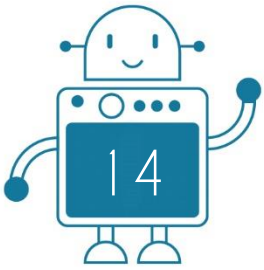


CLASSROOM VOICE CONTROL

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

Co-funded by the Erasmus+ Programme of the European Union

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☐

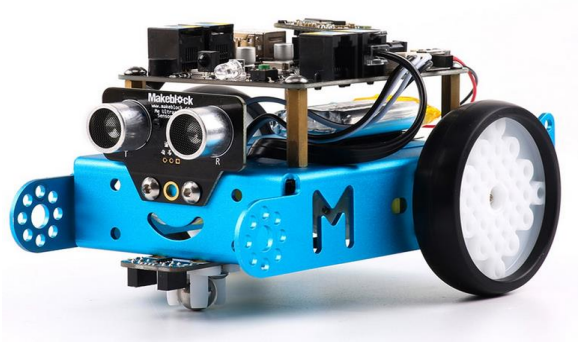
PROBLEM STATEMENT

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)

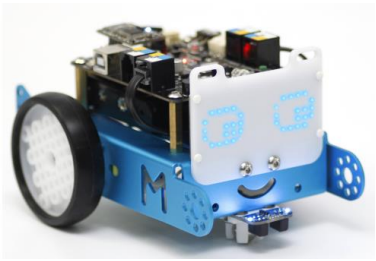
- mBot => Ref. 90054



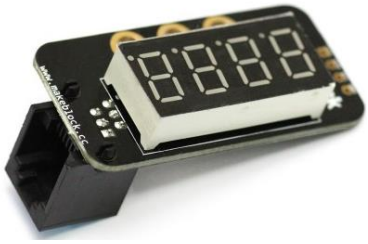
❖ Me **Sound Sensor**:

❖ Me **PIR Motion Sensor**:

❖ Me **LED Matrix 8 × 16**:



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



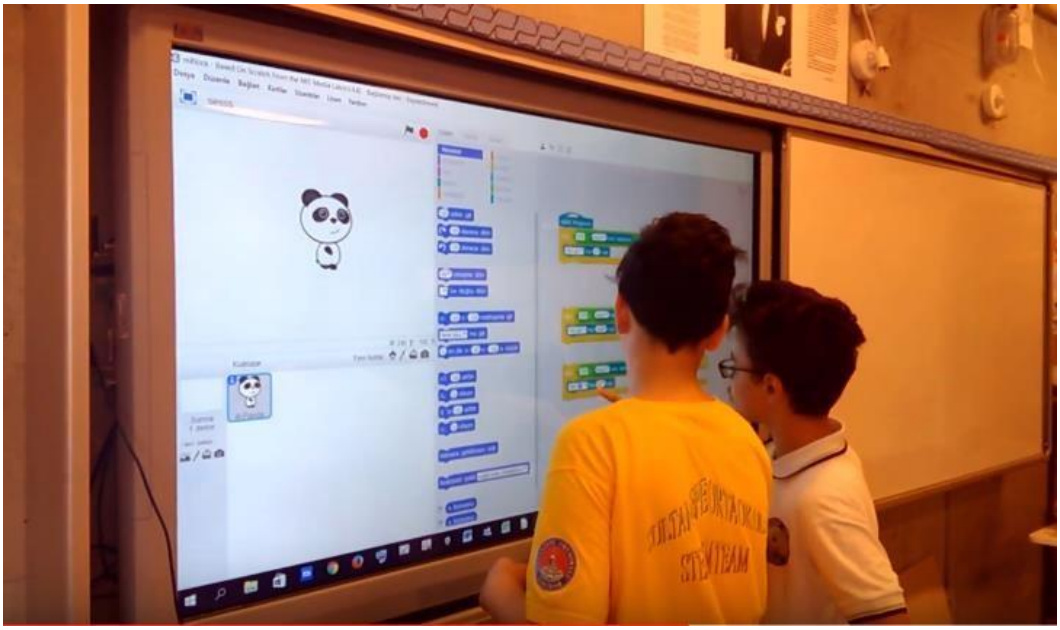
- Different beams and structures:

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

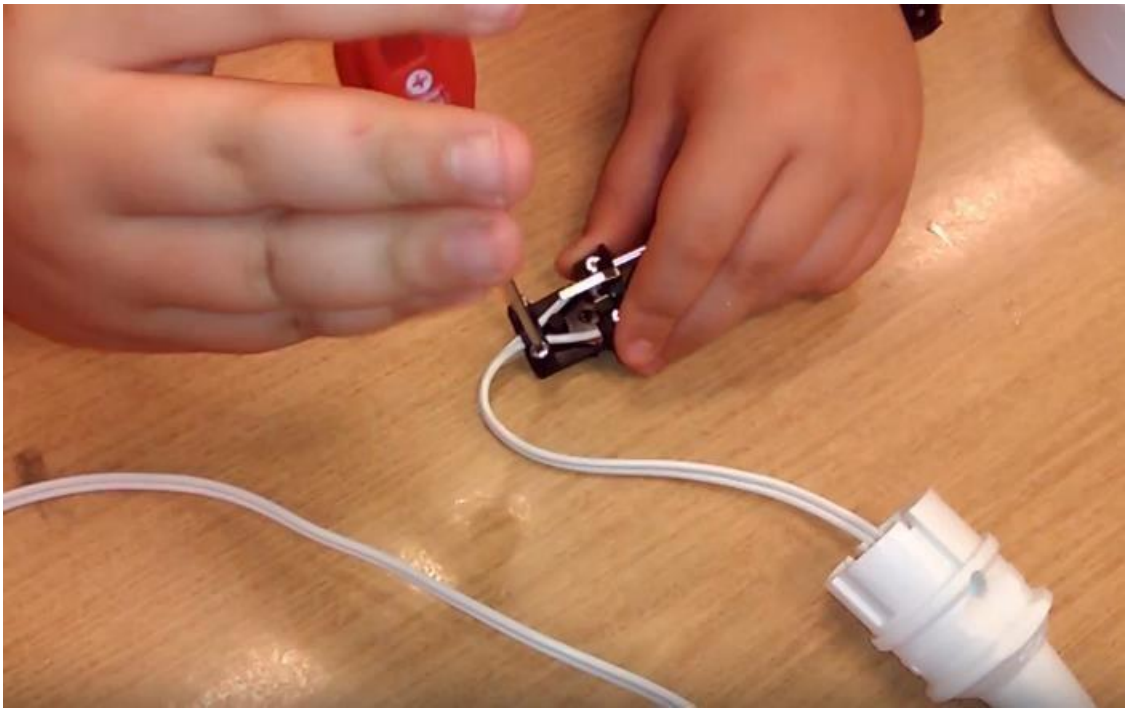
First version

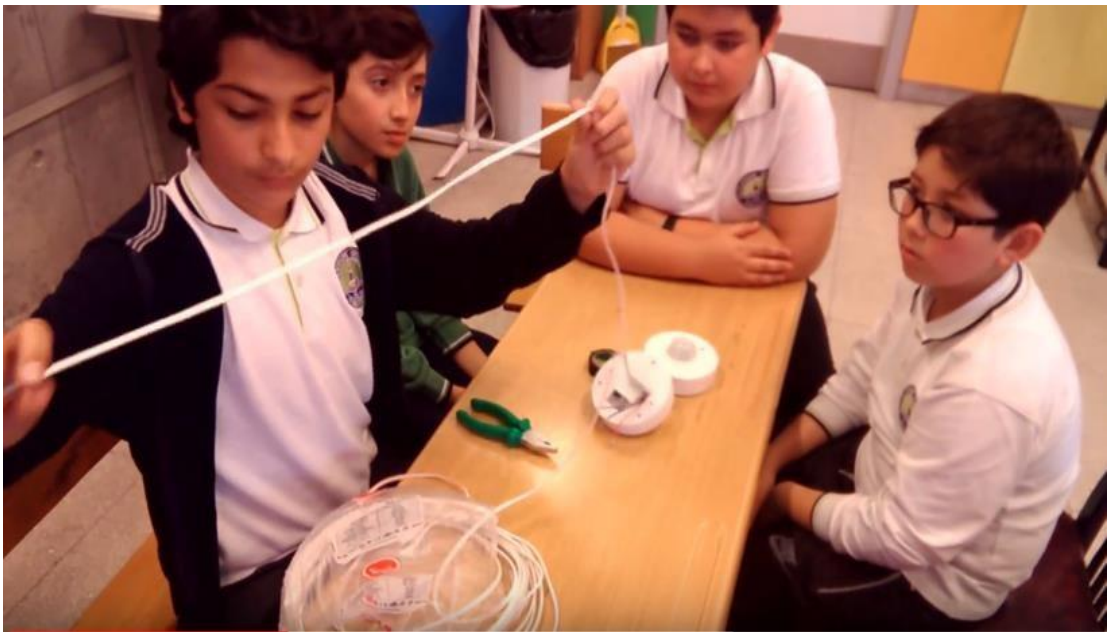
1. To diagnose before brain storming.

