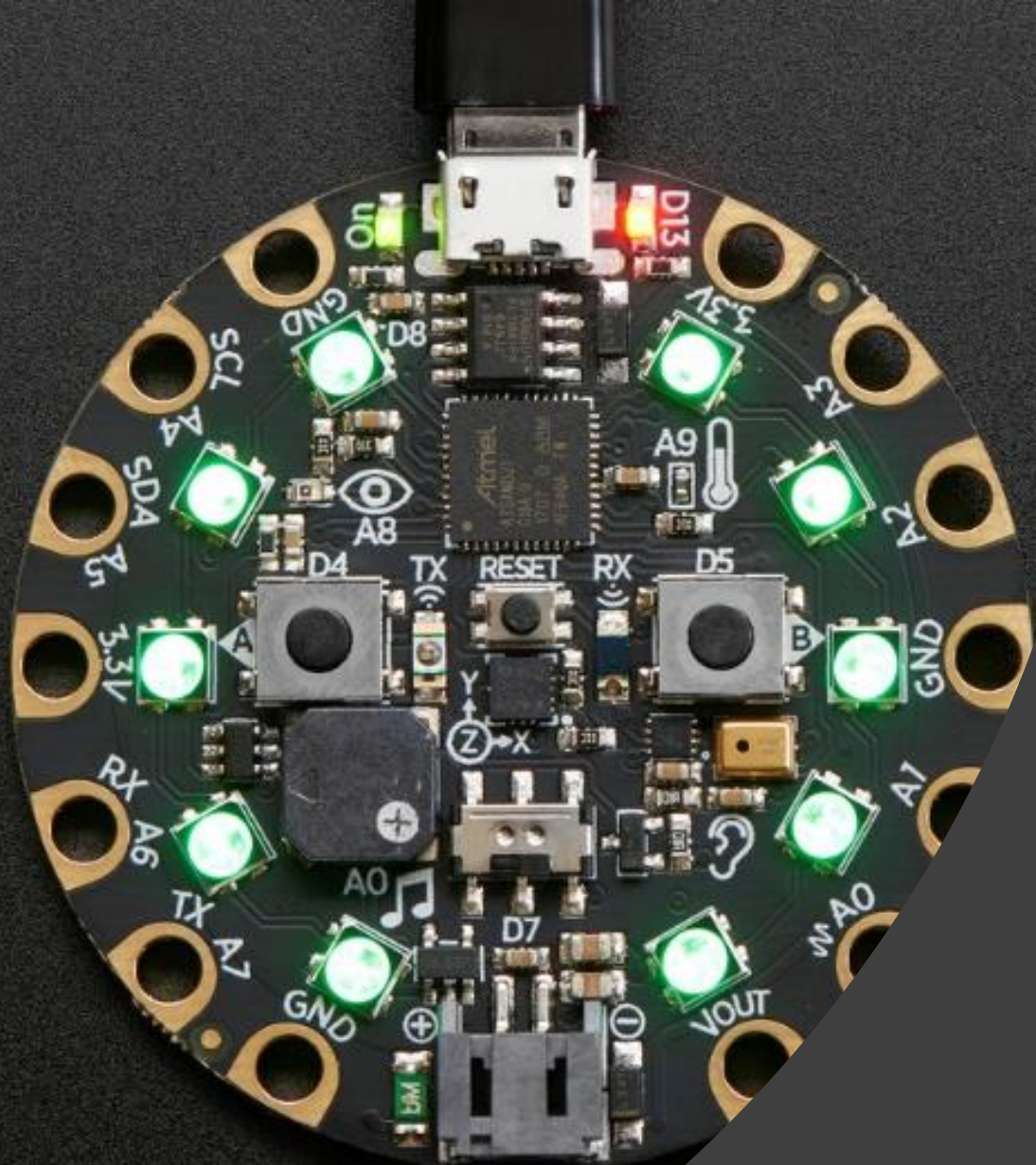


Illan ohjelma

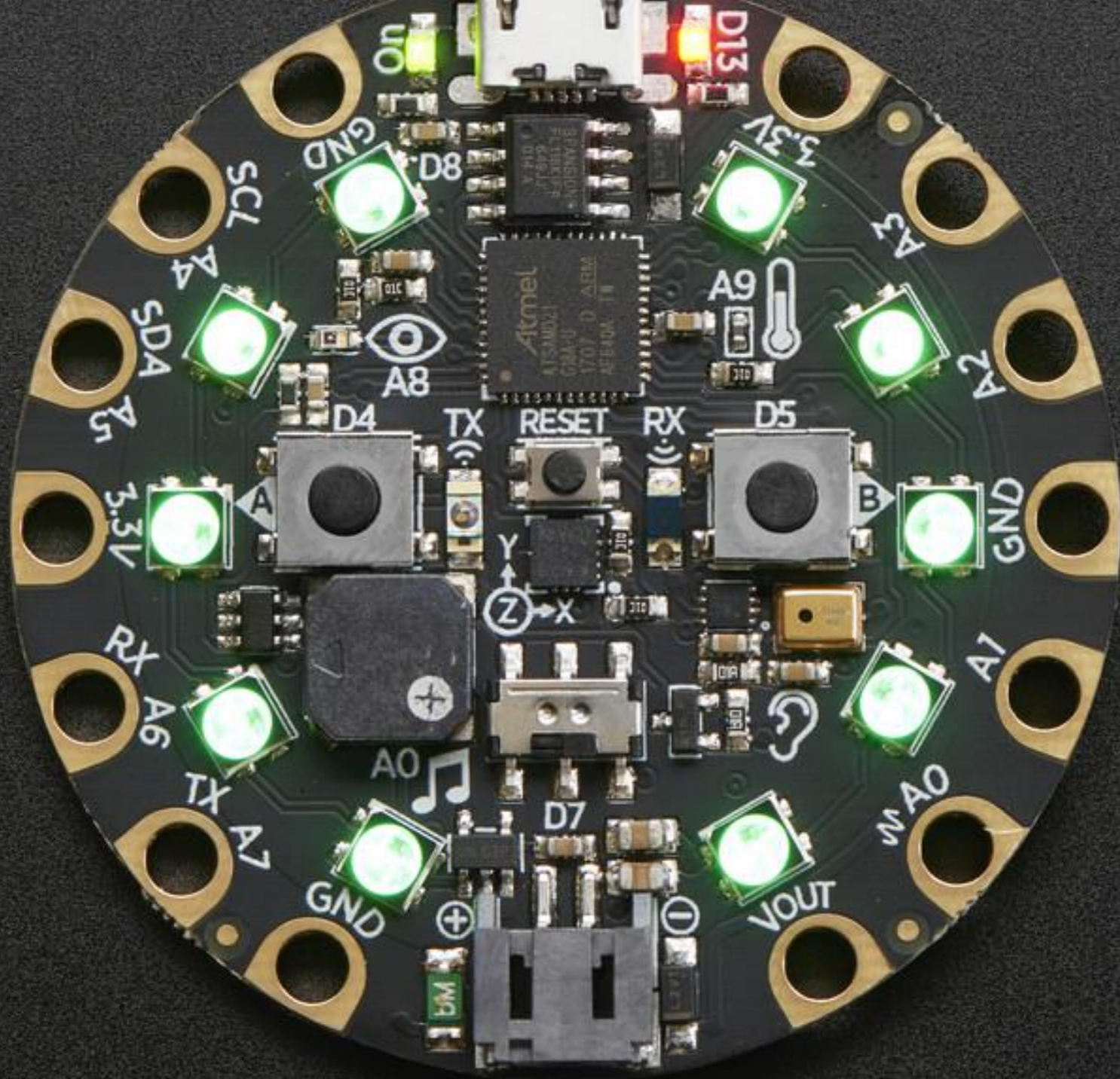
- Tutustutaan lyhyesti Circuit Playground -piirilevyyn
- Tutustutaan Adafruitin blokkikoodaus -kieleen ja kokeillaan ohjelmointia
- Noin klo 18.00 käydään läpi Circuit playgroundin sensoreita ja lisäosia
- Kokeillaan niiden käyttöä ja ohjelmointia
- Tutustutaan, millaisia projekteja voi tehdä ja miten hyödyntää peruskoulussa
- Vapaata ohjelmointia, lisäosien kokeilua yms



