# Week 4

Sound and Music’ish

# This Week is brought to you with the Letters

# F F and T

2013. SESAME WORKSHOP. ALL RIGHTS RESERVED

# But first lets play music

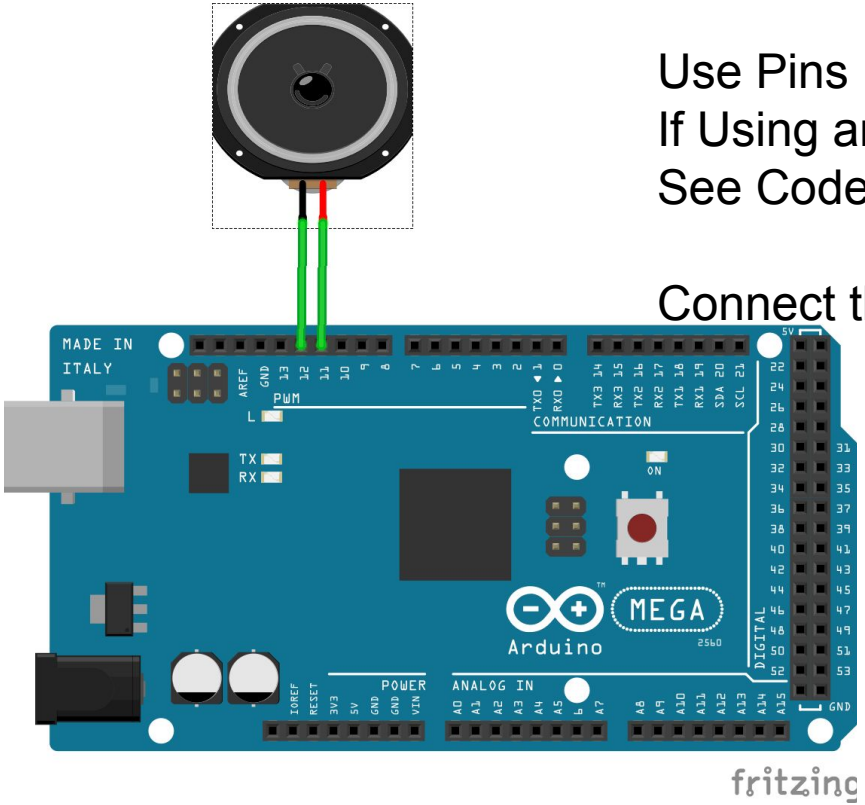
The Arduino is not brilliant at playing music.

Don’t Expect C.D Quality sound.

But it can make fun and interesting Beeps, Bloops and Whistles.

