

# CLASSROOM VOICE CONTROL



## STEMJAM Teaching Guide

Developing make spaces to promote creativity  
around STEM in schools

Acronym: STEMJAM

Project no. 2016-1-ES01-KA201-025470

[www.stemjam.eu](http://www.stemjam.eu)



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# CLASSROOM VOICE CONTROL

## ABSTRACT

The students can not realize their noises at classroom. So we get help by mBot to make them realize their noise at class.

Students will programming different movements, noises, faces, etc. At the same time, the codings will manage to minimize the noise level in the classrooms.

## DIDACTIC OBJECTIVES

- ❖ Learning about how to control the time in coding.
- ❖ Learning about using a sound sensor and how to relate it to some effects.
- ❖ Learning how to use a 7 segment display.
- ❖ Learning about using a Led matrix.

STEM Subject:    Science             Technology             Engineering             Mathematics

Education Level:            12-14 years             14-16 years

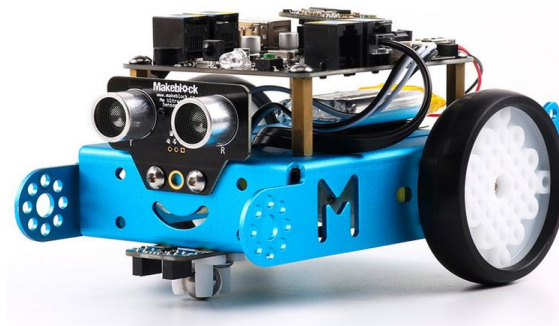
## PROBLEM STATEMENT

The mBot must react to the noise, with lights, sounds, feelings (faces) and movement.

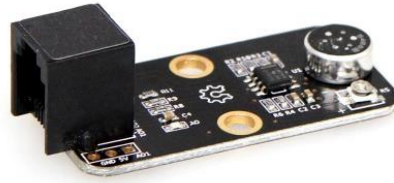
At the same time, students must establish different levels of noise, with their different reactions.

## BOM (Bill of Materials Needed)

- mBot => Ref. 90054



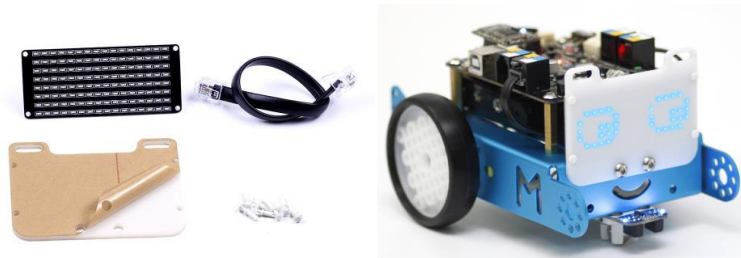
❖ **Me Sound Sensor:**



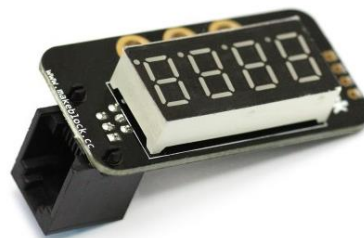
❖ **Me PIR Motion Sensor:**



❖ **Me LED Matrix 8 × 16:**



❖ **Me 7-Segment Serial Display - Red:**



- ❖ Different beams and structures:



- ❖ A lamp.
- ❖ Styrofoam foam.
- ❖ Electrical cable, plastic tape, glue, knife, pens etc...

