



# Emerging Music Nexuses: Technology, Video Games, and Coding

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Avondale Elementary School District

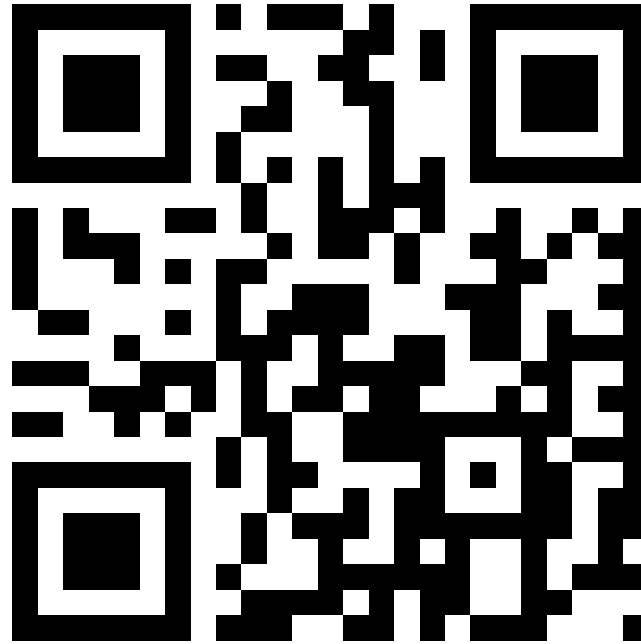


# What's the plan?

- ▶ Three emerging music nexuses:
  - ▶ Music performance and Technology
  - ▶ Music and Video Games
  - ▶ Music & Coding
- ▶ Let's Talk

# How to reach the resources

- ▶ [www.JaredOLEary.com](http://www.JaredOLEary.com)
  - ▶ Presentations
  - ▶ Emerging Music Nexuses





# Music performance and technology

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# Digital and hybrid musicianship

▶ [youtube.com/OCPDMusic](https://youtube.com/OCPDMusic)

