

# 1. Getting Started

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Music Blocks is designed to run in a browser. Most of the development has been done in Chrome, but it should also work in Firefox, Opera, and some versions of Safari. You can run it from [musicblocks.sugarlabs.org](https://musicblocks.sugarlabs.org), from [github io](#), or by downloading a copy of the code and running a local copy directly from the file system of your computer. (Note that when running locally, you may have to use a local server to expose all of the features.)

This guide details the music-specific features of Music Blocks. You may also be interested in the [Turtle Blocks Guide](#), which reviews many programming features common to both projects.

For more details on how to use Music Blocks, see [Using Music Blocks](#). For more details on how to use Turtle Blocks, see [Using Turtle Blocks JS](#).

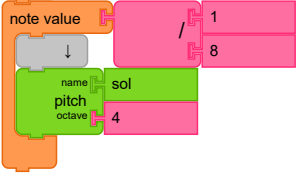
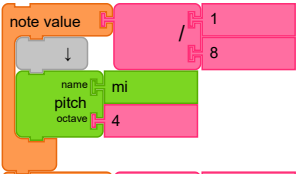
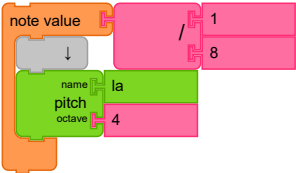
## 2. Making Sounds

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Music Blocks incorporates many common elements of music, such as [pitch](#), [rhythm](#), [volume](#), and, to some degree, [timbre](#) and [texture](#).

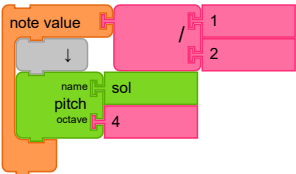
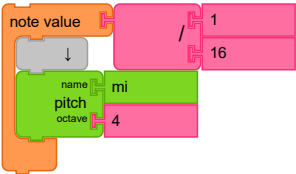
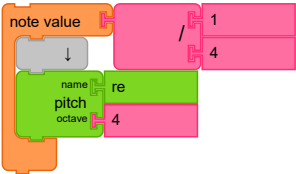
### 2.1 Note Value Blocks

At the heart of Music Blocks is the *Note value* block. The *Note value* block is a container for a [Pitch block](#) that specifies the duration (note value) of the pitch.



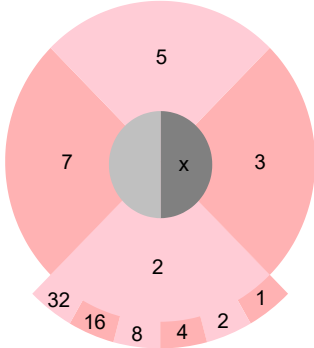
At the top of the example above, a single (detached) *Note value* block is shown. The  $\frac{1}{8}$  is value of the note, which is, in this case, an eighth note.

At the bottom, two notes that are played consecutively are shown. They are both  $\frac{1}{8}$  notes, making the duration of the entire sequence  $\frac{1}{4}$ .



In this example, different note values are shown. From top to bottom, they are:  $\frac{1}{4}$  for a quarter note,  $\frac{1}{16}$  for a sixteenth note, and  $\frac{1}{2}$  for a half note.

Note that any mathematical operations can be used as input to the *Note value*.



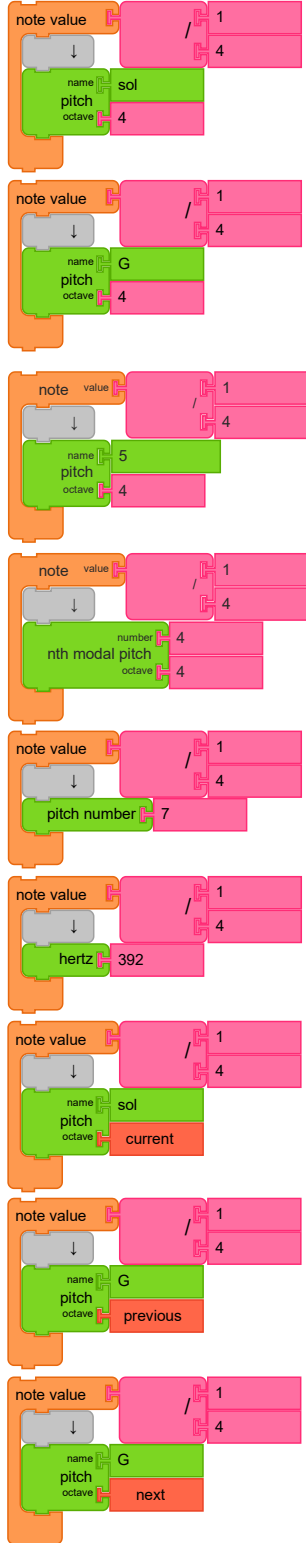
As a convenience, a pie menu is used for selecting common note values.