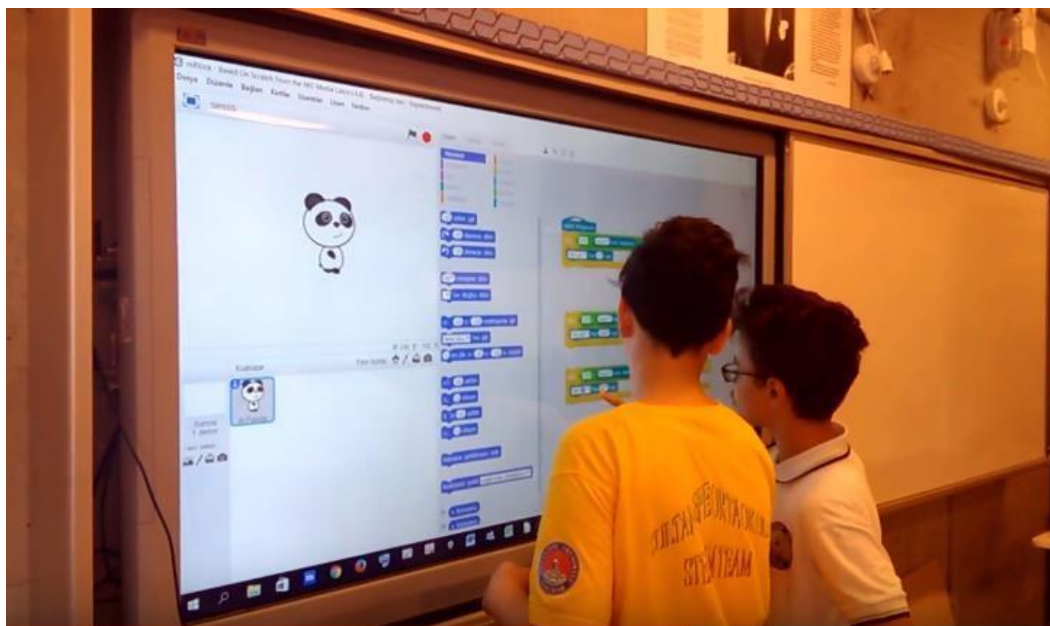
## ACTIVITY DESCRIPTION

### First version

1. To diagnose before brain storming.

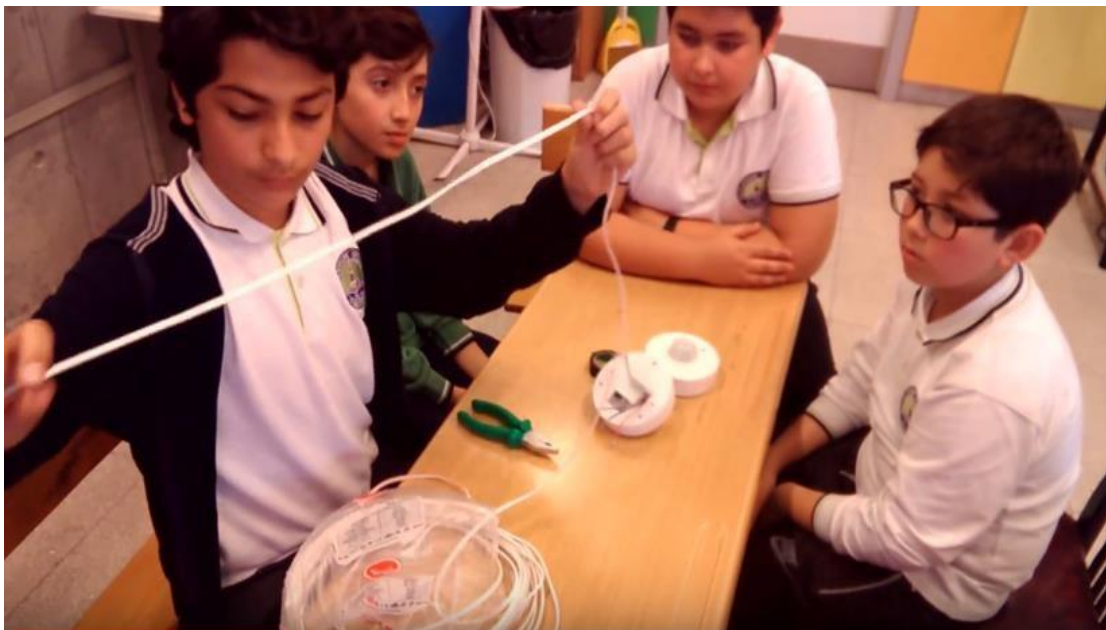
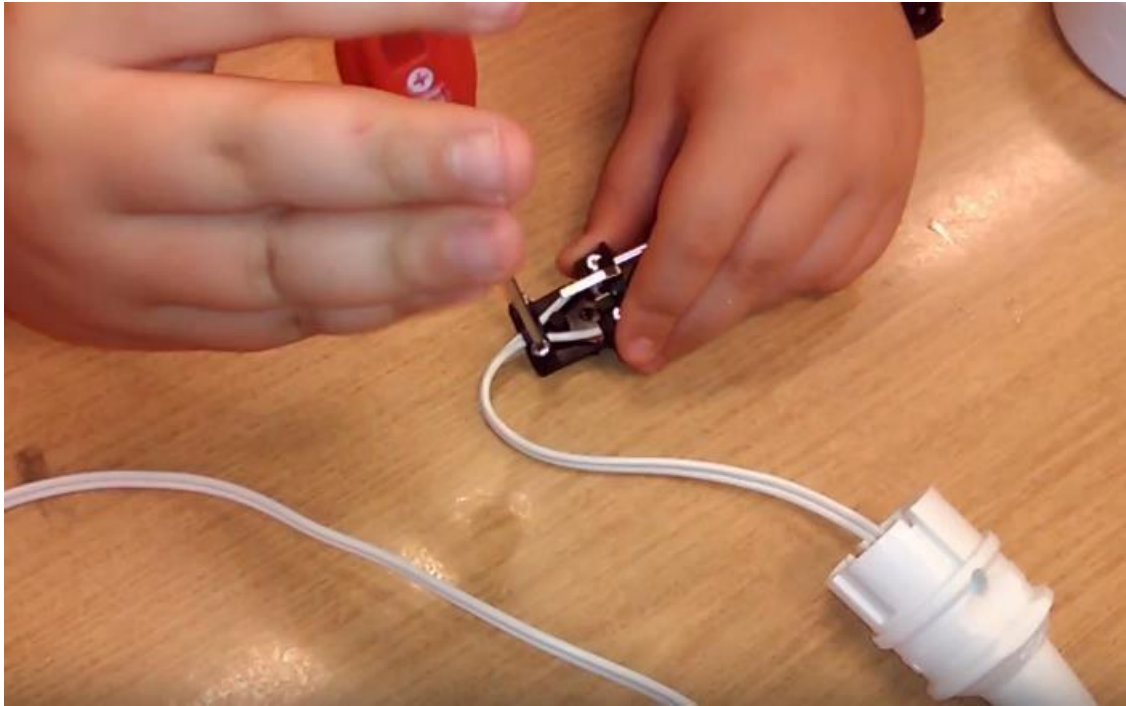


