Sonic Pi & Multiplication

3rd Grade Math Lesson Using Coding | Sarah Kramer

TEKS Alignment

3.4E - Represent multiplication facts by using a variety of approaches such as repeated addition, equal-sized groups, arrays, area models, equal jumps on a number line, and skip counting.

Learning Goal

Students will use Sonic Pi to find a product and represent a multiplication equation.

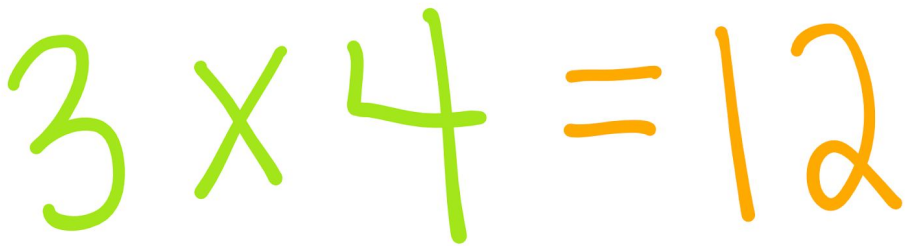
I'll know I've got it when I can…

- Define factor, product, and multiplication
- Represent a multiplication repeated addition, equal groups, array, and a number line
- Repeat a sound in code using an iteration

