2. Making Sounds

Music Blocks incorporates many common elements of music, such as pitch, rhythm, volume, and, to some degree, timbre and texture.
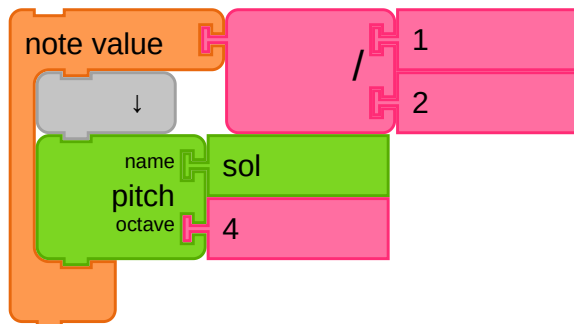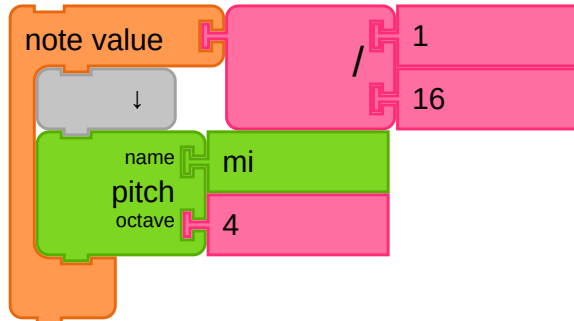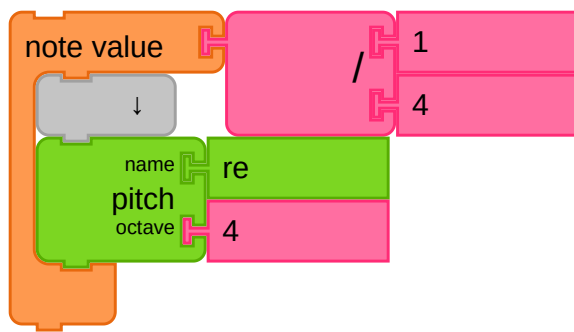
2.1 Note Value Blocks

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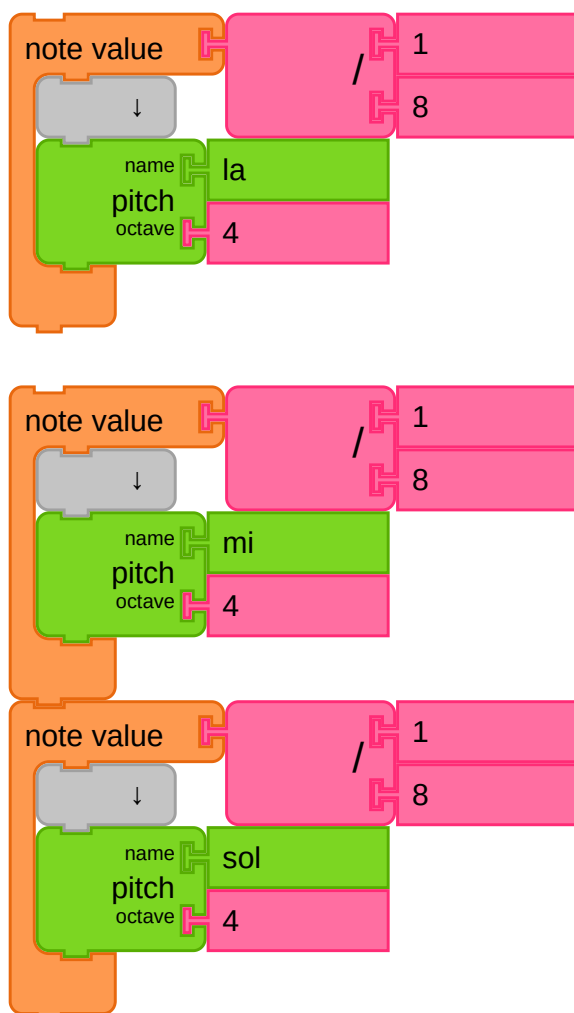
At the top of the example above, a single (detached) *Note value* block is shown. The `1/8` is value of the note, which is, in this case, an eighth note.

