micro:bit pre pokročilých

Richard Balogh

STU FEI

SLOVAK UNIVERSITY OF
TECHNOLOGY IN BRATISLAVA
FACULTY OF ELECTRICAL ENGINEERING
AND INFORMATION TECHNOLOGY

ajtyvit

Richard Balogh

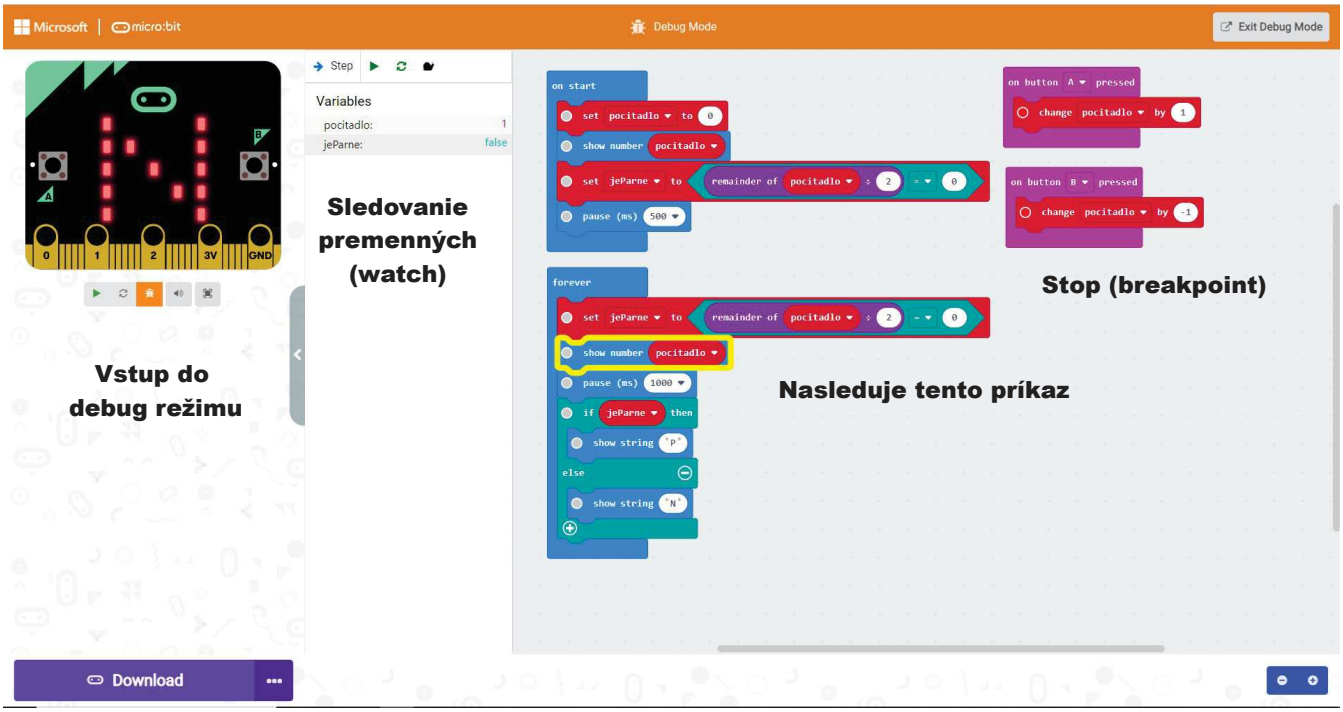
STU FEI

1. debugger

Debugger

Ovládacie prvky:
Step (krok)
Run (spusti)
Reštart
Slow (spomaľ)

Návrat



Úloha: vyskúšajte!

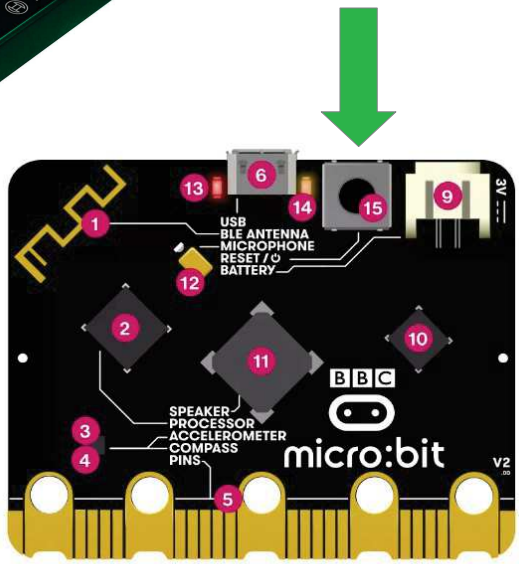
micro:bit

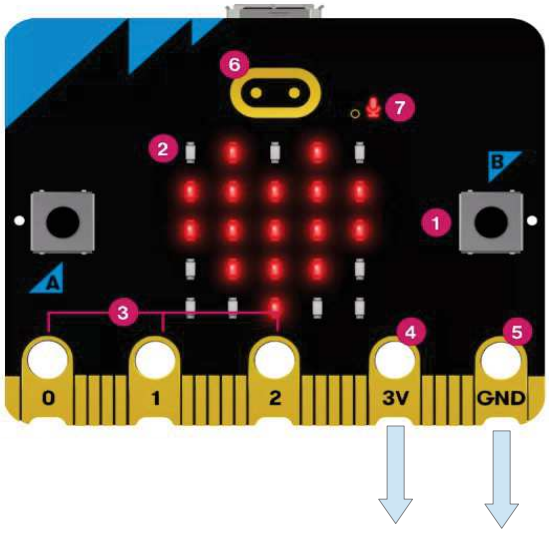
2. napájanie

USB napájanie

- z PC
- mobil + OTG
- z Powerbanky (skontrolovať U_{max} a I_{min})

