

# Robot edukacyjny dla dzieci

i nie tylko....

# agenda

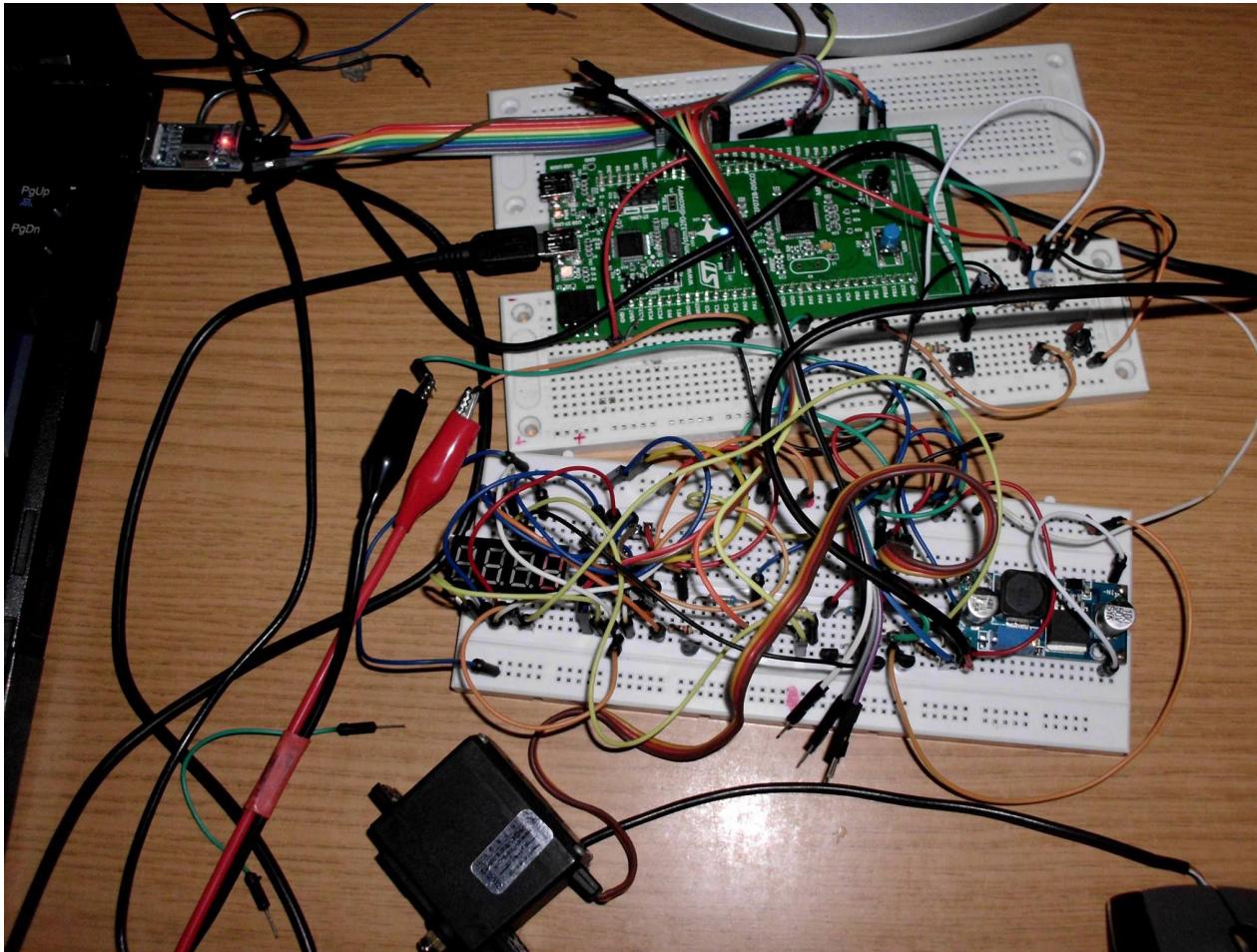
edukacja

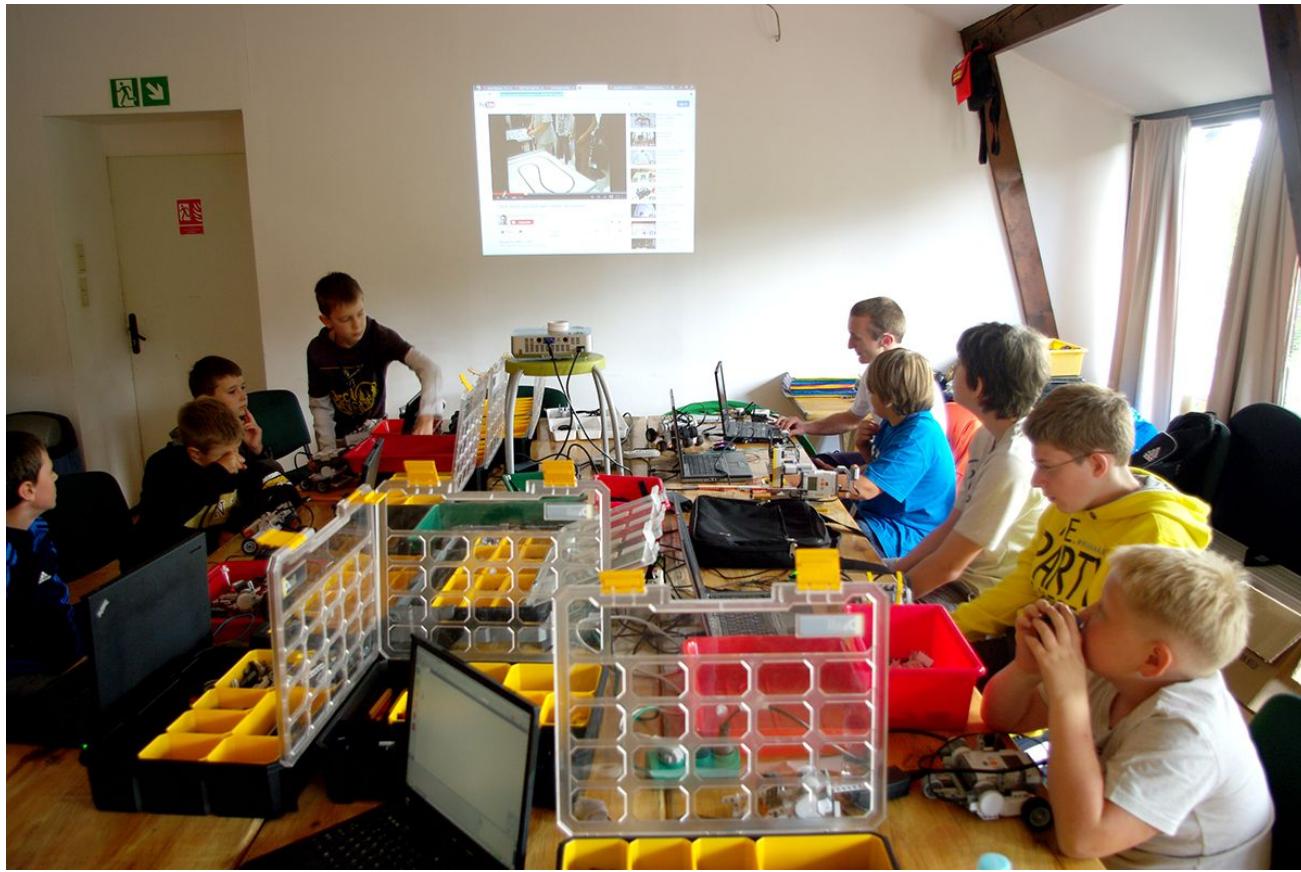
przedstawienie informacji na temat robota