At the bottom, two notes that are played consecutively are shown. They are both `1/8` notes, making the duration of the entire sequence `1/4`.
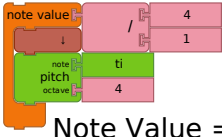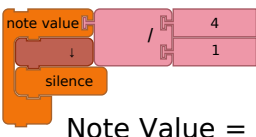
note value ↓
name: re
pitch
octave: 4
/ 1 / 4

note value ↓
name: mi
pitch
octave: 4
/ 1 / 16

note value ↓
name: sol
pitch
octave: 4
/ 1 / 2
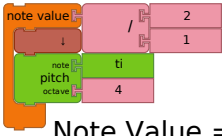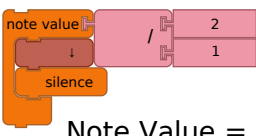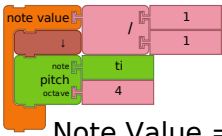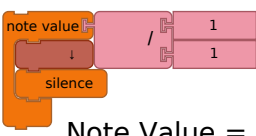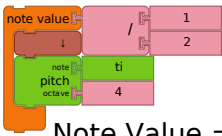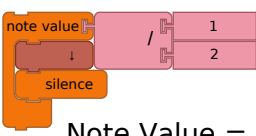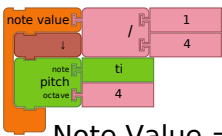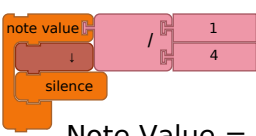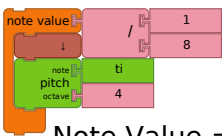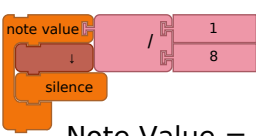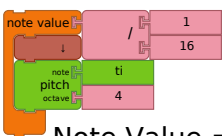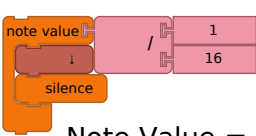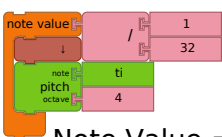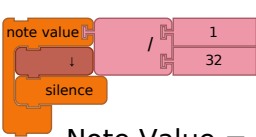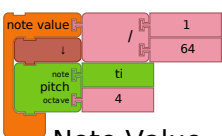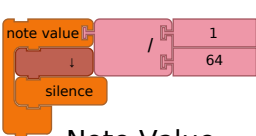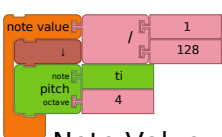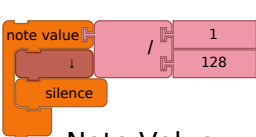
In this example, different note values are shown. From top to bottom, they are: `1/4` for an quarter note, `1/16` for a sixteenth note, and `1/2` for a half note.

Note that any mathematical operations can be used as input to the *Note value*.
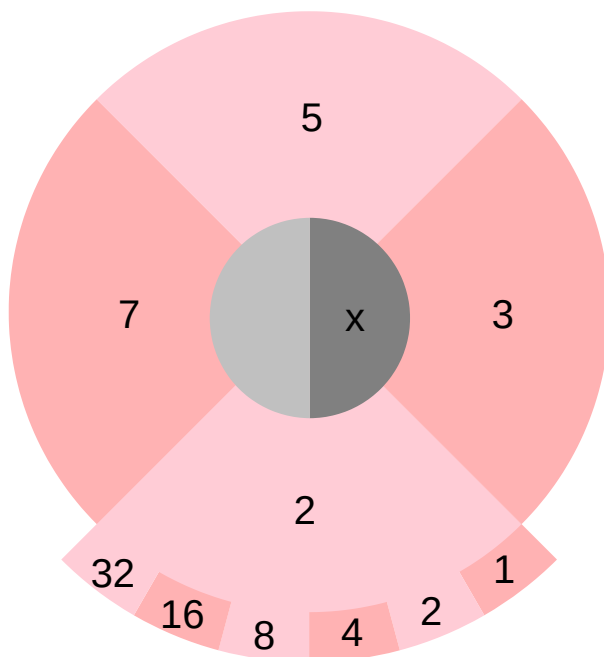
As a convenience, a pie menu is used for selecting common note values.