Circuit Playground express

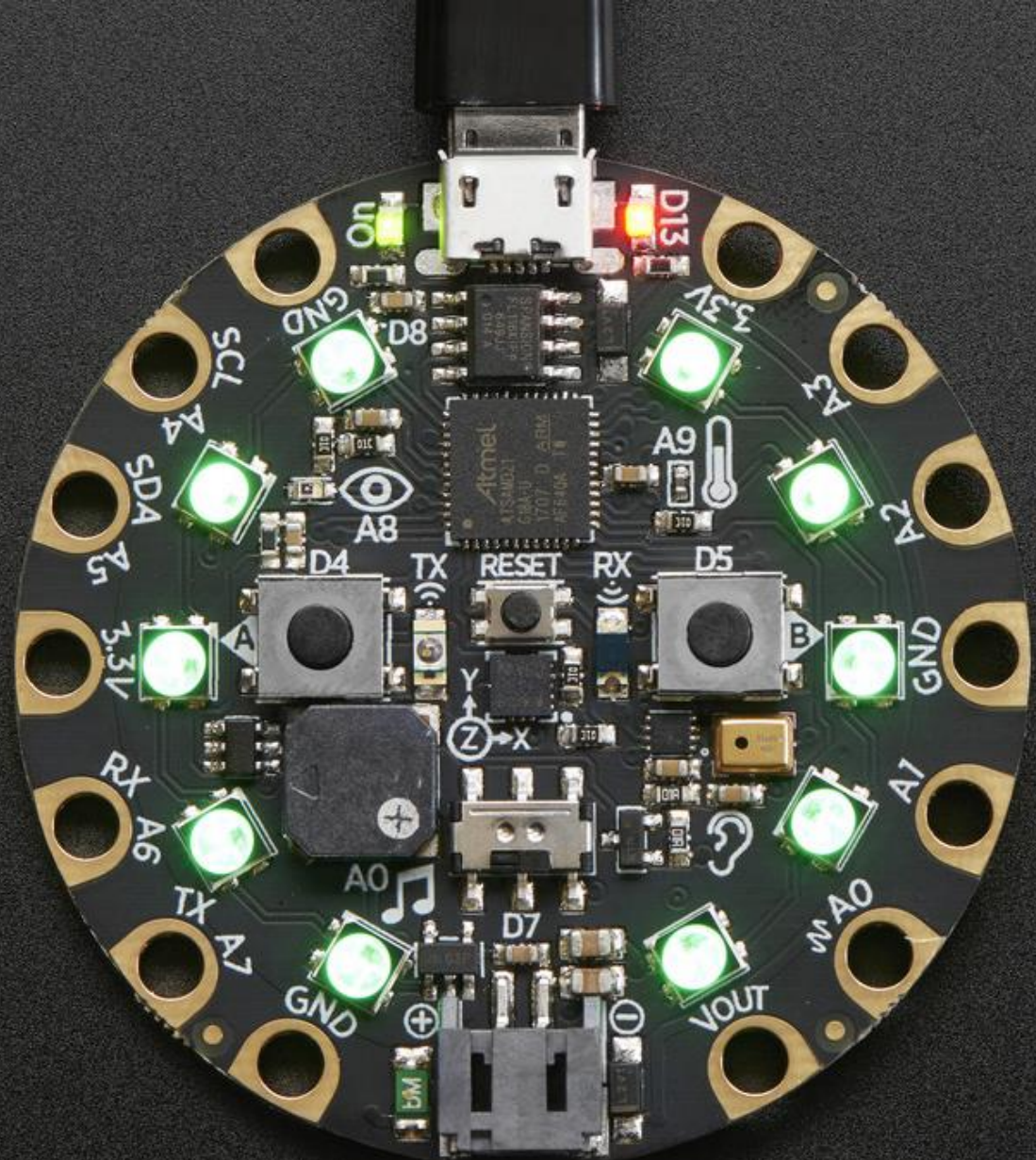
Ope oppii

8.5.2019



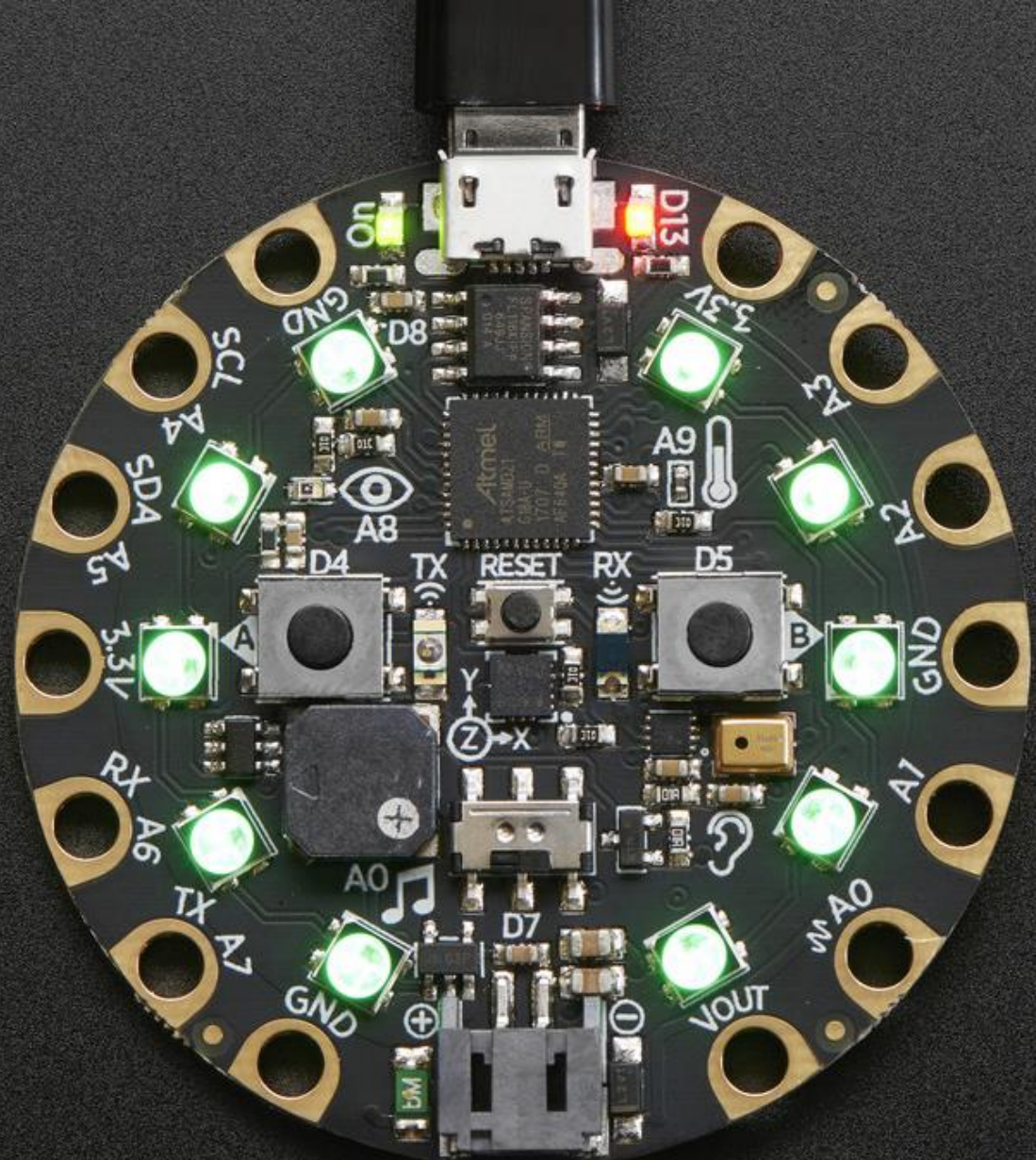
Ohjelmoitava piirilevy

- Reset-painike
- A-painike
- B-painike

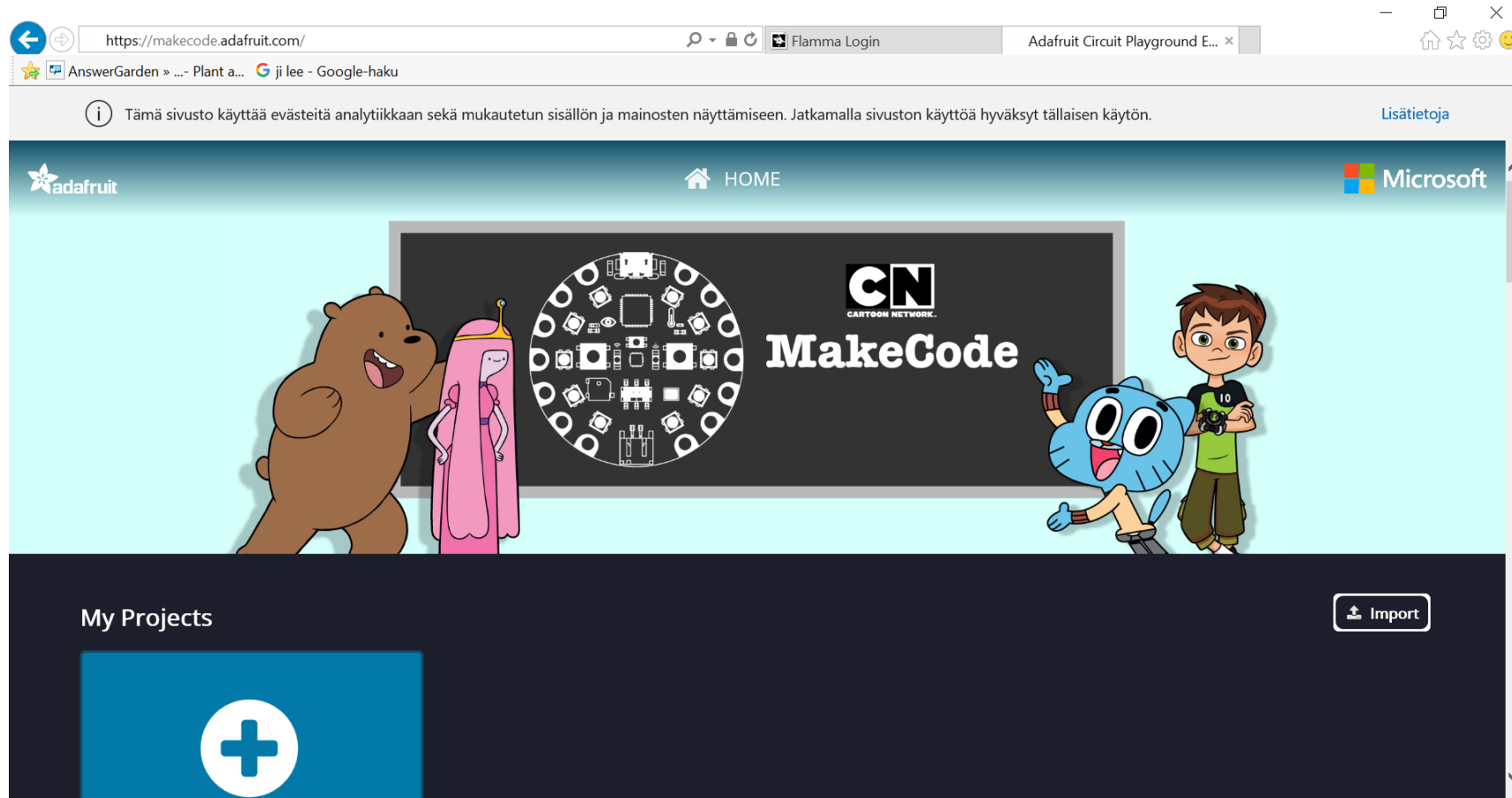


Ohjelmoitava piirilevy

- 10 lediä, voidaan ohjelmoida erikseen
- kaiutin
- Äänisensori
- Valosensori
- Analoginen lämpösensori
- Liikesensori
- Infrapunälähetin ja -vastaanotin