V2: On/Off/Reset

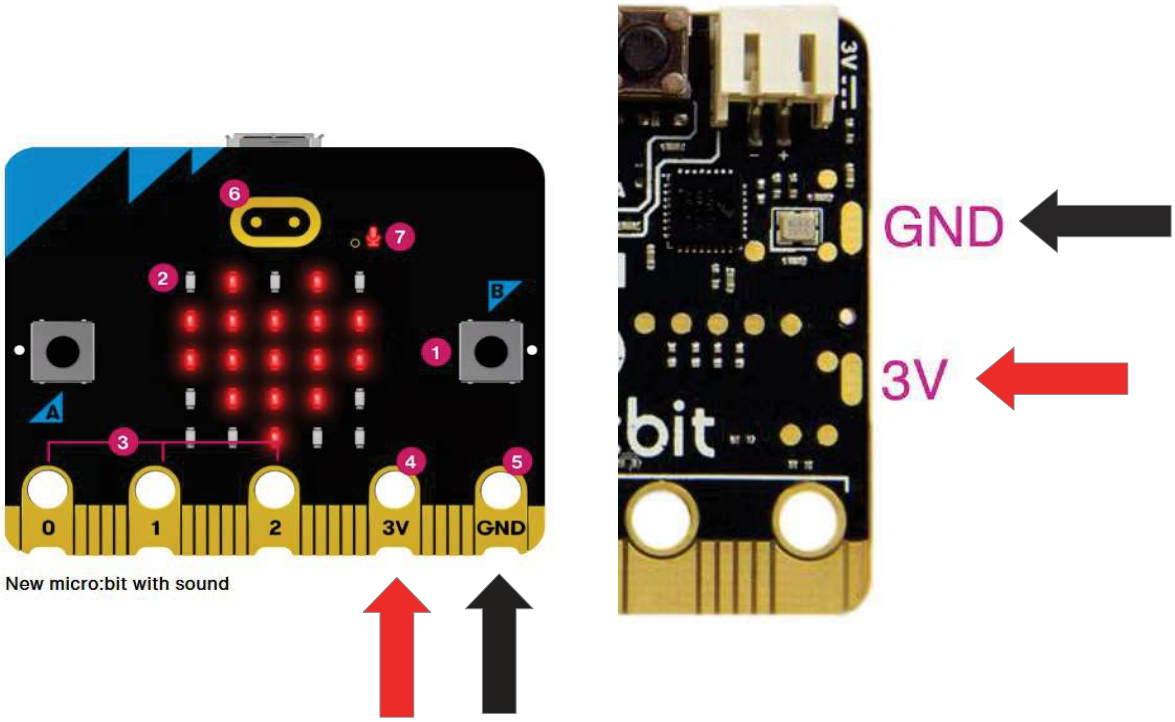




Pre periférie:
~ 90 mA **V1**
~ 270 mA **V2**

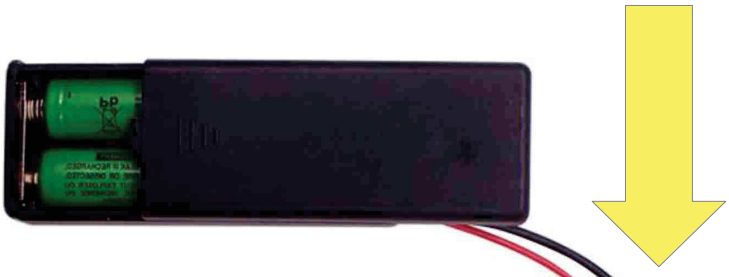
málo pre motorčeky, neopixel a pod.

Externé napájanie



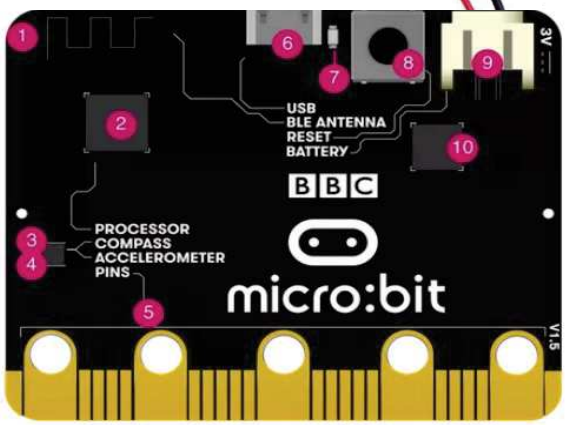
Battery Power I.

- s vypínačom (+)
- bez vypínača



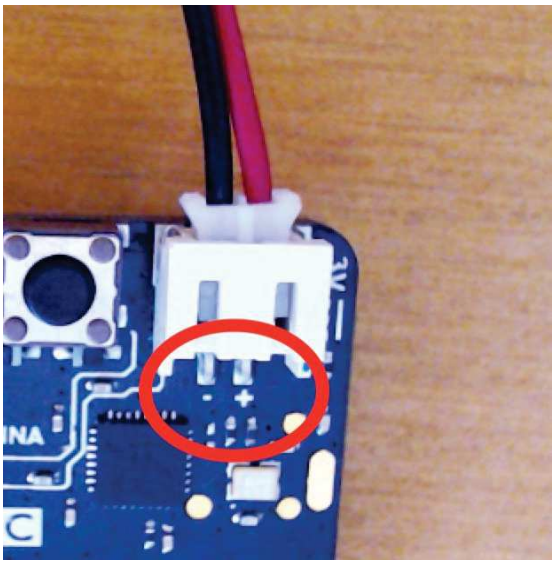
2 x zinc or alkaline AA or AAA batteries

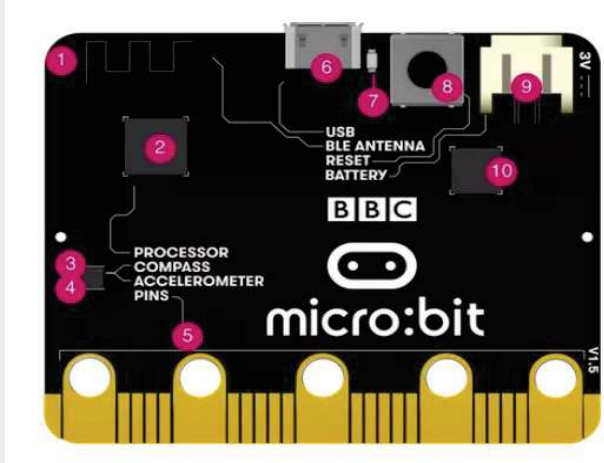
Ak je USB aj baterie, napatie sa prepne automaticky na vyssie (USB) a tym sa baterie setria.



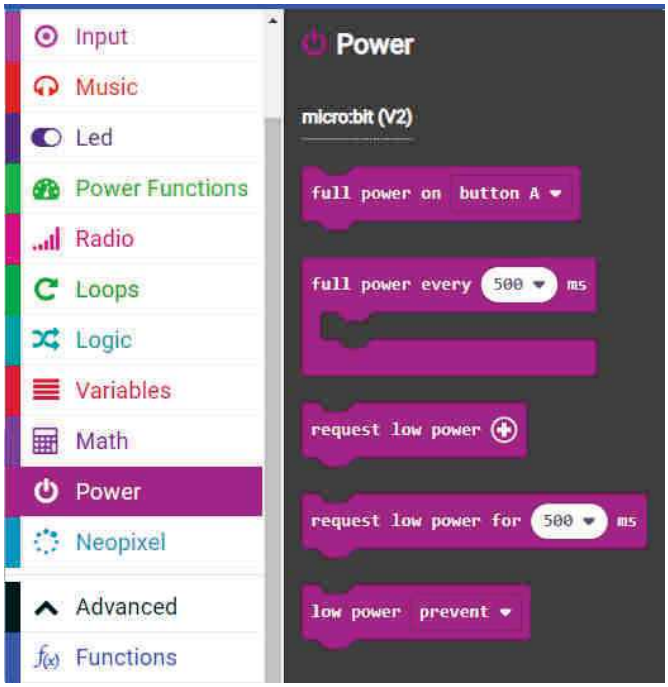
Battery Power II.

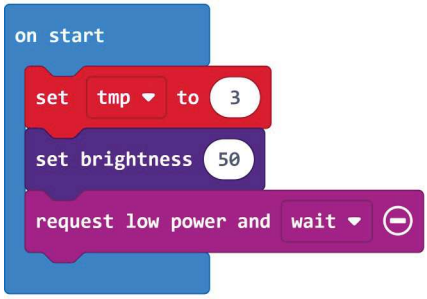
fully charged LiPoly battery that is specified
to reach **4.2V** will be give greater than the 3.6V!!!

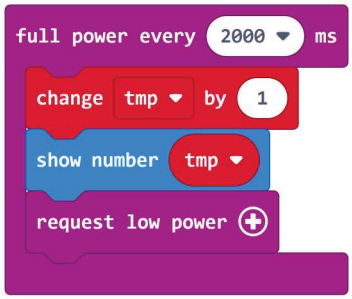




Device	min	max	absolutemax
NRF52	**1,70V**	3,6V	3,9V
KL27	1,71V	3,6V	3,8V
LSM303	1,71V	3,6V	**3,6V**







POZNAMKY

- Aj v low power rezime si pamata obsah premennej
- Znizit svietivost LED je tiez jeden velmi dobry sposob usetrenia energie
- Tymto prikazom uspime mikropocitac

A tymto ho kazde 2 sekundy zobudime...

