SUMBANDILA

OUTLIERS

Micro bit projects

Project Coordinator:

Josh Merrow (Riverdale Country School – USA)

Knowledge Zinondo (Sumbandila – SA)

Box Beam Level

By: Ndivhuwo, Chuchekani, Gudani, Lufuno, Hactor [12 August 2017] (Form 4)

Description: They use a microbit to determine if a surface is level (straight) or not and make sure long surfaces are on a same level.

- The box beam level also indicates the surface level using arrows and the change in numbers [negative or positive].
- it can be widely used at construction site to determine surface levels.

Components of the box beam level
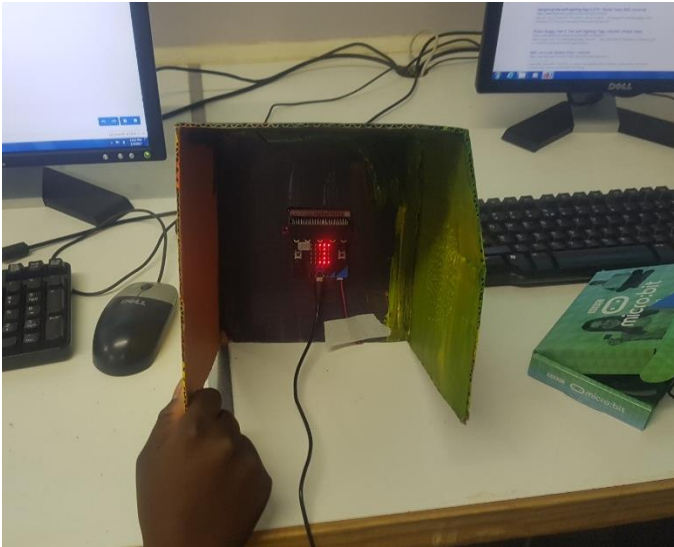- Microbit
- Battery
- Cardboard
- Wires

LIGHT SENSOR

BY HULISANI AND HLAMALANI (Form 4)

12 AUGUST 2017

This a system commonly used for and in houses. It senses light and if it is dark, it lights up. If you shake it, it displays a code on the screen. The darker it gets, the brighter the light.

Fitting Room Traffic Light

Do not enter when light is red.
By: Selaelo and Kamogelo. [12/08/2017] (Form 4)

Description

You do not want to be disturbed you are trying on the next outfit that you will slay in. A sensor is placed in the fitting room and senses your movement, sends a signal to the micro bit, switching the light in front of the door on. Showing the person outside that the room is occupied.
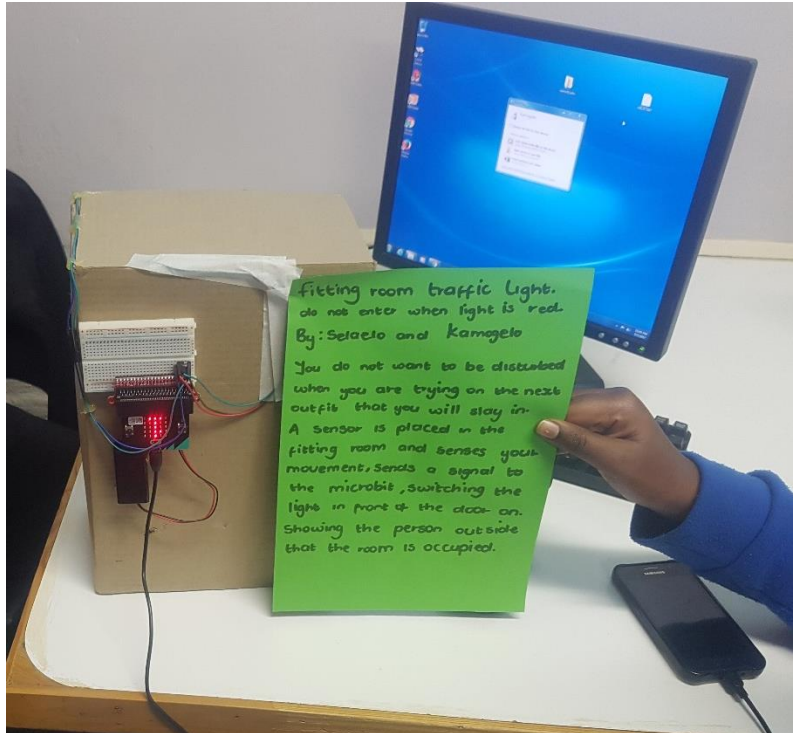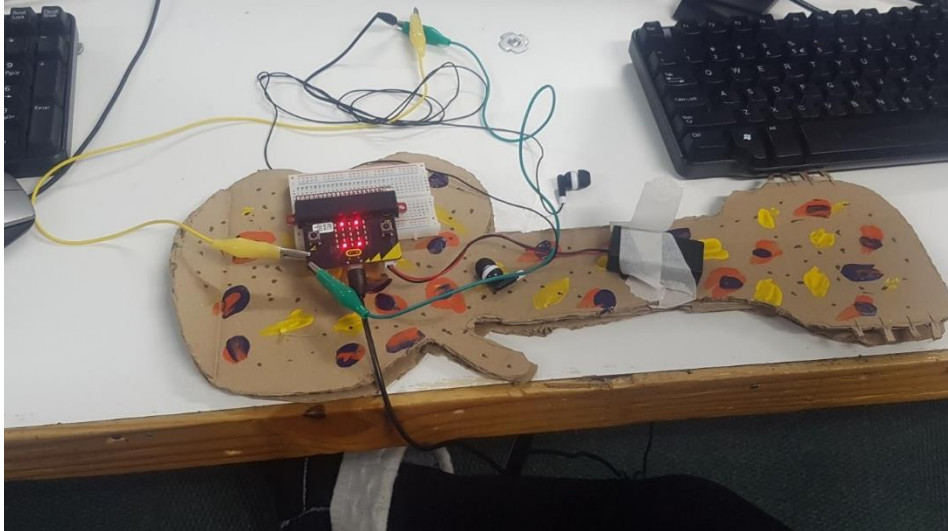
GUITAR

By Nelisiwe,Nakisani,Londani and Mulisa (Form 4)

How it functions

When you press button A and B simultaneously the music will start playing on the earphones.

