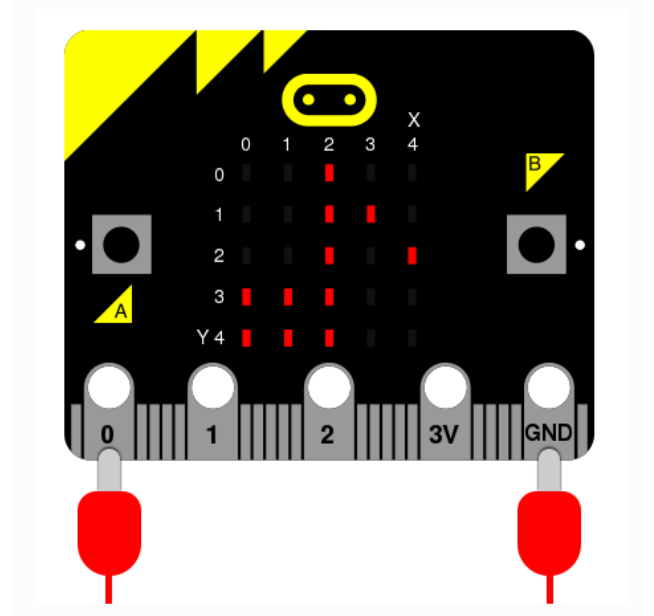


# Micro:bit Christmas Carols

## Materials:

1 micro:bit  
speaker or headphone  
2 Crocodile Clips  
micro-usb cord  
computer with mu downloaded  
([codewith.mu/](http://codewith.mu/))

First, we will connect your micro:bit to a speaker (or headphones) by following the instructions below. You will then connect your micro:bit to your computer, and use `mu` to write code.

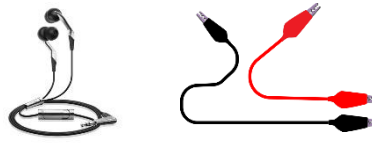


- If you do not already have `mu` installed on your computer, go to [codewith.mu](http://codewith.mu)
- Download the version for your computer, and save the file somewhere you'll remember.
- Double click on the downloaded file to open `mu`.

## Connecting Headphones

You will need:

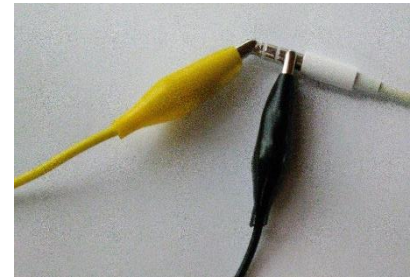
- Pair of headphones
- Two crocodile clips



Connect one end of one crocodile clip to the pin labelled **0**.  
Connect one end of the **other** crocodile clip to the pin labelled **GND**.

A headphone jack is separated into three sections.  
Connect the other end of one of the crocodile clips, to the **innermost section** of the jack.  
Connect the other end of the other crocodile clip, to the **outermost section** of the jack.  
**It does not matter which way around you connect them.**

You are now ready to test your headphones with some code!



 Headphones can be **extremely loud** – DO NOT put them in your ears when testing them!

## Connecting a Speaker

You will need:

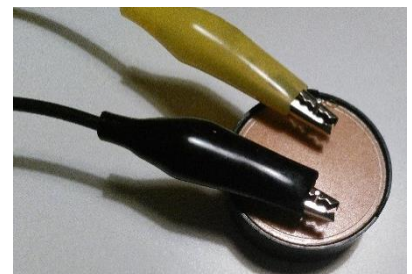
- Mini speaker
- Two crocodile clips




Connect one end of one crocodile clip to the pin labelled **0**.  
Connect one end of the **other** crocodile clip to the pin labelled **GND**.

The mini speaker has two legs underneath.  
Connect the other end of one of the crocodile clips to one leg.  
Connect the other end of the other crocodile clip to the other leg.  
**It does not matter which way around you connect them.**

You are now ready to test your speakers with some code!



 The speakers can be very quiet – **listen carefully** when you test them to make sure they are working!

To use music, you first need to **import the music** functions. To do this type the following:

```
import music
```

To start with, you are going to tell the micro:bit to play one of the built-in tunes when you press button A. Check the Inputs/Outputs worksheet if you can't remember how to do this.