▶ Playlists

▶ Digital and Hybrid Musicianship

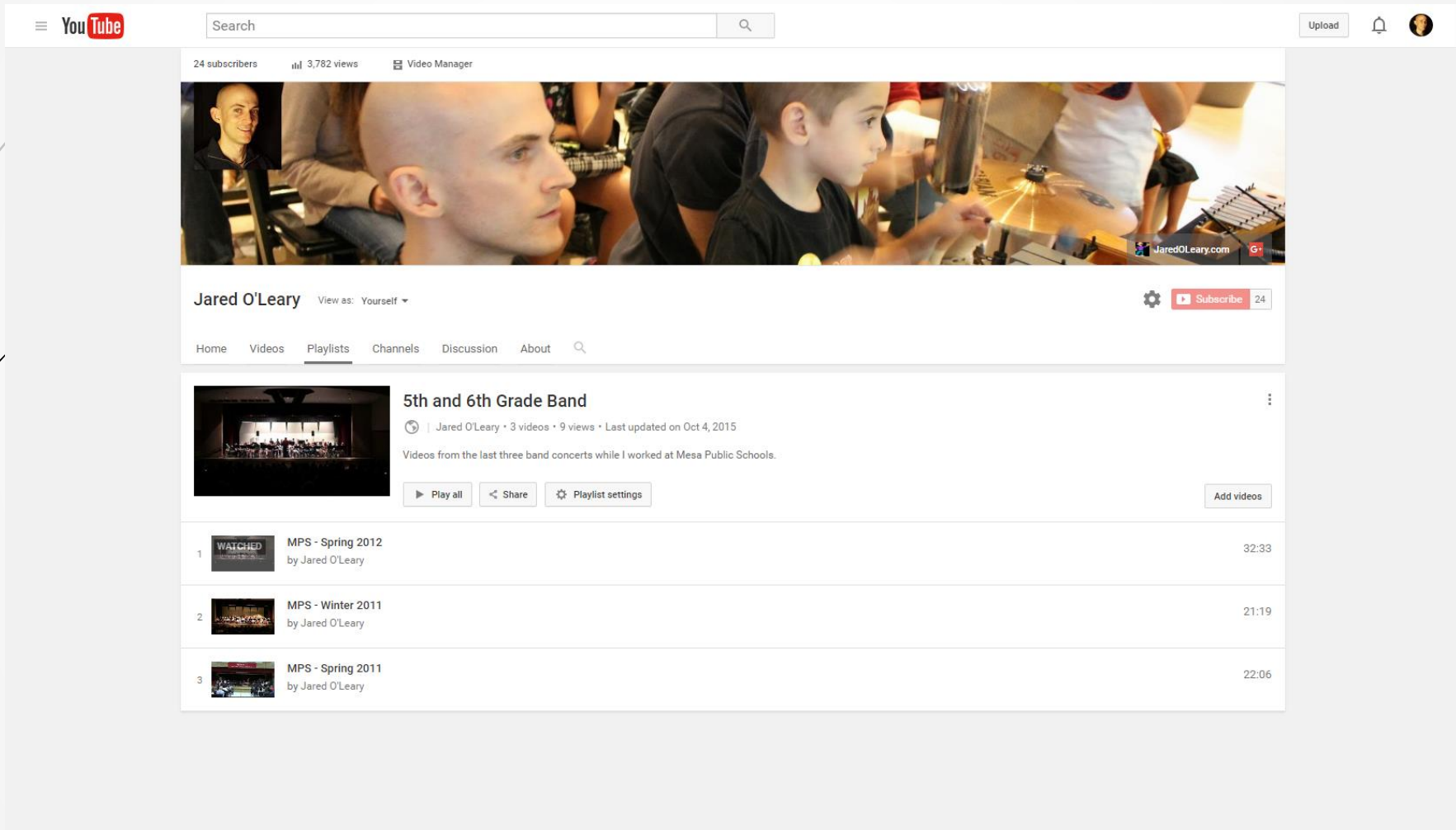


<https://goo.gl/k5edaL>

# Augmenting an elementary ensemble



# Augmenting an elementary ensemble



The image shows a screenshot of a YouTube channel page for Jared O'Leary. The channel has 24 subscribers and 3,782 views. The main video thumbnail shows a man and a young boy playing drums. Below the channel name, there are navigation tabs for Home, Videos, Playlists, Channels, Discussion, and