THE SNAKE GAME

BY : MPHO AND FUNANANI (Form 4)

Description: The snake has to catch the rat that is moving really fast. The challenge is to catch the rat. This game is developed to enhance people's thinking capacity and also for entertainment. When button A is pressed the snake will move to the right and when button B is pressed the snake will move to the left. Shaking the microbit will make the snake to move up and down.
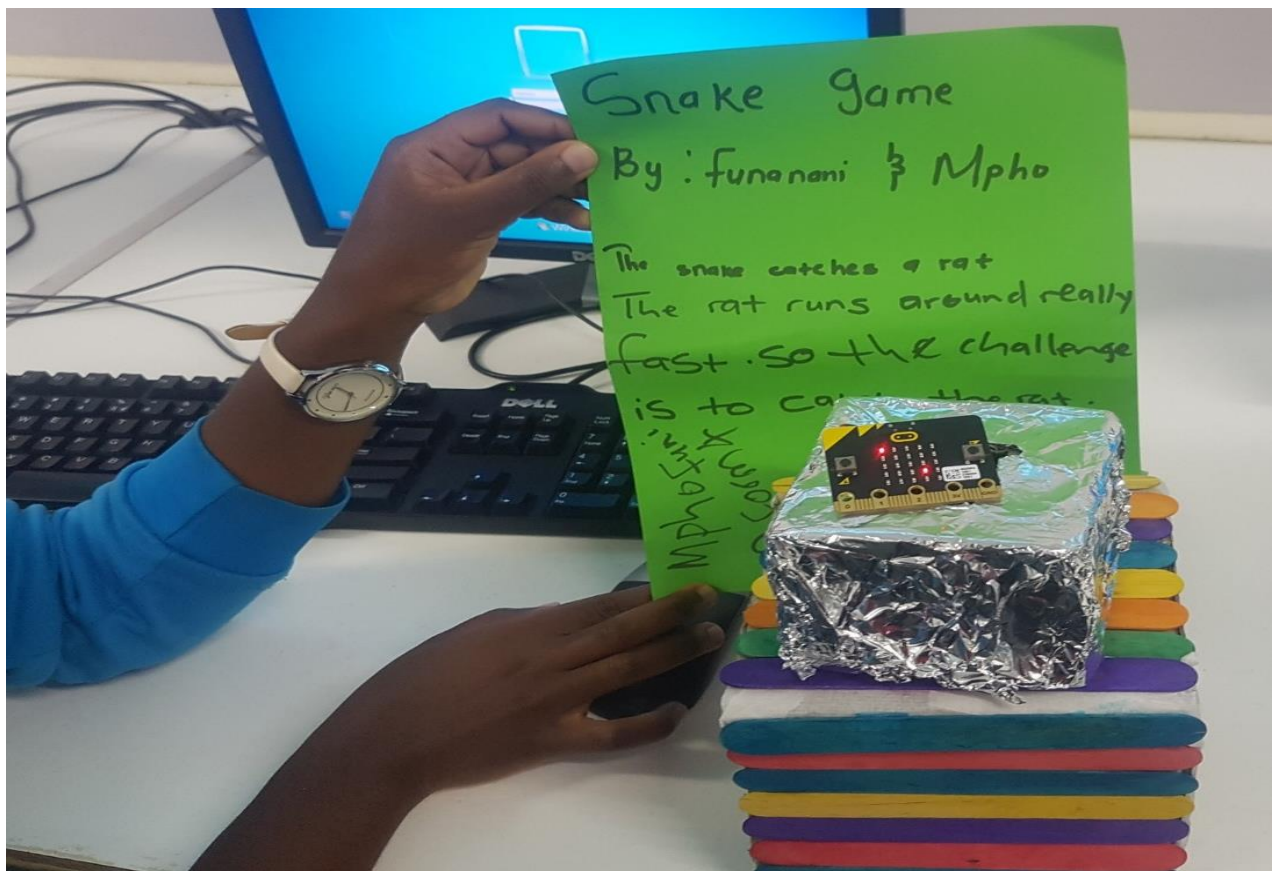
Components:

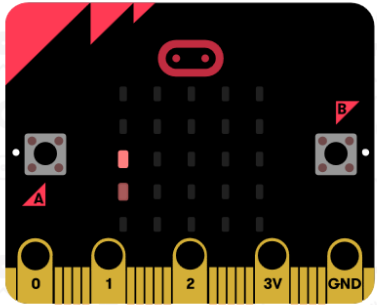Hardboard

Micro-bit Chip

Wheels

etc

```javascript
1  let snake: game.LedSprite = null
2  let rat: game.LedSprite = null
3  let ratDirection = "right"
4  let counter = 0
5  rat = game.createSprite(3, 3)
6  rat.changeBrightnessBy(-100)
7  snake = game.createSprite(0, 0)
8  while (1 == 1) {
9      if (input.buttonIsPressed(Button.A)) {
10         snake.changeXBy(1)
11         basic.pause(100)
12         snake.set(LedSpriteProperty.Y, 2)
13     }
14
15     if (input.buttonIsPressed(Button.B)) {
16         snake.changeXBy(-1)
17         basic.pause(100)
18     }
19     if (input.rotation(Rotation.Pitch) > 40) {
20         snake.changeYBy(1)
21         basic.pause(100)
22     }
23     if (input.rotation(Rotation.Pitch) < -40) {
24         snake.changeYBy(-1)
25         basic.pause(100)
26     }
27     if (rat.isTouching(snake)) {
28         basic.showNumber(1)
```
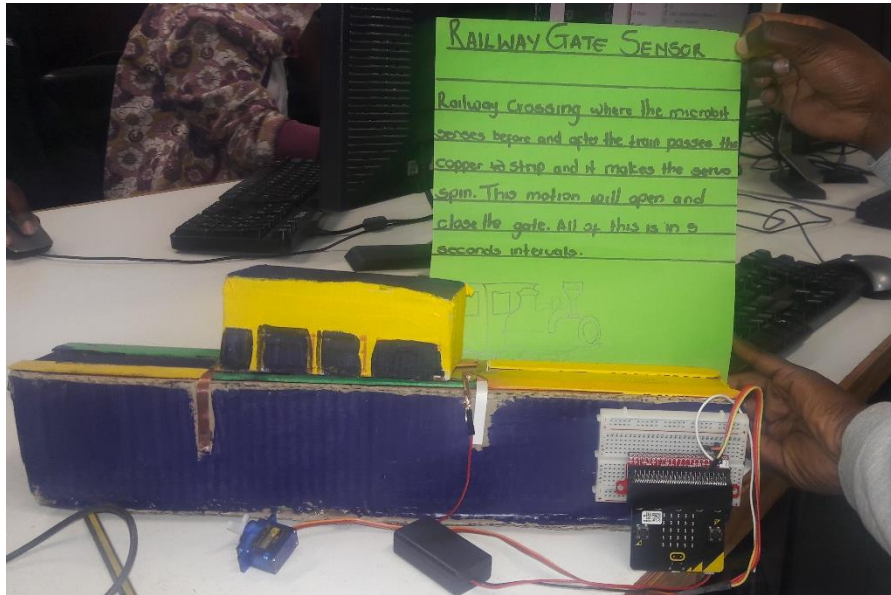
RAILWAY GATE SENSOR

HOW IT FUNTIONS: Our project is about a railway crossing whereby the microbit senses the motion of the train before and after the train passes the copper stripes and it makes the servo spin.this motion of the servo will open and close the gate and all of this is in seconds(s) intervals.


```
1  let sensor = 0
2  pins.digitalWritePin(DigitalPin.P3, 1)
3  basic.forever(() => {
4
5      sensor = pins.digitalReadPin(DigitalPin.P0)
6
7      if (sensor == 1) {
8          pins.digitalWritePin(DigitalPin.P3, 0) // turn
9
10         pins.servoWritePin(AnalogPin.P2, 90)
11         basic.pause(5000)
12         pins.servoWritePin(AnalogPin.P2, 10)
13         basic.pause(5000)
14         pins.digitalWritePin(DigitalPin.P3, 1) // turn
15     }
16
17 })
18
19
```

TRUTH OR DARE GAME

BY NDIZWONE NEKOTA AND MUDZUNGA MUTEPE [12 AUGUST 2017] (Form 4)

The system uses the micro bit to spin 180 degrees clockwise and anti-clockwise after it has been shaken......this works like a spin a bottle game with the exemption that this is electronic and only depends on how much you shake it.it has to be shaken until it changes from 0-1 for it to start spinning.

GOOD LUCK......
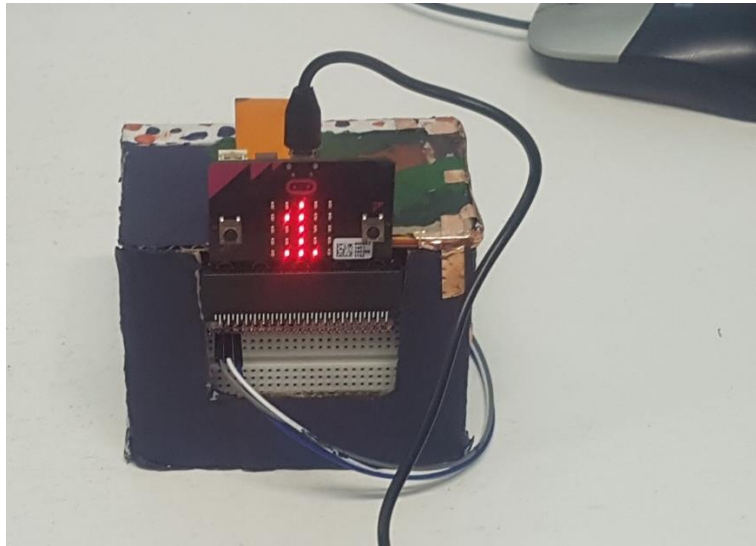

```
1  let fulrot = 0
2
3
4  basic.forever(() => {
5      pins.servoSetPulse(AnalogPin.P0, 1500)
6      if (fulrot == 0) {
7          if (input.acceleration(Dimension.X)) {
8              pins.servoWritePin(AnalogPin.P0, 170)
9              fulrot = 1
10         }
11     }
12
13
14
15 })
```

PIR Motion Sensor Intruder Alarm

BY: MUSHAATHAMA; ADIVHAHO AND MUOFHE (Form 4)
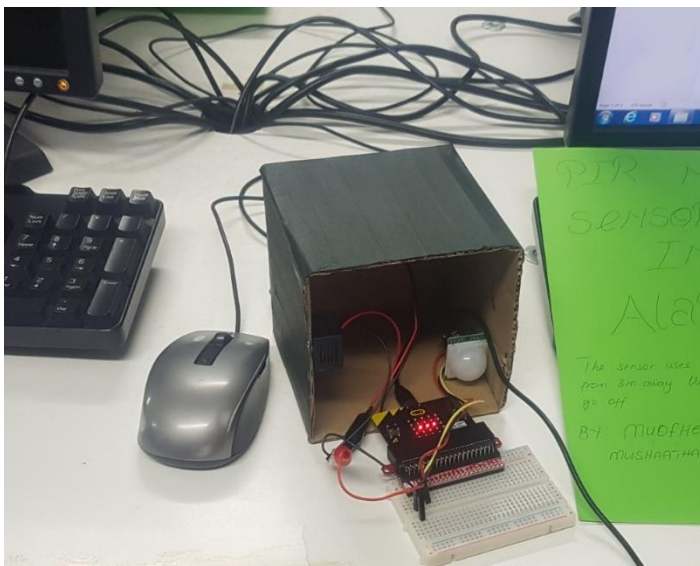
12 August 2017