Vocabulary

Factors: Numbers being multiplied together

Product: The answer to a multiplication equation

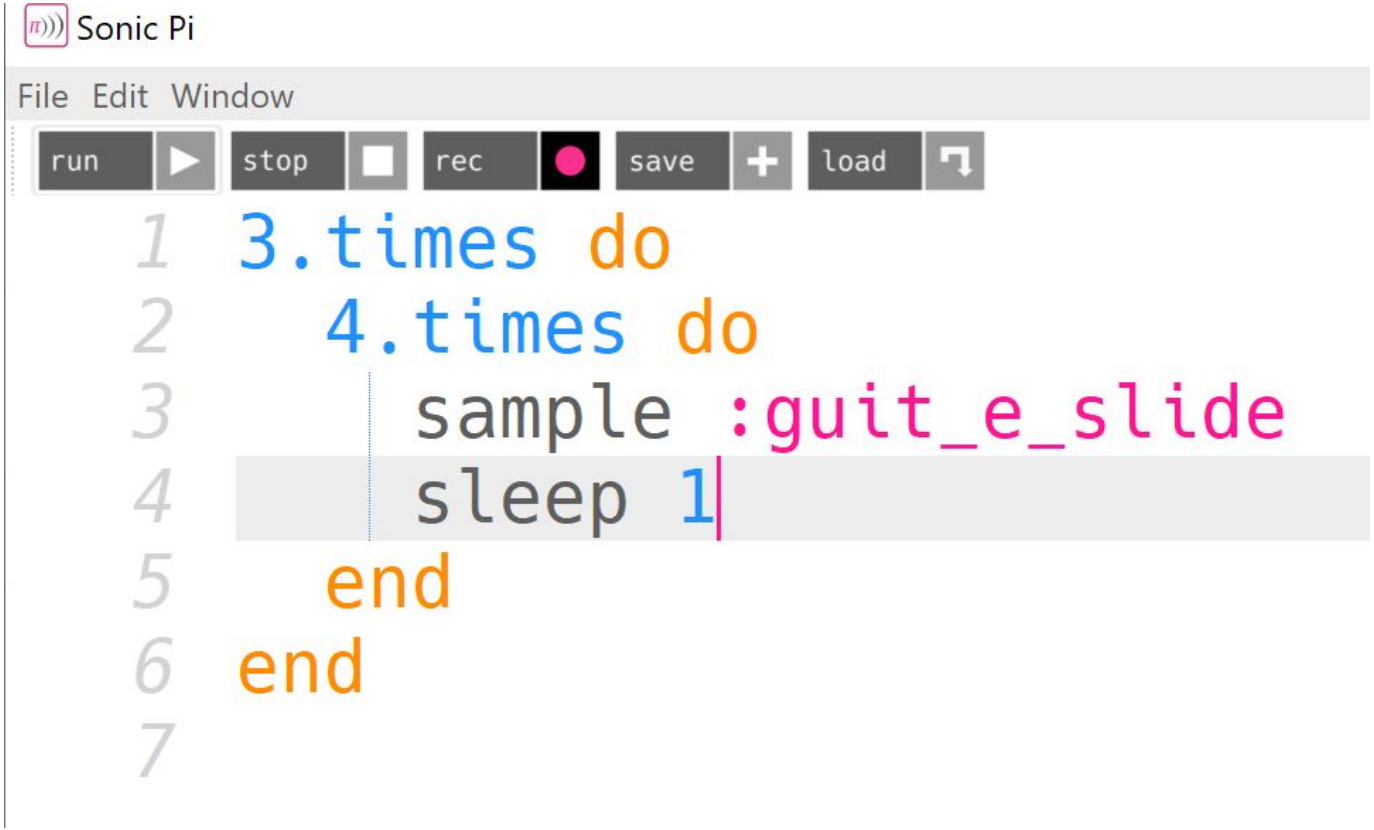


How many times do you hear the drum beat?

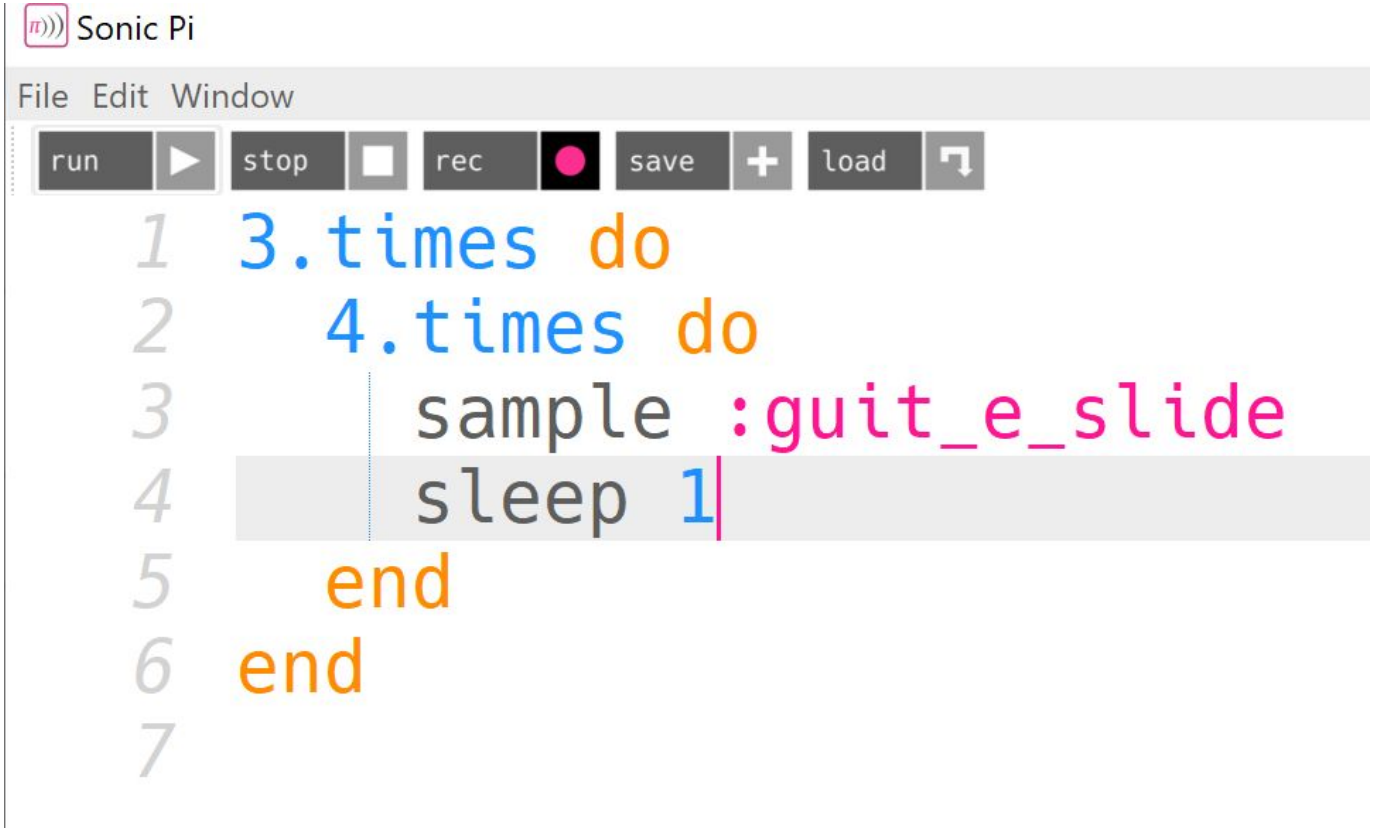
How many times do you hear the drum beat? 1 time

