**Roboloco In Real Life**

**Basic Sound**

Learning scenario

**AUTHOR(S)**

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**SUMMARY**

Use of basic sound using Lego Mindstorm EV3 robot

**KEY ELEMENTS**

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| OVERVIEW | |
| Subjects | Music , Computer Science |
| What is going to be done | 1. Students are going to learn how to use basic sounds in Lego Mindstorm EV3 robot, also to use Python while using the robot |
| Target public | Students |
| Preparation time | 15 min |
| Teaching time | 30 min |
| Where you can download this lesson  (and more). | RoboLocode Teaching Materials:  <https://teducativas.madeira.gov.pt/roboloco>  <https://ev3dev-lang.readthedocs.io/projects/python-ev3dev/en/2.0.0beta1/other.html> |
| What you’ll need | The LEGO Mindstorm EV3 |
| Resources used | The LEGO Mindstorm EV3 – only brick  Classes (<https://ev3dev-lang.readthedocs.io/projects/python-ev3dev/en/2.0.0beta1/other.html>)  [**https://sites.google.com/site/ev3python/learn\_ev3\_python/loudspeaker\_speech**](https://sites.google.com/site/ev3python/learn_ev3_python/loudspeaker_speech) |

**LESSON INTRODUCTION**

**LESSON PLAN**

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| Exercise |
| 1. Instructions 2. 1. Prepare wav format files. Take sound.zip file from page   <https://sites.google.com/site/ev3python/learn_ev3_python/loudspeaker_speech> where you can find all LEGO MINDSTORMS EDUCATION files converted to wav format.   1. 2.Create a special directory called ‘sounds’ in your robot’s directory and copy into it wav files (full path /home/robot/sound). 2. 3. Create a programme to make the robot  * -play a wav file, any sound signal and will read the sentence “Welcome to the E V 3 development project”, * -l play a song |
| Short help on programming |
| Commands/functions needed for the exercise  Library: [ev3dev](http://mumin.pl/Probot/_downloads/f1554763194447c0c438f34af286000d/Sound_lib_ev3dev.zip)  Play a standard beep  beep(<frequency in Hz>)  Play a single tone  tone(frequency in Hz,duration in milliseconds)  Play a sequence of tones  tone(tone\_sequence)  tone\_sequence – list of tuples.  Each tuple has the form (frequency in Hz, duration in milliseconds, wait in milliseconds)  Play a WAV sound file  play(*wav\_file*)  Play a song  play\_song(*song*, *tempo=120*, *delay=0.05*) song – list of tuples.  Each tuple has the form(note name, values)  The note name and its value using music conventional notation (see  <https://newt.phys.unsw.edu.au/jw/notes.html>) for frequency and duration. Symbolic notes are acceptable (e.g. A4, D#3, Gb5). For denote durations it should be used w- whole note, h- half note, q-quarter note, e- eighth note, s – sixteenth note. Triplet should be written as for example (‘D4’,’e3’), (‘D4’,’e3’), (‘D4’,’e3’). Speak a text speak(*text*)  Example:  #!/usr/bin/env python3  Sound.speak(’Hello’)  or  sound=Sound()  sound.speak(’Hello’)  Library: [ev3dev2](http://mumin.pl/Probot/_downloads/079228b4da187933c84ef53f32edc7eb/Sound_lib_ev3dev2.zip)  Play a standard beep  beep(<frequency in Hz>,play\_type=0)  Play a single tone  tone(frequency in Hz,duration in milliseconds,play\_type=0)  Play a WAV sound file  play\_file(*wav\_file*, *volume=100*, *play\_type=0*)  Play a song  play\_song(*song*, *tempo=120*, *delay=0.05*)  Analogically as above  *#!/usr/bin/env python3*  Speak a text  speak(text, speak\_opts='-a 200 -s 130', volume=100, play\_type=0)  a = amplitude (200 max, 100 default), s = speed 80-500, default = 175  play\_type  has two options  | Sound.PLAY\_WAIT\_FOR\_COMPLEE=0 (| default)  Sound.PLAY\_NO\_WAIT\_FOR\_COMPLETE=1  The behavior once playback has been initiated. We don’t use wait() after this command.  Example  #!/usr/bin/env python3  Sound().speak(’Hello’,volume=50)  or  sound=Sound()  sound.speak(’Hello’,volume=50) |

**ASSESSMENT**

To evaluate the lesson, a simple question should be asked to the students.

What did you learn with this exercise?

**STUDENT FEEDBACK**

After the end of the lesson the students can give their feedback.

**TEACHER’S REMARKS**

*Add here your comments and evaluation* ***AFTER*** *the implementation of this lesson, if any.*