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

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.

note value — / 1 4
pitch — name sol — octave 4

note value — / 1 4
pitch — name G — octave 4

note — value / 1 4
pitch — name 5 — octave 4

note — value / 1 4
nth modal pitch — number 4 — octave 4

note value — / 1 4
pitch number 7

note value — / 1 4

hertz 392

note value ↓ / 1 4
name sol
pitch
octave current

note value ↓ / 1 4
name G
pitch
octave previous

note value ↓ / 1 4
name G
pitch
octave next
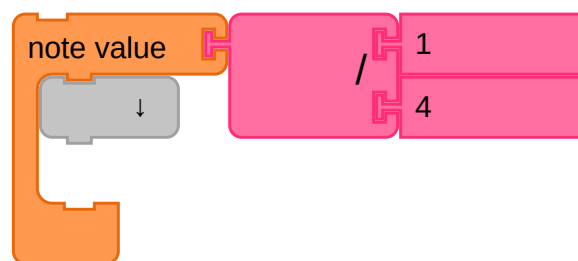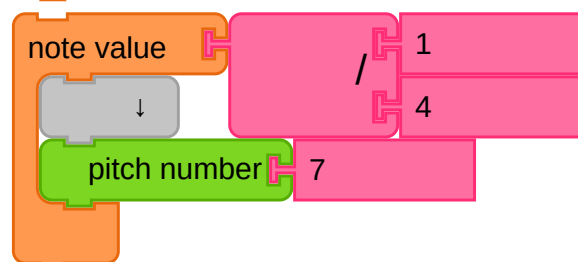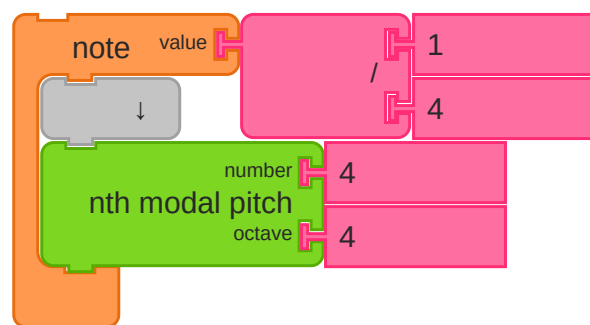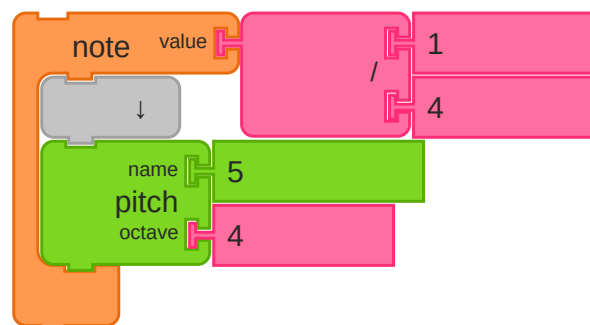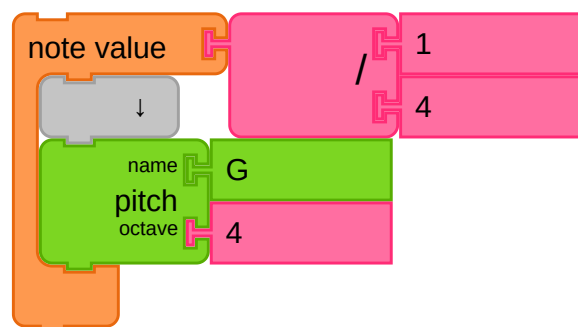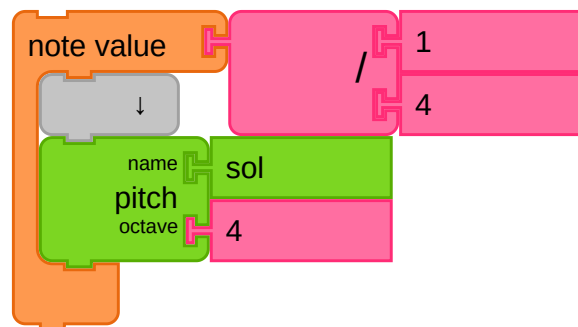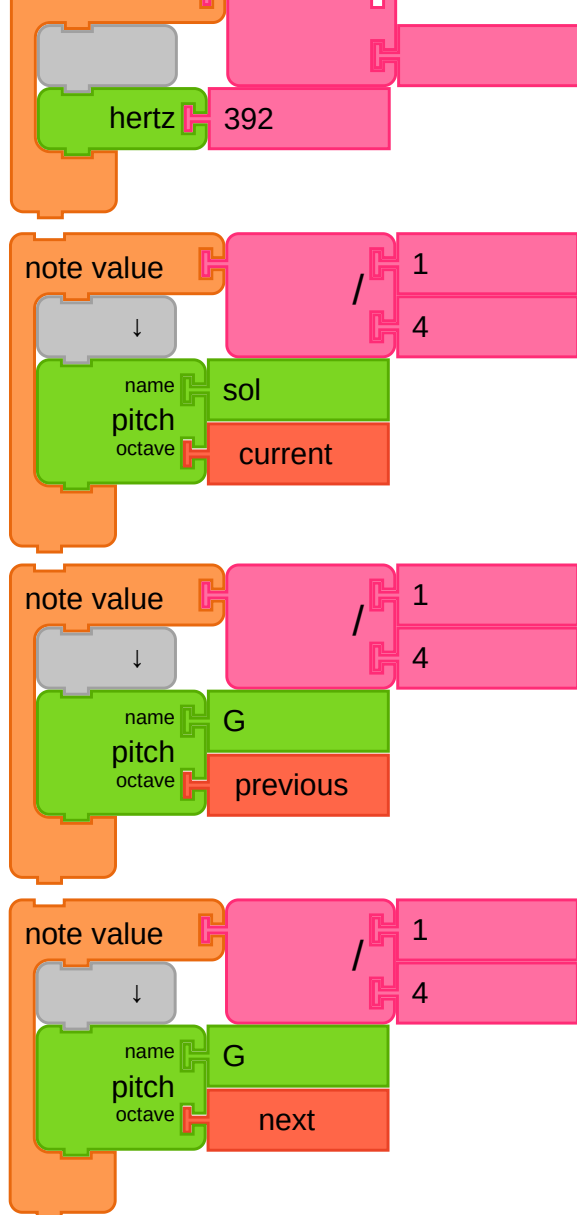
There are many systems you can use to specify a *pitch* block's name and octave. Some examples are shown above.