Note Value Blocks	Western Notation (Notes)	Silence Blocks	Western Notation (Rests)
<p>Note Value = 4/1</p>	<p>Longa Note</p>	<p>Note Value = 4/1</p>	<p>Longa Rest</p>
<p>Note Value = 2/1</p>	<p>Breve Note</p>	<p>Note Value = 2/1</p>	<p>Breve Rest</p>
<p>Note Value = 1/1</p>	<p>Whole Note</p>	<p>Note Value = 1/1</p>	<p>Whole Rest</p>
<p>Note Value = 1/2</p>	<p>Half Note</p>	<p>Note Value = 1/2</p>	<p>Half Rest</p>
<p>Note Value = 1/4</p>	<p>Quarter Note</p>	<p>Note Value = 1/4</p>	<p>Quarter Rest</p>
<p>Note Value = 1/8</p>	<p>Eighth Note</p>	<p>Note Value = 1/8</p>	<p>Eighth Rest</p>
<p>Note Value = 1/16</p>	<p>Sixteenth Note</p>	<p>Note Value = 1/16</p>	<p>Sixteenth Rest</p>
<p>Note Value = 1/32</p>	<p>Thirty-second Note</p>	<p>Note Value = 1/32</p>	<p>Thirty-second Rest</p>
<p>Note Value = 1/64</p>	<p>Sixty-fourth Note</p>	<p>Note Value = 1/64</p>	<p>Sixty-fourth Rest</p>
<p>Note Value = 1/128</p>	<p>Hundred twenty-eighth Note</p>	<p>Note Value = 1/128</p>	<p>Hundred twenty-eighth Rest</p>

Please refer to the above picture for a visual representation of note values.

## 2.2 Pitch Blocks

As we have seen, *Pitch* blocks are used inside the *Note value* blocks. The *Pitch* block specifies the pitch name and pitch octave of a note that in combination determines the frequency (and therefore pitch) at which the note is played.



There are many systems you can use to specify a *pitch* block's name and octave. Some examples are shown above.

The top *Pitch* block is specified using a *Solfege* block (Sol in Octave 4), which contains the notes Do Re Me Fa Sol La Ti .

The pitch of the next block is specified using a *Pitch-name* block (G in Octave 4), which contains the notes C D E F G A B .

The next block is specified using a *Scale-degree* block (the 5th note in the scale, 'G', also in 'Octave 4'), C == 1, D == 2, ... . The *Scale-Degree* block has numbers like the *Number* block, but also has an accidental so that the user may play pitches outside a given key.

The next blocks is specified using a *Nth Modal Pitch* block. This block takes a number argument and turns it into the "nth pitch of a given scale" with an index of 0 (i.e. C for C major is 0). Therefore in order to get G, we input the number 4. The octave argument will force the octave up or down; otherwise the user may just keep going up or down in either direction to go through scalar pitches of any mode.

The next block is specified using a *Pitch-number* block (the 7th semi-tone above C in Octave 4 is G). The offset for the pitch number can be modified using the *Set-pitch-number-offset* block.

The pitch of the next block is specified using the *Hertz* block in conjunction with a *Number* block (392 Hertz is G in Octave 4), which corresponds to the frequency of the sound made.

The octave is specified using a number block and is restricted to whole numbers. In the case where the pitch name is specified by frequency, the octave is ignored. The octave argument can also be specified using a *Text* block with values *current*, *previous*, *next* which does as 0, -1, 1 respectively.

The octave of the next block is specified using a *current* text block (Sol in Octave 4).