https://makecode.adafruit.com/



Ohjelmointi

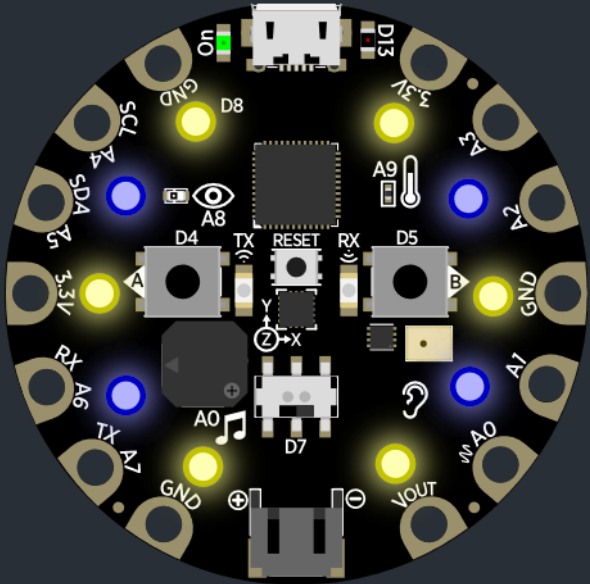
- Make code-blokkikieli
- Javascript
- Python
- Arduino

The screenshot shows the MakeCode editor interface for an Arduino board. The top navigation bar includes the Adafruit logo, 'HOME', 'SHARE', 'BLOCKS', and 'JAVASCRIPT' tabs. The central workspace displays a circular diagram of an Arduino board with various components labeled. To the right is a 'BLOCKS' palette with categories like LIGHT, INPUT, MUSIC, NETWORK, LOOPS, LOGIC, VARIABLES, MATH, and ADVANCED. A 'forever' loop block is visible in the workspace. At the bottom, there is a 'Download' button and a file name field showing 'Untitled'.

Make code-blokkikieli

The image shows a screenshot of the Adafruit MakeCode editor interface. The browser address bar displays `https://makecode.adafruit.com/#editor`. The page header includes the Adafruit logo, navigation links for HOME and SHARE, and tabs for BLOCKS and JAVASCRIPT. A Microsoft logo is visible in the top right corner. The main workspace features a circular board layout on the left with various pins and components labeled. A central block palette contains categories such as LIGHT, INPUT, MUSIC, NETWORK, LOOPS, LOGIC, VARIABLES, MATH, and ADVANCED. A search bar is located above the palette. On the right side, a code editor displays a single block labeled "forever". At the bottom, there is a prominent pink "Download" button, a text input field containing "Untitled", and several control buttons for undo, redo, and zoom.

Want a faster download? Get the app!



- LIGHT
- INPUT
- MUSIC
- NETWORK
- LOOPS
- LOGIC
- VARIABLES
- MATH
- ADVANCED

forever

show ring

on button A click

show ring

Download

Untitled

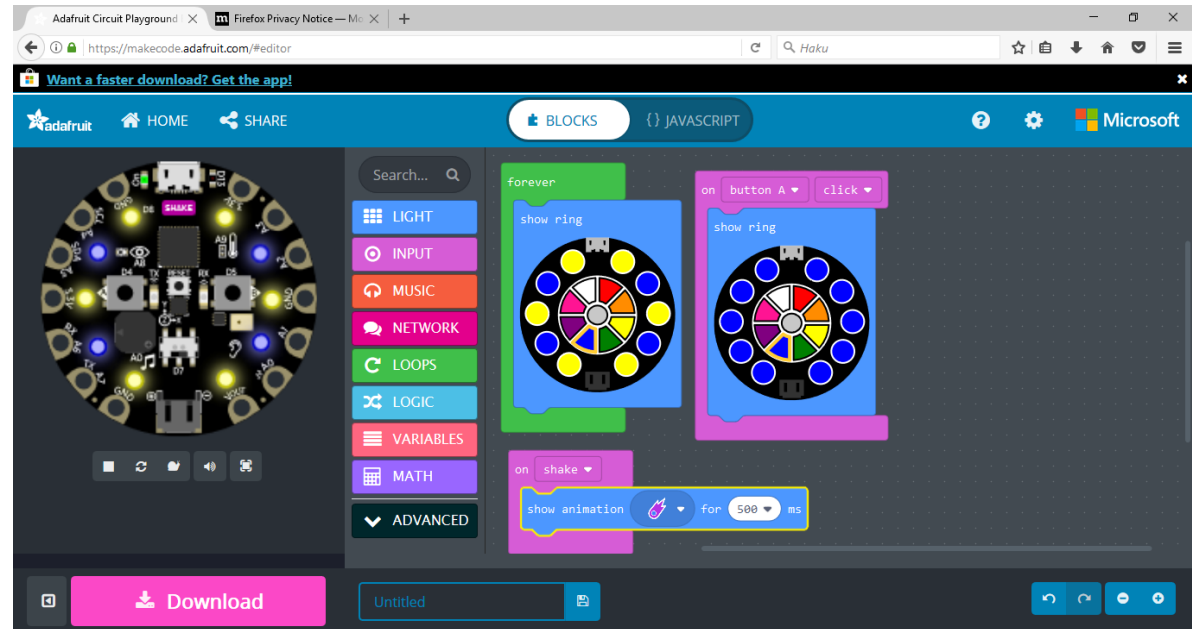
Navigation icons: back, forward, zoom in, zoom out

1. Tehtävä

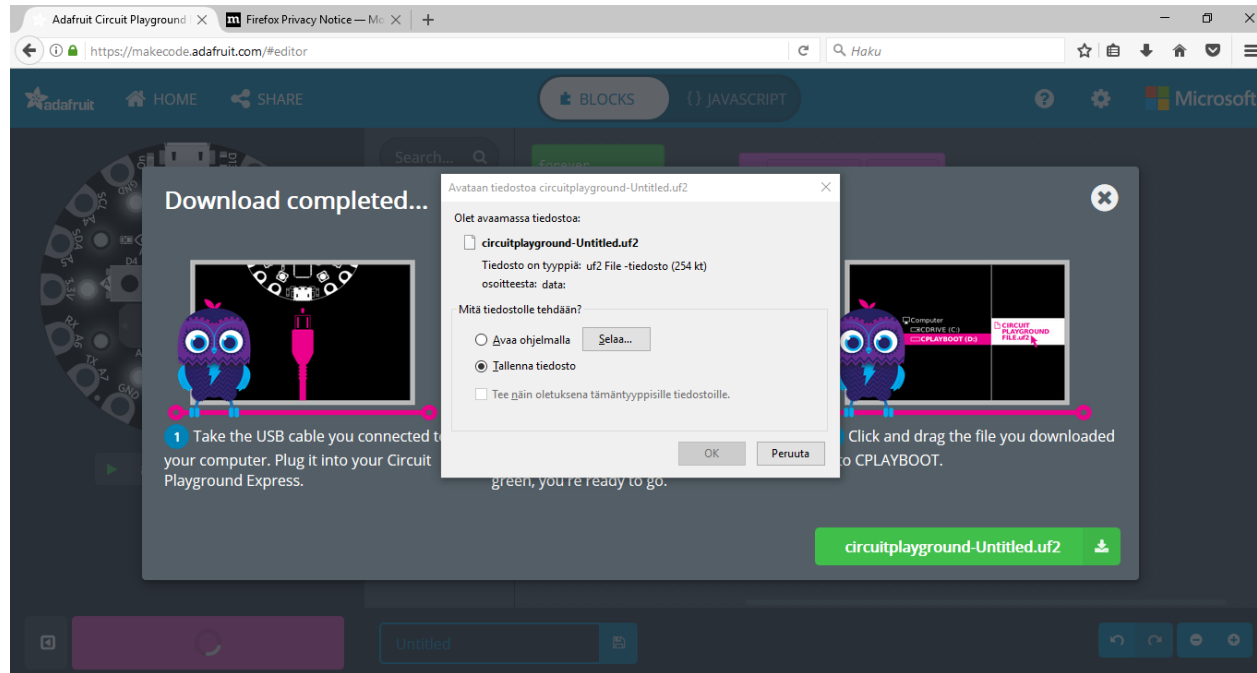
- <https://makecode.adafruit.com/#>
- --> Siren