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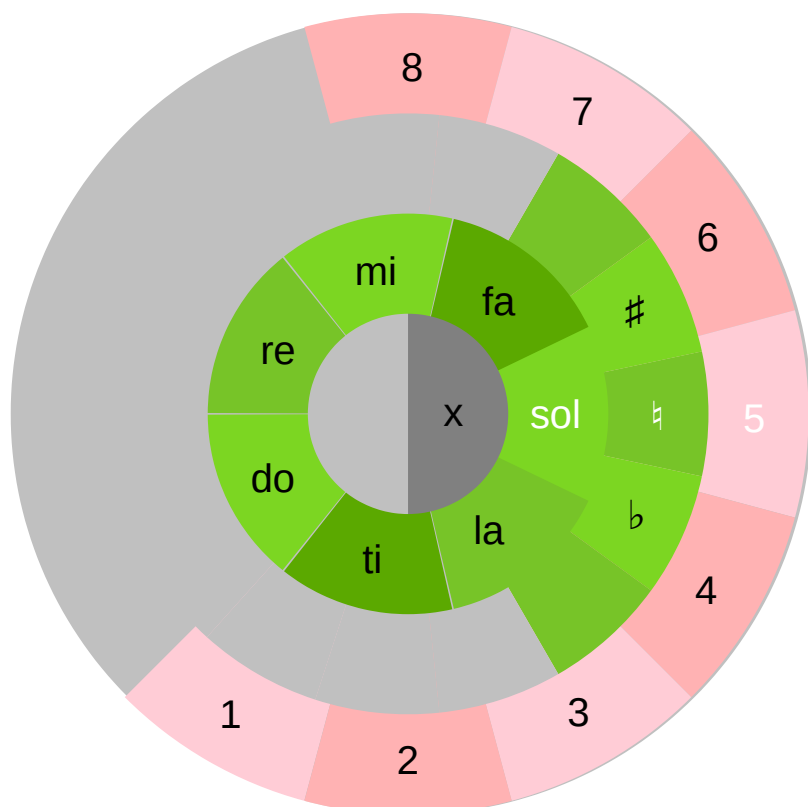
As a convenience, a pie menu is used for selecting pitch, accidental, and octave.