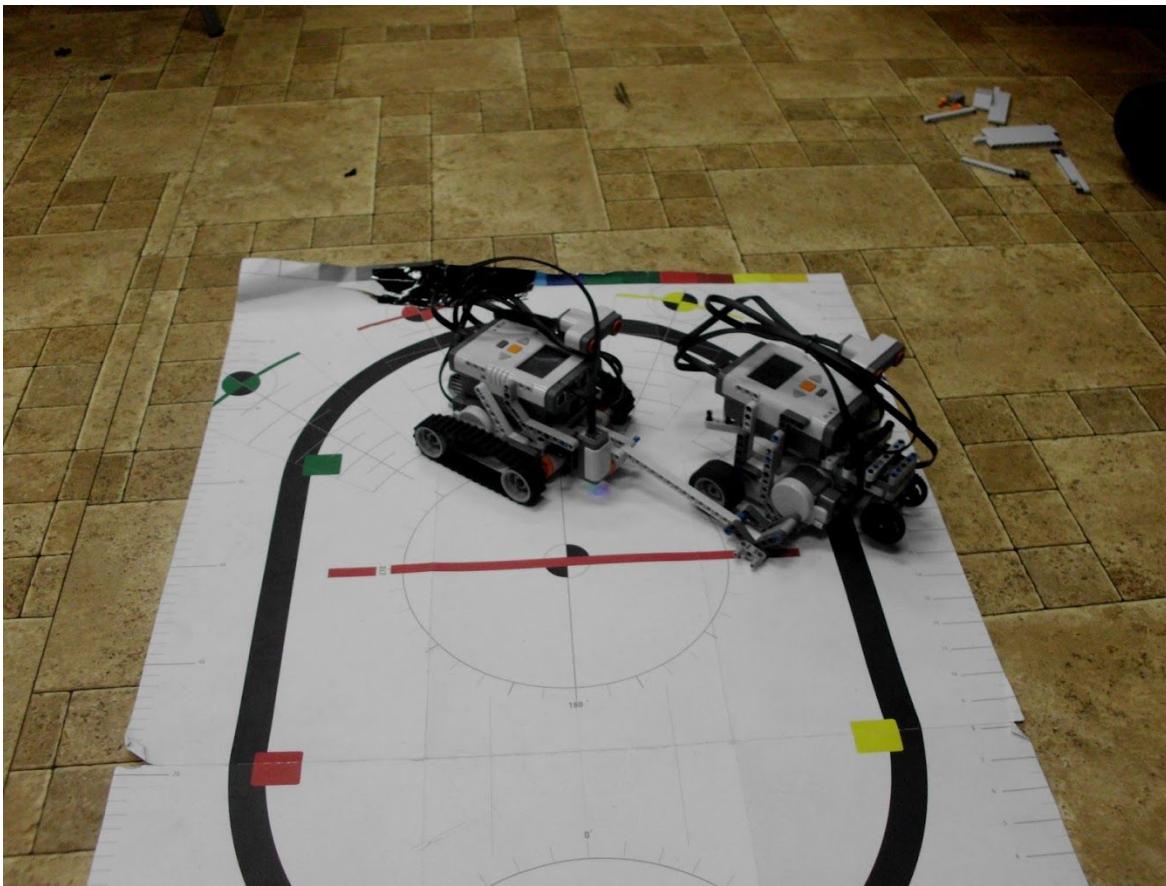
możliwości programowania

przegląd sprzętu

budowa przykładowego programu: omijanie przeszkód











SCRATCH

File Edit Tutorials Untitled-16 Share See Project Page ceebee

Code Costumes Sounds

Motion

- move (10 steps)
- turn C° (15 degrees)
- turn ° (15 degrees)

Looks

Sound

Events

Control

Sensing

Operators

Variables

My Blocks

Tutorials

Close X

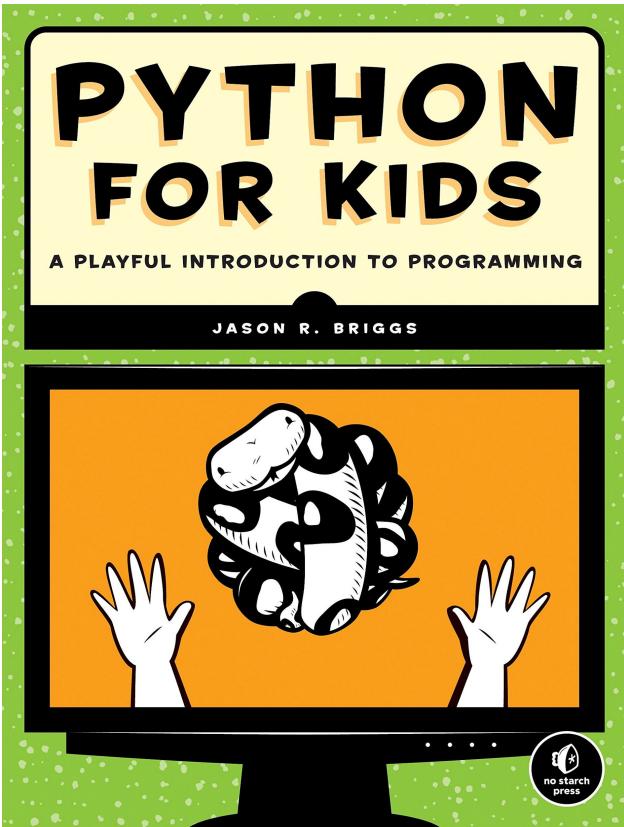
Backpack

Sprite Sprite1

Show Size Direction

Stage Backdrops

The image shows the Scratch programming environment. On the left, the script editor displays a 'Motion' category with several blocks: 'move (10 steps)', 'turn C° (15 degrees)', and 'turn ° (15 degrees)'. To the right of the editor is the stage area, which features a colorful backdrop of mountains and a toucan bird. A small window titled 'Tutorials' is open on the stage, showing a person climbing a mountain with a flag. Below the stage are toolbars for 'Sprite' properties (Show, Size, Direction), 'Stage' (empty), and 'Backdrops' (with four options shown). The top navigation bar includes links for 'File', 'Edit', 'Tutorials', 'Untitled-16', 'Share', 'See Project Page', and a user profile for 'ceebee'.