HOW THE PROJECT WORKS

All the time nothing is sensed, a simple line pulses across the display − − − But when something is sensed the motion sensor sends an electric signal out on its 'OUT' pin, which is detected by the micro:bit as a change from 0 to 1 on ring P0 (the ring the 'OUT' pin is connected to by the crocodile clips).

All the time a 1 is detected on ring P0, the micro:bit will change its display to ! ! ! and send an electric signal out on ring 1 (digital write 1 to pin P1). The buzzer is connected to this ring by crocodile clips, so it causes the buzzer to buzz for 1 second (1000 ms).

Now connect your micro:bit to your computer via the USB cable, write the code in Block Editor, then compile the .hex file and drag it onto your MICROBIT icon.

It takes a good minute for the sensor to start up properly. After that, you can test things are working properly by covering the motion sensor with an opaque box (or put in in a drawer) for a while. Nothing should be sensed: the display should read − − − and no buzzer noise should be heard. Once you take the box away the display should change to ! ! ! and the buzzer should start going off, as it detects your movement. If it doesn't work, double check your crocodile clip connections and/or try increasing the sensitivity of the motion sensor by gradually turning the orange dial (the one on the right if the dome it pointing upwards) clockwise.

Picture   Codes for the project

THE SUMBANDILA LOGO

By Mawelewele Nemabaka and Orifha Madzivhe [12 AUGUST 2017] Form 4

We came with an idea to design the Sumbandila logo using a micro bit. What we did was to cut a cardboard and make tiny 15 holes through it using. We took 15 LEDs and put each inside the holes. We then connect jumper wires to the LEDs. We then connected the LEDs to the micro bit using jumper wires and block connecter.
You use the A button on the micro bit to switch it on. After being switched on, the lights go on and off. Simple as that!

MATERIALS
Micro bit; LEDs; Block connecter; Cardboard; Jumper wires; Crocodile clips; Batteries

We have not yet created the code so it is not working.
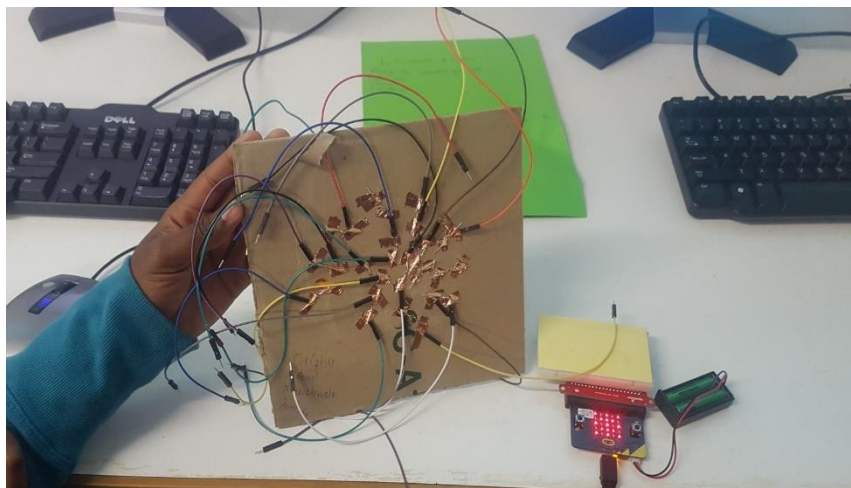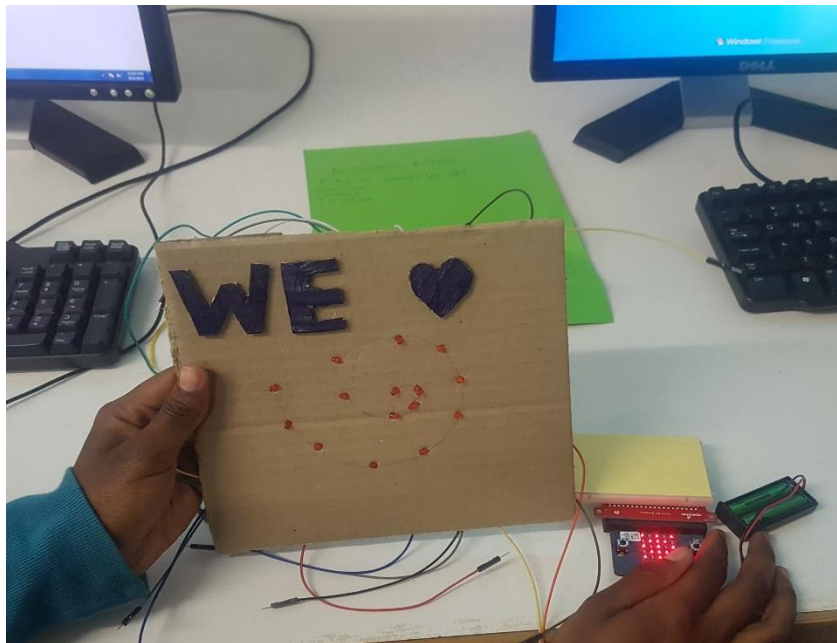
DIRECTION POINTER COMPASS

12 August 2017

By:Motsoko Mbengeni and Makhomisani Phethani (Form 4)

This compass uses a microbit to show direction. It shows the letter S for south, N for north, E for east and W for west . In order for the microbit to show direction it need to be moved to all different sides the letters will appear that will tell the direction.

