand > voorbeelden > 01.basics en klik op Blink.

20



Je hebt nu code in je witte vlak staan die er voor zorgt dat de LED van je fabschoolino gaat knipperen. Maar voordat de LED gaat knipperen moeten we eerst de code compileren. Dit doe je door op het vinkje boven in beeld te klikken.

fabschoolino Fabschoolino programmeren

CODE / HACK / PLAY

21

Arduino 1.6.12

Bewerken Schets Hulpmiddelen Help

Blink

1. It's attached to digital pin 13, on MEGA16U on pin 6. LED_BUILTIN takes care of use the correct LED pin whatever is the board used.
If you want to know what pin the on-board LED is connected to on your Arduino model, check the Technical Specs of your board at <https://www.arduino.cc/en/Main/Products>

This example code is in the public domain.

modified 8 May 2014
by Scott Fitzgerald

modified 2 Sep 2016
by Arturo Guadalupi

*/

```
// the setup function runs once when you press reset or power the board
void setup() {
  // initialize digital pin LED_BUILTIN as an output.
  pinMode(LED_BUILTIN, OUTPUT);
}

// the loop function runs over and over again forever
void loop() {
  digitalWrite(LED_BUILTIN, HIGH); // turn the LED on (HIGH is the voltage level)
  delay(1000); // wait for a second
  digitalWrite(LED_BUILTIN, LOW); // turn the LED off by making the voltage LOW
  delay(1000); // wait for a second
}
```

Sketch aan het compileren:

```
C:\Program Files (x86)\Arduino\hardware\tools\avr\bin\avr-gcc" -c -g -Os -w -std=gnull -ffunction-sections -fdata-sections -MM -fIto -fno-fat-lto-objects -mmcu=atmega328p -DF_CPU=16000000L ^
C:\Program Files (x86)\Arduino\hardware\tools\avr\bin\avr-gcc" -c -g -Os -w -std=gnull -ffunction-sections -fdata-sections -MM -fIto -fno-fat-lto-objects -mmcu=atmega328p -DF_CPU=16000000L ^
C:\Program Files (x86)\Arduino\hardware\tools\avr\bin\avr-gcc" -c -g -Os -w -std=gnull -ffunction-sections -fdata-sections -MM -fIto -fno-fat-lto-objects -mmcu=atmega328p -DF_CPU=16000000L ^>
```

Arduino/Genuino Uno op COM3

Als je op het vinkje hebt geklikt zie je onder in beeld dat de code wordt gecompileerd. Wacht tot de groene balk vol is.

22

Arduino 1.6.12

Bewerken Schets Hulpmiddelen Help

Blink

1. It's attached to digital pin 13, on MEGA16U on pin 6. LED_BUILTIN takes care of use the correct LED pin whatever is the board used.
If you want to know what pin the on-board LED is connected to on your Arduino model, check the Technical Specs of your board at <https://www.arduino.cc/en/Main/Products>

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modified 8 May 2014
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*/

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  delay(1000); // wait for a second
  digitalWrite(LED_BUILTIN, LOW); // turn the LED off by making the voltage LOW
  delay(1000); // wait for a second
}
```

Sketch aan het compileren:

```
C:\Program Files (x86)\Arduino\hardware\tools\avr\bin\avr-gcc" -w -Os -fIto -fuse-linker-plugin -Wl,--gc-sections -mmcu=atmega328p -o "C:\Users\Marc\AppData\Local\Temp\arduino_build_830494\B^
C:\Program Files (x86)\Arduino\hardware\tools\avr\bin\avr-objcopy" -O ihex -j .eeprom --set-section-flags=.eeprom=alloc,load --no-change-warnings --change-section-lma .eeprom=0 "C:\Users\Mar^
C:\Program Files (x86)\Arduino\hardware\tools\avr\bin\avr-objcopy" -O ihex -R .eeprom "C:\Users\Marc\AppData\Local\Temp\arduino_build_830494\Blink.ino.elf" "C:\Users\Marc\AppData\Local\Temp\^>
```

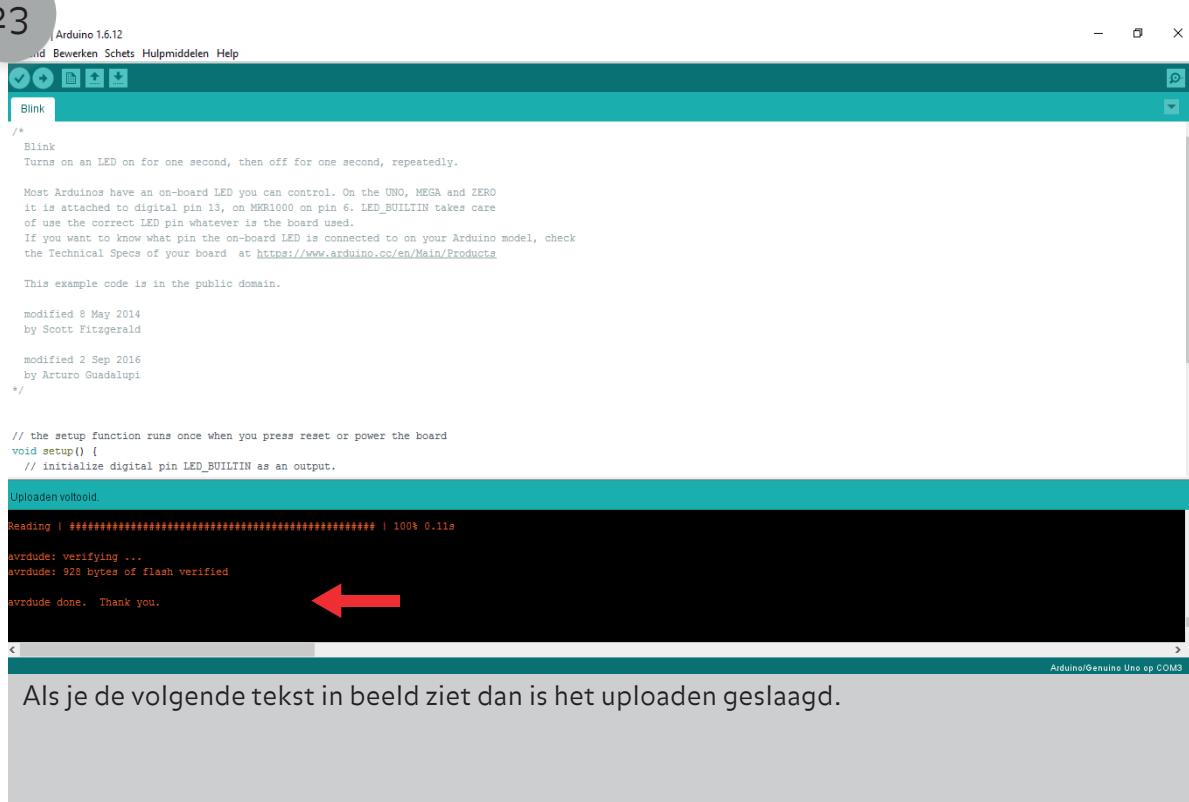
Arduino/Genuino Uno op COM3

Nu de code is gecompileerd is het tijd om de code te uploaden naar de fabschoolino. Om dit te doen klik je op de knop met het pijltje er in . Net als bij het compileren heeft dit heel even tijd nodig.

fabschoolino Fabschoolino programmeren

CODE / HACK / PLAY

23



The screenshot shows the Arduino IDE interface with the title bar "Arduino 1.6.12". The menu bar includes "File", "Bewerken", "Schets", "Hulpmiddelen", and "Help". A toolbar with icons for file operations is at the top. The main area displays the "Blink" sketch code. The code is as follows:

```
/*
  Blink
  Turns on an LED on for one second, then off for one second, repeatedly.

  Most Arduinos have an on-board LED you can control. On the UNO, MEGA and ZERO
  it is attached to digital pin 13, on MKR1000 on pin 6. LED_BUILTIN takes care
  of use the correct LED pin whatever is the board used.
  If you want to know what pin the on-board LED is connected to on your Arduino model, check
  the Technical Specs of your board at https://www.arduino.cc/en/Main/Products

  This example code is in the public domain.

  modified 8 May 2014
  by Scott Fitzgerald

  modified 2 Sep 2016
  by Arturo Guadalupi
*/
```

// the setup function runs once when you press reset or power the board

```
void setup() {
  // initialize digital pin LED_BUILTIN as an output.
```

Uploaden voltooid.

Reading | ##### | 100% 0.11s

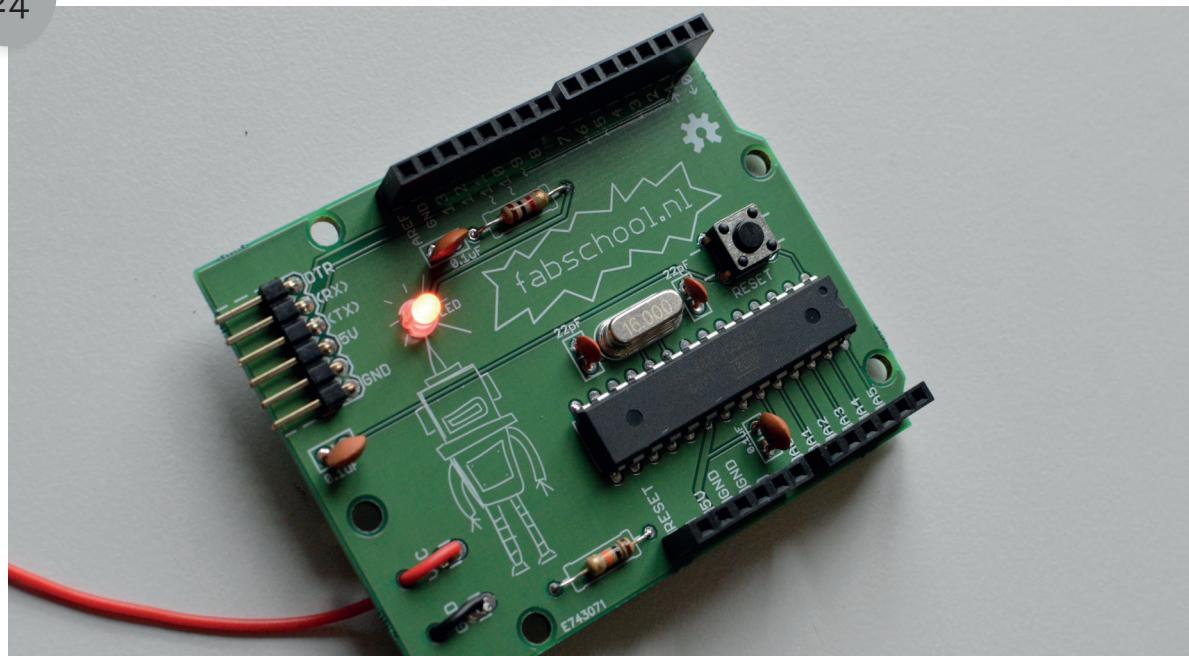
avrdude: verifying ...
avrdude: 928 bytes of flash verified

avrdude done. Thank you.

A red arrow points to the text "avrdude done. Thank you."

Als je de volgende tekst in beeld ziet dan is het uploaden geslaagd.

24



Gefeliciteerd. Je hebt zelf je Fabschoolino geprogrammeerd