To play a built-in tune, type the following code:

```
music.play(music.ODE)
```

**Connect your speaker and test your code** – what does your micro:bit play you?

---

To play a single note, you will use the format:

```
music.play("A1:2")
```

*plays the note C, in a higher octave (try higher!), for 4 beats*

```
music.play("C2:4")
```

*plays the musical note A, in the lowest octave, for 2 beats*

You can use notes A-G, a # after any of these makes it sharp, b after any note makes it flat, and R is a rest (pause).

**Connect your speaker and test your code** – can you make your micro:bit play multiple notes?

---

To write a tune, you will use a **function**. To do this, first give your song a name, and make a list of the notes. Then in the music.play instructions, you tell it to play the list:

```
mysong = [ 'e:2','e:2','e:4', 'R:2',  
'e:2','e:2','e:4']
```

*list of notes*

```
music.play(mysong)
```

*function referring to the list*

**Connect your speaker and test your code** – What note do you think R is? Can you recognize what song plays?

Try expanding the tune this way:

```
mysong = [ 'e:2','e:2','e:4', 'e:2','e:2','e:4', 'e:2','g:2','c','d', 'e:8']  
music.play(mysong)
```

**Connect your speaker and test your code** - What song plays? How can you modify it to finish it?

---

Below are some great Christmas jingles that we've written for you!

Jingle Bells

```
1  from microbit import *  
2  import music  
3  music.set_tempo(ticks=4, bpm=120)  
4  # play Jingle Bells - (c) James Peirpont 1857.  
5  jingle = [  
6      'e:2','e:2','e:4',  
7      'e:2','e:2','e:4',  
8      'e:2','g:2','c','d',  
9      'e:8', 'f:2','f:2','f:3',  
10     'f:1','f:2','e:2',  
11     'e:2','e:1','e:1',  
12     'e:2','d:2','d:2',  
13     'e:2','d:4','g:4',  
14     'e:2','e:2','e:4',  
15     'e:2','e:2','e:4',  
16     'e:2','g:2','c','d',  
17     'e:8','f:2','f:2','f:2',  
18     'f:2','f:2','e:2',  
19     'e:2','e:1','e:1',  
20     'g:2','g:2','f:2',  
21     'd:2', 'c:4'  
22 ]  
23 music.play(jingle,wait=False,loop=True)
```

Chica Noc, provided by peterblazewicz

```
1 from microbit import *
2 import music
3
4 cicha_noc = ['g4:6', 'a4:2', 'g4:4', 'e4:12', 'g4:6',
5             'a4:2', 'g4:4', 'e4:12',
6             'd5:8', 'd5:4', 'b4:8',
7             'b4:4', 'c5:8', 'c5:4', 'g4:12',
8             'a4:8', 'a4:4', 'c5:6', 'b4:2',
9             'a4:4', 'g4:6', 'a4:2', 'g4:4', 'e4:8', 'g4:4',
10            'a4:8', 'a4:4', 'c5:6', 'b4:2', 'a4:4', 'g4:6',
11            'a4:2', 'g4:4', 'e4:8', 'g4:4',
12            'd5:8', 'd5:4', 'f5:6', 'd5:2', 'b4:4', 'c5:12',
13            'e5:4', 'r:8', 'c5:6', 'g4:2', 'e4:4', 'g4:6',
14            'f4:2', 'd4:4', 'c4:16', 'r:8'
15 ]
16 music.play(cicha_noc, pin=pin1, wait=False, loop=True)
```

We Wish you a Merry Christmas

```
1 from microbit import *
2 import music
3 music.set_tempo(ticks=4, bpm=120)
4
5 wewishyou = ['a5:2', 'd6:4', 'd6:2', 'e6:2',
6             'd6:2', 'c#6:2', 'b5:4', 'g5:4', 'b5:2',
7             'e6:4', 'e6:2', 'f#6:2', 'e6:2', 'd6:2',
8             'c#6:4', 'a5:4', 'c#6:2', 'f#6:4', 'f#6:2',
9             'g6:2', 'f#6:2', 'e6:2', 'd6:4', 'b5:4',
10            'a5:2', 'b5:2', 'e6:2', 'c#6:2', 'd6:2', 'R:4'
11 ]
12 music.play(wewishyou, wait=True, loop=True)
```