Components

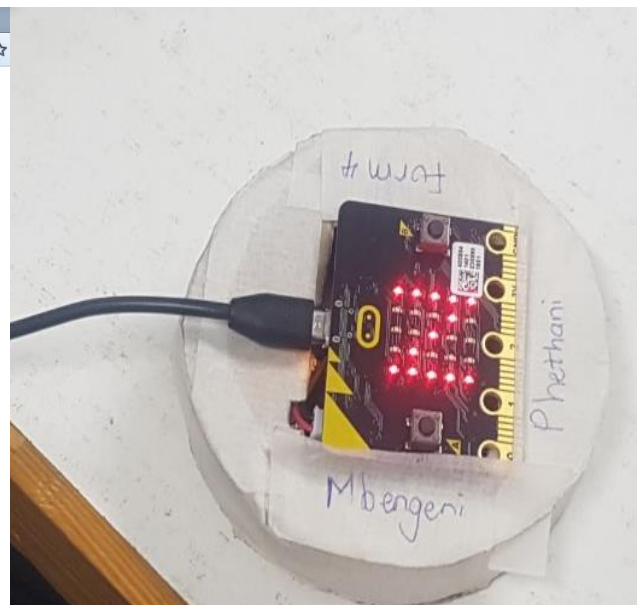- Cardbox
- Microbit
- Wire
- Battery

Codes

Picture

LIGHT BOX

BY: PHATHU, LESEDI, MUKHETHWA, THUSO AND VHUTSHILO (F5)

DESCRIPTION: We made a light box reason behind being that a light box is too modest and a lot of individuals have never been exposed to what exactly is a "light box" is and how coding is done.

COMPONENTS: microbit, 15X LED lights, cardbox, batteries, tape, foil, plastic cover and copper connecting tape.
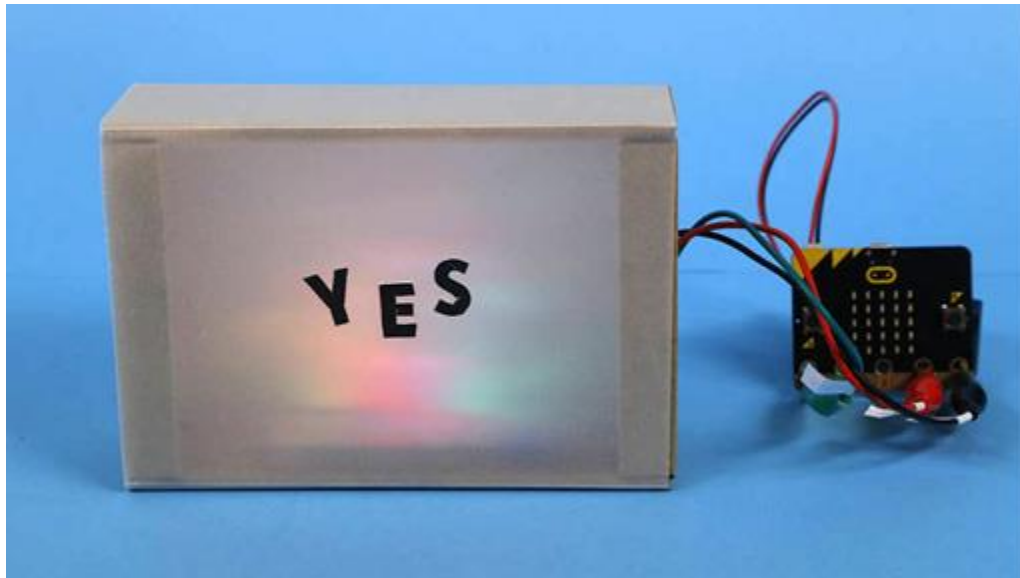
Sample picture obtained from the internet

Code: Coding was a new experience to explore, even though it was not very easy to do.


```javascript
basic.forever(() => {
    pins.digitalWritePin(DigitalPin.P0, 1)
    basic.pause(100)
    pins.digitalWritePin(DigitalPin.P0, 0)
    basic.pause(100)
    pins.digitalWritePin(DigitalPin.P1, 1)
    basic.pause(100)
    pins.digitalWritePin(DigitalPin.P1, 0)
    basic.pause(100)
    pins.digitalWritePin(DigitalPin.P2, 1)
    basic.pause(100)
    pins.digitalWritePin(DigitalPin.P2, 0)
    basic.showNumber(100)
    pins.digitalWritePin(DigitalPin.P3, 1)
    basic.pause(100)
    pins.digitalWritePin(DigitalPin.P3, 0)
    basic.pause(100)
    pins.digitalWritePin(DigitalPin.P4, 1)
    basic.pause(100)
    pins.digitalWritePin(DigitalPin.P4, 0)
    basic.pause(100)
    pins.digitalWritePin(DigitalPin.P5, 1)
    basic.pause(100)
    pins.digitalWritePin(DigitalPin.P5, 0)
})
```

TEDDY BEAR

BY: Rambau Khuthadzo, Shiviti Joy, Mulaudzi Marubini, Chauke Masana,Matshidi Mulalo, Samphinyane Rinadakalo, Kutama Musiwalo, Maphakela Fhulufhelo, Tshikovhi Muwanwa

DESCRIPTION: As the teddy bear's sensor senses movement, it switches on its eyes to red and the reading on the micro bit turns to 1 and when the eyes switches off, the reading turns to 0.