# Arduino dla początkujących

## Podstawy i szkice

Podręcznik programisty Arduino!

Simon Monk

O'REILLY®

# Elektronika z wykorzystaniem Arduino i Raspberry Pi

RECEPTURY

Helion

Simon Monk



**XII ROBOTIC ARENA**

25TH JANUARY 2020

**81** DAYS   **14** HOURS   **30** MINUTES

CENTENNIAL HALL  
WROCŁAW, POLAND  
REGISTRATION OPEN

Baltic Robot Battles 2019

17-19 V 2019

Gdansk Science and Technology Park

### Competitions



Sumo



Line Follower



Freestyle



Micromouse



LEGO



Robohockathon

# informacje o producencie

<https://www.makeblock.com>

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**makeblock**

Hardware Software Education Competition Support About Us [Store](#)

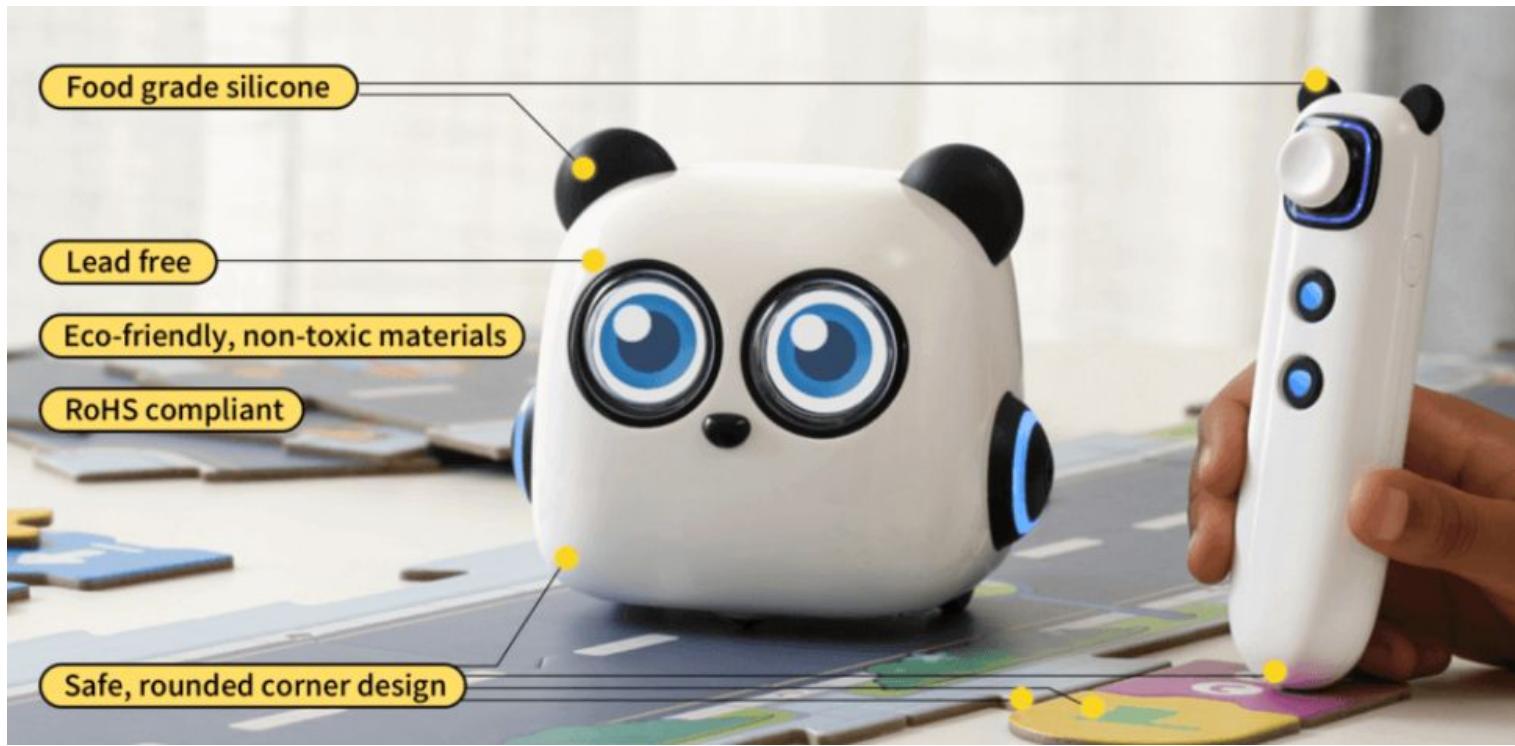
mBot Overview Software Manuals Specifications Add-on Packs Support [Buy Now](#)



**mBot**

**Entry-level educational robot kit**

mBot is a STEAM education robot for beginners, that makes teaching and learning robot programming simple and fun. With just a screwdriver, the step by step instructions, and a study schedule, children can build a robot from scratch and experience the joys of hands-on creation. As they go, they will learn about a variety of robotic machinery and electronic parts, get to grips with the fundamentals of block-based programming, and develop their logical thinking and design skills.



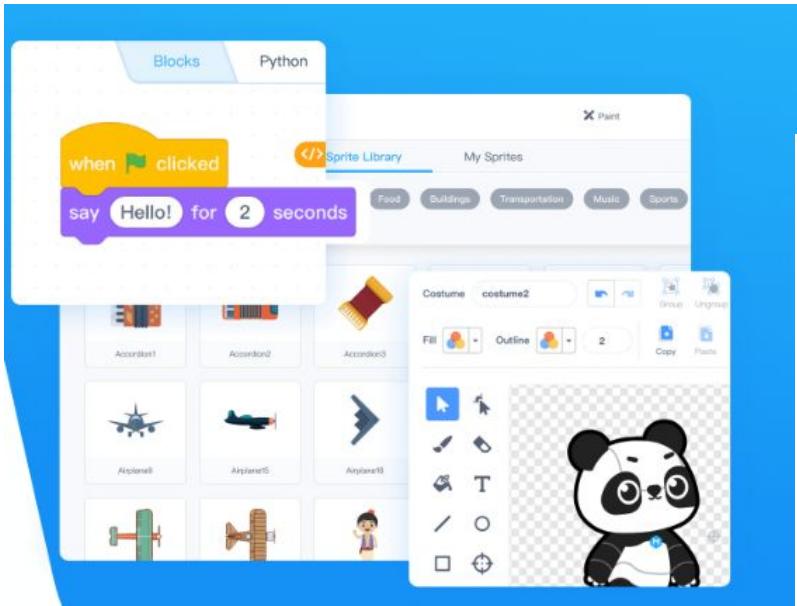






# neuron





The Scratch stage displays a sequence of movement blocks:

- move (10) steps
- turn C (15) degrees
- turn L (15) degrees
- go to: random position
- go to x: 262 y: 11
- glide (1) secs to: random
- glide (1) secs to x: 262
- point in direction: 90
- point towards: mouse-pointer
- change x by (10)

The right side of the screen shows the generated code for mBlock5 and Arduino C.