Staff Notation

Keyboard

Using the *Hertz Block*
1 Hertz = 1 Hz = 1 Cycle per second

Using the *Pitch Block*

Using the *Solfege Block*

Use Individually to create a *Note*

Combine them to create a *Chord*
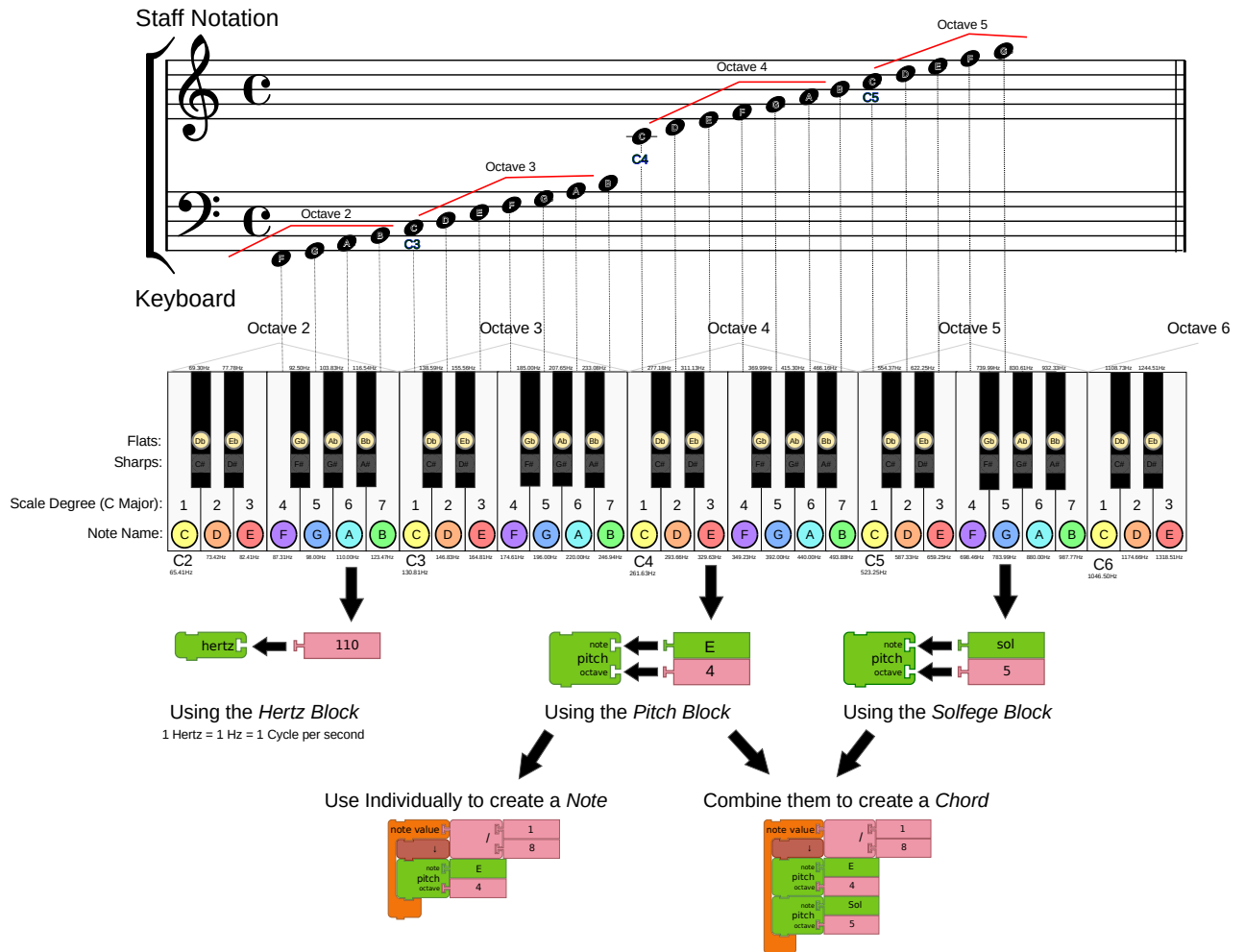
Staff Notation: Flats & Sharps
Mallet sounds are two octaves higher than written