About. The 'Playlists' tab is selected, showing a playlist titled '5th and 6th Grade Band' with 3 videos and 9 views. The playlist description states: 'Videos from the last three band concerts while I worked at Mesa Public Schools.' The playlist contains three videos:

Video Title	Duration
MPS - Spring 2012	32:33
MPS - Winter 2011	21:19
MPS - Spring 2011	22:06

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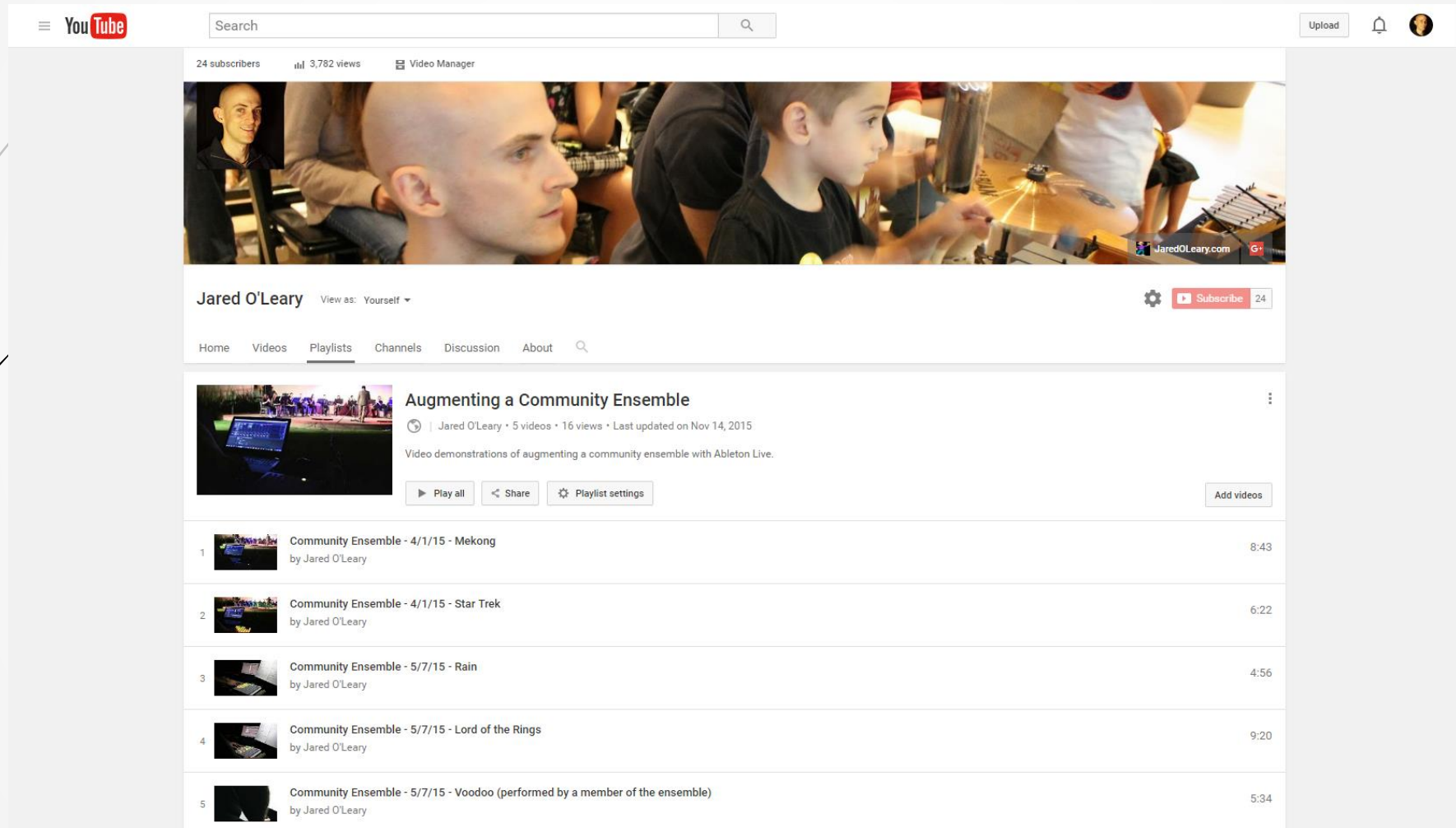
# Augmenting a community ensemble