Ohjelman siirtäminen

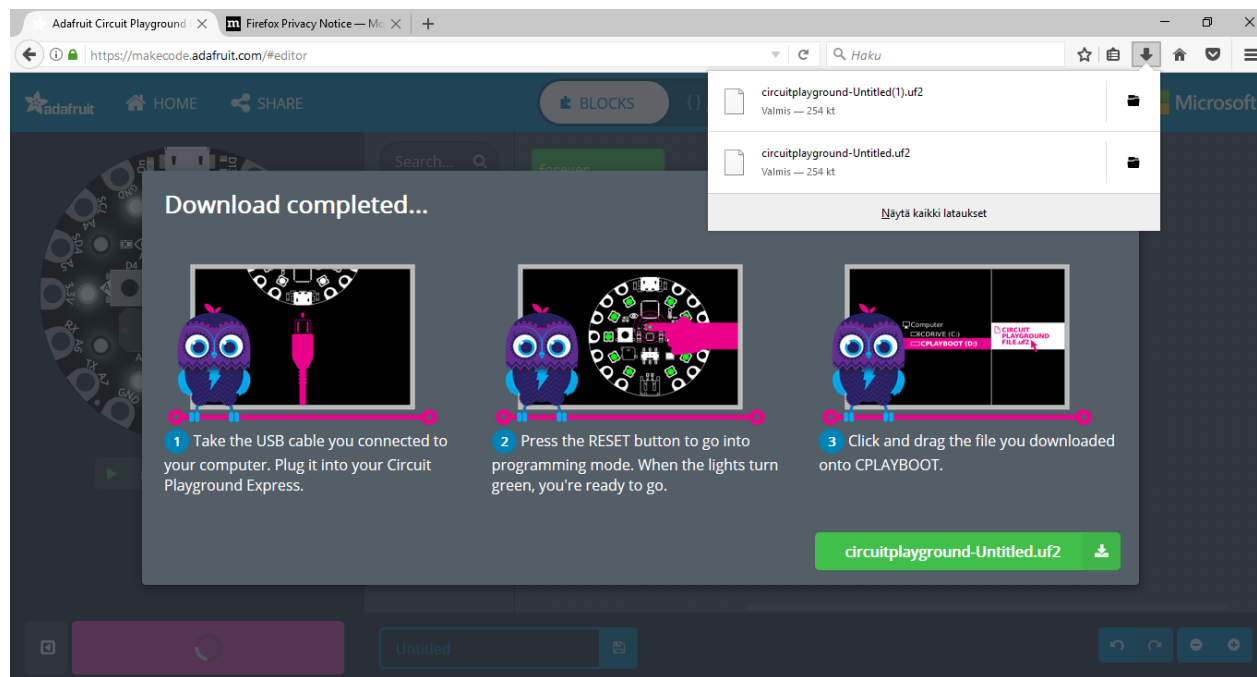
- Anna ohjelmalle nimi
- Kiinnitä kaapeli
- Paina piirilevyn reset-painiketta
- Paina Download



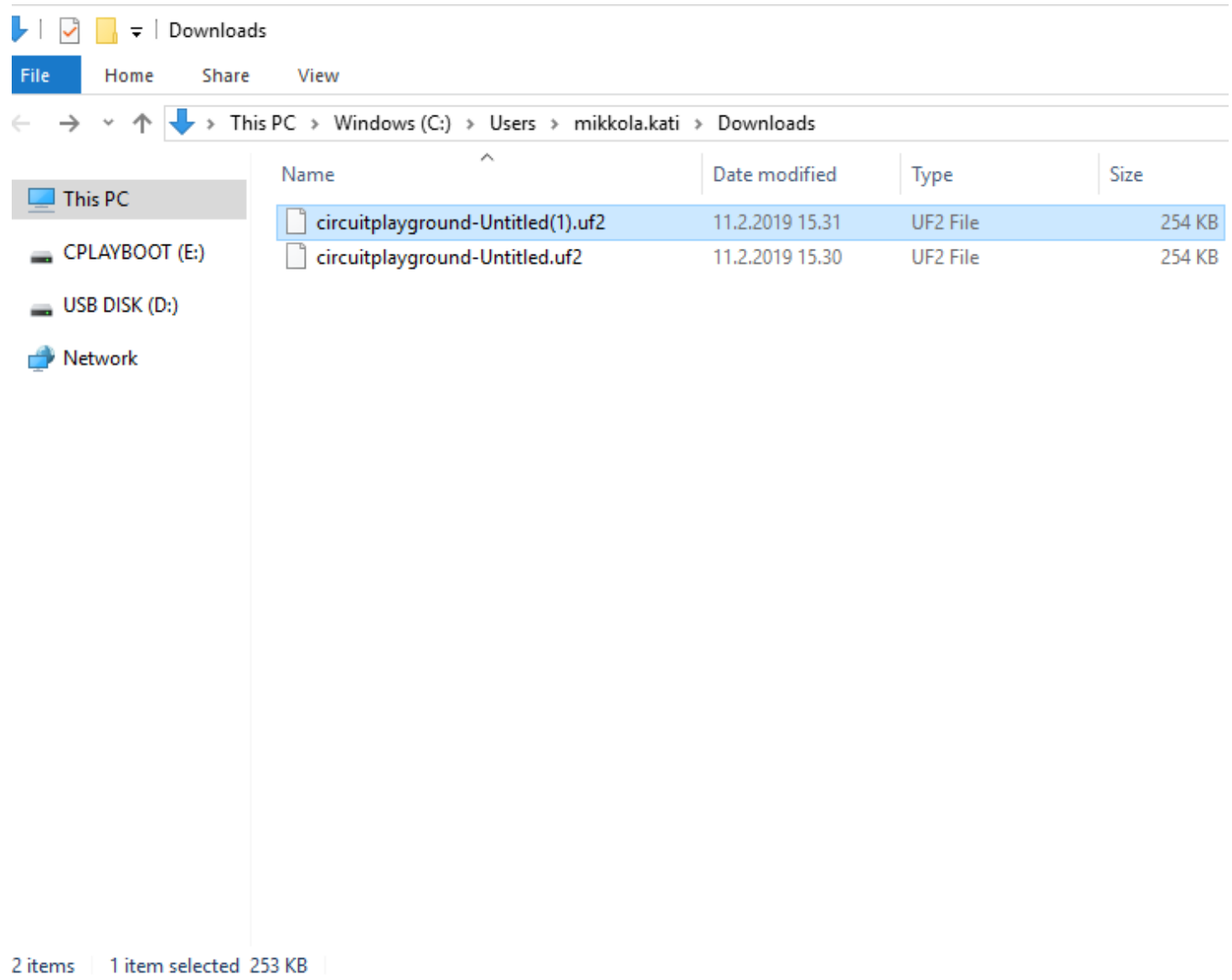
- Valitse tallenna tiedosto



- Avaa oikeasta ylänurkasta Ladatut tiedostot ja valitse siirrettävä tiedosto



- Vie ohjelmasi
cplayboot-
piirilevylle

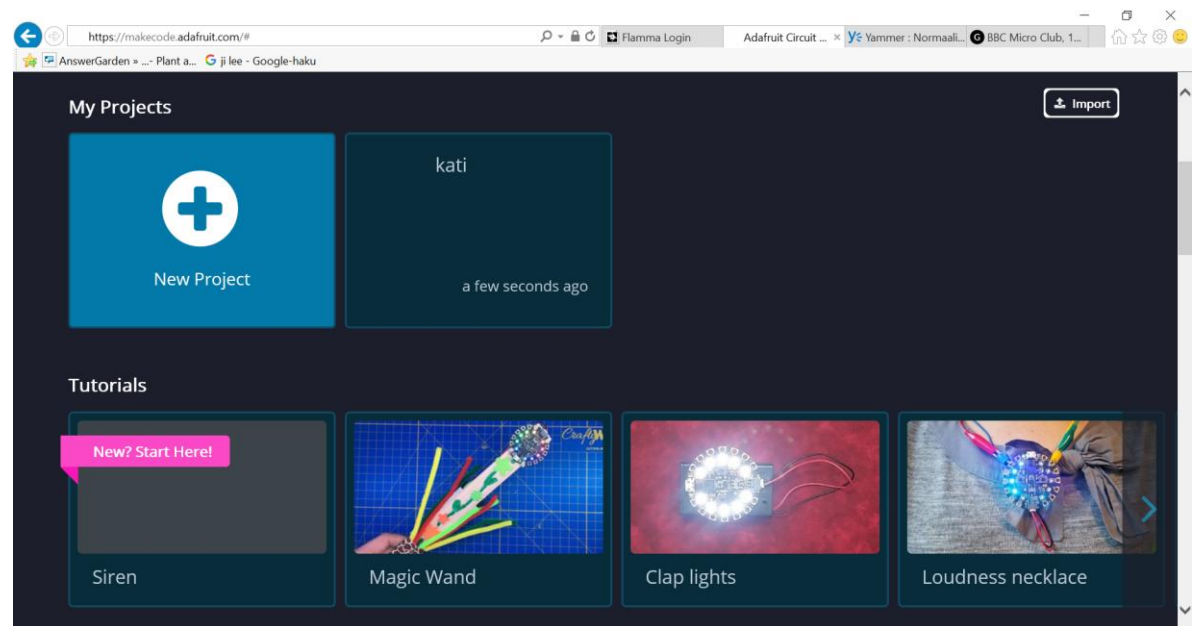


The screenshot shows a Windows File Explorer window titled "Downloads". The address bar indicates the path: "This PC > Windows (C:) > Users > mikkola.kati > Downloads". The left sidebar shows "This PC" selected, with other options like "CPLAYBOOT (E:)", "USB DISK (D:)", and "Network". The main pane displays a table of files:

Name	Date modified	Type	Size
circuitplayground-Untitled(1).uf2	11.2.2019 15.31	UF2 File	254 KB
circuitplayground-Untitled.uf2	11.2.2019 15.30	UF2 File	254 KB