Lets connect our circuit

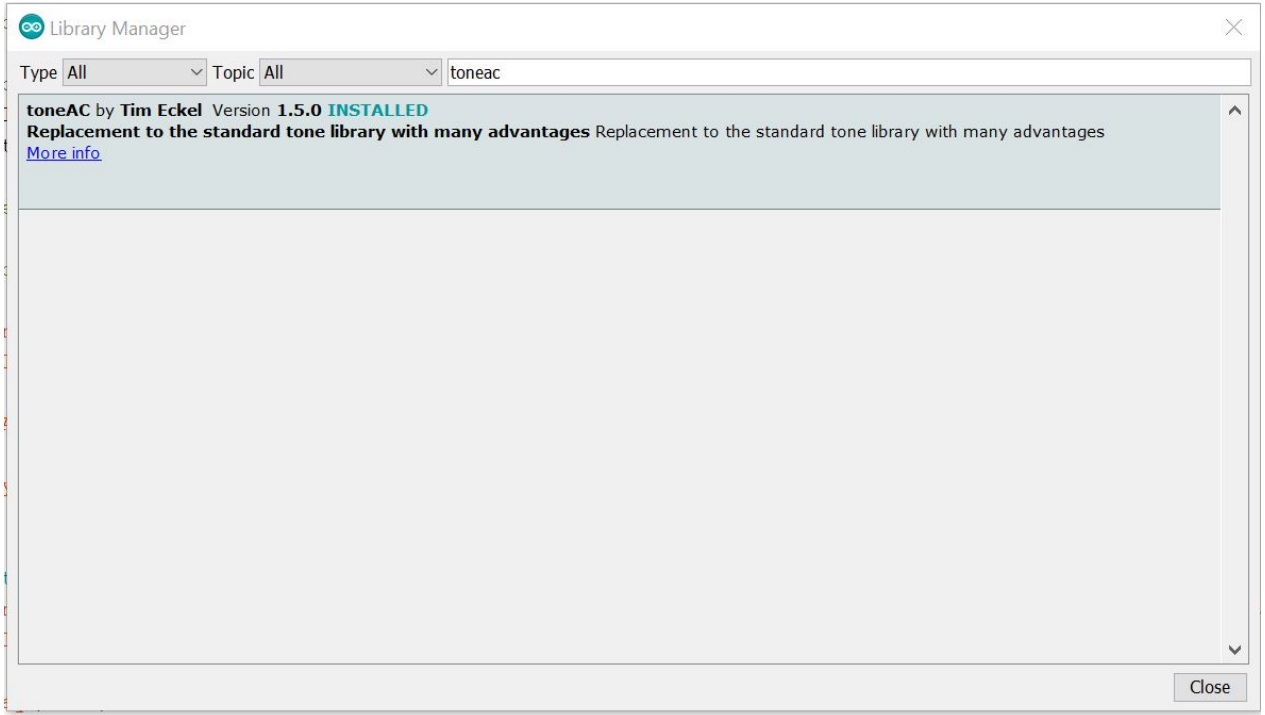
# Playing with Music and Sounds




Use Pins 12 and 13
If Using an Arduino UNO use Pins 11 and 12
See Code for Further details.

Connect them either way around.

# Install the toneac Library




Tools > Manage Libraries

# Open toneac_Demo from the Folder on your desktop

**Two things we haven't seen before**

**Before Setup**

int melody[] = { 262, 196, 196, 220, 196, 0, 247, 262 };

Melody is an array.

It has been declared as an int. So it can contain multiple ints.

https://www.arduino.cc/reference/en/language/variables/data-types/array/

# Next Thing

In Setup()

```
Serial.begin(9600);
```

This lets us use the serial Port to send data from the Arduino back to our Laptop

In the For Loop

```
Serial.println(melody[thisNote]);
```

This is great for debugging our program and monitoring it when running

Serial is accessed from

Tools > Serial Monitor.

Make sure the speed it is set to is the same as declared in the line.- (Bottom Right hand Corner)

```
Serial.begin(9600);
```

Have a play creating tunes.
For each note in

```
int melody[] = { 262, 196, 196, 220, 196, 0, 247, 262 };
```

There needs to be a duration in

```
int noteDurations[] = { 4, 8, 8, 4, 4, 4, 4, 4 };
```

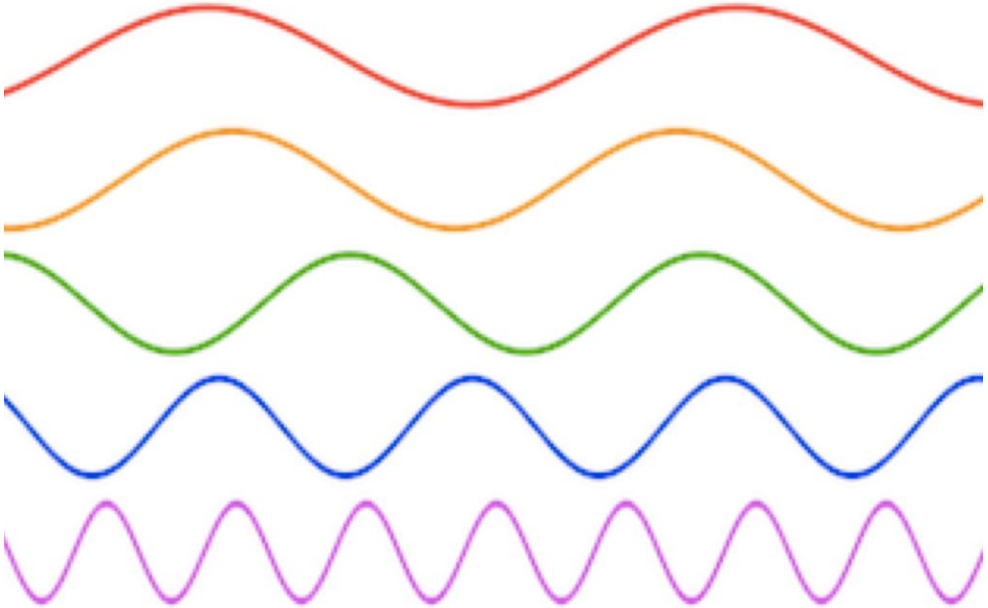
Uncomment the line
//int melody[] = { c4, g3, a3, a3,g3, 0, b3,c4 };
And
Comment out
int melody[] = { 262, 196, 196, 220, 196, 0, 247, 262 };

To use the defined notes above rather than the Numbers.

# And now for something completely different’ish

# Its Sine Waves all the way down

My Voice, sound and music can be separated into Sine Waves.