2. Phasing of mBotProgramming:





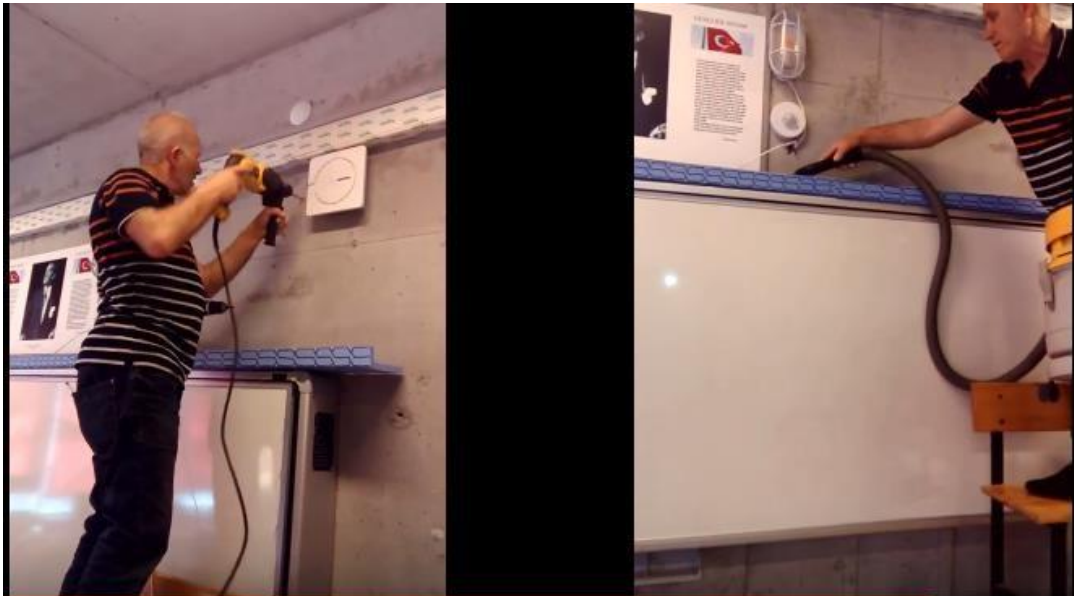
3. Phasing of electrical system setting up:



#### 4. Phasing of Design:









## Second version

The work of the students consists first of all, in establishing some intervals of noise:

- almost nothing = mBot is happy
- little = mBot is not happy
- some more noise = mBot is sad
- noise = mBot is annoyed

Then they must decide what they want the robot to do according to which noise interval it is in.