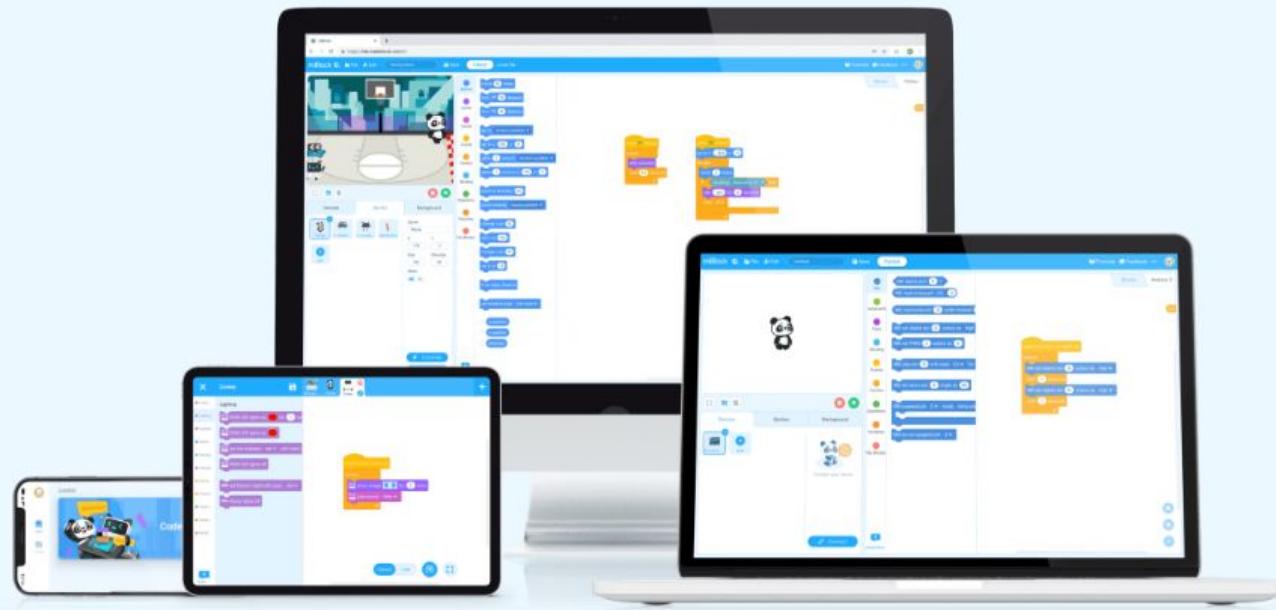
**mBlock5 Generated Code:**

```
import time
sprite.say
for count @sprite.say_for_seconds
time.sleep(0.1)
@sprite.play
@sprite.play_drum
@sprite.play_note
@sprite.play_until_done
@sprite.change_y_by
@sprite.change_x_by
@sprite.change_sfx_by
@sprite.change_size_by
@sprite.change_tempo_by
```

**Arduino C Generated Code:**

```
// generated by mBlock5
// codes make you happy
#include <Arduino.h>
#include <Wire.h>
#include <SoftwareSerial.h>
void _delay(float seconds) {
    long endTime = millis() + seconds * 1000;
    while(millis() < endTime) _loop();
}
void setup() {
    while(1) {
        analogWrite(DOUTPUT);
    }
}
```

Use mBlock across Windows, Mac, Chromebook and mobile devices to work for different STEAM education purposes.