vykoname co treba

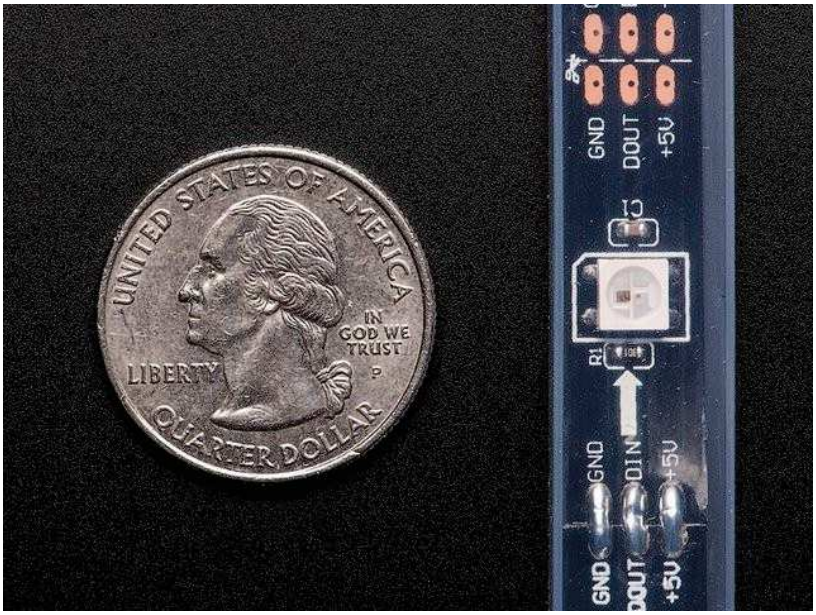
... a na konci zasa uspime

Tento program sa bude inak spravat pri napajani z USB a inak z baterie.

Úloha: importujte knižnicu a naprogramujte micro:bit v úspornom režime, vyskúšajte rozdiel pri napájaní cez USB a z batérie.