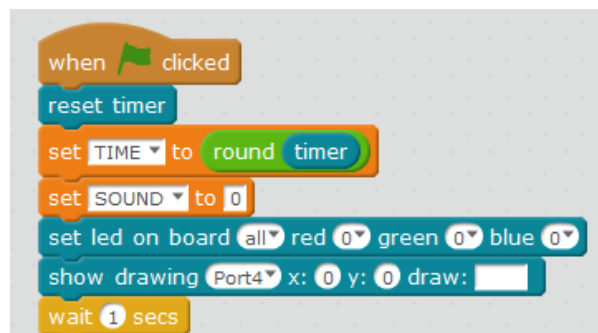
That is, they must decide for each interval, whether or not it will move, how fast it will move, what face it will show, whether it will emit lights and what colour, whether it will emit any sound, etc.

Finally, they will have to create the flowchart and make the code.

After all these technical tasks, we start with the PROGRAMMING.

### Setting the starting parameters:

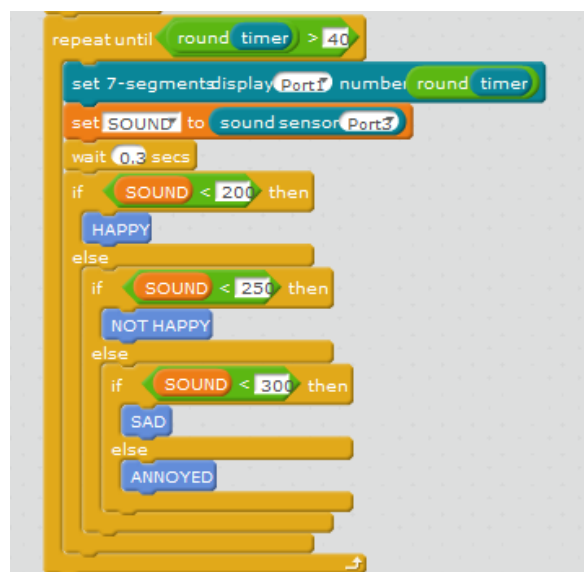
We set the leds on board, the timer, the sound sensor and the show face:



```
when clicked
  reset timer
  set TIME to round timer
  set SOUND to 0
  set led on board all red 0 green 0 blue 0
  show drawing Port4 x: 0 y: 0 draw: 
  wait 1 secs
```

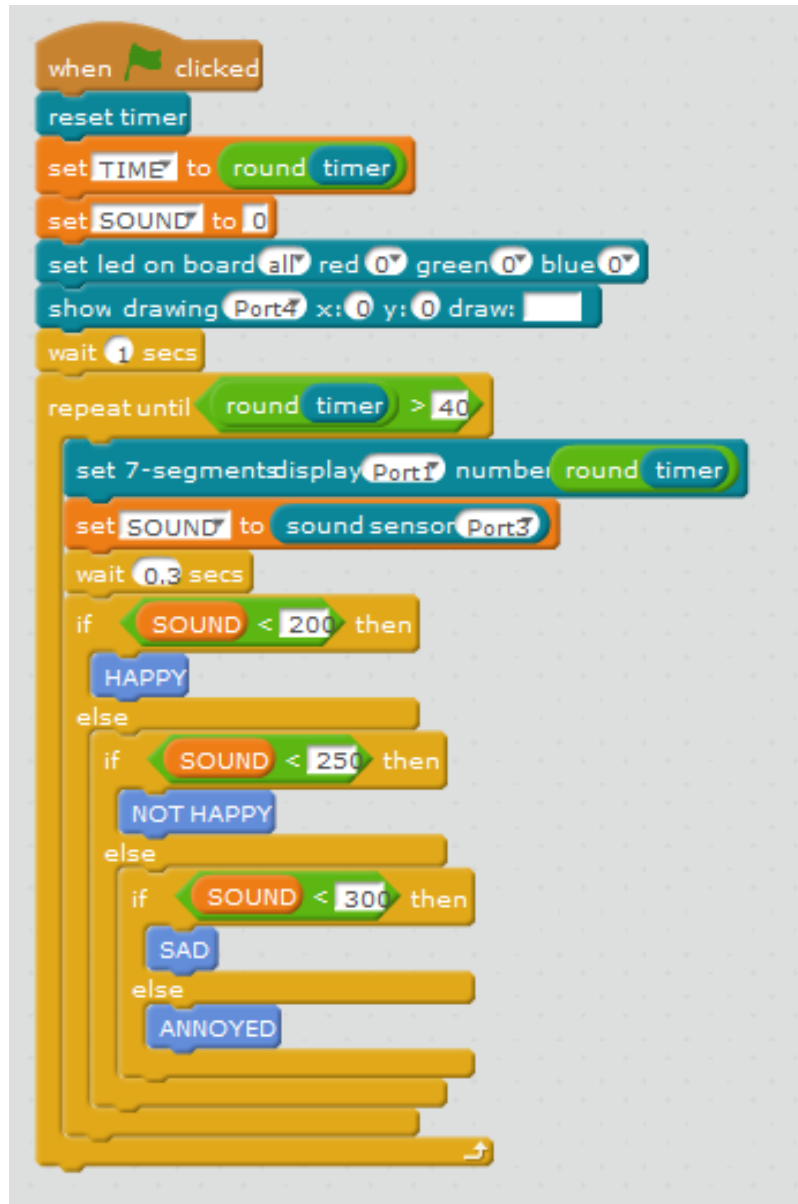
### Setting the main routine:

In this part, we determine what effects the robot will do, according to which range of noise we are in the classroom.



```
repeat until round timer > 40
  set 7-segments display Port7 number round timer
  set SOUND to sound sensor Port3
  wait 0,3 secs
  if SOUND < 200 then
    HAPPY
  else
    if SOUND < 250 then
      NOT HAPPY
    else
      if SOUND < 300 then
        SAD
      else
        ANNOYED
```

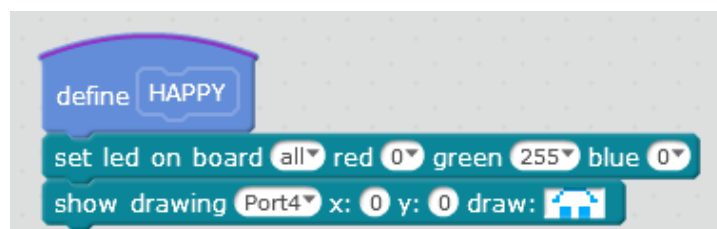
Here we can see both parts above, together:



```
when clicked
  reset timer
  set TIME to round timer
  set SOUND to 0
  set led on board all red 0 green 0 blue 0
  show drawing Port4 x: 0 y: 0 draw: [ ]
  wait 1 secs
  repeat until round timer > 40
    set 7-segment display Port1 number round timer
    set SOUND to sound sensor Port3
    wait 0.3 secs
    if SOUND < 200 then
      HAPPY
    else
      if SOUND < 250 then
        NOT HAPPY
      else
        if SOUND < 300 then
          SAD
        else
          ANNOYED
```

### Coding the different effects:

In this part we code what we want the mBot to do, depending on if it is happy, not happy, sad or annoyed.



```
define HAPPY
  set led on board all red 0 green 255 blue 0
  show drawing Port4 x: 0 y: 0 draw: [ ]
```

```

define NOT HAPPY
set led on board all red 255 green 150 blue 0
show drawing Port4 x: 0 y: 0 draw: [frowning face]
play tone on note D4 beat Quarter
run forward at speed 80
wait 1 secs
run forward at speed 0

```

```

define SAD
set led on board all red 250 green 65 blue 0
show drawing Port4 x: 0 y: 0 draw: [sad face]
play tone on note D6 beat Quarter
run forward at speed 120
wait 1 secs
run forward at speed 0

```

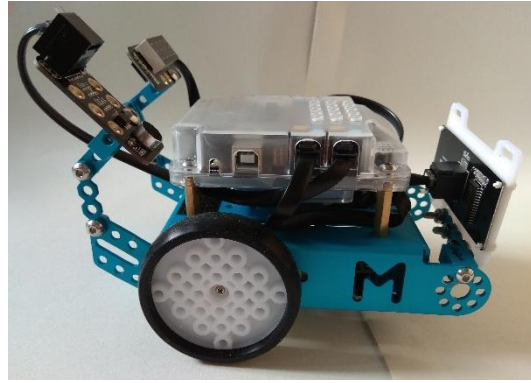
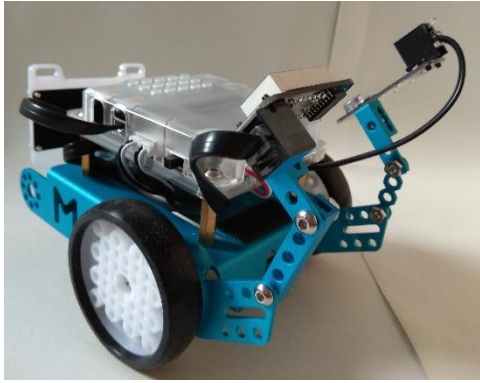
```

define ANNOYED
set led on board all red 250 green 0 blue 0
show drawing Port4 x: 0 y: 0 draw: [angry face]
play tone on note D8 beat Half
run forward at speed 150
wait 1 secs
run forward at speed 0

