Making music with micro:bit

What you will need:

- Web enabled device (PC, Tablet, Phone) with an up-to-date browser (Internet Explorer, Safari, Chrome)

- BBC micro:bit simulator (www.microbit.co.uk/)

- BBC micro:bit (Optional)

- Speaker or headphones & two crocodile clips (Optional)

Making music with Make Code:

The built-in music library in Make Code allows us to play music on our micro:bit.
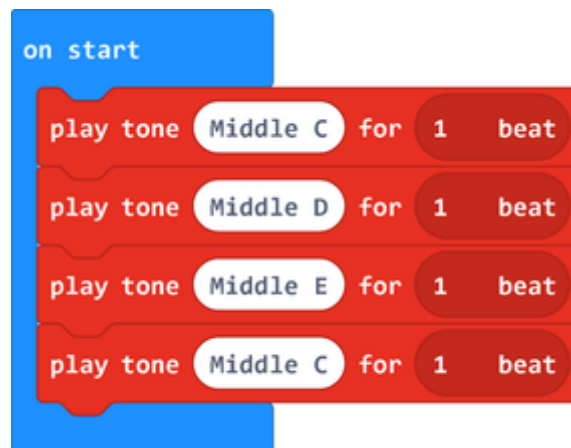
To play a note we use the following command

Where Middle C = note and 1 beat = duration.

Example

Try the following example:

Did you recognise the tune

Transcribing songs from sheet music

If we want to re-create our favourite songs on our micro:bit, we first need a basic understanding of sheet music.

Here's a reminder of the most common notes used in a musical score:

The Treble Clef

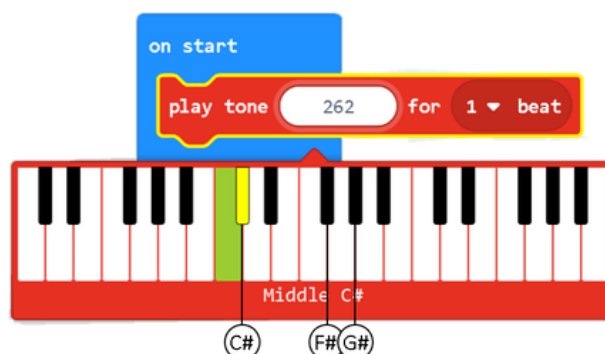Below is the score for a very popular piece of music - Can you can guess what it is?

Answer: Grande Valse (You may know it as the 'Nokia Ringtone')

Did you notice the special # symbols at the start of the score. This shows that some of the notes are sharps. In this case, the sharp notes are:

F#, C#, and **G#**

In Make Code, sharp notes are selected by clicking on the 'black notes' in the drop-down keyboard:

Below is the music score for the Nokia Ringtone (this time with notes underneath).

E5 D5 F#4 G#4   C#5 B4 D4 E4   B4 A4 C#4 E4   A4

It's all about the timing

If we look at the notes in a music score again, you will notice that they're different shapes and colours. These different shapes and colours denote the timings. (See below)

Notes	Name	Value	Code
o	Semibreve Whole note	4 beat	4 ▾ beat
♩ (minim)	Minim Half note	2 beat	2 ▾ beat
♩	Crotchet Quarter note	1 beat	1 ▾ beat
♪ ♫	Quaver Eighth note	1/2 beat	1/2 ▾ beat
♬	Semiquaver Sixteenth note	1/4 beat	1/4 ▾ beat

Notes – teachwithict.com

Notice that some of the notes have a dot (or full stop) after them. For these notes, we need to multiply the duration by 1.5.

Notes	Name	Value	Code
o.	Dotted Semibreve Whole note	6 beat	4 ▾ beat × ▾ 1.5
♩.	Minim Half note	3 beat	2 ▾ beat × ▾ 1.5
♩.	Crotchet Quarter note	1 ½ beat	1 ▾ beat × ▾ 1.5
♪. ♫.	Quaver Eighth note	3/4 beat	1/2 ▾ beat × ▾ 1.5
♬.	Semiquaver Sixteenth note	3/8 beat	1/4 ▾ beat × ▾ 1.5

Dotted notes – teachwithict.com

Below is the score again however, this time, with timings (duration).

1/2 1/2 1 1   1/2 1/2 1 1   1/2 1/2 1 1   3

E5 D5 F#4 G#4   C#5 B4 D4 E4   B4 A4 C#4 E4   A4

Rests

Rests are natural pauses or breaks in a piece of music. Rests can be added to your code using the following command:

Rests are identified by the following symbols:

Rests	Name	Value	Code
▬	**Semibreve** Whole note	4 beat	4 ▾ beat
▬	**Minim** Half note	2 beat	2 ▾ beat
⌇	**Crotchet** Quarter note	1 beat	1 ▾ beat
⸮	**Quaver** Eighth note	1/2 beat	1/2 ▾ beat
⸮	**Semiquaver** Sixteenth note	1/4 beat	1/4 ▾ beat