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# Augmenting a community ensemble



The screenshot shows the YouTube channel page for Jared O'Leary. The channel has 24 subscribers and 3,782 views. The main video is titled "Augmenting a Community Ensemble" and is part of a playlist of the same name. The playlist contains five videos, each demonstrating the use of Ableton Live to augment a community ensemble performance.

**Jared O'Leary** | View as: Yourself | 24 subscribers | 3,782 views | Video Manager

**Augmenting a Community Ensemble**  
Jared O'Leary • 5 videos • 16 views • Last updated on Nov 14, 2015  
Video demonstrations of augmenting a community ensemble with Ableton Live.

Video Title	Duration
1 Community Ensemble - 4/1/15 - Mekong by Jared O'Leary	8:43
2 Community Ensemble - 4/1/15 - Star Trek by Jared O'Leary	6:22
3 Community Ensemble - 5/7/15 - Rain by Jared O'Leary	4:56
4 Community Ensemble - 5/7/15 - Lord of the Rings by Jared O'Leary	9:20
5 Community Ensemble - 5/7/15 - Voodoo (performed by a member of the ensemble) by Jared O'Leary	5:34

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# Some other presentations on this topic

- 21<sup>st</sup> century elementary ensemble director
- From large ensembles to video games: Technology in music education
- Multimedia ensemble: Performing live music with live video games
- Using technology to augment musicianship
- Using technology to augment teaching



# Music and video games

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# Video game music and interactive audio

