



In this application, you will create a program that lets you control the sound coming from the speaker based on changing the brightness sensed by the light sensor and your own moving hand— hence, Hand Music!

Objectives:

- Write a program that converts brightness into sounds
- Review musical note frequencies and the twelfth root of 2 principle

Write a program that reads the BRIGHTNESS of a light sensor and plays a different sound depending on the brightness. There are two possible options for the sound:

- Play a frequency in the audible range (perhaps 100Hz – 1000Hz)
- Play a musical note (one of the specific harmonious sounds found on a piano or other musical instrument).

The first option would just play what sounds like ‘noise’. The second option will sound more like music, but the mathematics is a bit more complex.

This program makes the TI-Innovator™ Hub behave like a *theremin*.

Getting Started

1. Start a new program, and name it APPLIC3
2. Add **Disp**, add an opening and closing set of quotation marks, and type the text Hand Music! as shown.
3. Add a **While** loop to **READ** the **BRIGHTNESS** sensor and **Get** its value into a variable **b**.
4. Add the statement to play a sound.
 - Notice that we’re using the variable **B** for reading BRIGHTNESS and the variable **F** for playing the SOUND.

Your task is to complete the missing code that converts the BRIGHTNESS into an audible *sound* or a *musical note*.

For sound, use a frequency between 100 and 1000 (or two frequencies of your choice).

For musical notes, try a range starting with A1 (55Hz) and going up 50 notes. (You should refer to the activity studied in Unit 2, Skill Builder 3 (we called it prgmSOUND2) which played the 12 notes in an octave.

For the musical notes, you will need to convert your value to a whole number so that a note ‘number’ is correctly represented. You can use either the **int()** function or the **round(,0)** function.

int(X)→X gives the largest integer less than **X**.

round(X,0)→X rounds **X** to the nearest integer.

```

*applic3
Disp "Hand Music!"
b:=2
While b>1
  Send "READ BRIGHTNESS"
  Get b
  Send "SET SOUND eval(F)"
  Wait 0.2
EndWhile
EndPrgm
    
```

```

*applic3
Disp "Hand Music!"
b:=2
While b>1
  Send "READ BRIGHTNESS"
  Get b
  n:=b
  f:=5
  Disp
EndWhile
EndPrgm
    
```