Rests – teachwithict.com

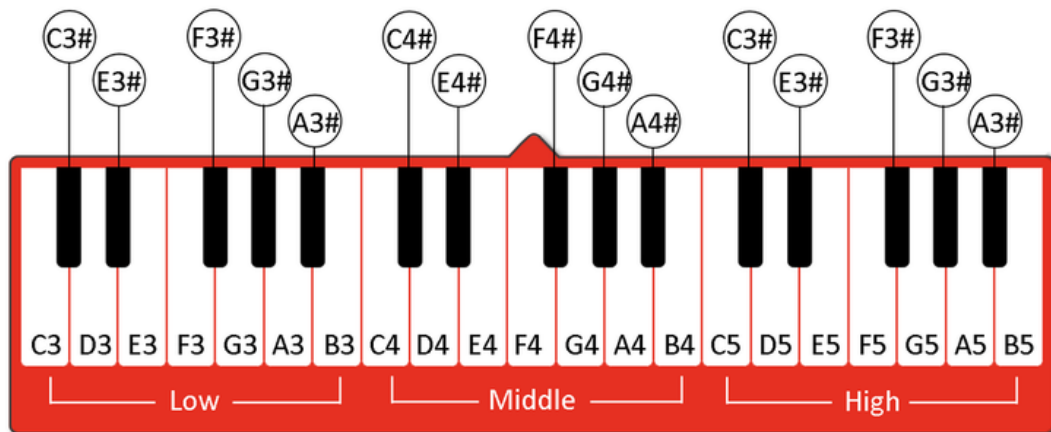| Rests	Name	Value	Code
▬.	**Dotted Semibreve** Whole note	6 beat	4 ▾ beat × ▾ 1.5
▬.	**Dotted Minim** Half note	3 beat	2 ▾ beat × ▾ 1.5
⌇.	**Dotted Crotchet** Quarter note	1 ½ beat	1 ▾ beat × ▾ 1.5
⸮.	**Dotted Quaver** Eighth note	3/4 beat	1/2 ▾ beat × ▾ 1.5
⸮.	**Dotted Semiquaver** Sixteenth note	3/8 beat	1/4 ▾ beat × ▾ 1.5

Dotted rests – teachwithict.com

Challenge

Program your micro:bit to play the Nokia ringtone.

- Use a loop to repeat the ringtone 4 times (or forever if you want to be really annoying!)

- Modify your code so that the ringtone only plays when you press the 'A' button

Resources

Three octave Treble Clef scale – teachwithict.com
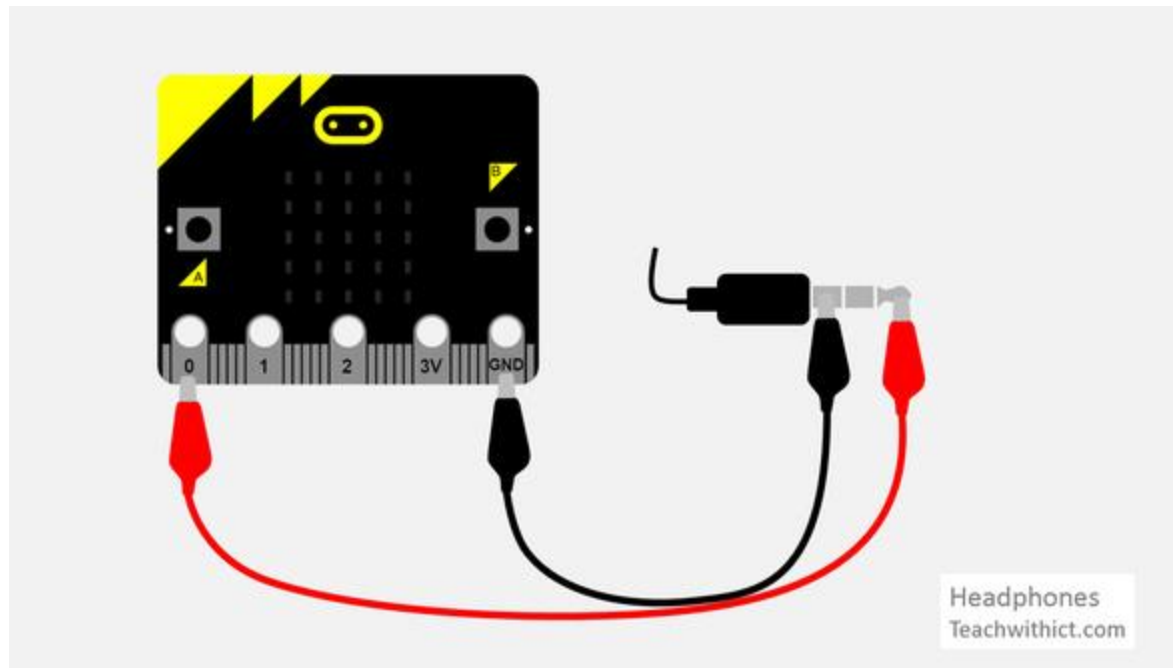
Sheet music:

Frere Jacques/Brother Jon (Beginner)

Arrangement by teachwithict.com

Playing music through your micro:bit

Headphones

Wiring instructions

1. Disconnect the micro:bit from your computer and disconnect the battery pack.

2. Using crocodile clips, connect the tip of the mini-jack to Pin 0, and the base of the mini jack to GND on the BBC micro:bit.

Headphones
Teachwithict.com

Useful links:

Micro:bit Music Fest - All the tools you need to make your own micro:bit band.

MicroPython - MicroPython music reference guide.

Play Tone - Reference guide for making music with Make Code.

Somebody to You: The Vamps - Learn how to play 'Somebody to You' by the Vamps on your BBC micro:bit using MicroPython.