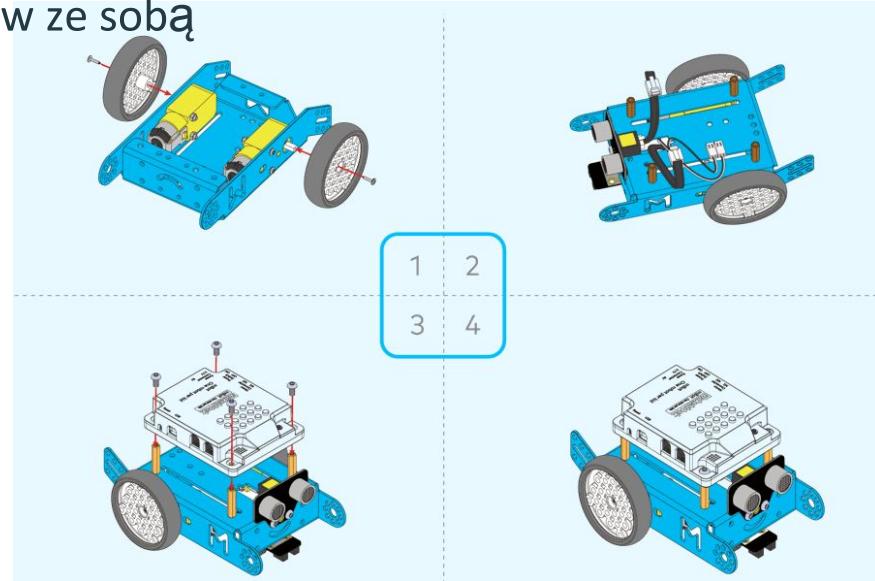


# Prezentacja robota

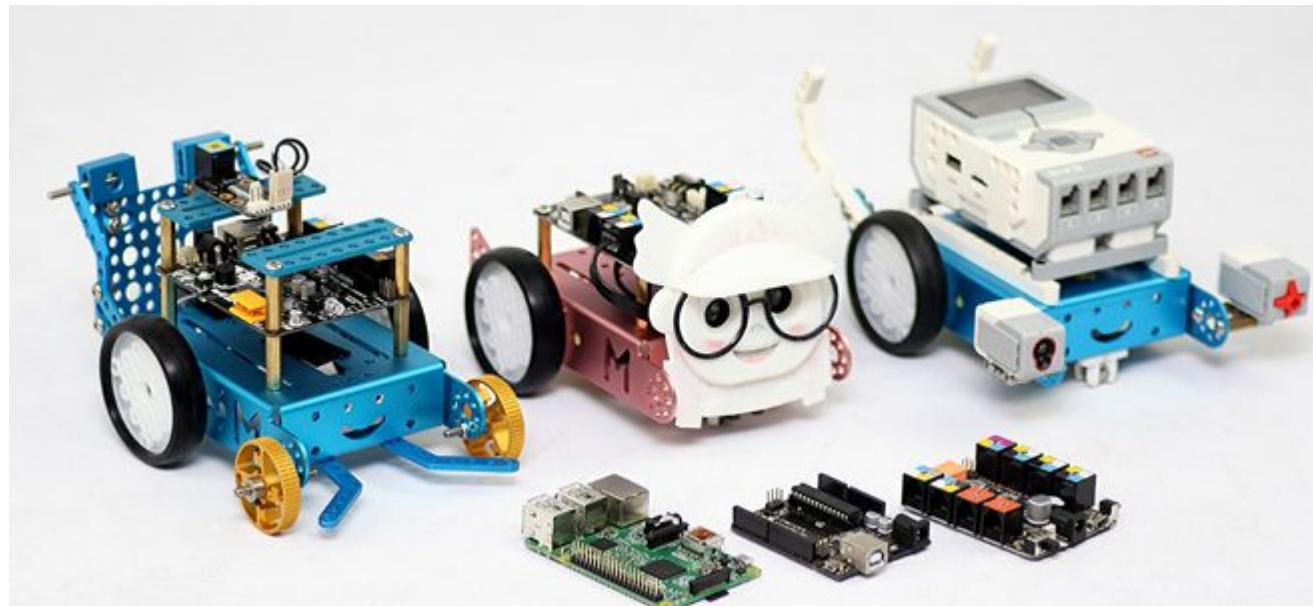


# informacje:

- roboty łatwo dostępne również na polskim rynku (cena ok 500zł wersja podstawowa)
- łatwość składania, łączenia modułów ze sobą



- integracja z urządzeniami mobilnymi: komunikacja bluetooth, oprogramowania sterujące
- możliwa rozbudowa o elementy z innych zestawów



- możliwe zadania: omijanie przeszkód, jazda po linii, rozpoznawanie kolorów, reakcja na poziom dźwięku



- możliwości współzawodnictwa: soccer game, walki sumo



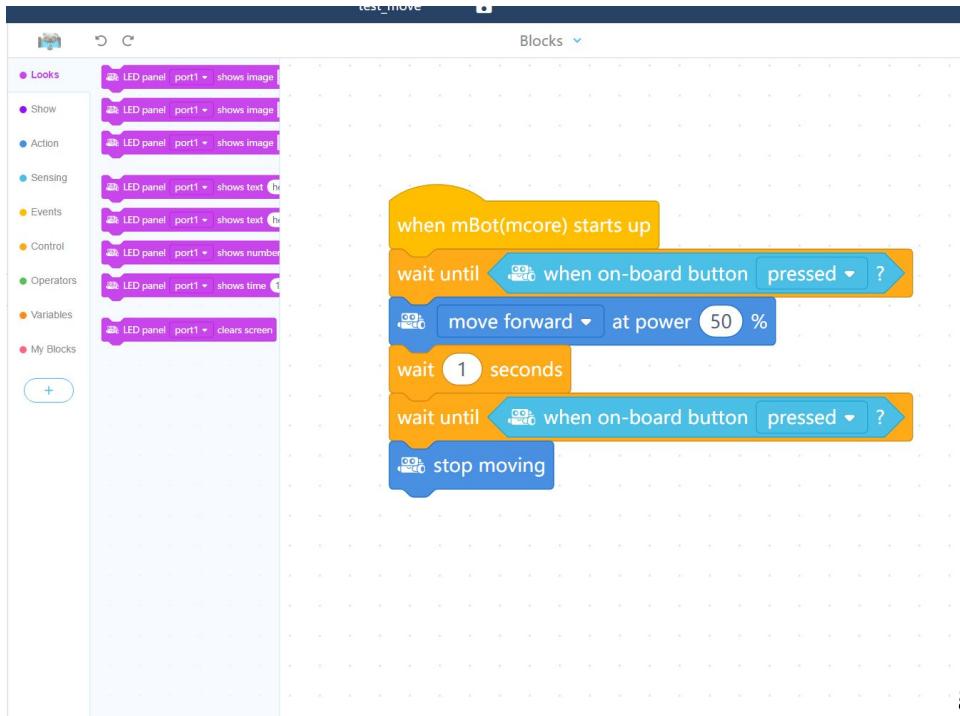
źródło: youtube.com

- producent rozwija swoje produkty: sprzęt + oprogramowanie
- dostępne części zamienne oraz rozszerzające moduły dodatkowe

## mBot Series Add-on Packs



# PROGRAMOWANIE



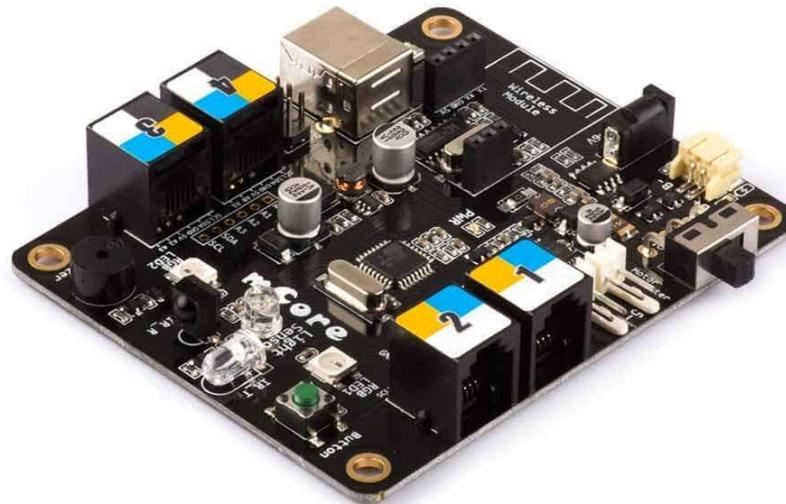
Two side-by-side Arduino IDE windows showing the same C code for reading DHT11 humidity. The code includes header file inclusion, pin definitions, and a function to read data from the sensor. It uses a loop to read the data and calculate the result based on the data bits.

```
#include <LiquidCrystal.h>
LiquidCrystal lcd(12, 11, 5, 4, 3, 2);
#define DHT11_PIN 0 // ADC0

byte read_dht11_dat()
{
    byte i = 0;
    byte result=0;
    for(i=0; i<8; i++)
    {
        while((PINC & _BV(DHT11_PIN)))// wait for 50us
            delayMicroseconds(30);
        if(PINC & _BV(DHT11_PIN))
            result |= (1<<(7-i));
        while((PINC & _BV(DHT11_PIN)));
    }
    return result;
}
```