Making a *Flat*

Making a *Sharp*

Mallet Bells

Octave 5   Octave 6   Octave 7   Octave 8
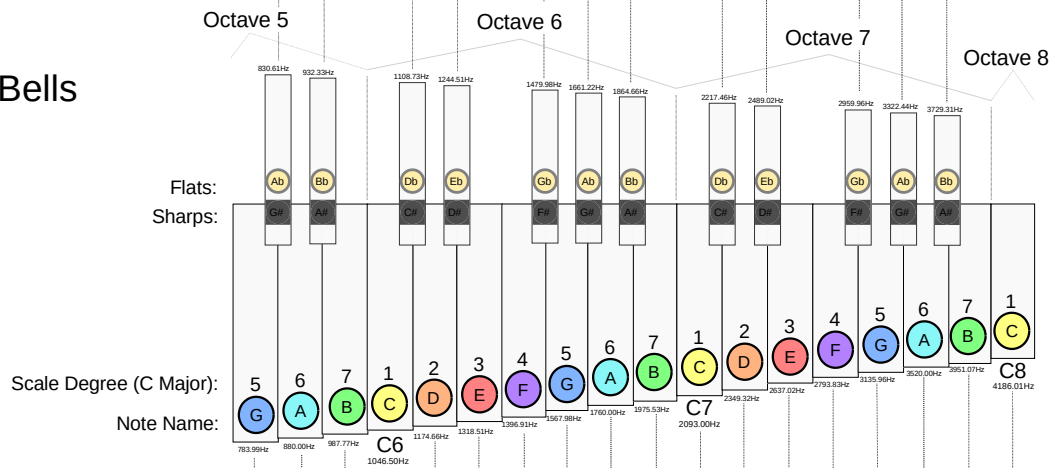
Flats:
Sharps:

Scale Degree (C Major):
Note Name:
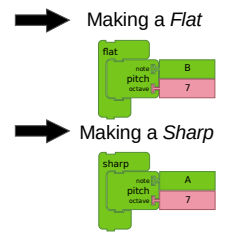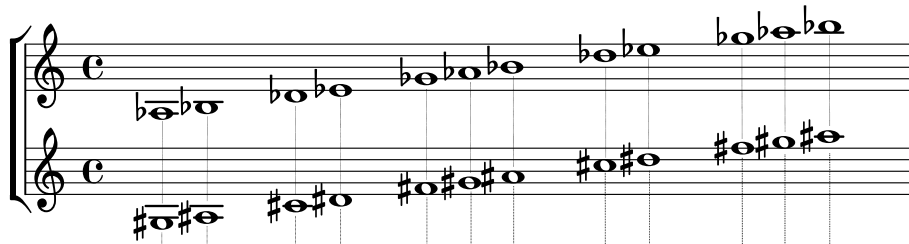
Staff Notation: Naturals
Mallet sounds are two octaves higher than written