▶ Video Game Music



<https://goo.gl/FSNAhB>

▶ Interactive Audio



<https://goo.gl/O5SOox>



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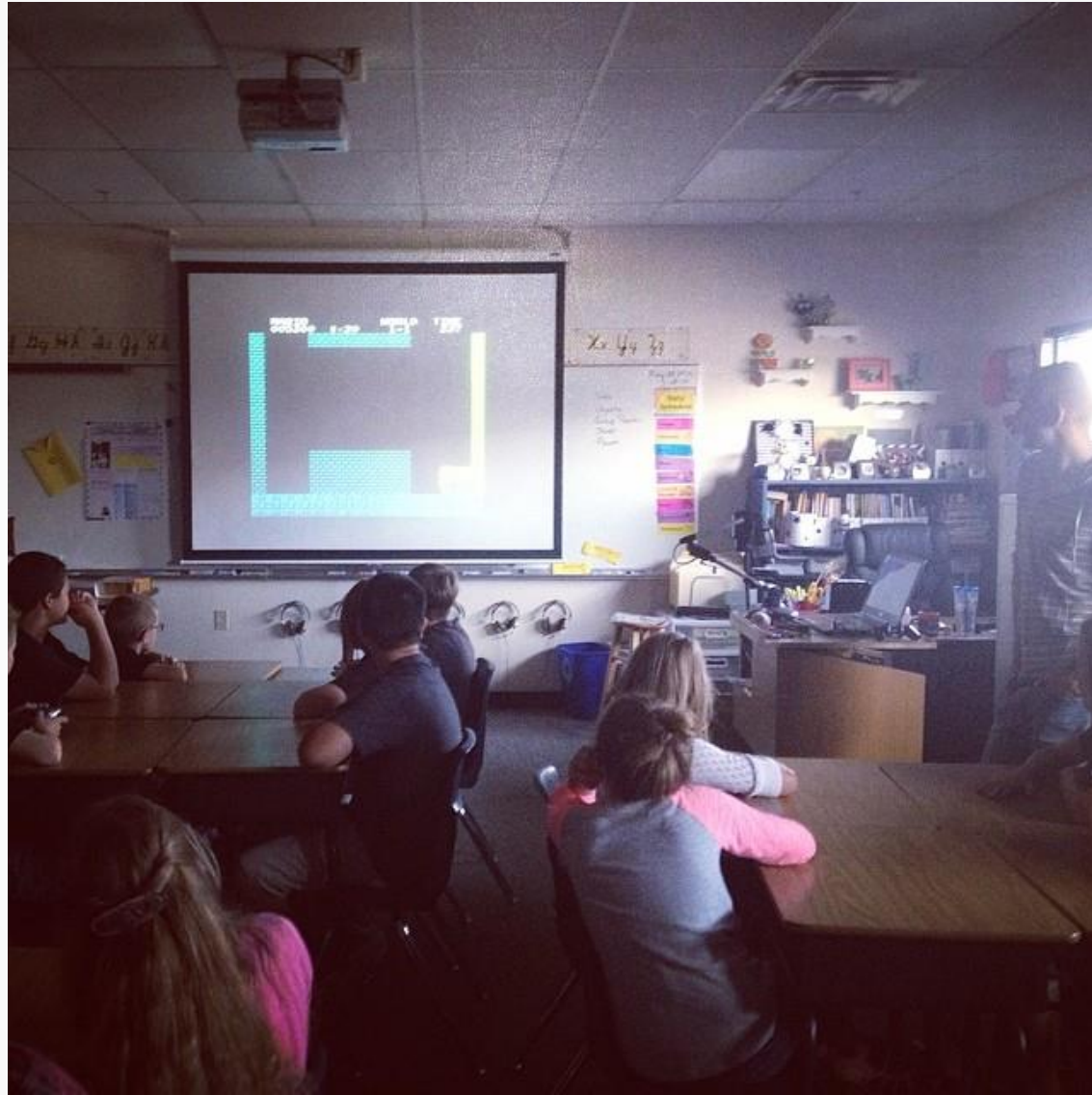
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8-Bit Composition Unit [8-Bit Composition Unit] - Ableton Live 9 Suite

File Edit Create View Options Help

TAP 100.00 IIII IIII 4 / 4 1 Bar

1. 1. 1 3. 1. 1 4. 0. 0

KEY MIDI 1%

Bass	Melody	Percussion	Sound Effects	Master
1 1-NES - Lemm	1 1-NES - Lemm	1 3 MIDI	blast-2600-n	1
1 1-NES - Lemm	1 1-NES - Lemm	1 3 MIDI	blast-2600-g	2
1 1-NES - Lemm	1 1-NES - Lemm	1 3 MIDI	blast-2600-h	3
1 1-NES - Lemm	1 1-NES - Lemm	1 3 MIDI	explo-2600-h	4
1 1-NES - Lemm	1 1-NES - Lemm	1 3 MIDI	10214-Random B	5
1 1-NES - Lemm	1 1-NES - Lemm	1 3 MIDI	10182-Random B	6
1 1-NES - Lemm	1 1-NES - Lemm	1 3 MIDI	3355-Random B	7
1 1-NES - Lemm	1 1-NES - Lemm	1 3 MIDI	10199-Random B	8
1 1-NES - Lemm	1 1-NES - Lemm	1 3 MIDI	You LoseA4-4Y3	9
1 1-NES - Lemm	1 1-NES - Lemm	1 3 MIDI	explo-2600-e	10
1 1-NES - Lemm	1 1-NES - Lemm	1 3 MIDI	Glitch KitC4-1SV	11
1 1-NES - Lemm	1 1-NES - Lemm	1 3 MIDI	F#2-E000-CLN	12
2 Bass	2 Bass	1 3 MIDI	48-Random Bit C	13
2 Bass	2 Bass	1 3 MIDI	Sawtooth-Trem	14
2 Bass	2 Bass	1 3 MIDI	blast-2600-s	15
2 Bass	2 Bass	1 3 MIDI	blast-2600-x	16