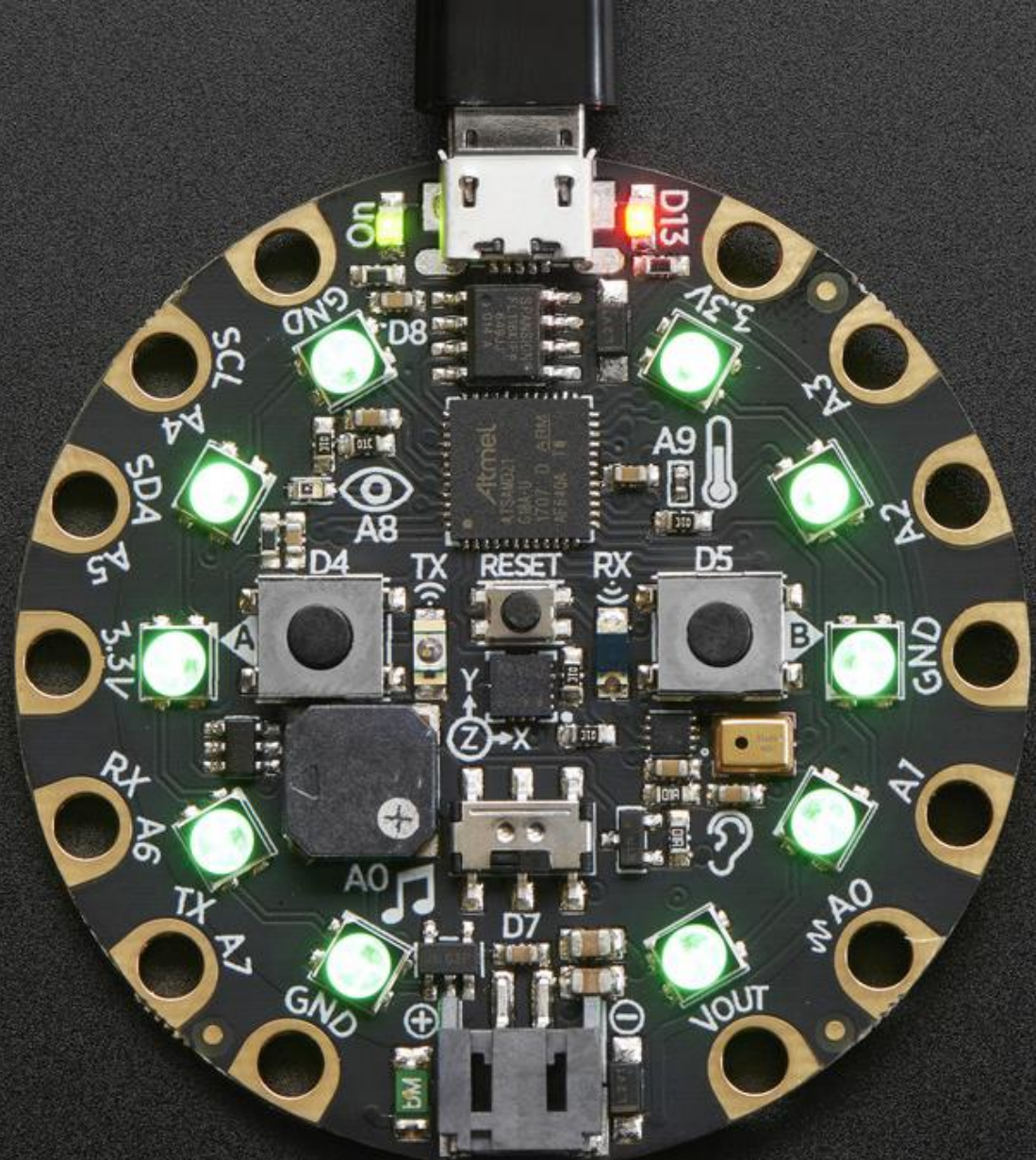
At the bottom of the window, a status bar shows "2 items | 1 item selected 253 KB".

- Valitse sivulta New Project
 - Voit tutustua blokkikieleen ja tutkailla, mitä kaikkea sieltä löytyy
- Kokeile koodata valmiiden tutoriaalien avulla, tai tee omia ohjelmointejasi (esim. Clap Lights)
- Klo 18 siirrytään seuraavaan aiheeseen



Ohjelmoitava piirilevy

- 10 lediä, voidaan ohjelmoida erikseen
- kaiutin
- Äänisensori
- Valosensori
- Analoginen lämpösensori
- Liikesensori
- Infrapunälähetin ja -vastaanotin



Valinnaisuus

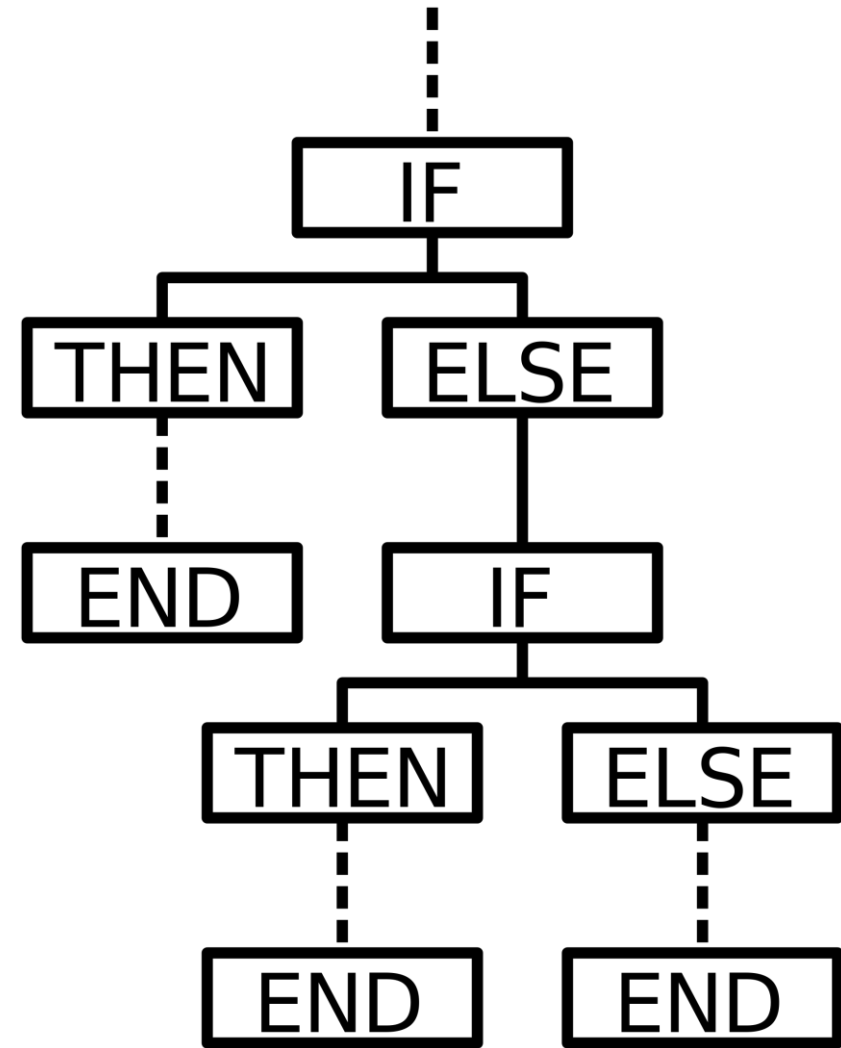
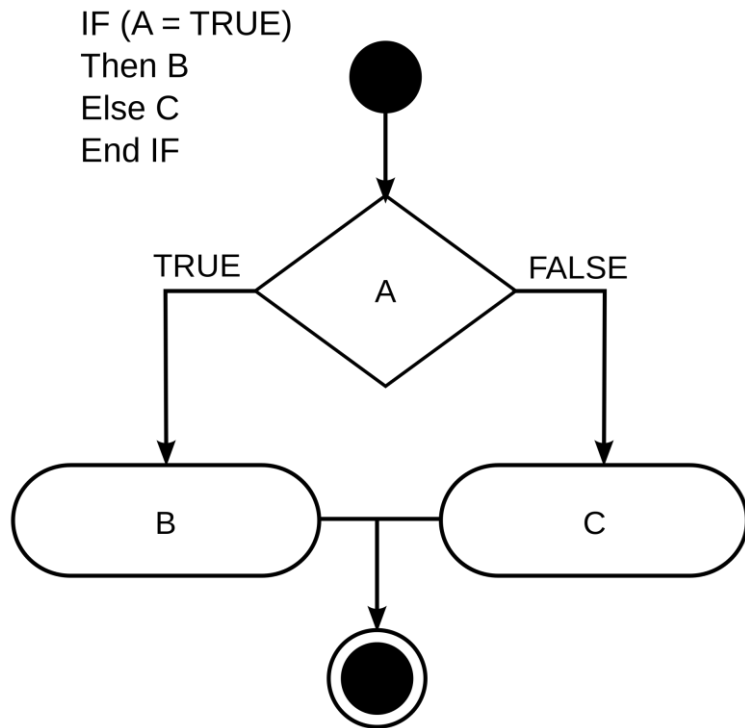
The screenshot displays the Adafruit Circuit Playground Express editor interface. The browser tabs at the top include "Microsoft Office -aloitus sivu", "Yammer : Normaalityseo", "Uusi välilehti", and "Adafruit Circuit Playground Exp". The address bar shows the URL "https://makecode.adafruit.com/#editor".

The interface features a top navigation bar with the Adafruit logo, "HOME", "SHARE", and tabs for "BLOCKS" and "JAVASCRIPT". On the left, a circular view of the Circuit Playground Express board is shown with a temperature gauge indicating 28°C. Below the board view are several control icons.

A central block palette contains categories: LIGHT, INPUT, MUSIC, NETWORK, LOOPS, LOGIC, VARIABLES, MATH, and ADVANCED. The "BLOCKS" tab is active, showing a script editor with the following blocks:

- Two "forever" loop blocks. The first contains an "if true then" block with a plus sign. The second contains an "if true then" block with an "else" block and a minus sign.
- Three "on loud sound" blocks.
- Two "on light" blocks: one with "dark" and one with "bright" dropdown menus.
- Two "on temperature" blocks: one with "hot" at 20°C and one with "cold" at 15°C. The "cold" block is highlighted with a yellow border.