2. Phasing of mBotProgramming:

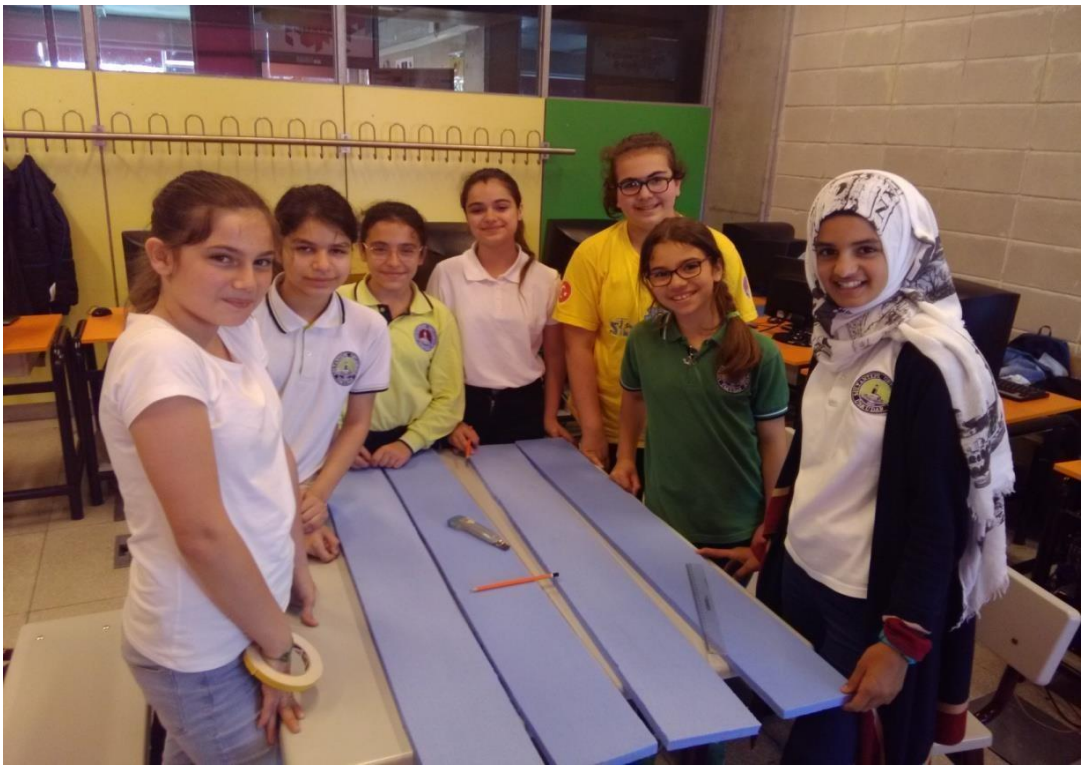


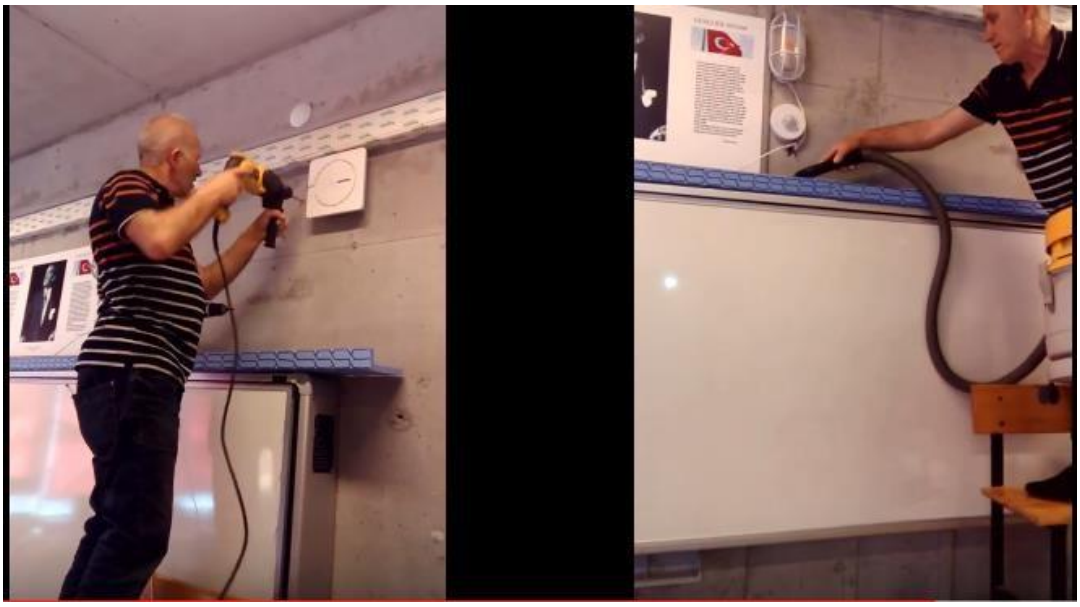
3. Phasing of electrical system setting up:





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.

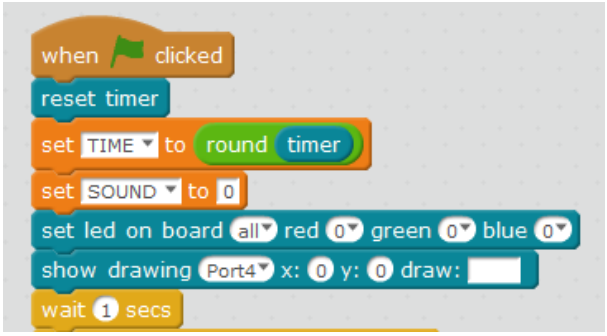
That is, they must decide for each interval, whether or not it