Drop Files and Devices Here

Clip Launch Sample

explo-2600-h

Launch Mode Gate Legato

Signature 4 / 4

Groove None

Commit

Sample

explo-2600-h.aif

44.1 kHz 16 Bit 1 Ch

Warp

Start 0 0 0

End 0 1 345

Seg. BPM 120.00

Beats

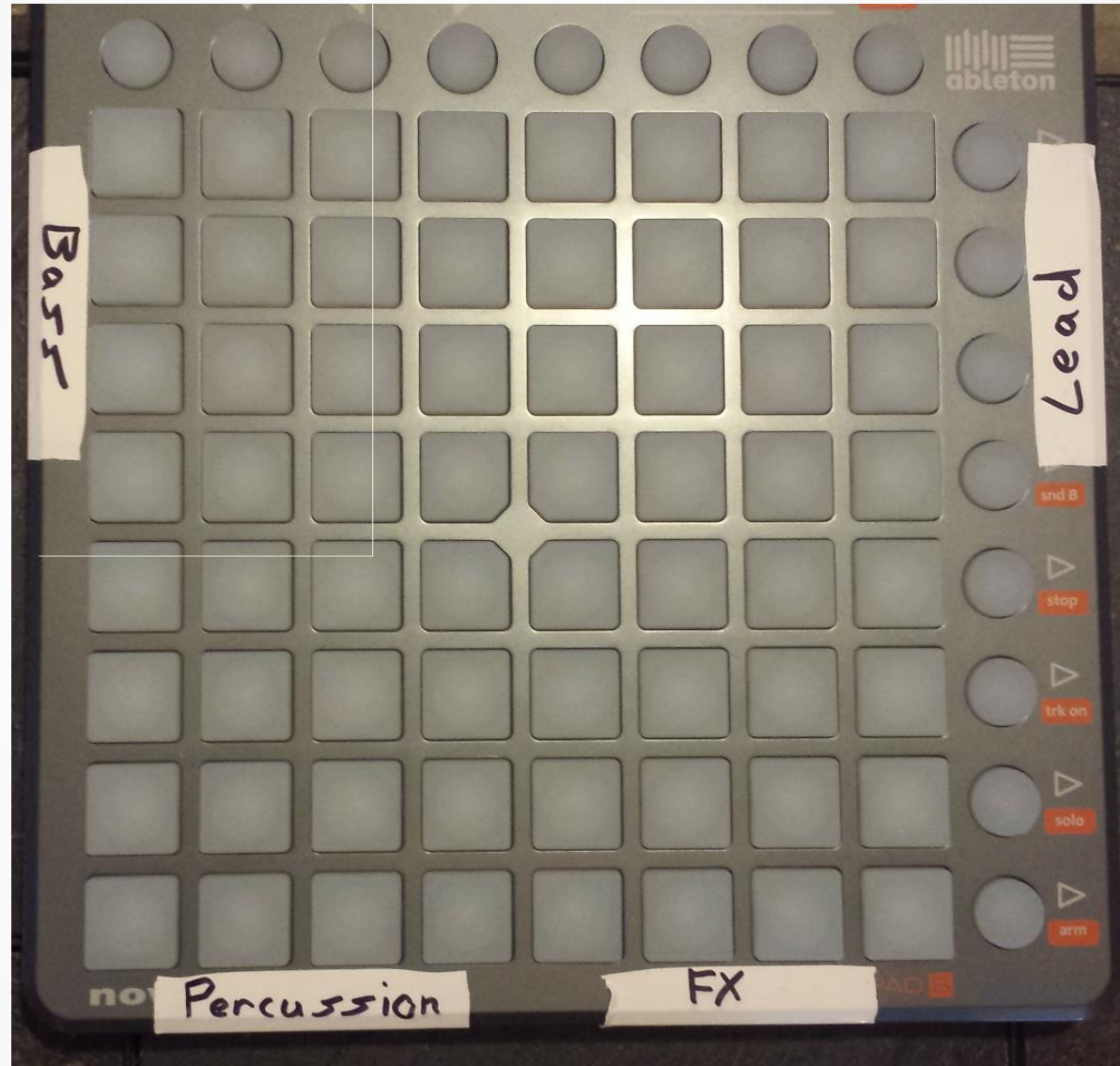
Loop

Position 0 0 0

Length 0 1 345

Transpose 0 st

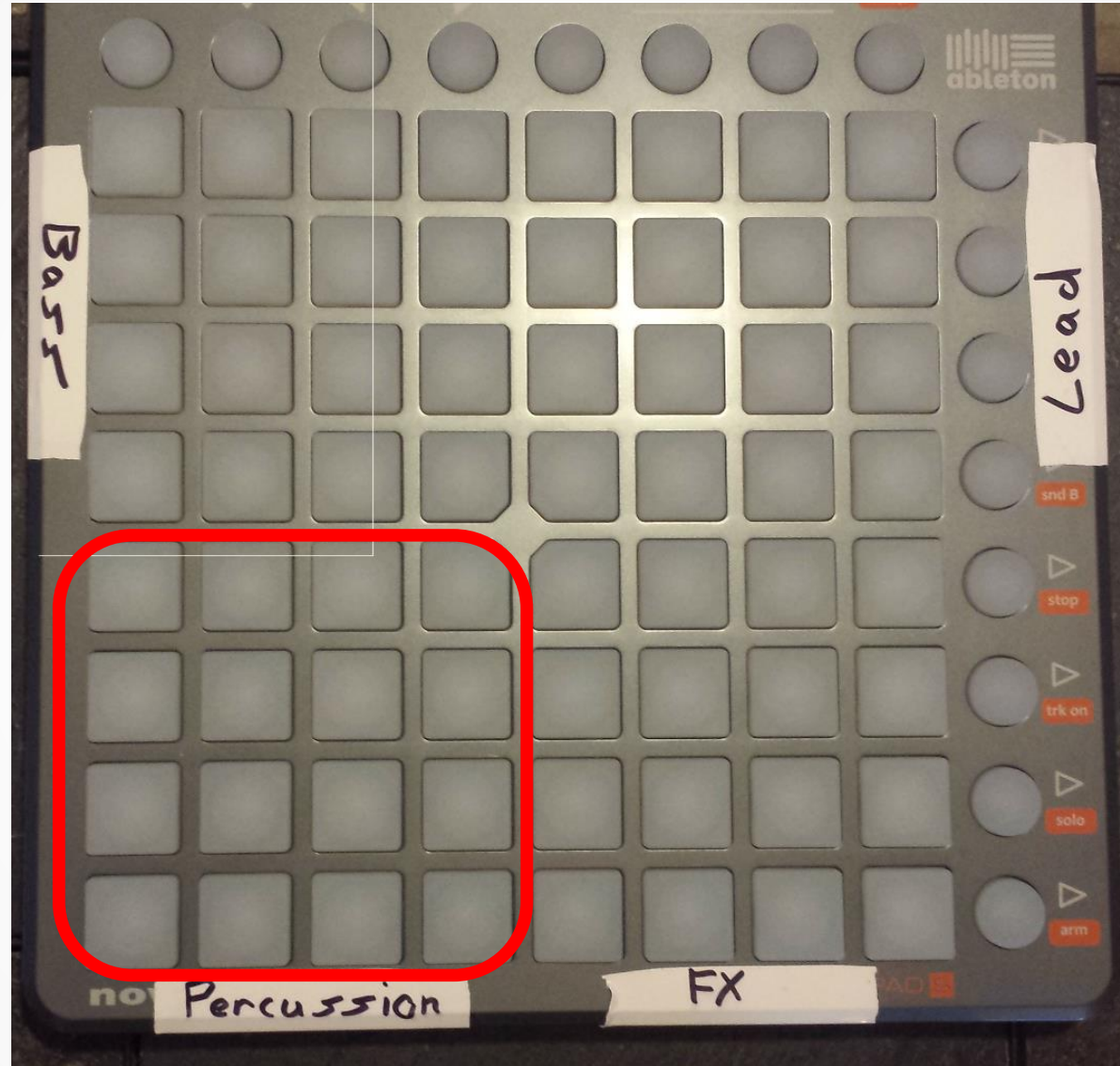
Detune 0 ct 0.00 dB



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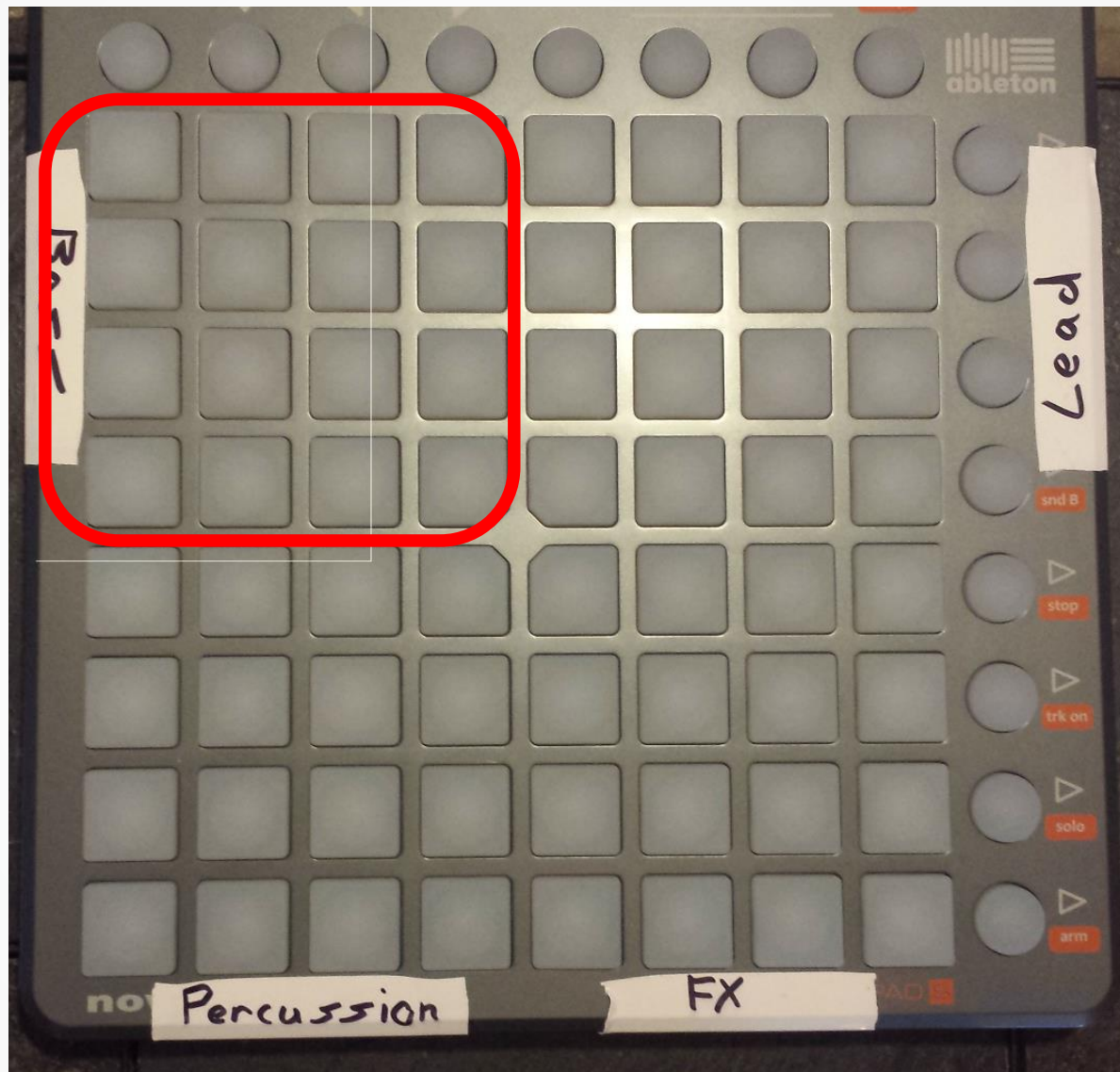