COMPONENTS: Teddy bear ,micro bit ,sensor ,LED lights ,conducting wires ,battery

PICTURE OF THE TEDDY BEAR

```javascript
1  let movement = 0
2  basic.forever(() => {
3
4      movement = pins.digitalReadPin(DigitalPin.P0)
5      basic.showNumber(movement)
6
7
8      if (movement == 1) {
9
10
11
12          pins.digitalWritePin(DigitalPin.P1, 1)
13
14
15
16
17
18
19     }
20     if (movement == 0) {
21         led.unplot(0, 0)
22         pins.digitalWritePin(DigitalPin.P1, 0)
23
24     }
25
```

THERMOMETER

BY: Nefolovhodwe Ofhani and Makganyoga Masego Chantel (form 3)

Brief explanation

We have a brief design of our thermometer in which we have designed and programmed using Microbit.

Our project is used to sense temperature. We place the thermometer in different areas, it could either be a room, box or temperature.

It has two LED's

- Red light: Only lights up when the temperature is greater than 23 degrees (<23)
- Yellow light: Only lights up when the temperature is below 23 degrees (>23)

The LED's are only there to indicate whether the temperature is normal/ mild or too hot

Components: Plastic; Hard cardboard; White tape; Glue
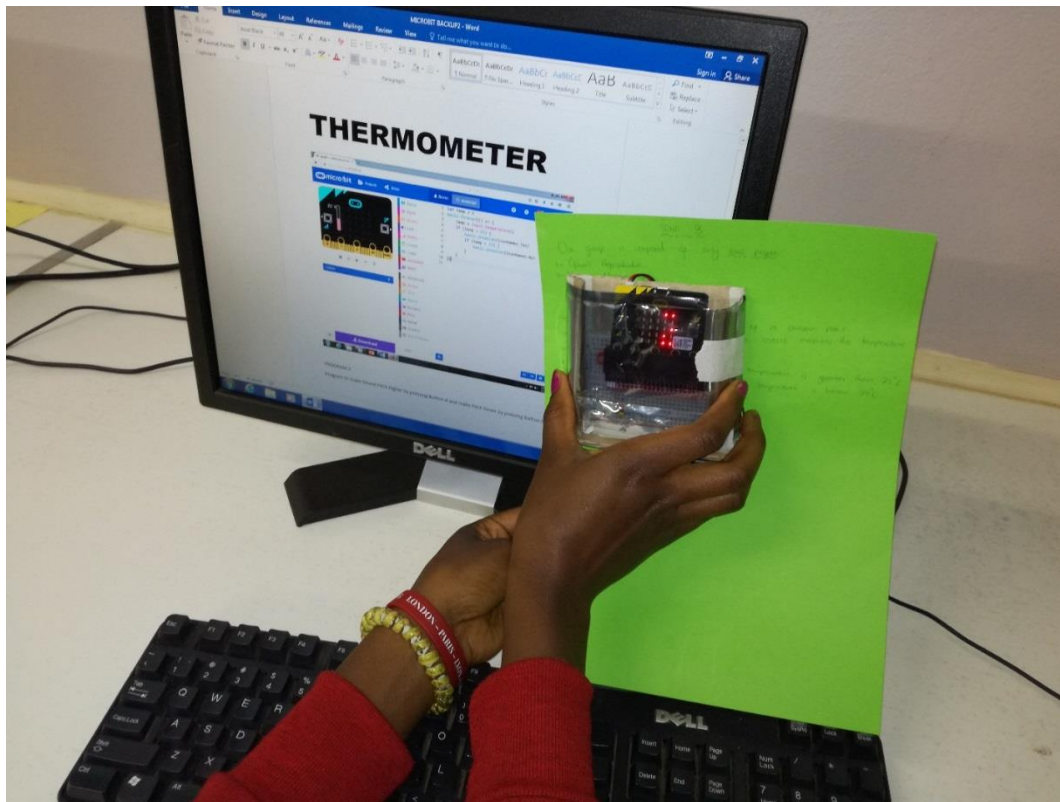
Motion sensor

By Mangata Gift and Malebana Tumelo

DESCRIPTION

It is a motion sensor designed to blend in with the environment it is in. The code is programed to produce a long, loud sound after sensing motion which plays for a minimum of 10 minutes. The body of the sensor is small to prevent it from being noticed.
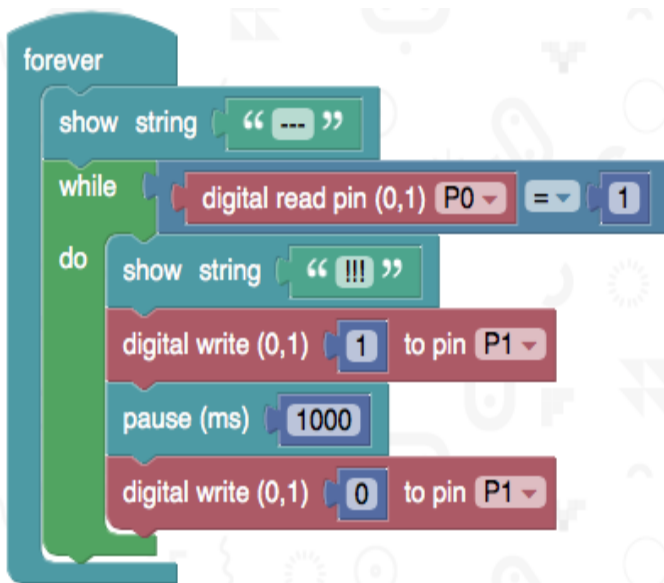
Components

