

**Sonic Pi** is a program that lets you make music by writing code, rather than pressing keys on a keyboard, hitting drums, or plucking guitar strings.

Let's see what you can do with it by listening to a piece of music we've already written.

### Get the code

Open a web browser and go to <http://bit.ly/shakepi>

Select and copy all the code, then paste it into **Buffer 0** in Sonic Pi.

Click on the **Run** button to hear how it sounds.



You might notice that some of the lines have a hashtag symbol in front of them: `#` These are **comments** that tell people useful things about the code, like what each bit does. The computer just ignores them.

Click on the **Stop** button to stop the music.



### Push the tempo

The *tempo* is the speed of a piece. People often talk about the **bpm**. This stands for **beats per minute**. A higher number = faster, a lower number = slower

In Sonic Pi the command `use_bpm` tells the computer how fast to play the music. Here we're using a bpm of 148:

```
#Shake it off!  
#Taylor Swift  
use_bpm 148
```

Change the code to see what effect different values have. What happens if you make the number bigger than 148? What about if you make it smaller?

There are **two types** of sound used in Sonic Pi: **synths** and **samples**.

## Synths

**Synths** (short for synthesisers) are what the computer uses to create a note electronically as you play it.

If you've ever played an electronic keyboard that lets you make sounds like other instruments (e.g. piano, violin, flute) you've used a synth.

Bands/musicians who use a lot of synths include:

- Lady Gaga
- Daft Punk
- Calvin Harris
- Keisha
- Nicki Minaj.

Can you think of others?

## Change the synth

Try using a different synth with the **use\_synth** command on lines 22 and 70. Some others to try are:

- `:prophet` `:pluck` `:supersaw` `:pretty_bell` `:mod_sine`
- `:chiplead` `:hoover` `:tb303` `:zawa` `:blade` `:piano`

Click on the Run button again to hear the change in sound - it might take a few seconds to work.



What do you think of the new sounds you've made? Which is your favourite synth of the ones you've tried?

Samples are small sound clips that have been made and recorded earlier.

## Samples

The `:loop_amen` sample is from the song "Amen, Brother" by The Winstons. It's been sampled thousands of times by other musicians.

Samples can be part of other songs or sounds from the real world. Songs that use samples from other songs include:

- One Direction's "Steal My Girl" samples "Faithfully" by Journey
- Coldplay's "Talk" samples "Computer Love" by Kraftwerk

Can you think of others?

Some samples in Sonic Pi:

`:ambi_lunar_landing` sounds like a spaceship landing on the moon.

`:drum_cymbal_closed` is someone hitting a closed cymbal once.

`:misc_crow` sounds like a crow cawing

## Change the sample

In the code for "Shake it Off"

- try using different samples with the `sample` command on some of the lines in the `:drumBeat` section of the code.

```
live_loop :drumBeat do
  5.times do
    sample :elec_cymbal
    sample :drum_bass_hard
    sleep 1
    sample :drum_snare_hard
    sleep 0.5
```

Some other samples to try are:

`:vinyl_rewind` `:bass_drop_c` `:bd_haus` `:bd_808` `:guit_em9`  
`:drum_cymbal_open` `:misc_crow` `:tabla_na` `:misc_cineboom`

**Effects** (or **FX** for short) change the sound either slightly or dramatically - like an FX pedal on an electric guitar.

## FX

The `:gverb` effect gives the impression that the sound is being played in a large room or cave.

`:flanger` creates a swirling/whooshing effect.

`:ring_mod` gives a robotic "Dalek" effect.

An FX only changes the code in between the orange keywords `do` and `end`.

```
with_fx :bitcrusher do
  play_chord [:g, :d]
  sleep 0.5
end
```

## Change the FX

Try using different FX on the code in each of the `:tune`, `:chords`, and `:drumBeat` sections of the code.

Some other FX to try are:

`:krush` `:wobble` `:echo` `:reverb` `:panslicer` `:ixi techno`

## Make New FX

You can make your own FX by combine the ones in Sonic Pi already. Do this by putting another `with_fx` command inside the `do...end` keywords of the first one.

```
with_fx :wobble do
  with_fx :whammy do
    play_chord [:g, :d]
    sleep 0.5
  end
end
```

## More Remixes

Here are some other songs you could try remixing:

"Running up that Hill" <http://bit.ly/sonichill>

"Get Lucky" <http://bit.ly/luckypi>

"Let it Go" <http://bit.ly/letgopi>