micro:bit

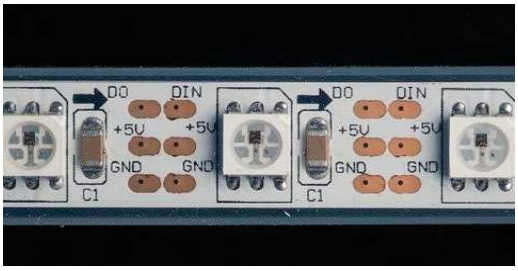
3. neopixel



Prestrihnúť

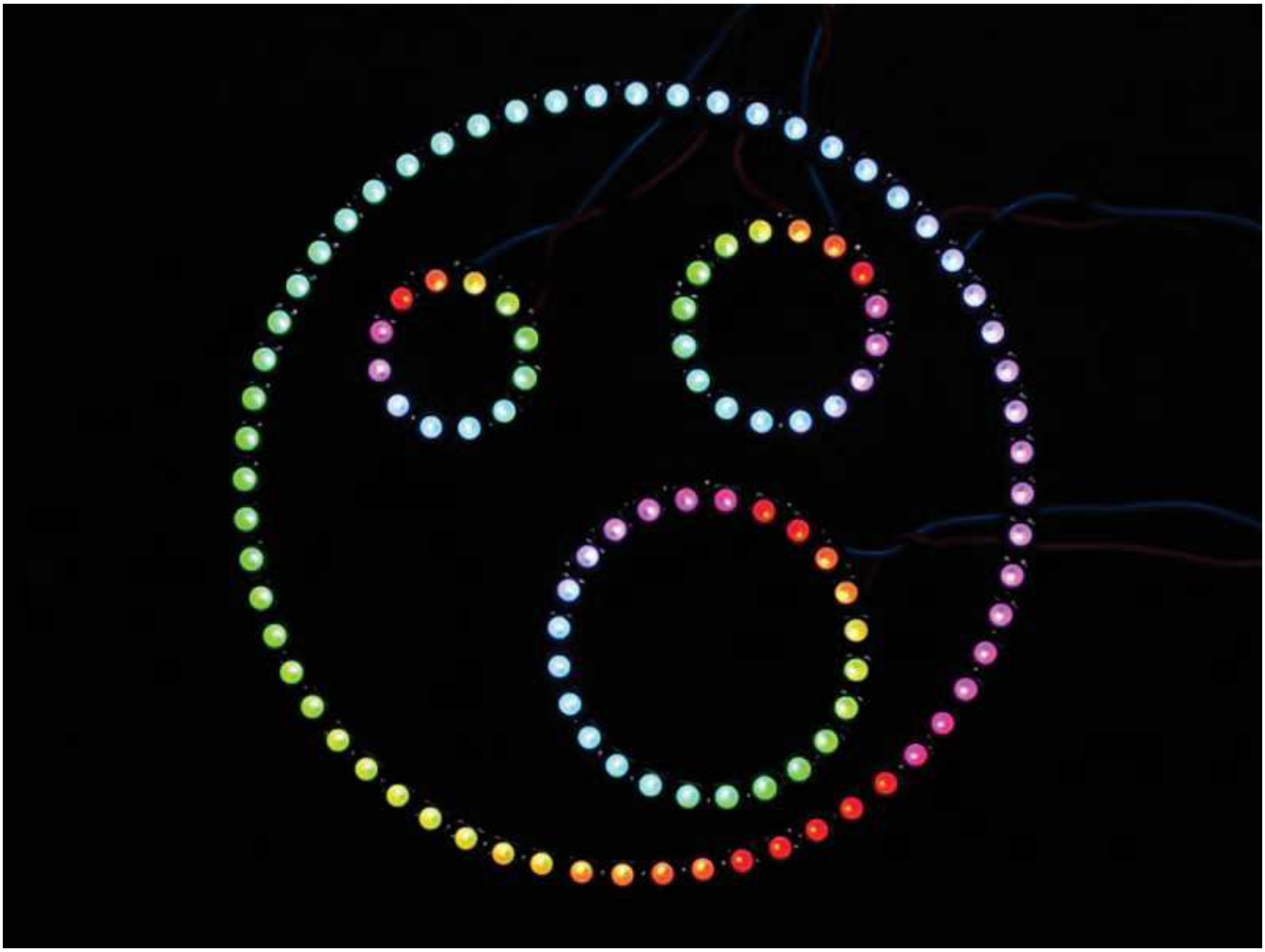
30 LED / meter

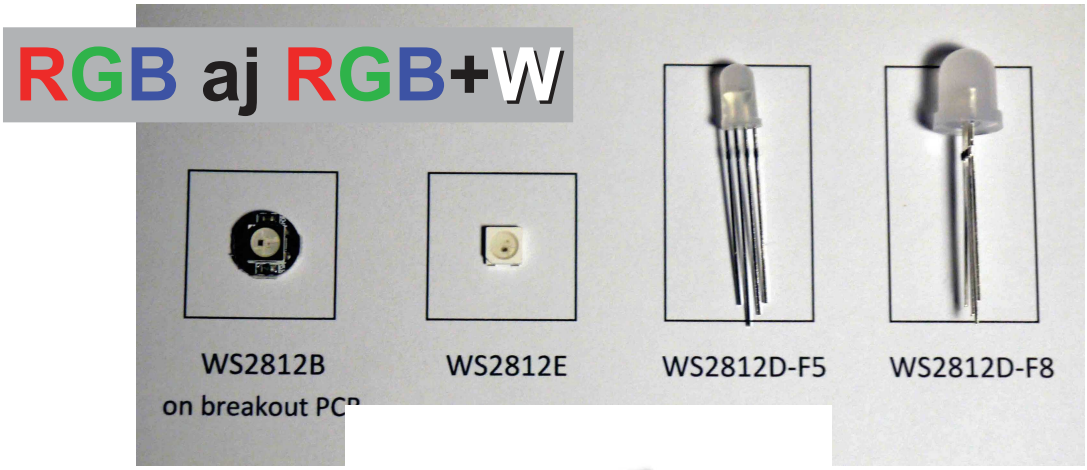
Spojiť

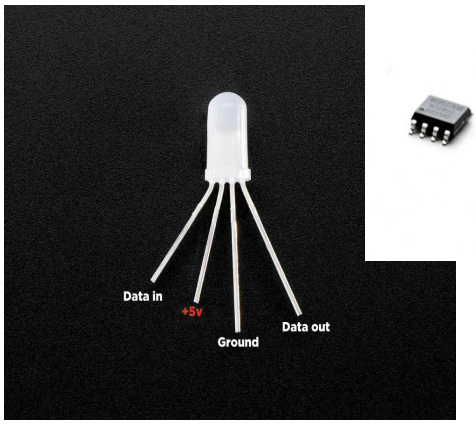


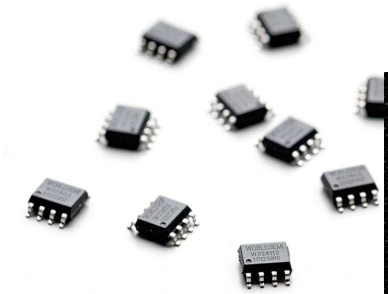
60 LED / meter - biely pás

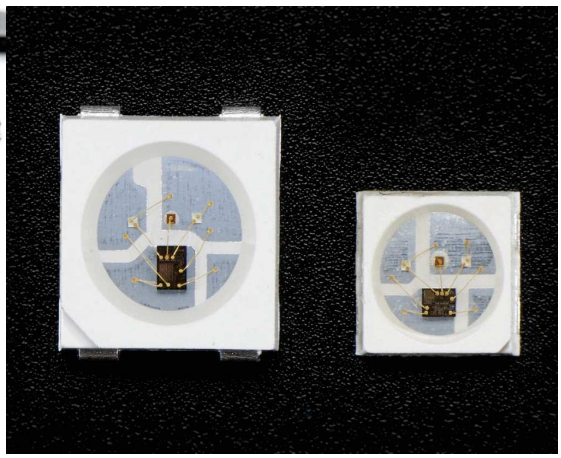
144 LED / meter - čierny pás



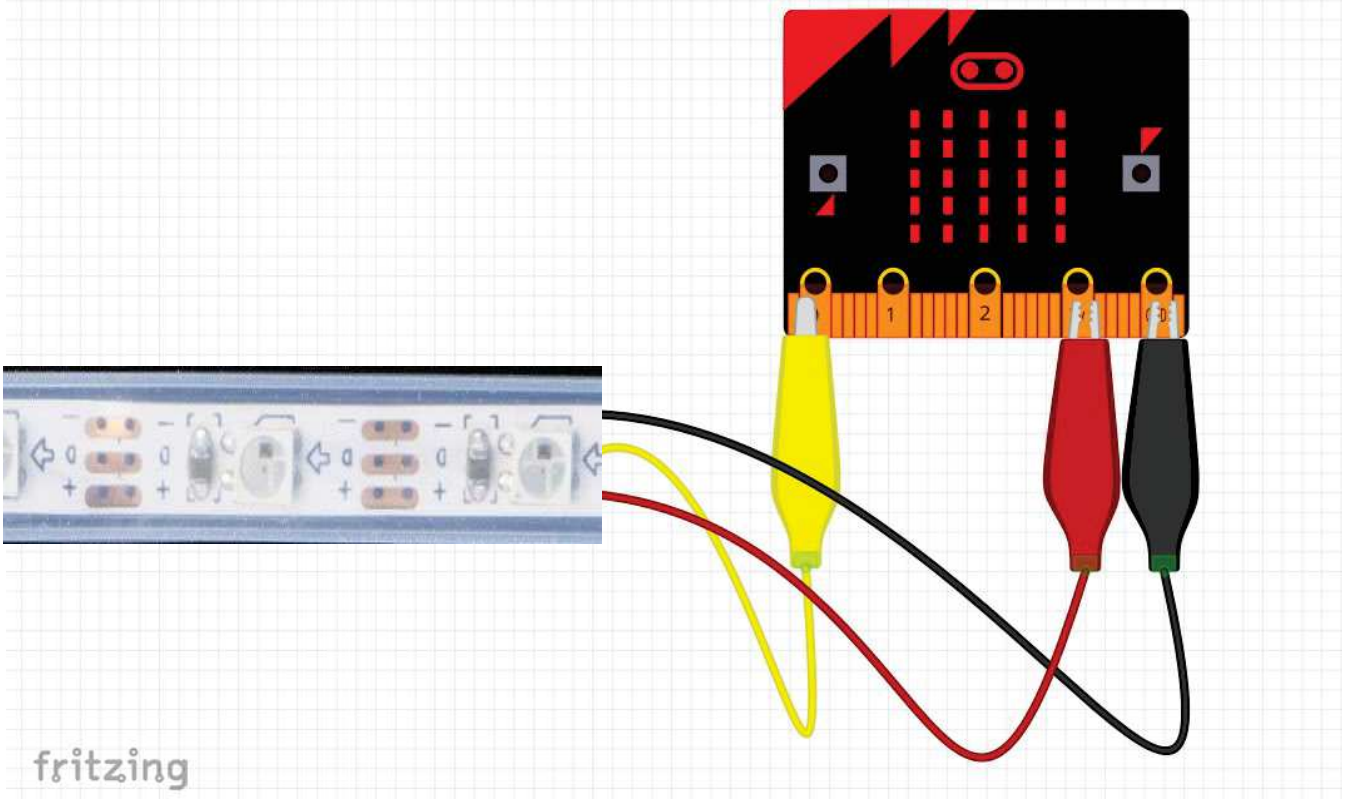

RGB aj RGB+W
WS2812B
on breakout PCB
WS2812E
WS2812D-F5
WS2812D-F8

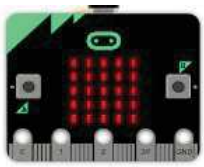

Data in
+5v
Ground
Data out





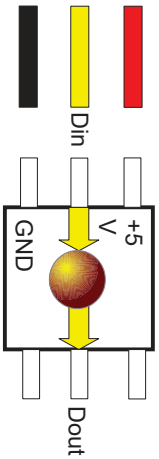
Pripojenie LED pásika

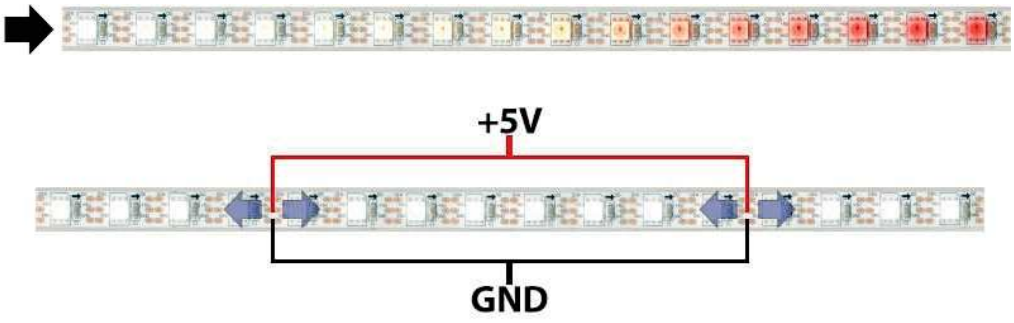




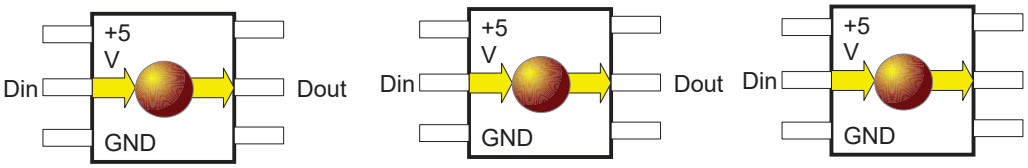
min **20 mA** / LED
max **60 mA** / LED

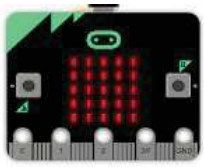
micro:bit pre periférie:
~ 90 mA **V1**
~ 270 mA **V2**