*BBC micro-micro-bit

*motion sensor

*buzzer

CODE
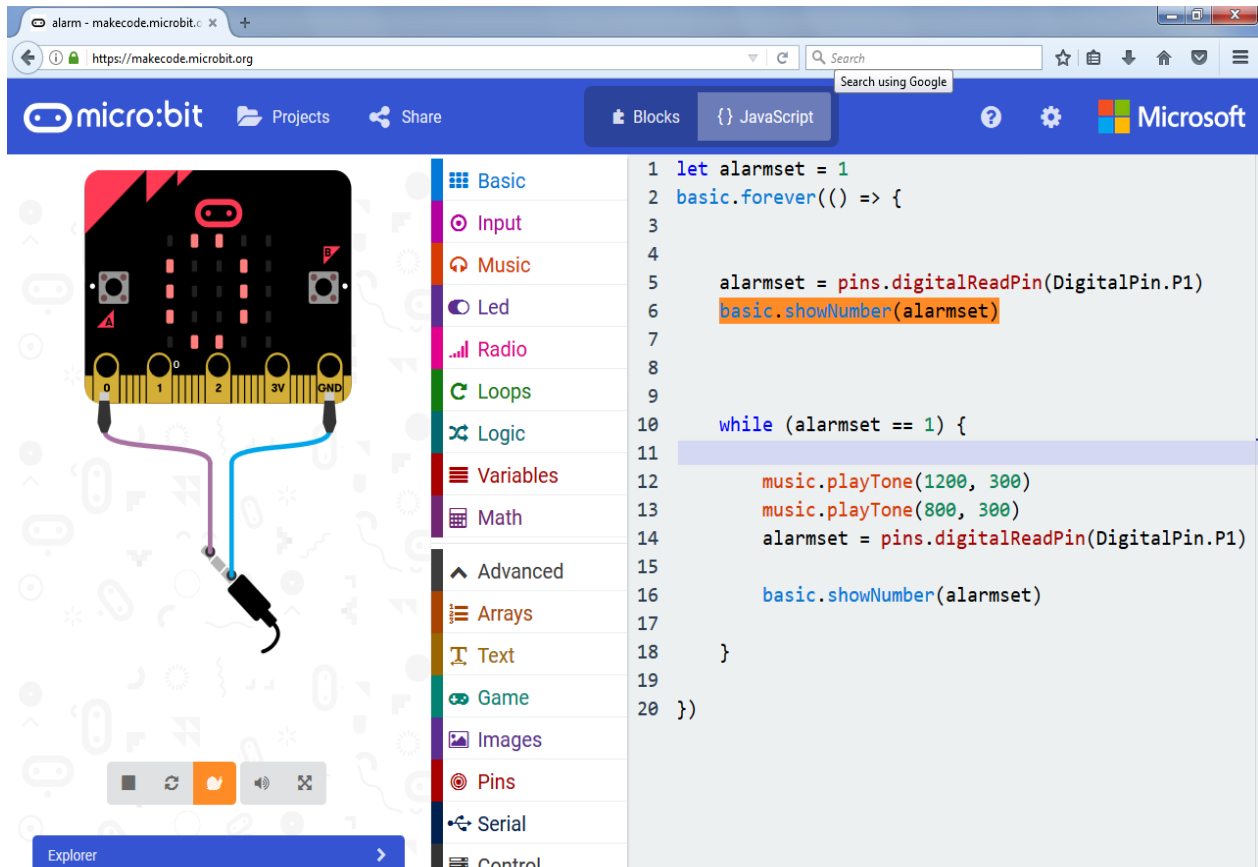
Door alarm

By Makhado, Memory and Zwashu (Form 2)

12 August 2017

DESCRIPTION: We used microbit, a proximity sensor and a speaker to make the alarm ring when something gets next to it. So we placed it behind the door so that when the door opens it rings.

CODES:

ROOM ATTACK INTRUDER

By Makungo Knowledge, Mutshidzi Ganyane , Netshaulu Pfufho and Likhanya Rotshidzwa

(Grade 9/Form 2) 12 August 2017

Description: We used a microbit, proximity sensor and a speaker. We placed the microbit and the sensor behind the door and every time you open the door the speaker makes a sound.

CODE:

AIR GUITAR

BY: WINNIE & AMANDA (GRADE 9/FORM 2)

DESCRIPTION:

Our project was supposed to make the sound go up by pressing A and by pressing button B the sound was supposed to go down but unfortunately we didn't finish with our project and another thing is that we lost our project we don't actually know where it is now.

But then this is a picture of how our project was supposed to look like:

We misplaced our micro bit so we don't have the codes
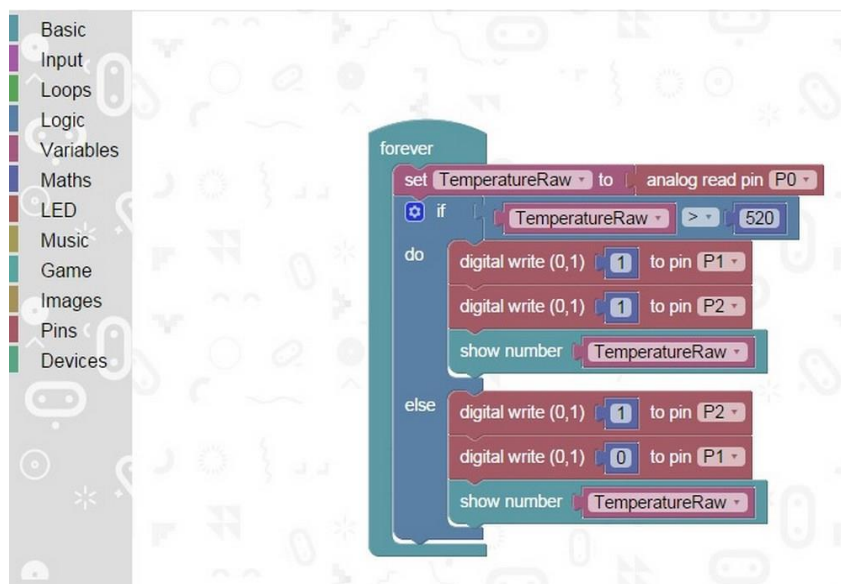
Temperature scanner