IF – then – else

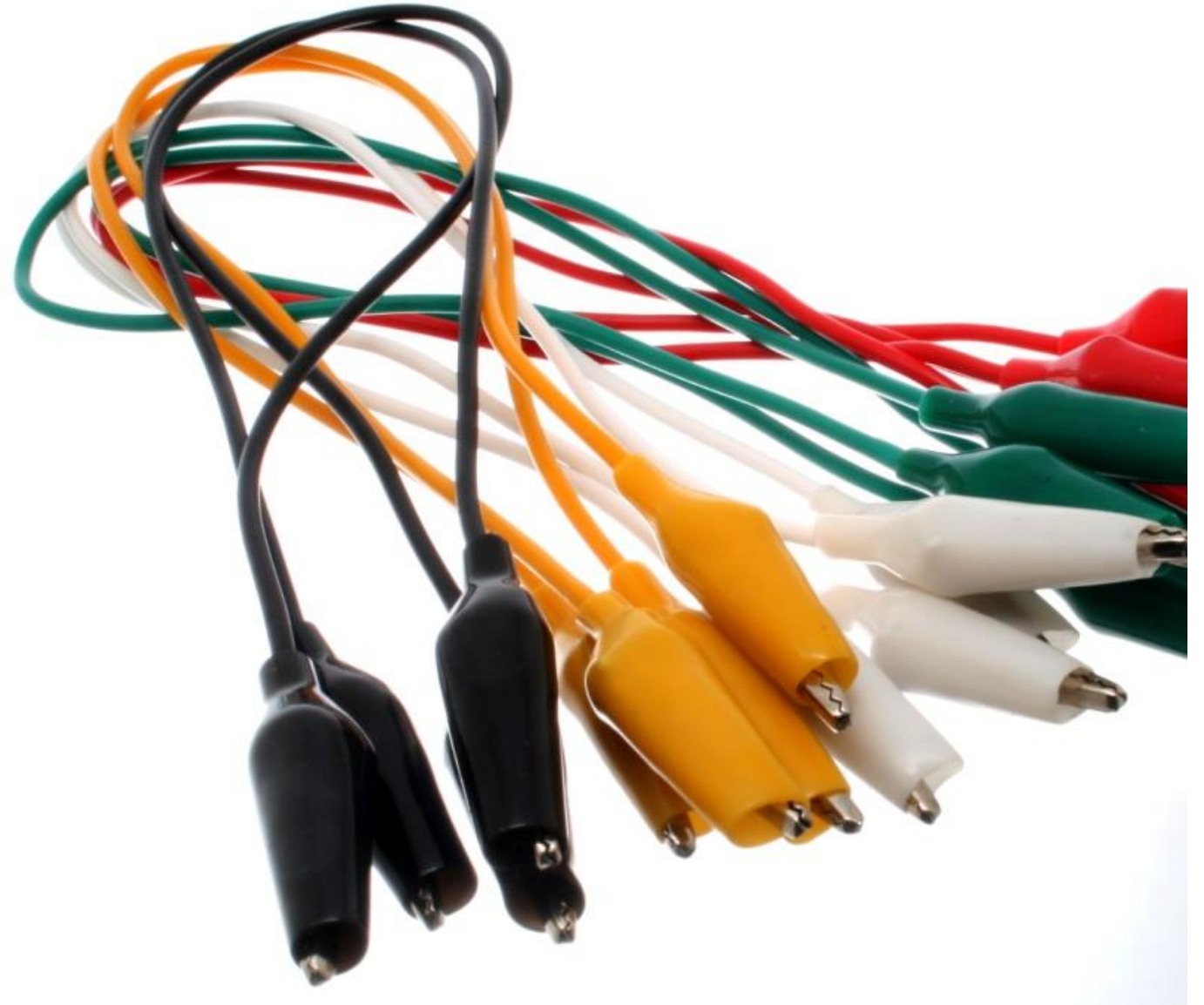


Lisäosat

- Yksittäiset ledit
- Ledinauhat
- Servomoottorit
- Paristokotelot, akut
- Katkaisijat, säätimet
- .
- .
- .

KytKentä kolmen
hauenleuan tai
nauhan avulla

Piirilevyn gnd ja ledin –
Piirilevyn vout ja ledin +
Piirilevyn a1 ja ledin nuoli
sisäänpäin



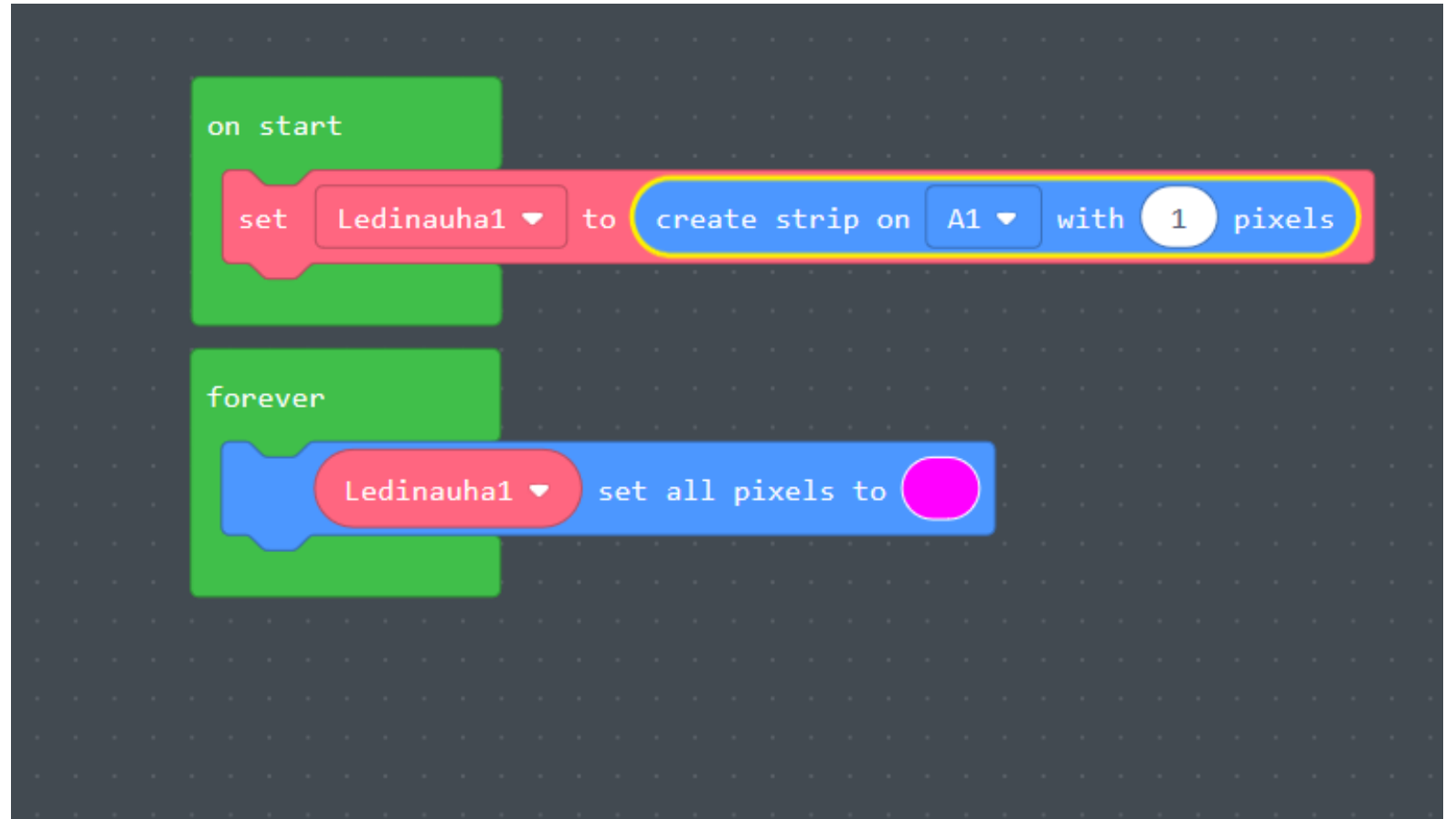
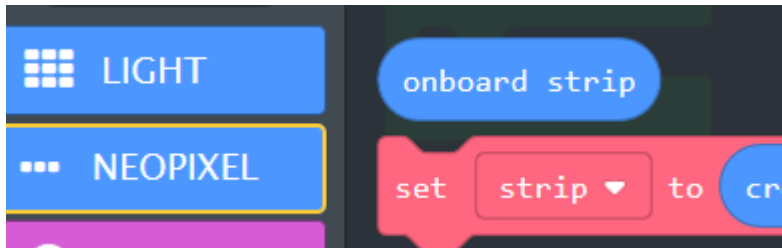
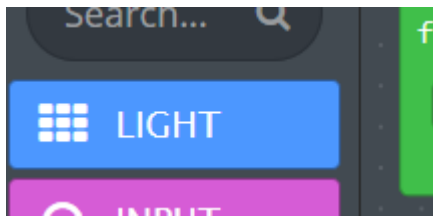
Ledin liittäminen sähköä johtavalla ompelulangalla

- E-tekstiilien hakusanana toimii parhaiten "wearables".
- Esim blogs.adafruit.com ja hae "wearables"
- <https://makecode.adafruit.com/projects/wearable-neopixels/make>



Ledin liittäminen piirilevyyn

Valitse ensin LIGHT, jotta saat näkyviin NEOPIXEL-valikon



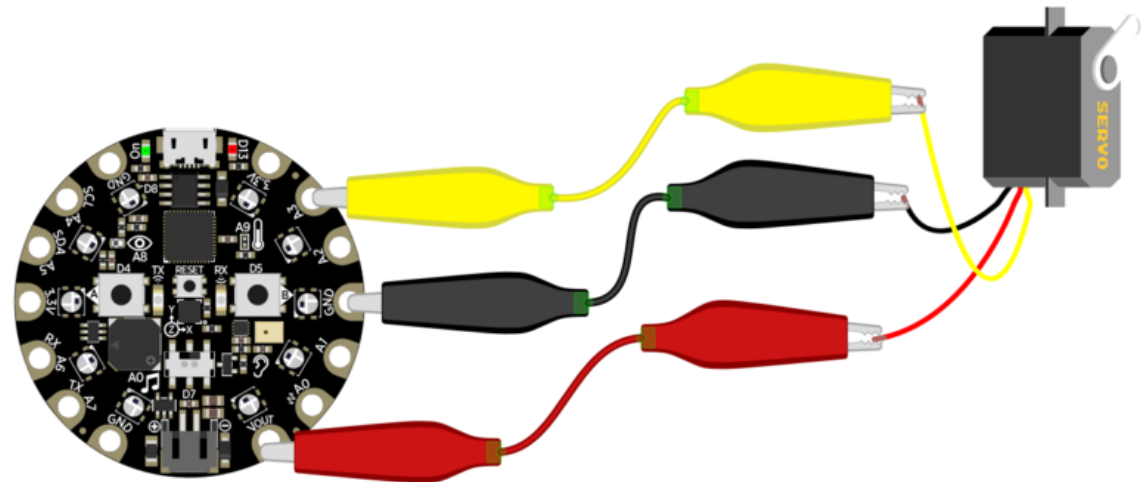
Servomoottorit

- Ovat ympäripyöriä
- Kytkenät hauenleuoilla

Punainen johto: piirilevyn vout

Musta johto: piirilevyn gnd

Keltainen johto: mikä tahansa piirilevyn a



Valmiita projekteja ja ideoita perusopetukseen

- Hyvä video tutustuttaa oppilaat Circuit Playground –projekteihin (1:40min)
- https://www.youtube.com/watch?v=IHC10q_a7Nc&feature=youtu.be