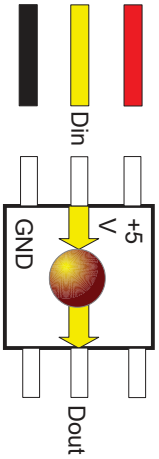
https://learn.adafruit.com/sipping-power-with-neopixels

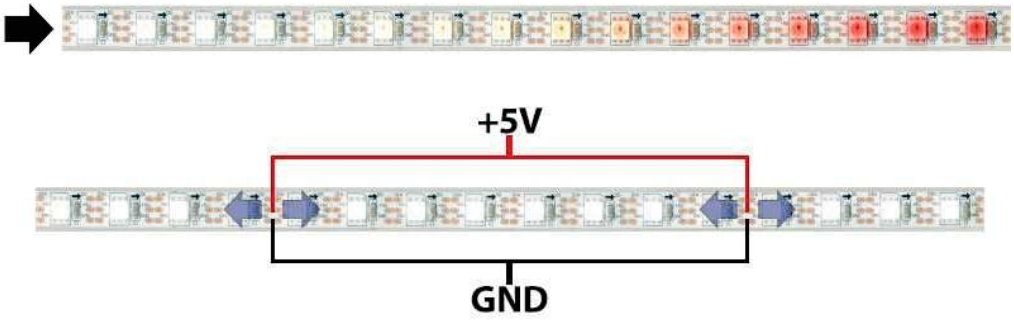




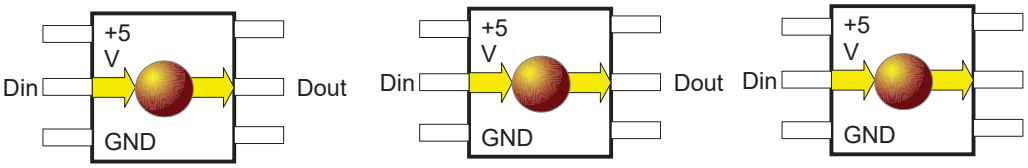
min **20 mA** / LED
max **60 mA** / LED

micro:bit pre periférie:
~ 90 mA **V1**
~ 270 mA **V2**

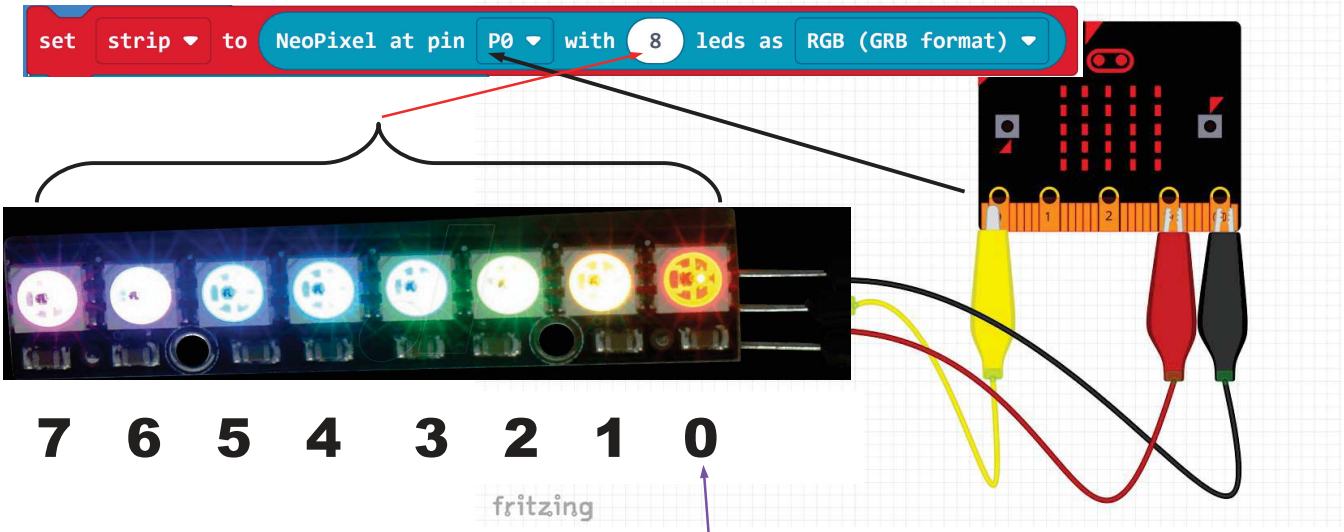




https://learn.adafruit.com/sipping-power-with-neopixels

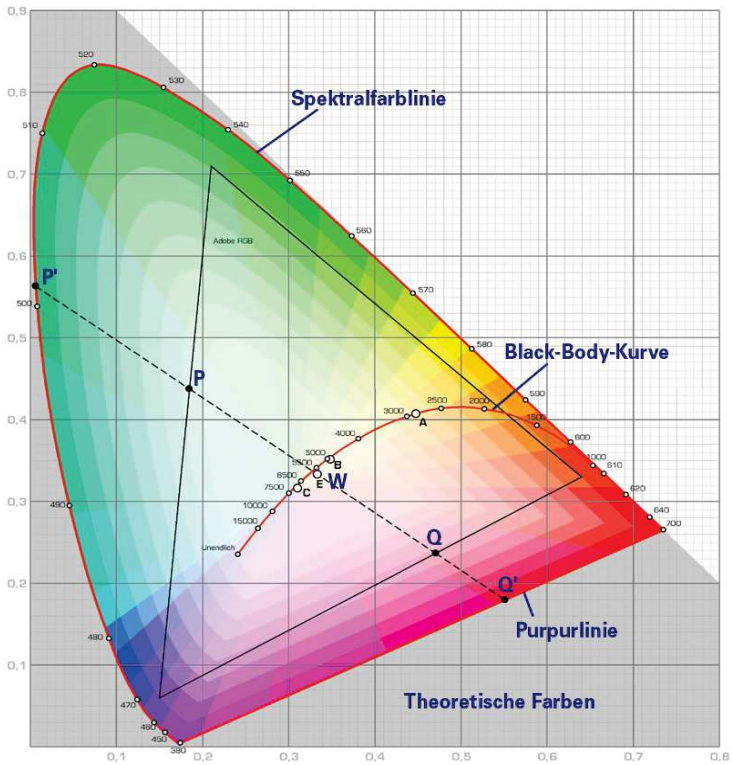


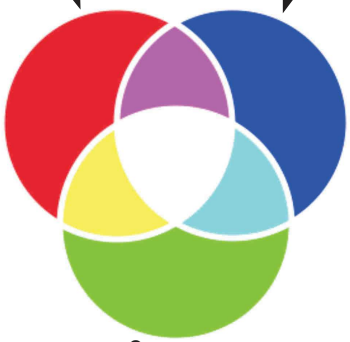
Pripojenie LED pásika - import nových blokov:

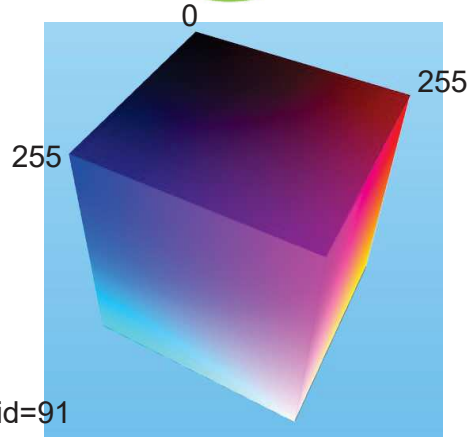



```
strip set pixel color at 0 to red 255 green 0 blue 255
```

strip set pixel color at 0 to red 255 green 0 blue 255



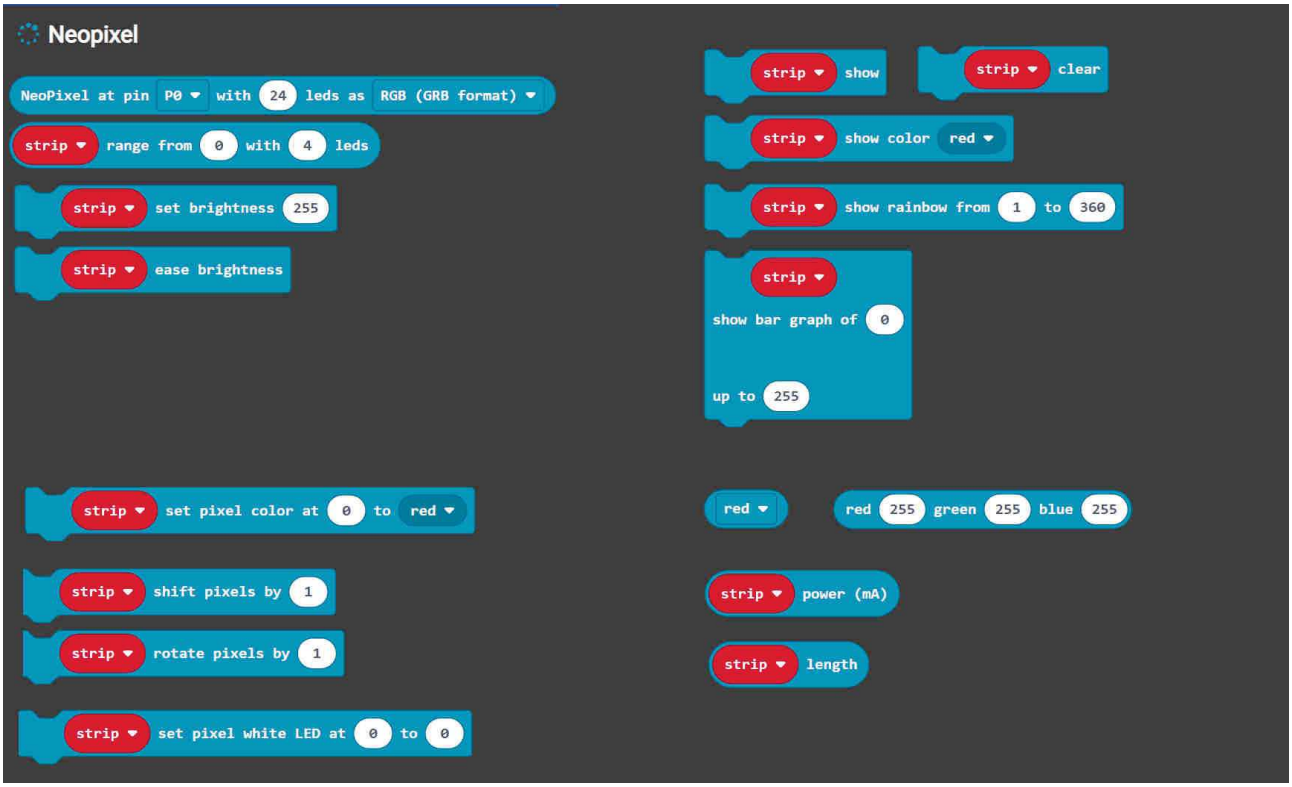




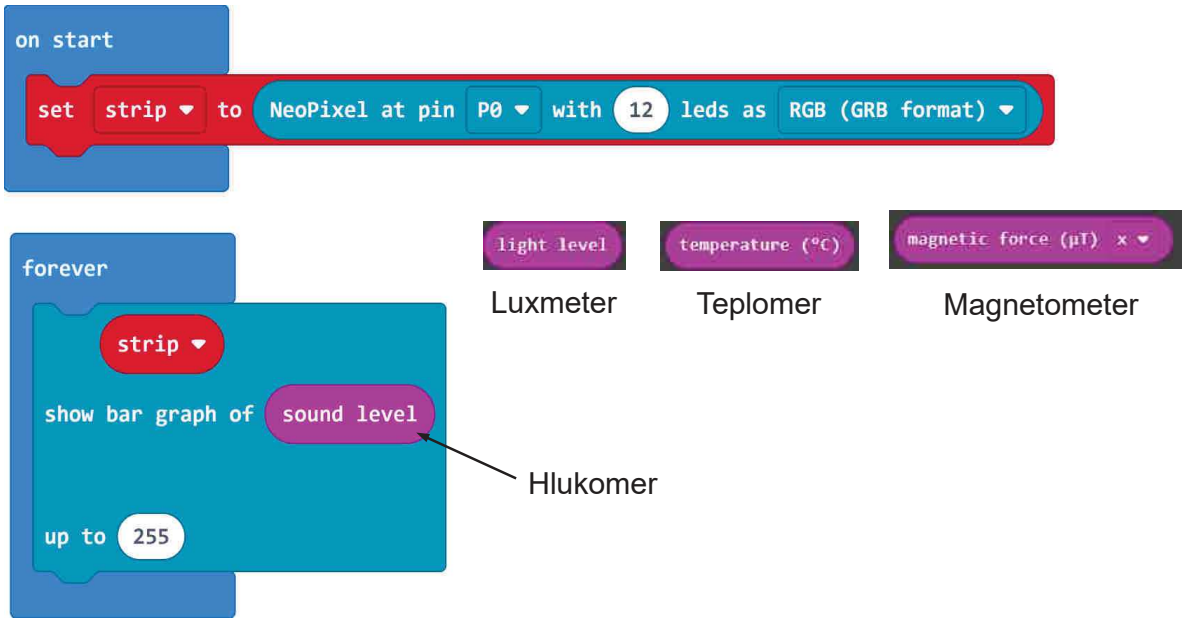
https://www.infinityinsight.com/product.php?id=91

https://3dwarehouse.sketchup.com/model/f28fa4312fc010f1c7ecd65c510d37b4/RGB-Color-Cube

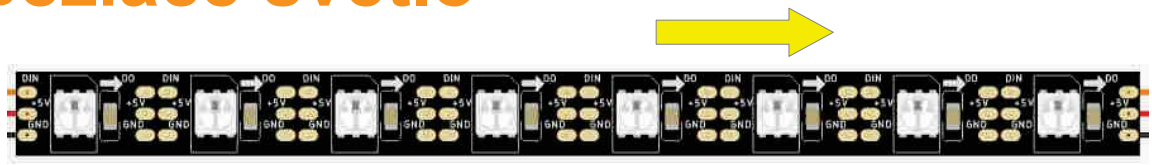
Príkazy



Stupnica



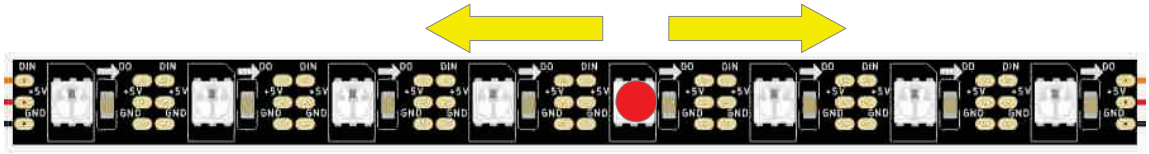
Bežiace svetlo



```
on start
    set ring to NeoPixel at pin P0 with 8 leds as RGB (GRB format)

forever
    for index from 0 to 7
    do
        ring set pixel color at index to blue
        ring show
        pause (ms) 100
        ring set pixel color at index to red 10 green 10 blue 10
        ring show
```

Vodováha



```
on start
    set strip to NeoPixel at pin P0 with 8 leds as RGB (GRB format)
    strip set pixel color at 4 to red

forever
    if acceleration (mg) x > 0 then
        strip shift pixels by 1
    else
        strip shift pixels by -1
    strip show
    pause (ms) 200
```