Livhuwani, Alycia, Vuledzani, Unarine and Muvhulawa

Description:

Whether you want to wear your favourite shorts or long denims and a scarf this device might just help you decide the right wear for the weather condition for it. It detects the temperature outside and uses smileys to tell you the weather. When its cold and under 15 degrees it makes an angry face. When its 16-24 it makes a sad face and when its 25 degrees and above it it makes a happy face
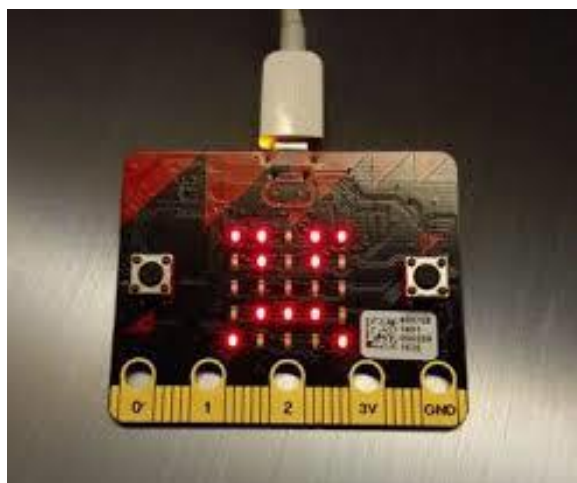
The pieces were misplaced, below are sample codes and pictures from the internet

Codes

OTHER SIMPLE PROGRAMS

PROGRAM 1

Program to type yes if temperature is higher than 23 and type no of temperature is lower than 23

let temp = 0

basic.forever(() => {

   temp = input.temperature()

  if (temp > 23) {
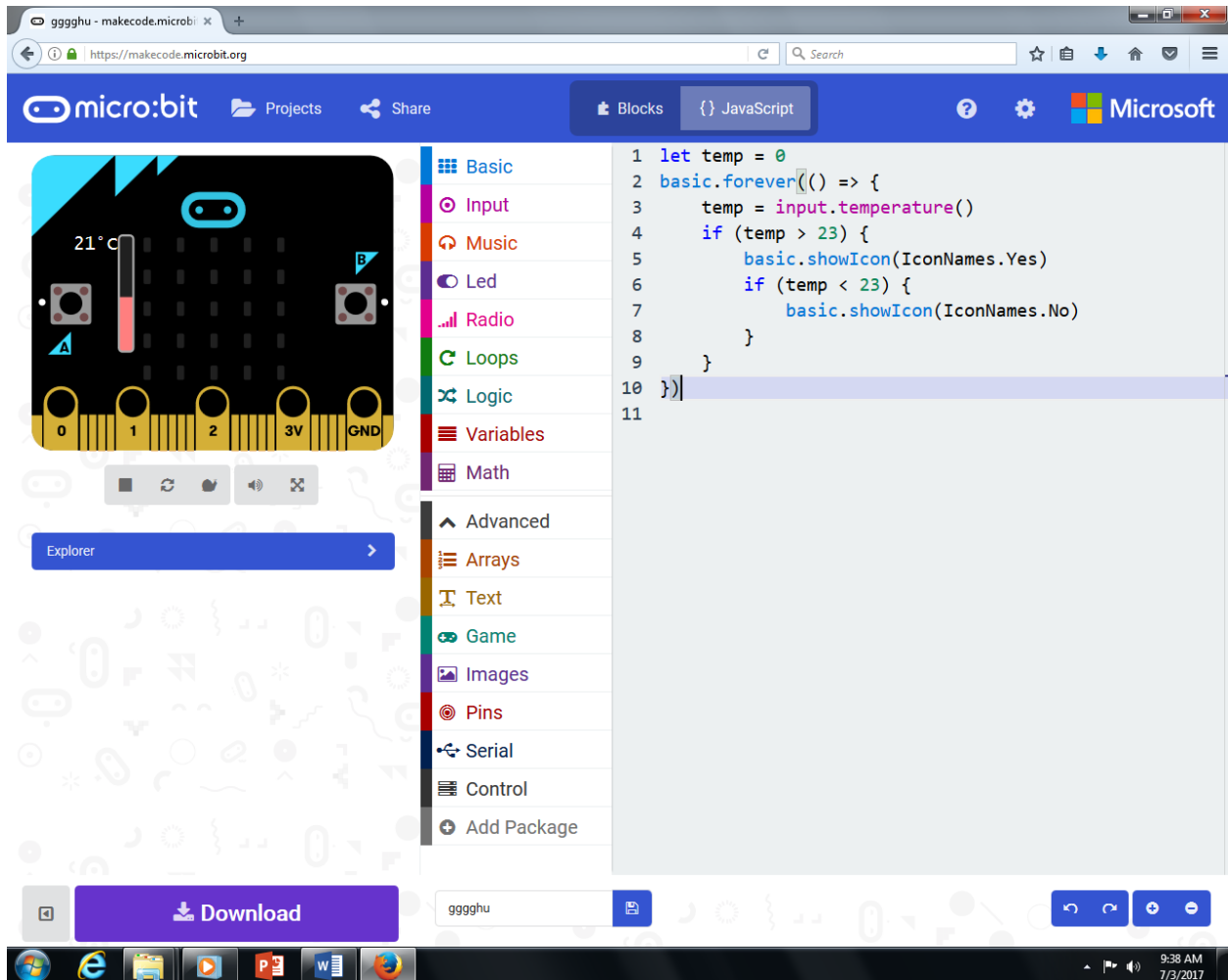
    basic.showIcon(IconNames.Yes)

  }

  if (temp < 23) {basic.showIcon(IconNames.No)}

})

PROGRAM 2

Program to make Sound Pitch higher by pressing Button A and make Pitch lower by pressing Button B