Ledit

E-tekstiilit



<https://sophywong.com/writing>

<https://dotuyau.files.wordpress.com/2015/02/25e63ebbec91314ef9bcf3be0b032e8d.jpg>

<https://dotuyau.files.wordpress.com/2015/02/20080315-led-cyclist-jacket.jpg>

Light up your wardrobe

Use the same simple circuit to add a splash of colour in three different ways



Sophie Wong

@sophywong

Sophie Wong is a designer, maker, and avid creator. Her projects range from period costumes to Arduino-driven wearable tech. She can be found on her YouTube channel and at sophywong.com, chronicling her adventures in making.

With a few modifications, one circuit can make many different projects. Here are three wearable ideas all built from one simple circuit. First, we'll make an LED headband from start to finish. Then, we'll use the same circuit to make both a *Star Trek*-inspired combadge, and a light up hoodie.

In all three builds, we'll play with capacitive touch and make a button using conductive fabric. This is a great technique for wearables, and the Gemma M0 from Adafruit makes it easy to incorporate into projects. Let's get started!

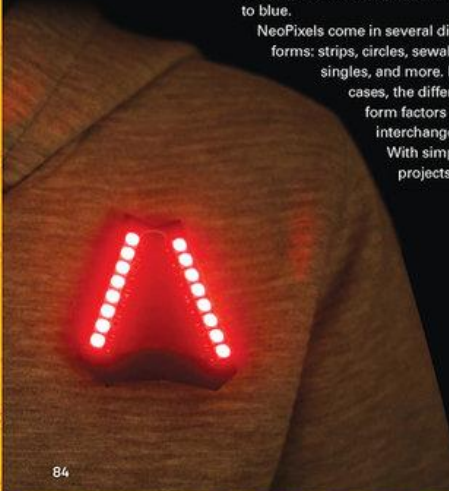
THE CIRCUIT

This circuit is basically a strand of NeoPixels controlled by a Gemma M0 microcontroller. It's simple enough to be used for many different projects, but we've given it a fun twist and added a soft 'button' made of conductive fabric. Touching the fabric changes the colour of the NeoPixels from red to green to blue.

NeoPixels come in several different forms: strips, circles, sewable singles, and more. In most cases, the different form factors are interchangeable. With simple projects like

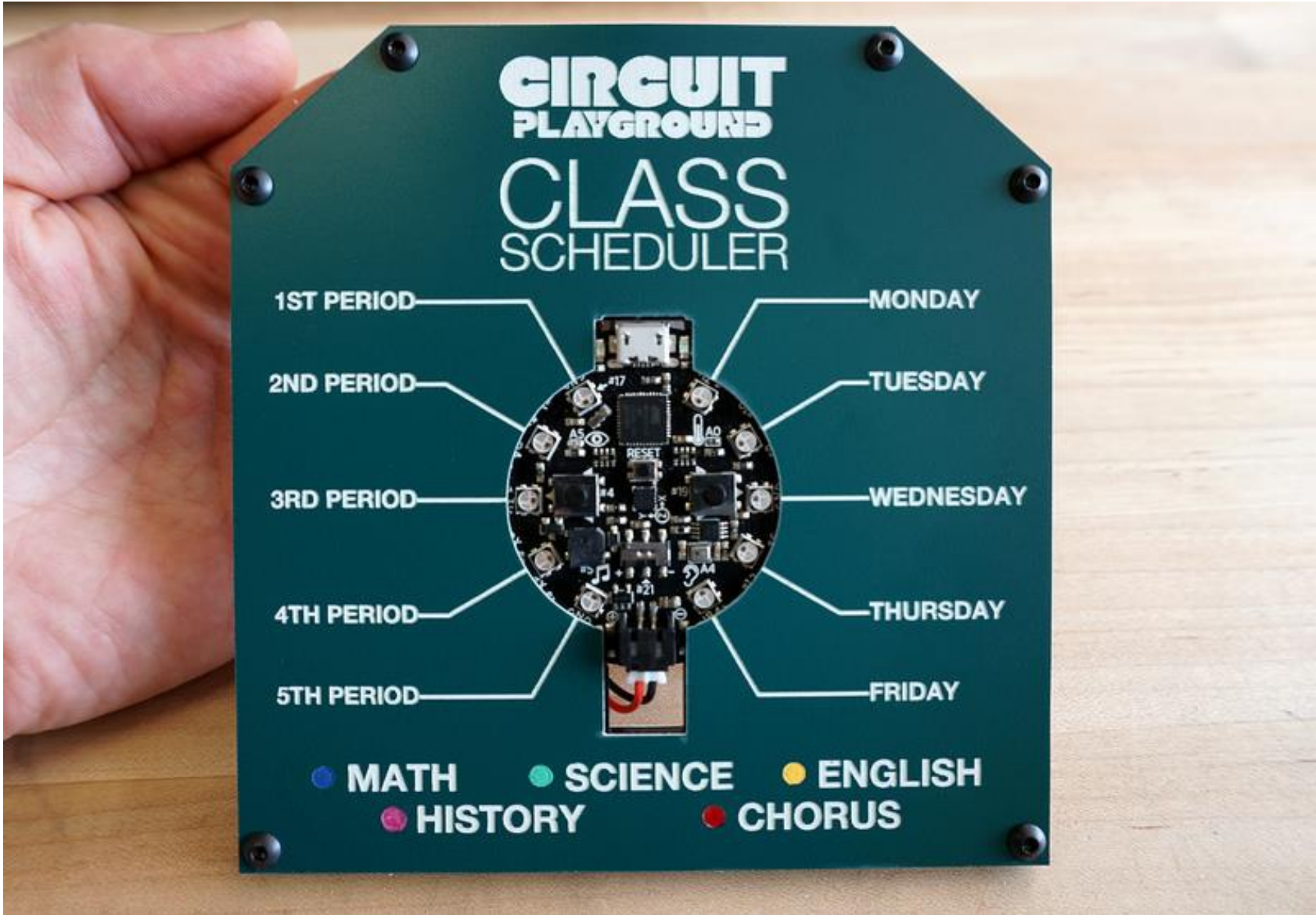
this one, you'll just need to update the number of pixels specified in your project's code.

The Adafruit Gemma M0 microcontroller is great for wearable projects, as it comes with an on/off switch and a JST battery connector on board. We'll make use of the Gemma M0's built-in capacitive touch function, and program it using beginner-friendly Circuit Python. >









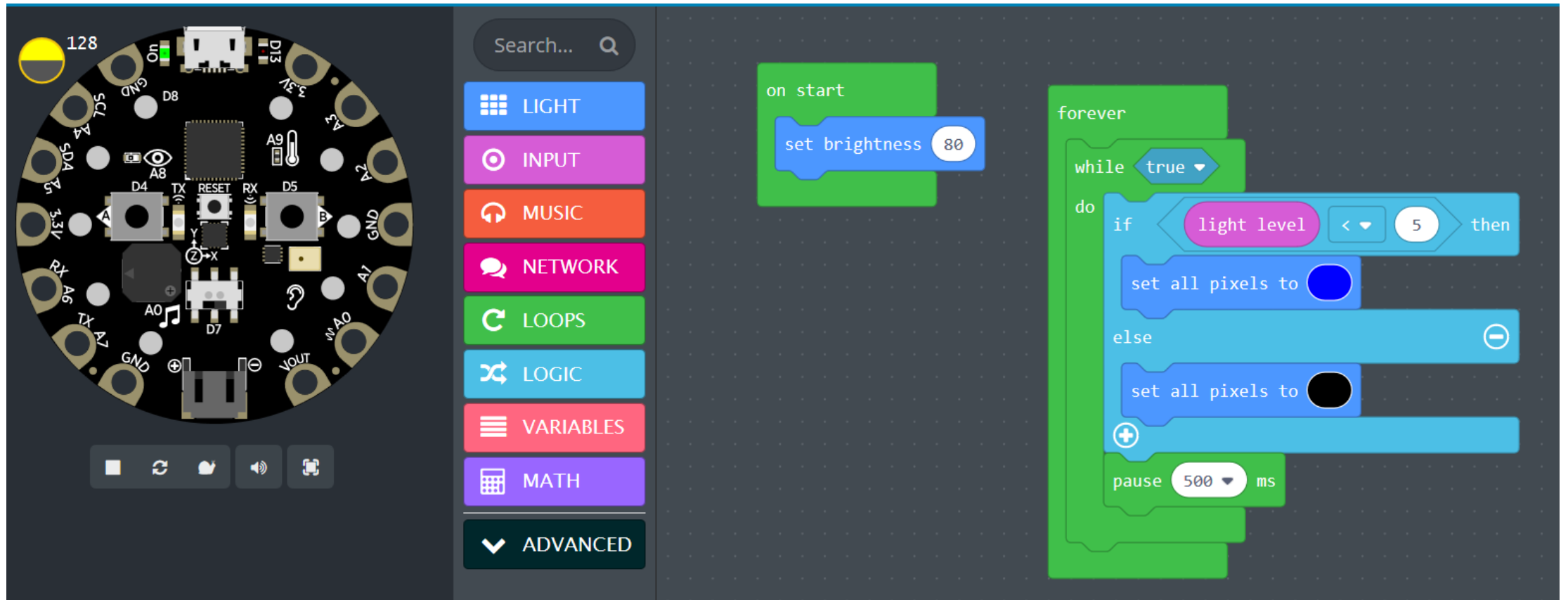
Esimerkki lämpösensorin käytöstä,
tarvitaan myös vara-akku, jotta voi mennä ulos testaamaan