How many times do you hear the drum beat?

How many times do you hear the drum beat? 3 times



How many times do you hear the guitar slide?



How many times do you hear the guitar slide? 12 times

How many times do you hear the drum beat? The guitar slide?

How many times do you hear the drum beat? 3 times The guitar slide? 6 times

This code is called an **iteration**. You can tell it how many times to “do” whatever you type underneath until the end.

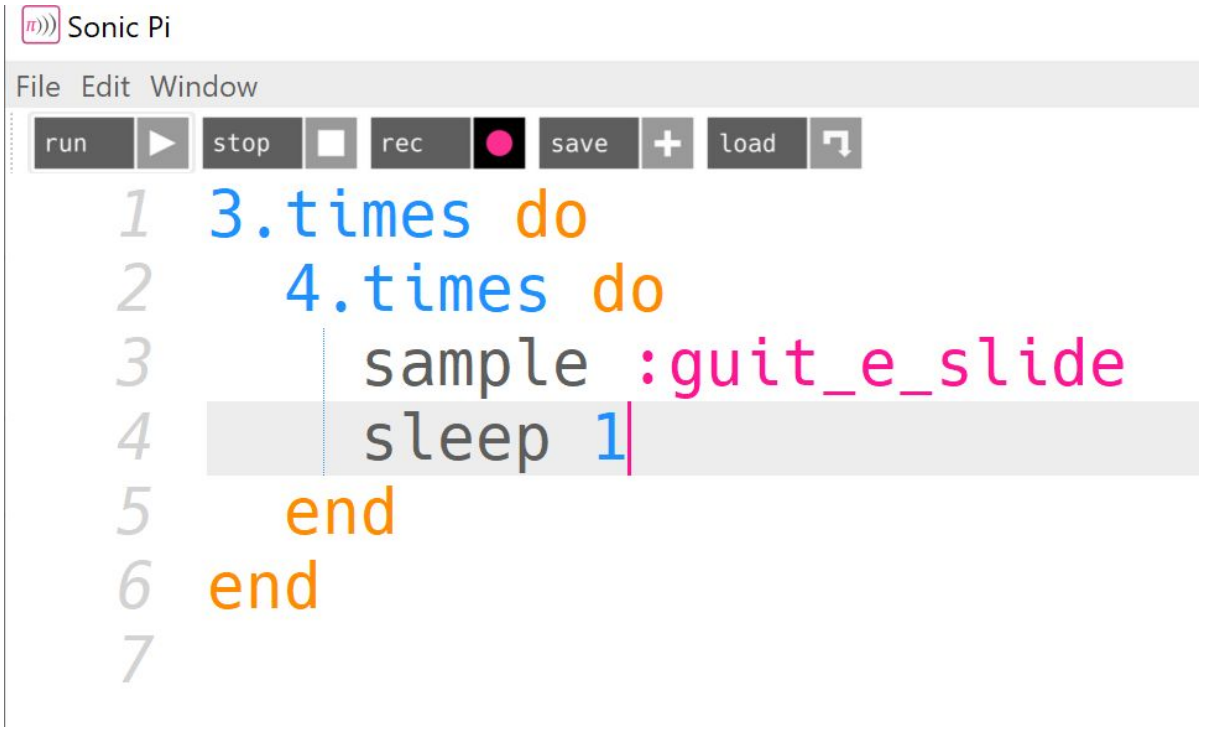
Here, Sonic Pi will play the drum bass sound **3 times**.