will move, how fast it will move, what face it will show, whether it will emit lights and what colour, whether it will emit any sound, etc.

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

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

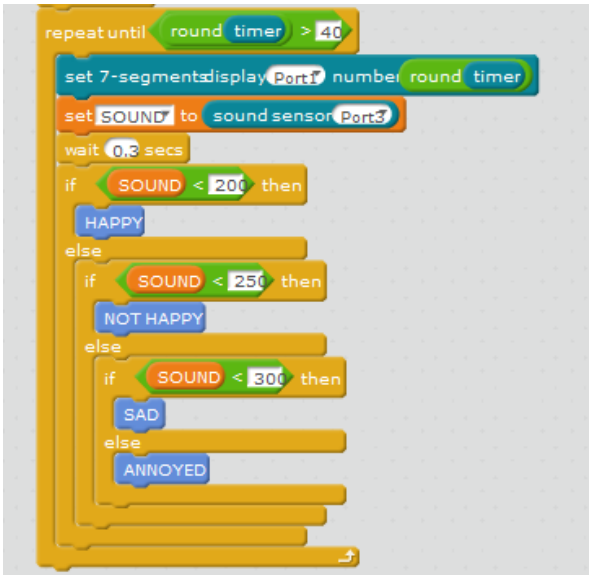
Setting the starting parameters:

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

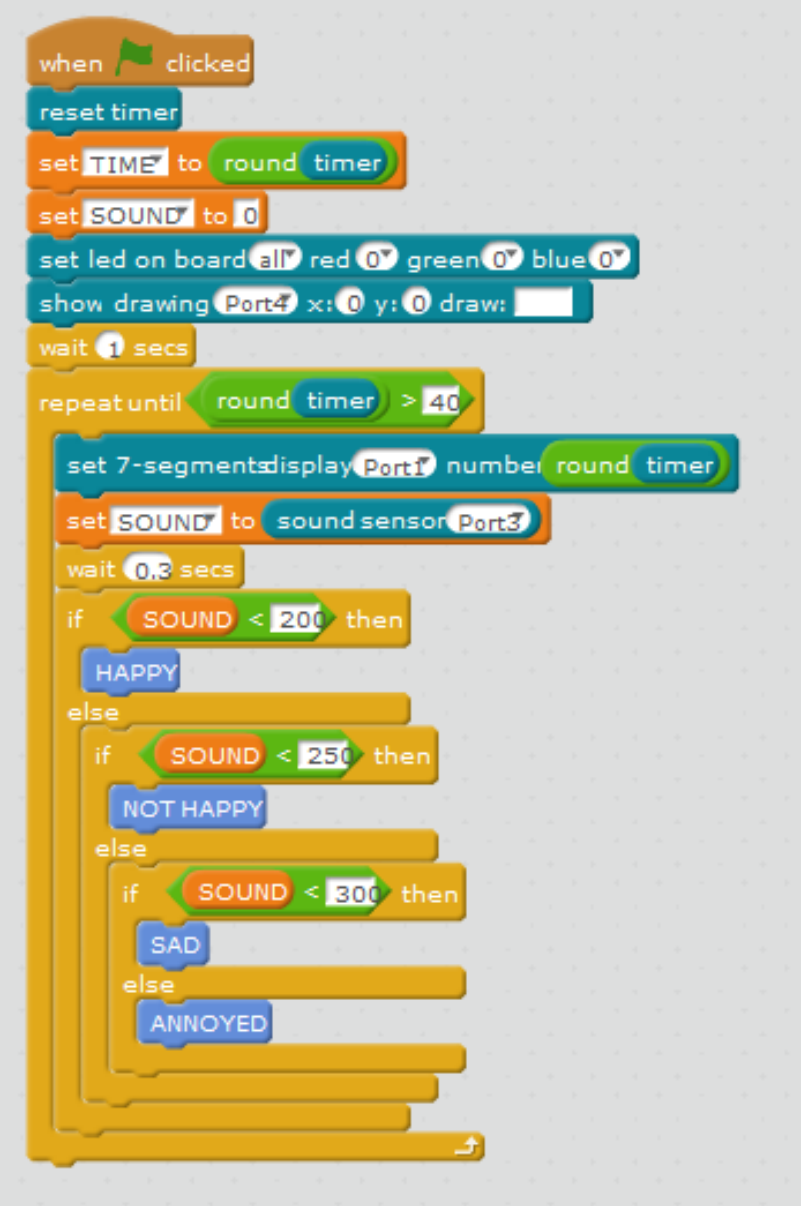


Setting the main routine:

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

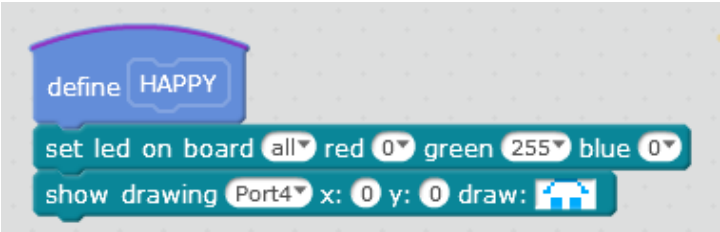


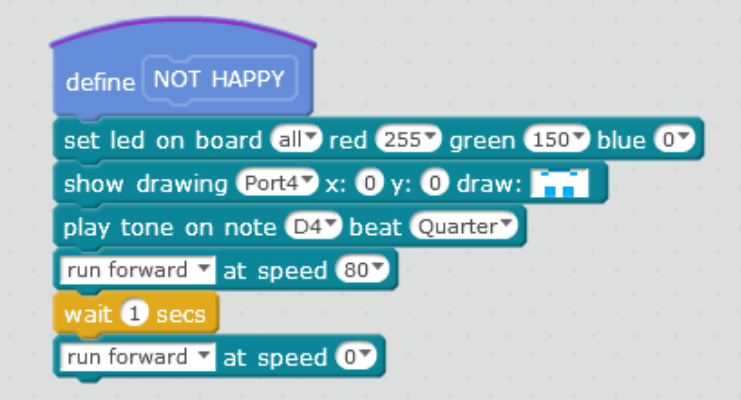
Here we can see both parts above, together:

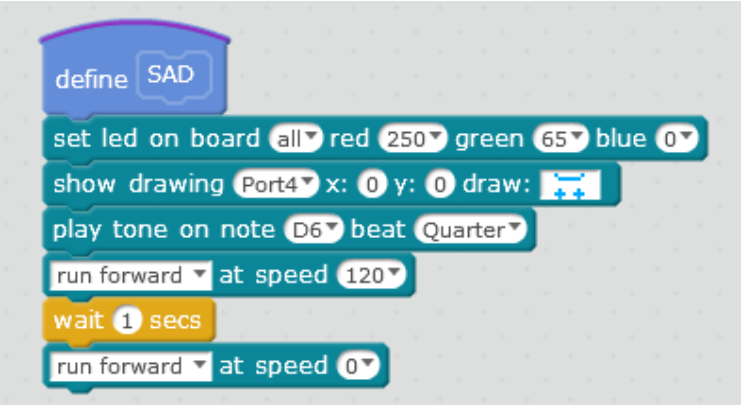


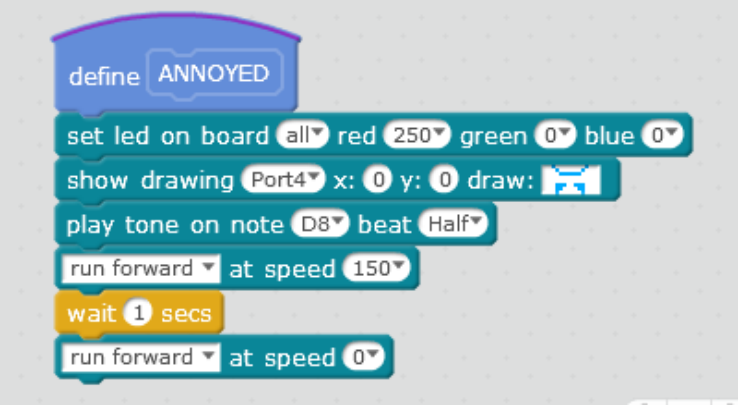
<u>Coding the different effects</u>**:**

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

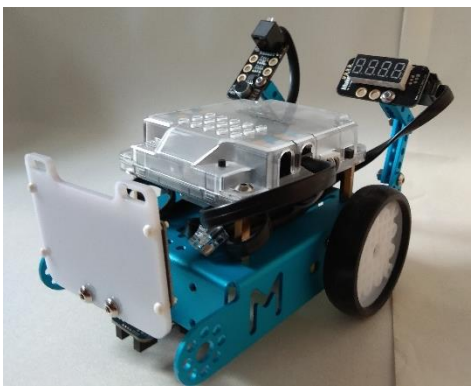


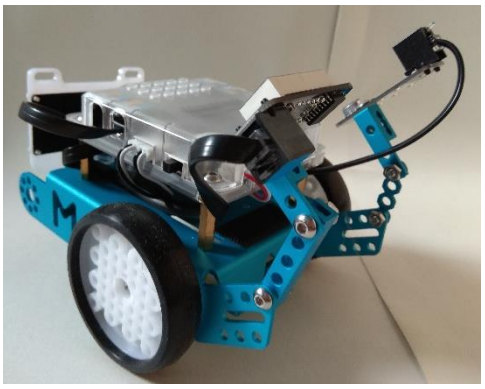


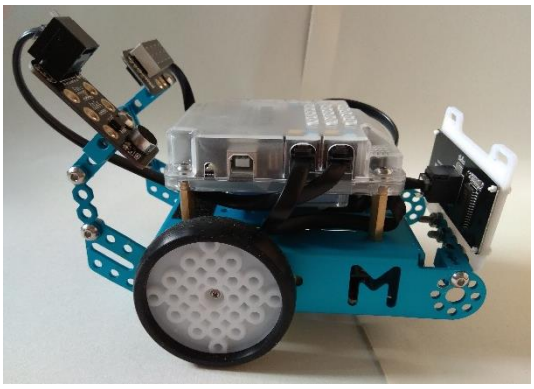




Structural composition:

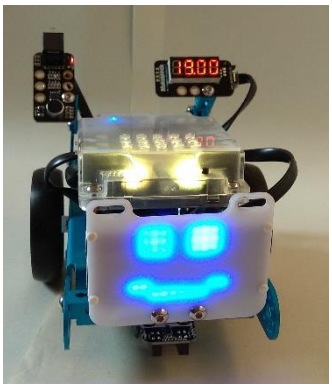


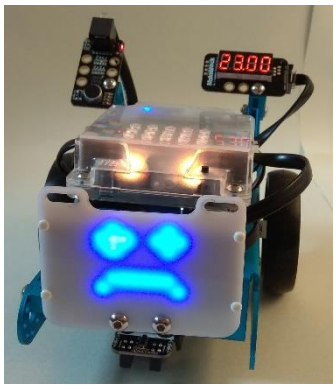




Effects caused by noise level:

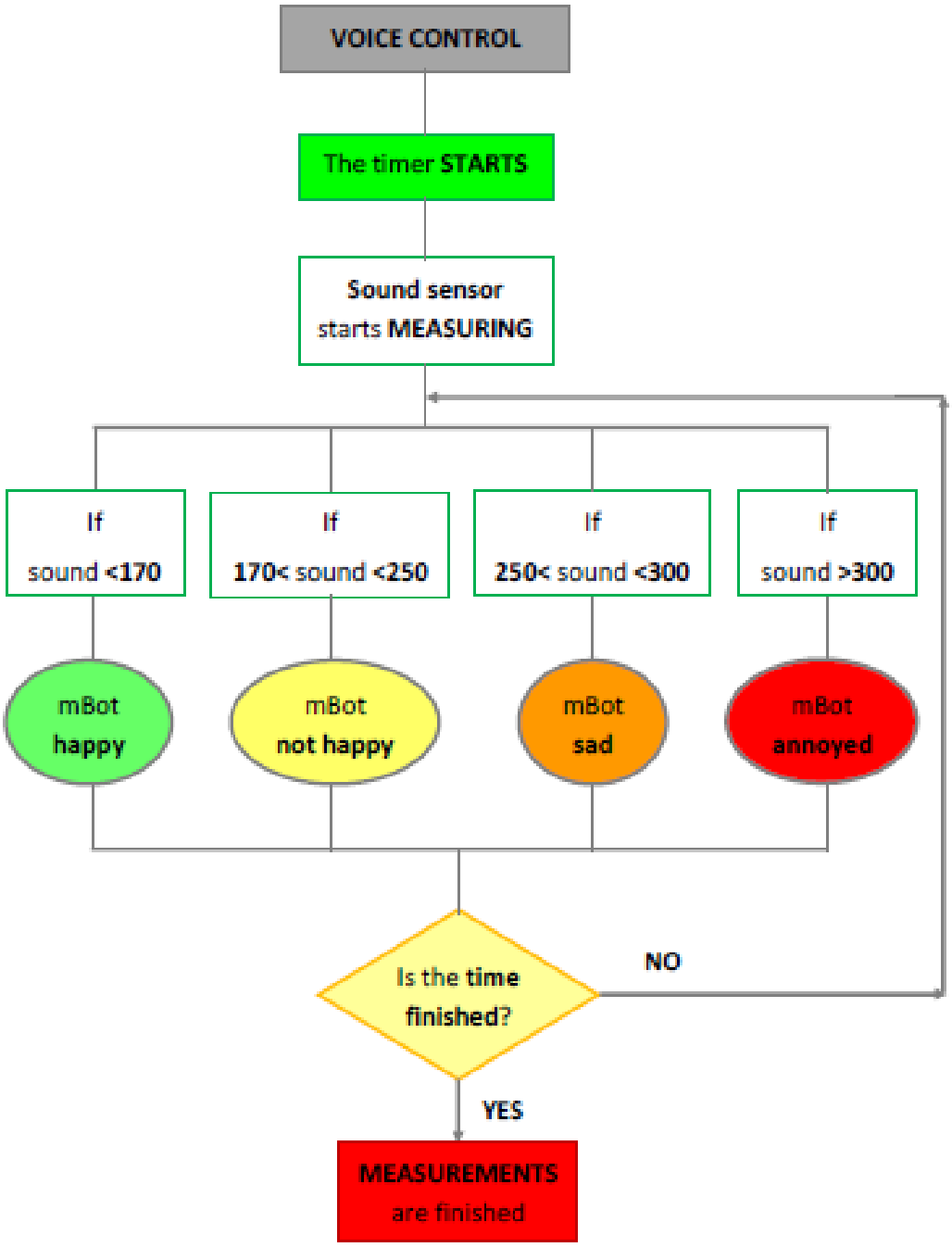
(Sound is also an effect.)





FLOW CHART

Second version



STUDENT'S EVALUATION

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

BIBLIOGRAPHY

http://www.makeblock.com/