We can separate music and speech into separate Sine Waves on an Arduino using FFT Libraries.

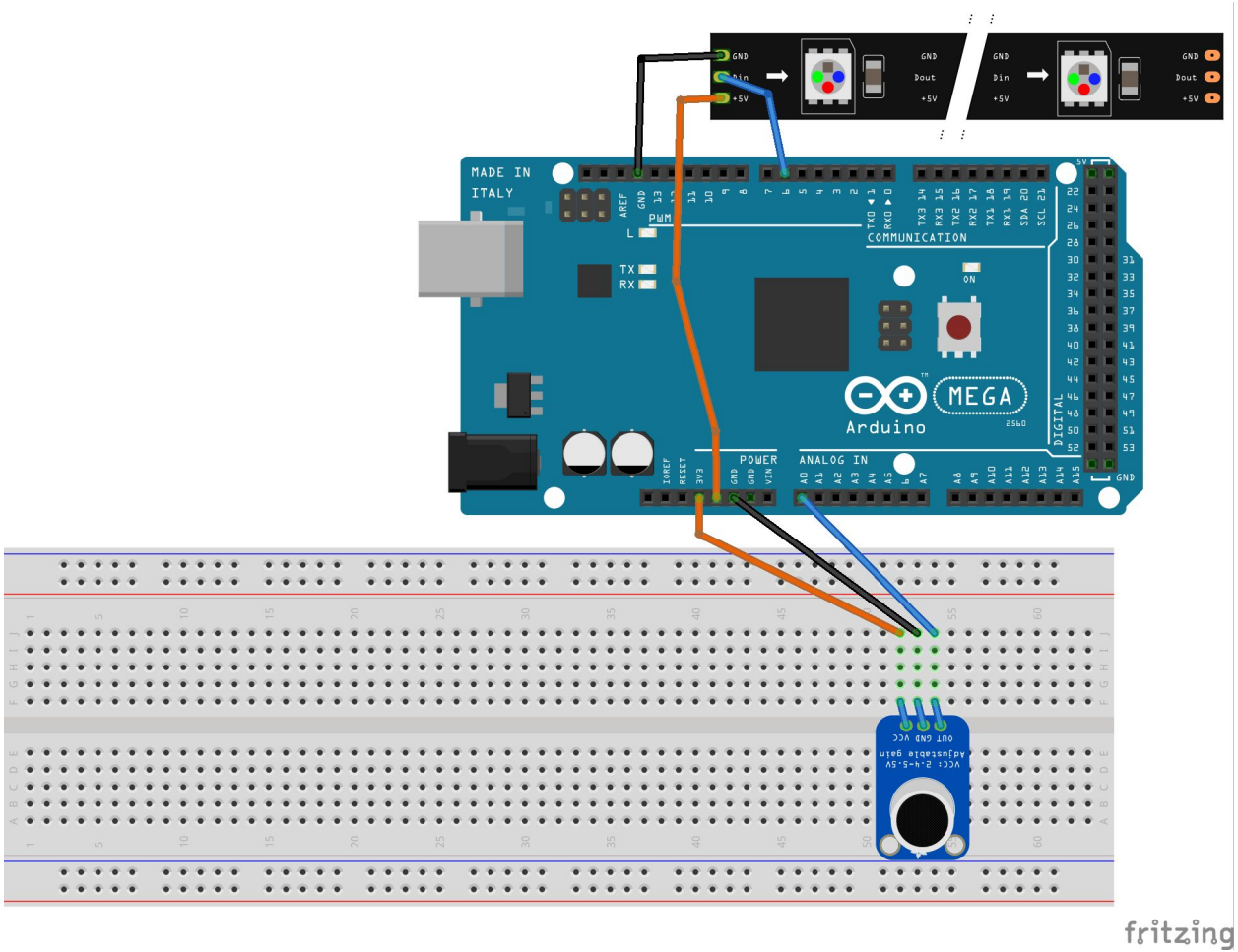
Bit about FFT.
Its short for Fast Fourier Transform
To learn more about Fourier Transform watch
https://www.youtube.com/watch?v=spUNpyF58BY

Especially the first 10 minutes

We are going to concentrate on what we can do with the output of the FFT and not worry about how it actually works.

There are lots of books and University courses that go into that.

But it’s really useful to know when playing with Sound


GND
Din
+5V
GND
Dout
+5V
MADE IN
ITALY
PWM
TX
RX
COMMUNICATION
ON
MEGA
Arduino
2560
POWER
ANALOG IN
DIGITAL
GND
OUT GND VCC
Adjustable gain
VCC: 2.4-5.5V
fritzing