

Name:

Student Number:

Date:

Lesson 11 mBot the Musician

Activity Sheet

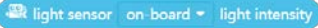
Context

In Lesson 7, we programmed the song, *Frère Jacques*, through looping algorithms. Are there any other ways to compose a song or melody? In this learning activity, we will continue to explore the composition method by using Sensing and Light Sound blocks to program mBot. What's special is that we will use the conditionals and mBot's light sensors to challenge ourselves and complete the composition.

Task 11-1 Making Music with...

Apart from using instruments to make music, can you think of other ways to make "music" without musical instruments? Could everyday objects make music? How?
Brainstorm and write down all the ideas that come to your mind, and then share with your partner(s).

Task 11-2 Light and Sound

Use the "light sensor" Sensing block () as well as the appropriate Show blocks and mBot's LED panel to detect the brightness in your room.

Use different ways to change the brightness conditions and record the data in the table below. You can try the same methods by three times and calculate the average value of the brightness. We will use these data in the next phase. (If you don't know how to do, please refer to the learning materials in Lesson 3 "*All about Lights.*")

Condition	Brightness 1	Brightness 2	Brightness 3	Average
e.g. Cover the mCore main control board by my Activity Sheet	512	481	544	512

Task 11-3 Light Piano



Program mBot and teach it to “sing” “Do (C4) – Re (D4) – Mi (E4) – Fa (F4) – Sol (G4) – La (A4) – Te (B4) – Do (C5)” in response to the change of the brightness. Remember to use conditional constructs to help you design the programs for this project.

Note: The C Major starts at **C4 (Do)** and consists of the notes D4, E4, F4, G4, A4, B4.

Reflect: When completing a demo, think of the following questions:

- How should you construct the conditional algorithm to make mBot play the sounds?
- Why should we use the “forever” block? What would happen if the program does not contain the loops?
- Is it easy for mBot to play all the notes (from C4 to C5)? Explain your reasons.

Key Concepts from this Learning Activity

Terms	What it means
Operators*	Logical operators are the blocks that perform math functions – for example, whether a value is less than (or greater than) the other, whether they are equal or not, etc.
AND Operator*	The “... and ...” Operators block can join two (and even more) conditions to check whether both (and all) would be true.

* New term