```

Structural composition:





Effects caused by noise level:

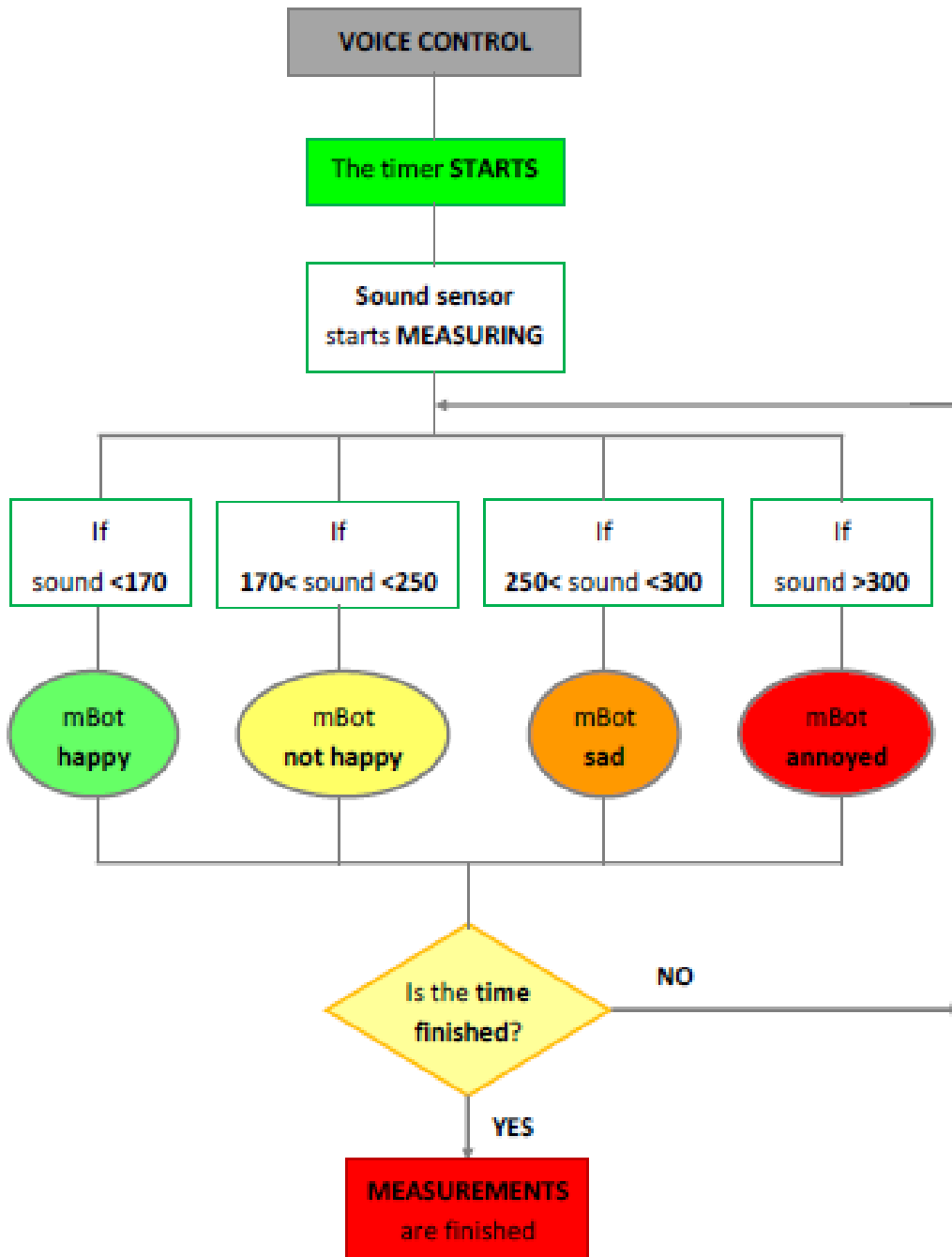
(Sound is also an effect.)





## FLOW CHART

### Second version



## STUDENT'S EVALUATION

The design is based on students with "zero" preconditions.

## BIBLIOGRAPHY

<http://www.makeblock.com/>