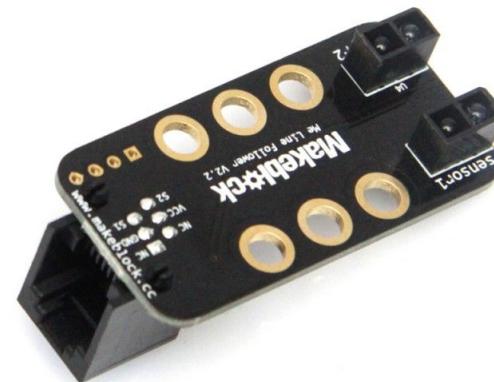
github-> biblioteki python

# STEROWNIK



Źródło: <https://www.makeblock.com/>

# Czujniki zewnętrzne w zestawie



Źródło: <https://www.makeblock.com/>

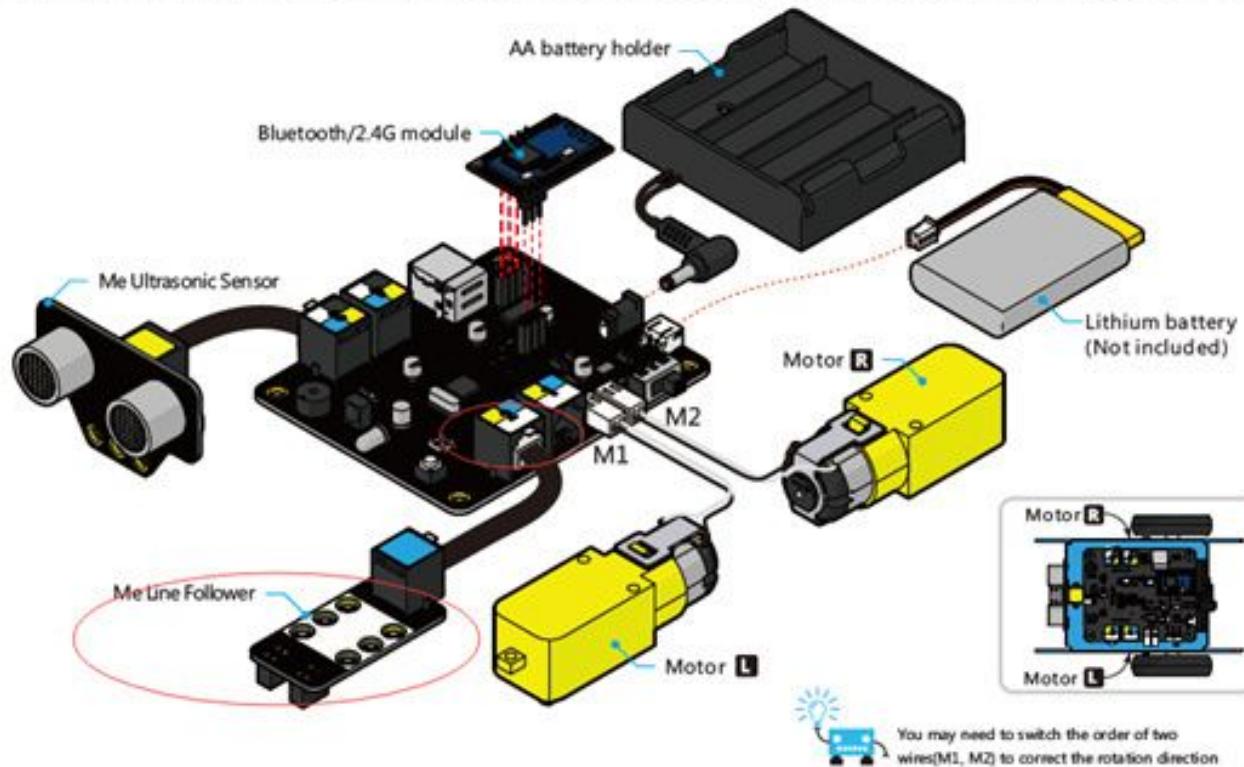
# Czujniki dodatkowe



Źródło: <https://www.makeblock.com/>

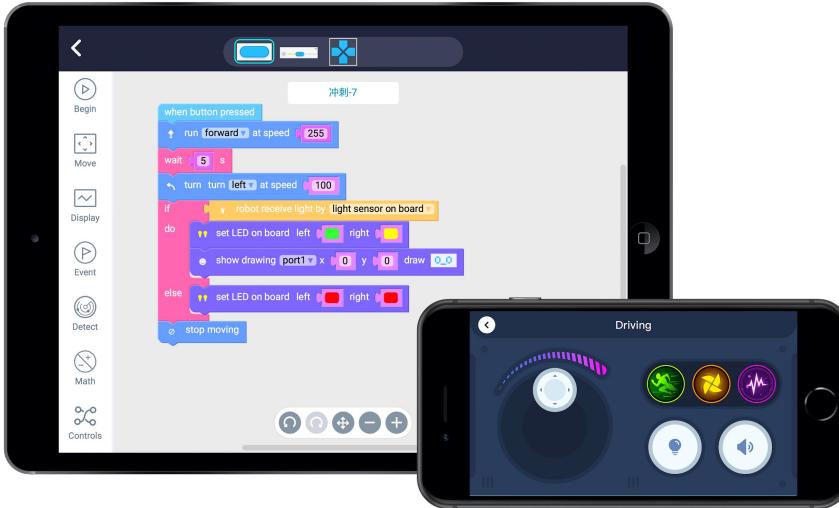
# połączenie

## Wiring



Źródło: <https://www.makeblock.com/>

# Obsługa z urządzeń mobilnych



Źródło: <https://www.makeblock.com/>

# środowisko programowania

mBlock dostępny na stronie producenta

oparty o język scratch

możliwość programowania w Arduino C

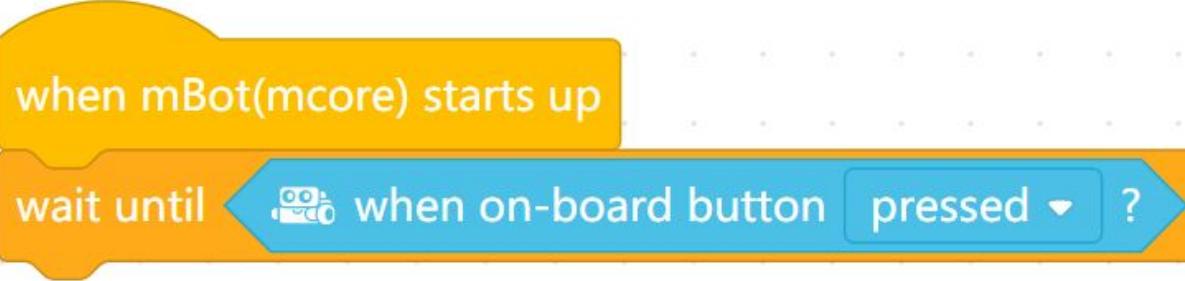
# PRZYKŁADOWY PROCES PROGRAMOWANIA

rozpoczynamy od instrukcji startowej:



```
when mBot(mcore) starts up
```

przydatna funkcjonalność: aktywowanie robota przyciskiem

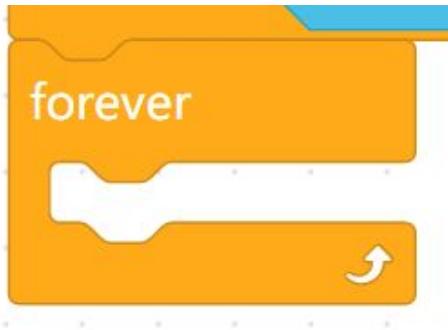


```
when mBot(mcore) starts up
```

```
wait until
```