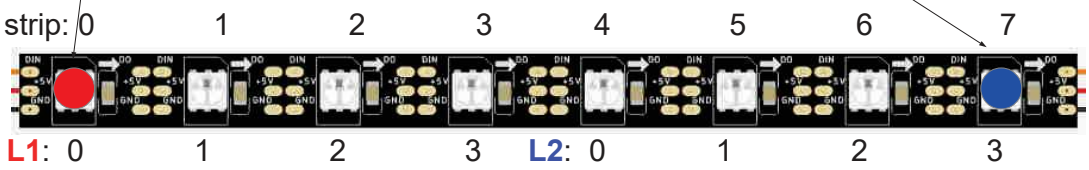
SHIFT je lepšie nahradiť ROTATE

Práca s rozsahmi (range)

```
on start
    set strip to NeoPixel at pin P0 with 8 leds as RGB (GRB format)
    set L1 to strip range from 0 with 4 leds
    set L2 to strip range from 4 with 4 leds
    L1 set pixel color at 0 to red
    L2 set pixel color at 3 to blue

forever
    L1 rotate pixels by 1
    L1 show
    L2 rotate pixels by -1
    L2 show
    pause (ms) 200
```

POZOR: ak tu dame namiesto 3 adresu 4
(ktora je uz mimo rozsah), tak svetielko neuvidime nikdy!



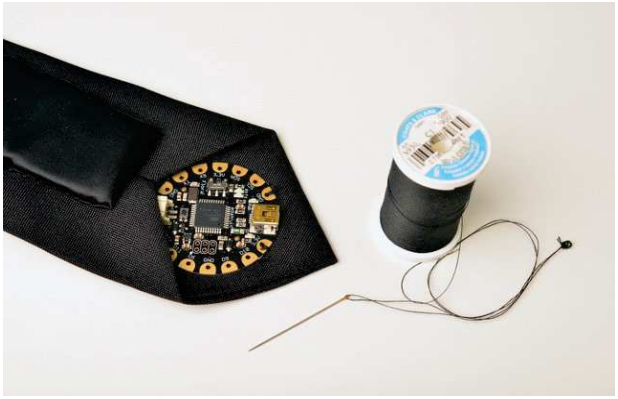
K.I.T.T

```
on start
    set strip to NeoPixel at pin P0 with 8 leds as RGB (GRB format)

forever
    strip set pixel color at 2 to red 150 green 0 blue 0
    strip set pixel color at 1 to red 50 green 0 blue 0
    strip set pixel color at 0 to red 20 green 0 blue 0
    repeat 8 times
    do
        strip shift pixels by 1
        strip show
        pause (ms) 150
    strip set pixel color at 5 to red 150 green 0 blue 0
    strip set pixel color at 6 to red 50 green 0 blue 0
    strip set pixel color at 7 to red 20 green 0 blue 0
    repeat 8 times
    do
        strip shift pixels by -1
        strip show
        pause (ms) 150
```

Photo by Shane K. / Flickr

Svietiaca Kravata



https://learn.adafruit.com/led-ampli-tie

Svietiaca Čelenka

https://www.ucimeshardverom.sk/materialy/microbit_wearables/celenka/

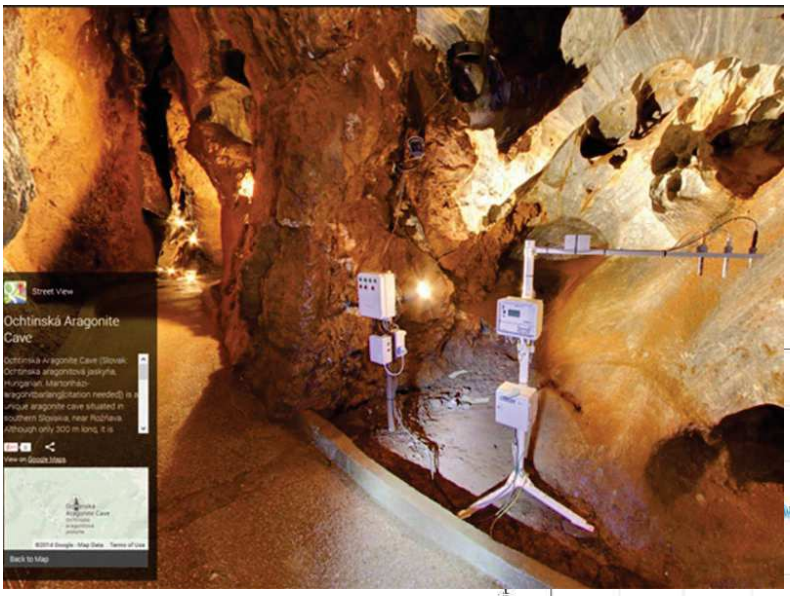
... a mnoho ďalších

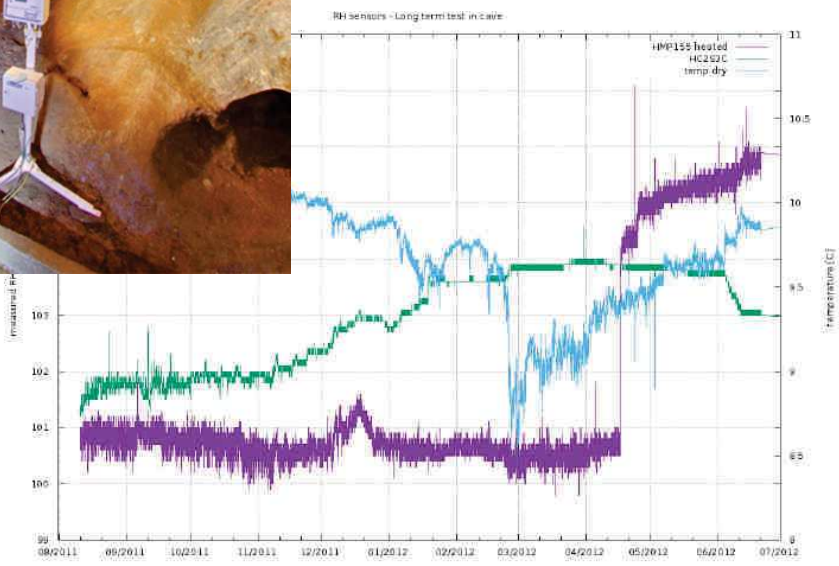
micro:bit

4. dataloger

Termohygrobarograf

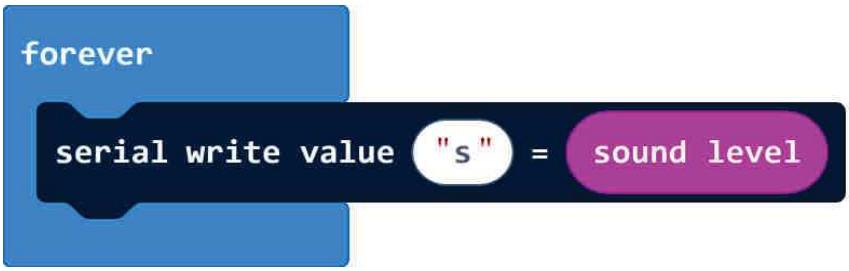
Monitoring

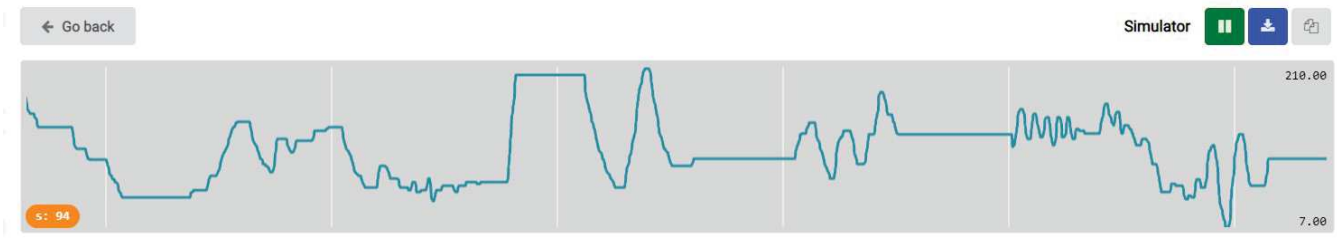

Street View
Ochtinská Aragonite Cave
Back to Map


RH sensors - Long term test in cave
HMP155 heated
HC2S3C
temp dry
temperature (C)
09/2011
10/2011
11/2011
12/2011
01/2012
02/2012
03/2012
04/2012
05/2012
06/2012
07/2012