The image shows a Scratch project interface for a temperature sensor. On the left, a circular sensor board is displayed with various components labeled, including SCL, SDA, TX, RX, A0-A9, D0-D9, VOUT, GND, RESET, TX, RX, Y, X, Z, and a temperature gauge showing 17°C. The right side of the interface shows a Scratch script with the following blocks:

- on start
- set brightness 80
- forever
- while true
- do
- if temperature in °C < 18 then
- set all pixels to cyan
- else
- set all pixels to yellow

The script is designed to set the brightness to 80 and then enter a forever loop. Inside the loop, it checks if the temperature is less than 18°C. If true, it sets all pixels to cyan; otherwise, it sets all pixels to yellow.

Esimerkki valosensorin käytöstä

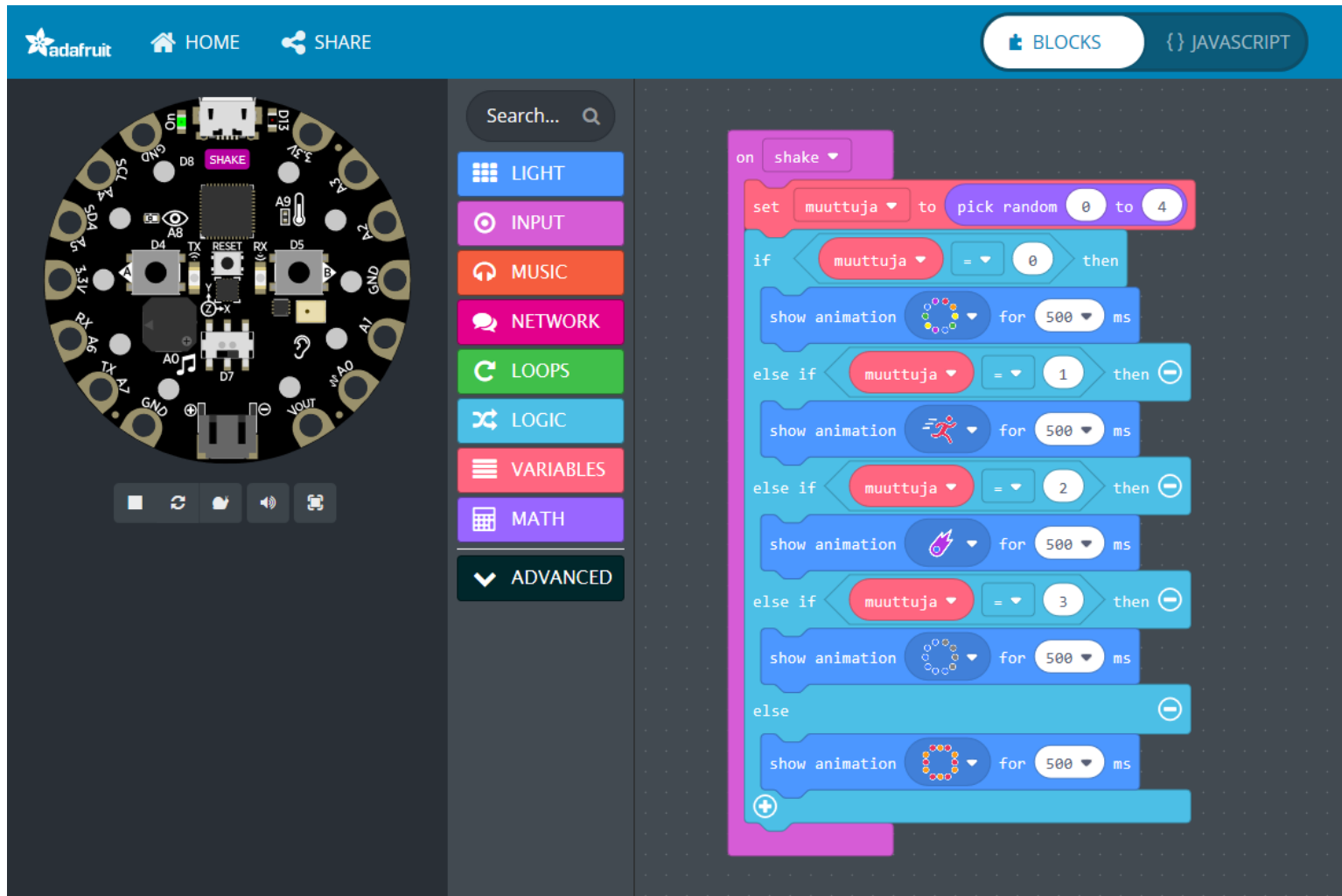


The image shows a screenshot of the MIT Scratch environment. On the left, there is a circular sensor board with various components labeled, including a light sensor (A8), a temperature sensor (A9), and several digital pins (D1-D8). A yellow light sensor icon in the top left corner shows a value of 128. In the center, a search bar is visible. Below it, a vertical menu lists categories: LIGHT, INPUT, MUSIC, NETWORK, LOOPS, LOGIC, VARIABLES, MATH, and ADVANCED. On the right, a Scratch script is shown. The script starts with an 'on start' block containing a 'set brightness' block set to 80. This is followed by a 'forever' loop containing a 'while true' loop. Inside the 'while true' loop, there is an 'if' block: 'if light level < 5 then set all pixels to blue', and an 'else' block: 'set all pixels to black'. The script concludes with a 'pause 500 ms' block.

```
on start
  set brightness 80

forever
  while true
  do
    if light level < 5 then
      set all pixels to blue
    else
      set all pixels to black
    pause 500 ms
```

Esimerkki valinnaisuudesta ja liikeseensorin käytöstä



The image shows the Adafruit Blocks IDE interface. On the left, a circular sensor board is displayed with various pins labeled (e.g., GND, TX, RX, VOUT, A0-A9, D0-D7, SCL, SDA, I2C, I2C+, I2C-). A pink 'SHAKE' sensor is highlighted. Below the board is a search bar and a menu with categories: LIGHT, INPUT, MUSIC, NETWORK, LOOPS, LOGIC, VARIABLES, MATH, and ADVANCED.

On the right, the JavaScript code is written in a block-based style:

```
on shake  
  set muuttuja to pick random 0 to 4  
  if muuttuja = 0 then  
    show animation [animation] for 500 ms  
  else if muuttuja = 1 then  
    show animation [animation] for 500 ms  
  else if muuttuja = 2 then  
    show animation [animation] for 500 ms  
  else if muuttuja = 3 then  
    show animation [animation] for 500 ms  
  else  
    show animation [animation] for 500 ms
```

Moottorin ohjelmointi

The screenshot shows the Adafruit Circuit Playground Express web editor interface. The browser tabs include "Microsoft Office Home", "8E ohjelmointi - OneDrive", "Circuit Playground express", and "Adafruit Circuit Playgro". The address bar shows the URL "https://makecode.adafruit.com/#editor".

The interface features a top navigation bar with the Adafruit logo, "HOME", "SHARE", "BLOCKS", and "JAVASCRIPT" tabs. A search bar is located above a category menu on the left, which includes: LIGHT, INPUT, MUSIC, NETWORK, LOOPS, LOGIC, VARIABLES, MATH, ADVANCED, and PINS.

The main workspace displays a circular image of the Circuit Playground Express board on the left. On the right, a block-based program is visible, consisting of a "forever" loop containing the following blocks:

- servo write pin A1 to 179
- pause 1000 ms
- servo write pin A1 to 0
- pause 1000 ms
- servo write pin A1 to 90
- pause 1000 ms
- servo write pin A1 to 0
- pause 1000 ms

At the bottom of the editor, there is a "Download" button, a text field containing "Untitled", and a set of navigation controls (undo, redo, home, refresh).

Ideoita

- <https://youtu.be/4lGRgO40UhM>
- <https://youtu.be/lat4n7FLc-4>
- https://youtu.be/zLD_77xkrW4
- https://youtu.be/QHRHdEvh_DQ
- <https://youtu.be/BGnZTnGnGAA>
- <https://youtu.be/jMI0epjfTLM>
- <https://youtu.be/2ufhJ7YOA4c>
- <https://youtu.be/5CZSwDKfQds>
- <https://makecode.adafruit.com/projects/wearable-neopixels>
- <https://www.youtube.com/watch?v=z2fJalBqbbE>

Lisää esimerkkejä ja projekteja

- <https://makecode.adafruit.com/examples>
- <https://makecode.adafruit.com/projects>
- <https://blog.adafruit.com/>
- <https://learn.adafruit.com/>

Hauskoja koodauskokeiluja!

Adafruitia myy suomessa PARTCO

- **Circuit Playground 39€ (alv 0%):**
- <https://www.partco.fi/fi/elektroniikan-komponentit/aktiivit/mikrokontrollerit/arm/19189-ada3333.html>
- **USB-kaapeli, 50cm 3€ (alv 0%):**
- https://www.partco.fi/fi/tietokonetarvikkeet/vaeylaet/usb/usb-kaapelit/496-dk-usb-vj17-05m.html?search_query=USB-2.0+VALIJOHTO+A-UROS+%2F+microB+UROS&results=6