Using the *Hertz Block*
1 Hertz = 1 Hz = 1 Cycle per second

Using the *Pitch Block*

Using the *Solfege Block*

Use Individually to create a *Note*
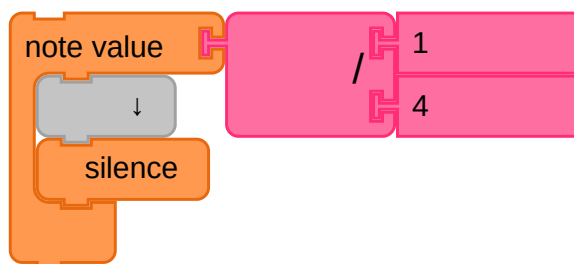
Combine them to create a *Chord*
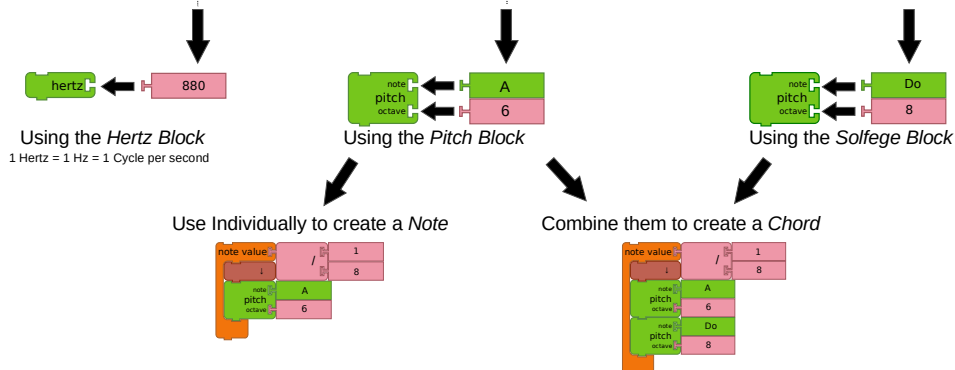
Please refer to the above charts for a visual representation of where notes are located on a keyboard or staff.
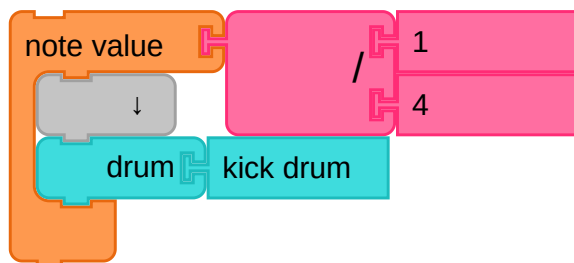
2.3 Multiple Pitches
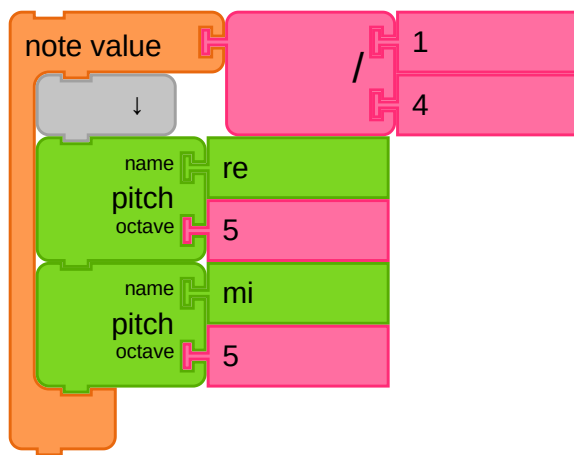
Multiple, simultaneous pitches can be specified by adding multiple *Pitch* blocks into a single *Note value* block, like the above example.
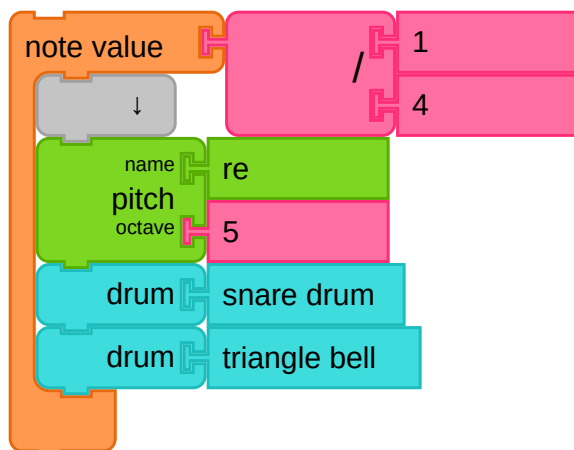
2.4 Rests

A rest of the specified note value duration can be constructed using a *Silence* block in place of a *Pitch* block.

2.5 Drums

Anywhere a *Pitch* block can be used—e.g., inside of the matrix or a *Note value* block—a *Drum Sample* block can also be used instead. Currently there about two dozen different samples from which to choose. The default drum is a kick drum.

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.