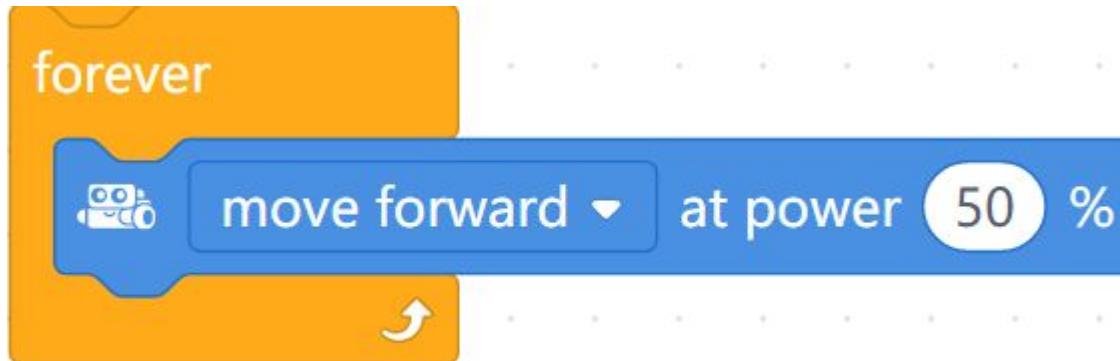
```
when on-board button pressed ?
```

wykorzystamy pętle nieskończoną.



do dyspozycji mamy również innego rodzaju pętle: z licznikami,  
warunkowe

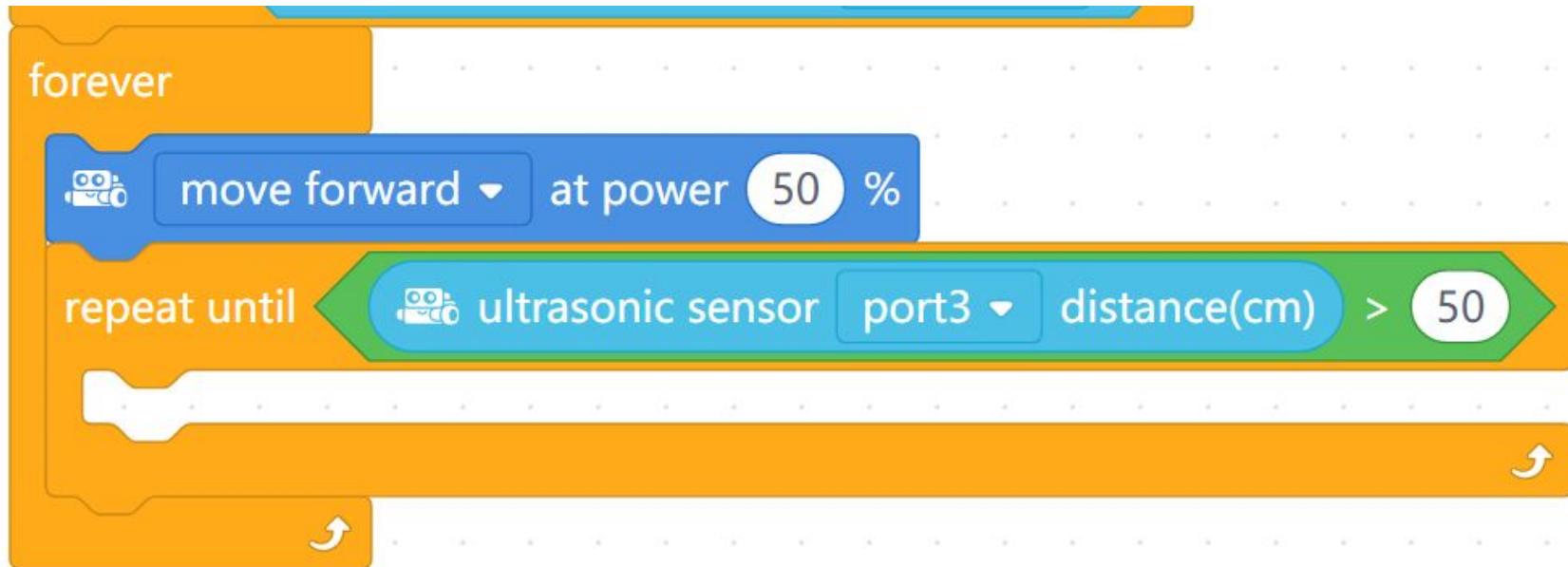
ruch robota do przodu:



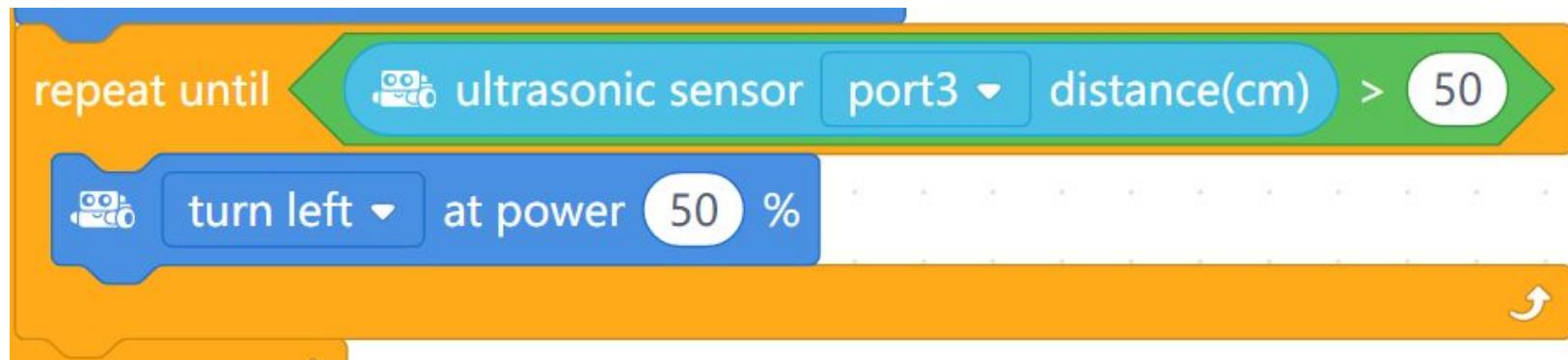
zbliżamy się do przeszkody?:



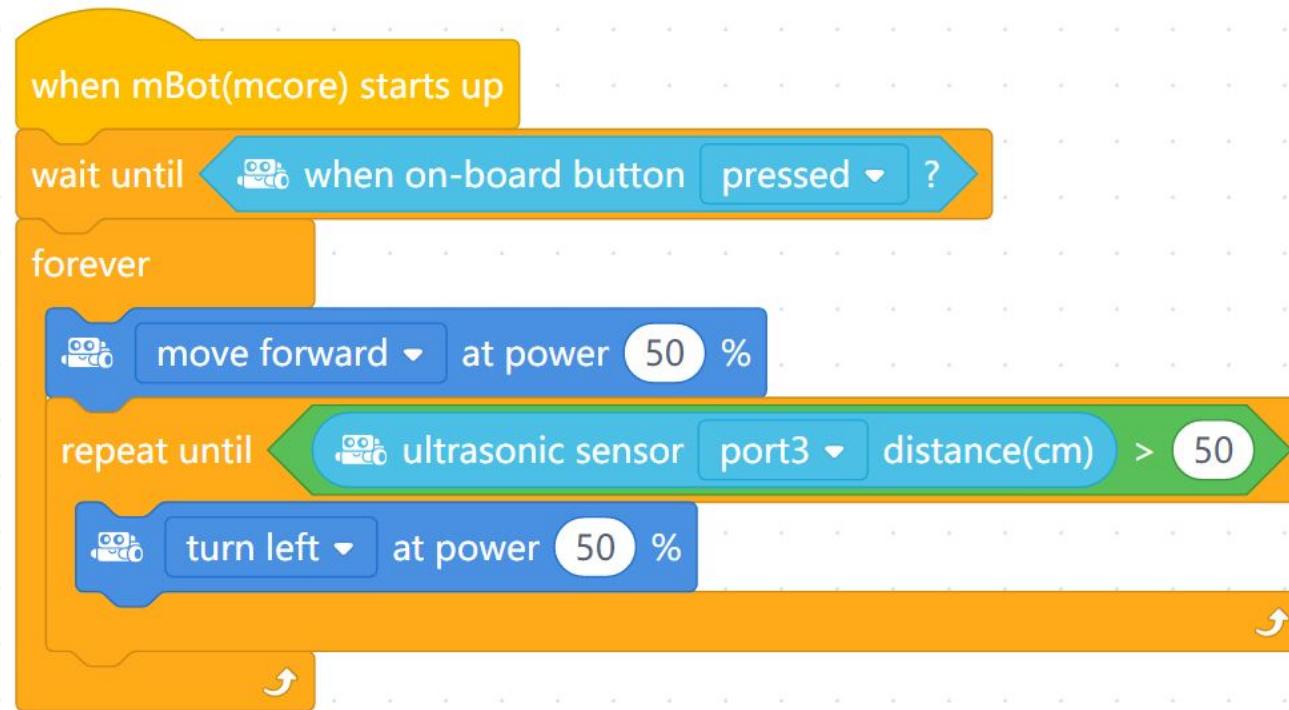
wyrażenie logiczne wstawiamy do instrukcji warunkowej, np:



i omijamy przeszkodę



## czas na testy



when mBot(mcore) starts up

wait until  when on-board button pressed ?

forever

if  ultrasonic sensor port3 ▾ distance(cm) > 50 then

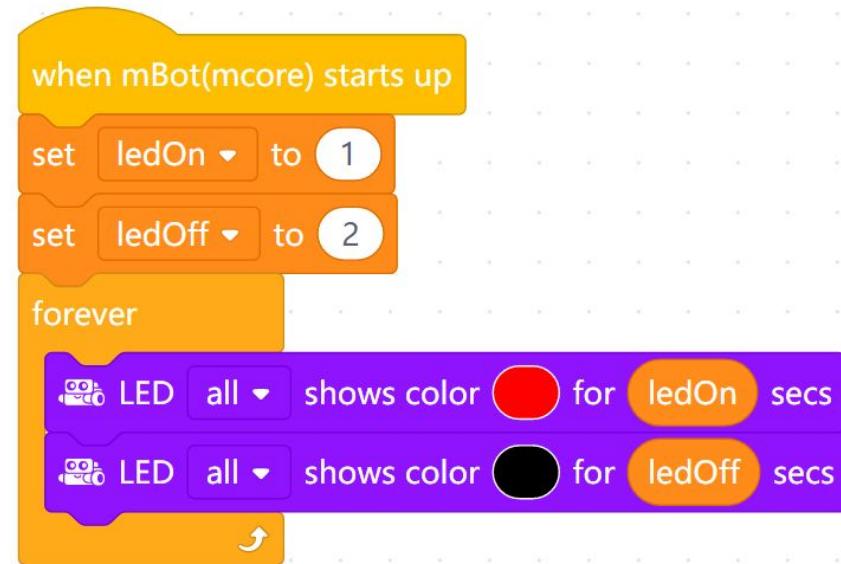
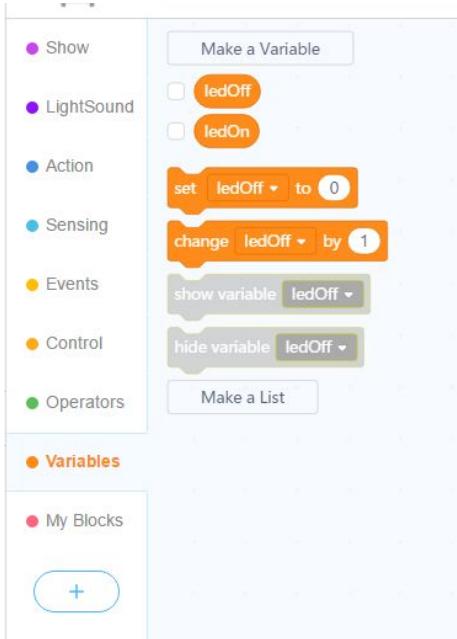
 move forward ▾ at power 50 %

else

 turn left ▾ at power 50 %

```
when mBot(mcore) starts up
  wait until [when on-board button pressed ?]
    forever
      if [ultrasonic sensor port3 distance(cm) > 50] then
        move forward at power [ultrasonic sensor port3 distance(cm) %]
      else
        turn left at power [50 %]
    end
end
```

# zmienna?



mBlock:

tworzenie własnych bloczków

obsługa innych zestawów

język bloczkowy scratch oraz  
innny język tekstowy: python, C