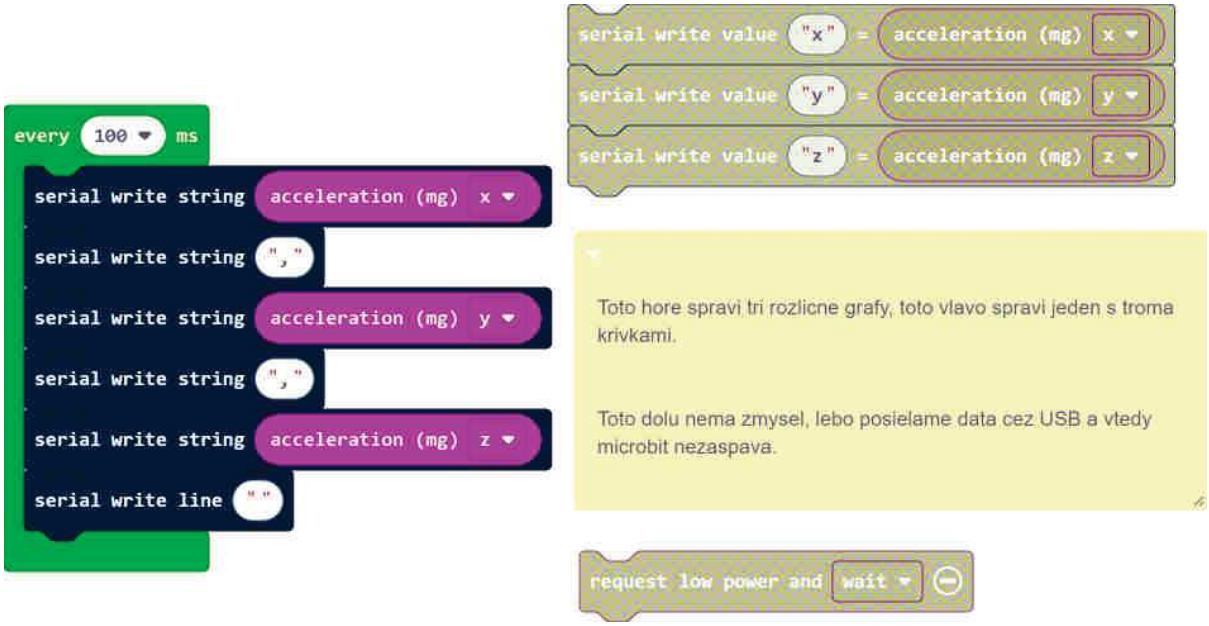
Black Box - čierna skrinka

Datalogger - najjednoduchšia verzia

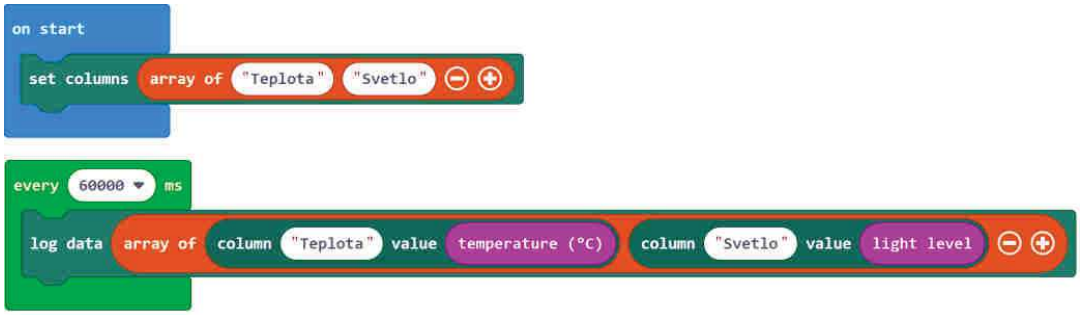




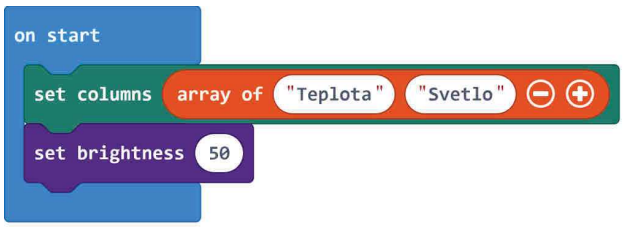
Datalogger - viac hodnôt

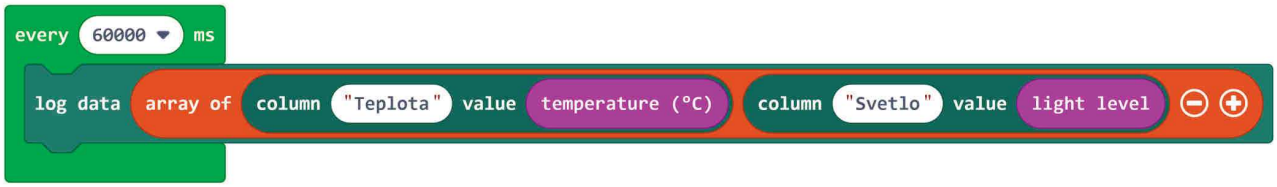


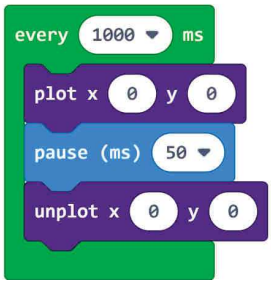
Datalogger Extension

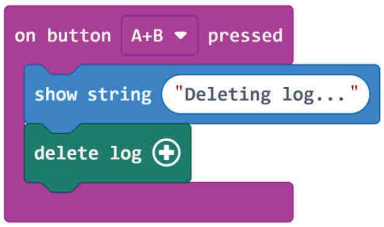


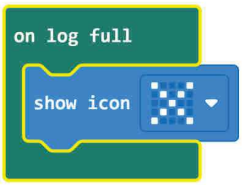
Datalogger Extension II.











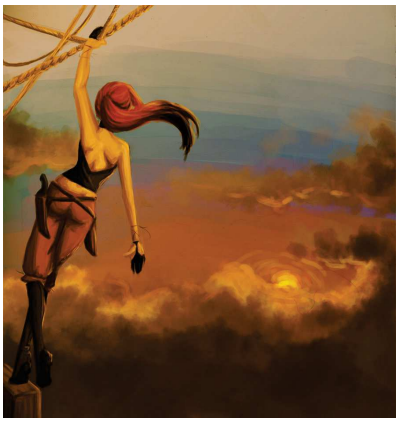
Linky a zdroje

https://akademiaprogramovania.sk
https://www.ucimeshardverom.sk
https://microla.cz
https://www.microbit.org

https://makecode.microbit.org
https://app.edublocks.org/
https://python.microbit.org/

https://www.alza.sk
https://rlx.sk
http://edutronik.sk/v2/sady/
https://learn.sparkfun.com/tutorials

Thank you!



Richard Balogh

Slovak University of Technology in Bratislava

richard.balogh@stuba.sk

STU FEI

SLOVAK UNIVERSITY OF
TECHNOLOGY IN BRATISLAVA
FACULTY OF ELECTRICAL ENGINEERING
AND INFORMATION TECHNOLOGY