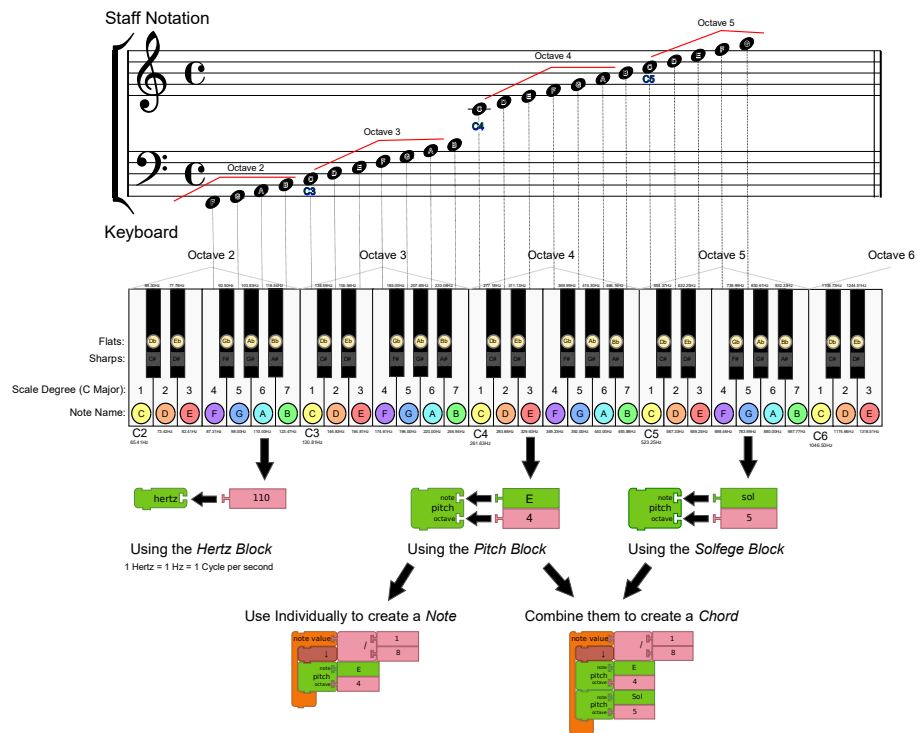
The octave of the next block is specified using a *previous* text block (G in Octave 3).

The octave of the last block is specified using a *next* text block (G in Octave 5).


Note that the pitch name can also be specified using a *Text* block.



As a convenience, a pie menu is used for selecting pitch, accidental, and octave.



Sharps



A musical staff with two staves, both in C major (one sharp). The top staff contains the sequence of sharp notes: F#, C#, G#, D#, A#, E#. The bottom staff contains the sequence of sharp notes: C#, G#, D#, A#, E#, F#.

nat

note	B
pitch	7
octave	

pitch

octave

A

7

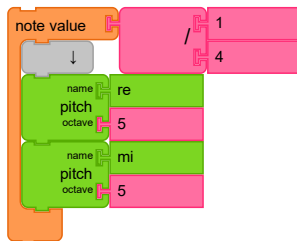
[illegible]

Using the *Pitch* Block

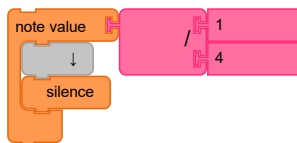
Combine them to create a *Chord*

Use Individually to create a *Note*

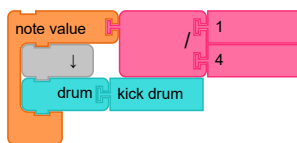
## 2.3 Multiple Pitches



## 2.4 Rests



## 2.5 Drums



The diagram shows a MIDI note block with the following components:

- note value**: A pink block with a downward arrow pointing to the **pitch** block.
- name**: A green block.
- pitch**: A pink block.
- octave**: A green block.
- drum**: A blue block.
- velocity**: A pink block.

The blocks are arranged in a grid-like structure, with the **note value** block at the top left, the **name** block below it, and the **pitch** block to the right of the **name** block. The **octave** block is to the right of the **pitch** block. The **drum** block is below the **pitch** block. The **velocity** block is to the right of the **drum** block.

Just as in the [multi-pitch](#) example above, you can use multiple *Drum* blocks within a single *Note value* blocks, and combine them with *Pitch* blocks as well.