Here we have a **nested iteration**. Sonic Pi will play the first iteration 3 times.

Within those 3 times, it plays the guitar slide sound 4 times.

There are 3 groups of 4 guitar slide sounds for a total of 12 guitar slide sounds.

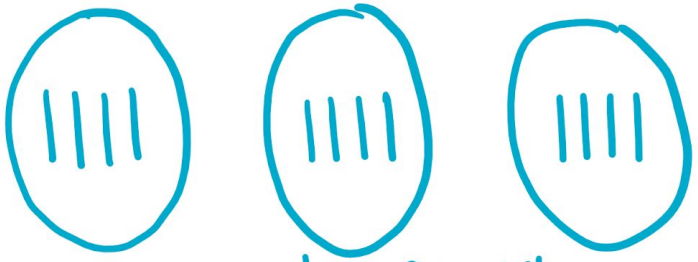
We just multiplied the **factors** 3x4 to get a **product** of 12.



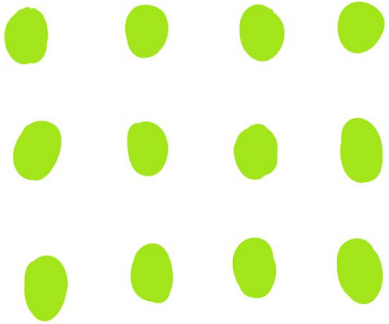
Multiplication Models for 3 x 4

4+4+4=12

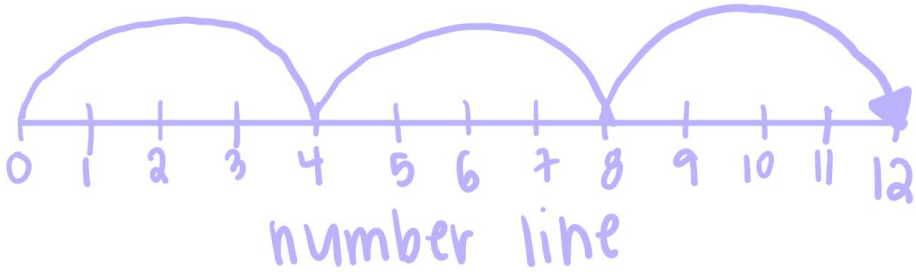
repeated addition



equal groups



array



number line

Remember this is how we coded it in a nested iteration!

Sonic Pi

File Edit Window

run stop rec save load

```
3.times do
  4.times do
    sample :guit_e_slide
    sleep 1
  end
end
```

Your task...

Code your own sounds using nested iteration! Use this code to get you started. Fill in the highlighted portions with your factors.

```
factor.times do
  factor.times do
    sample :sound
    sleep 1
  end
end
```

When you start typing **sample :**, sound options will pop up. Here are some you may want to give a try!

```
:ambi_lunar_land
:drum_cymbal_open
:perc_snap
:ambi_piano
:bass_woodsy_c
:sn_dub
```

Show your understanding of multiplication!

Name: _____ My multiplication equation: ___ x ___ = ___

Show your multiplication equation using each model.

Repeated Addition

Equal Groups

Array

Number Line

Extension

Explore Sonic Pi! Have fun and play with your learning.

What other sounds can you find to add to your iterations to create a song?

Can you add more iterations to repeat in different patterns and make the song longer?