# Percussion

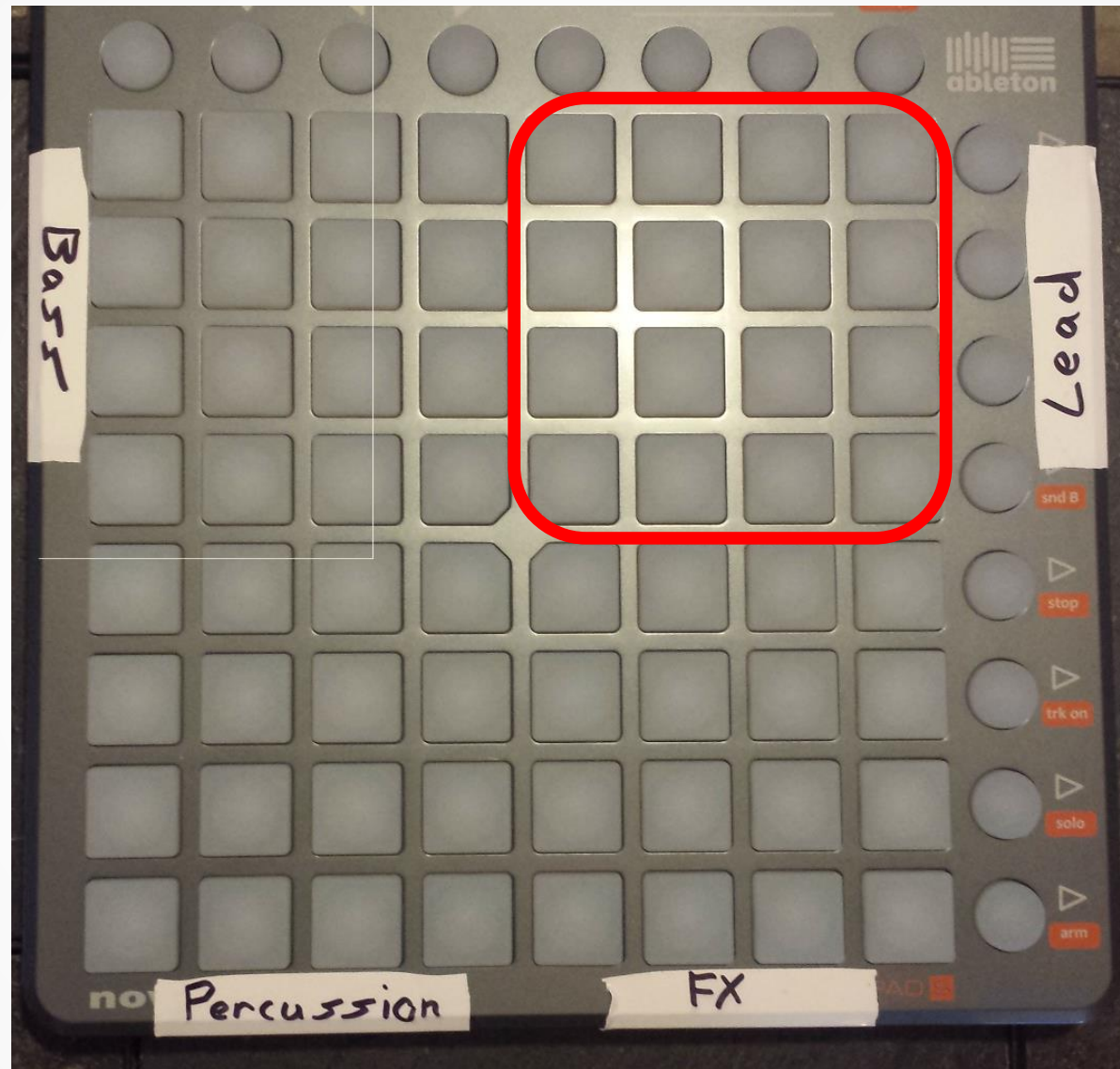
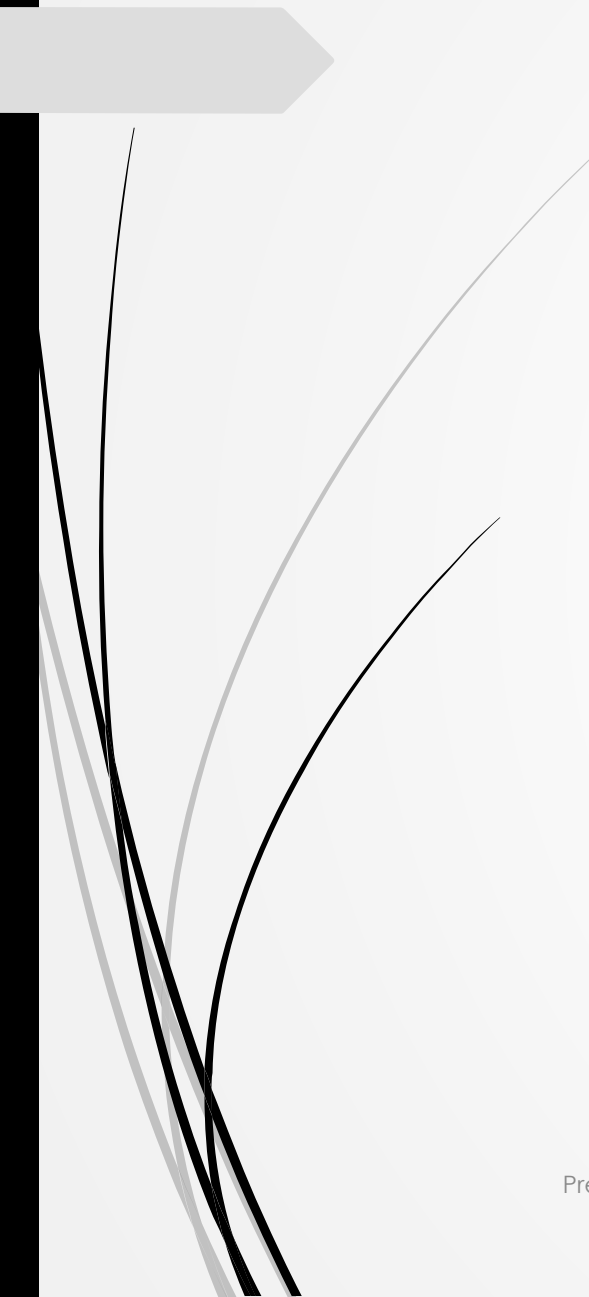


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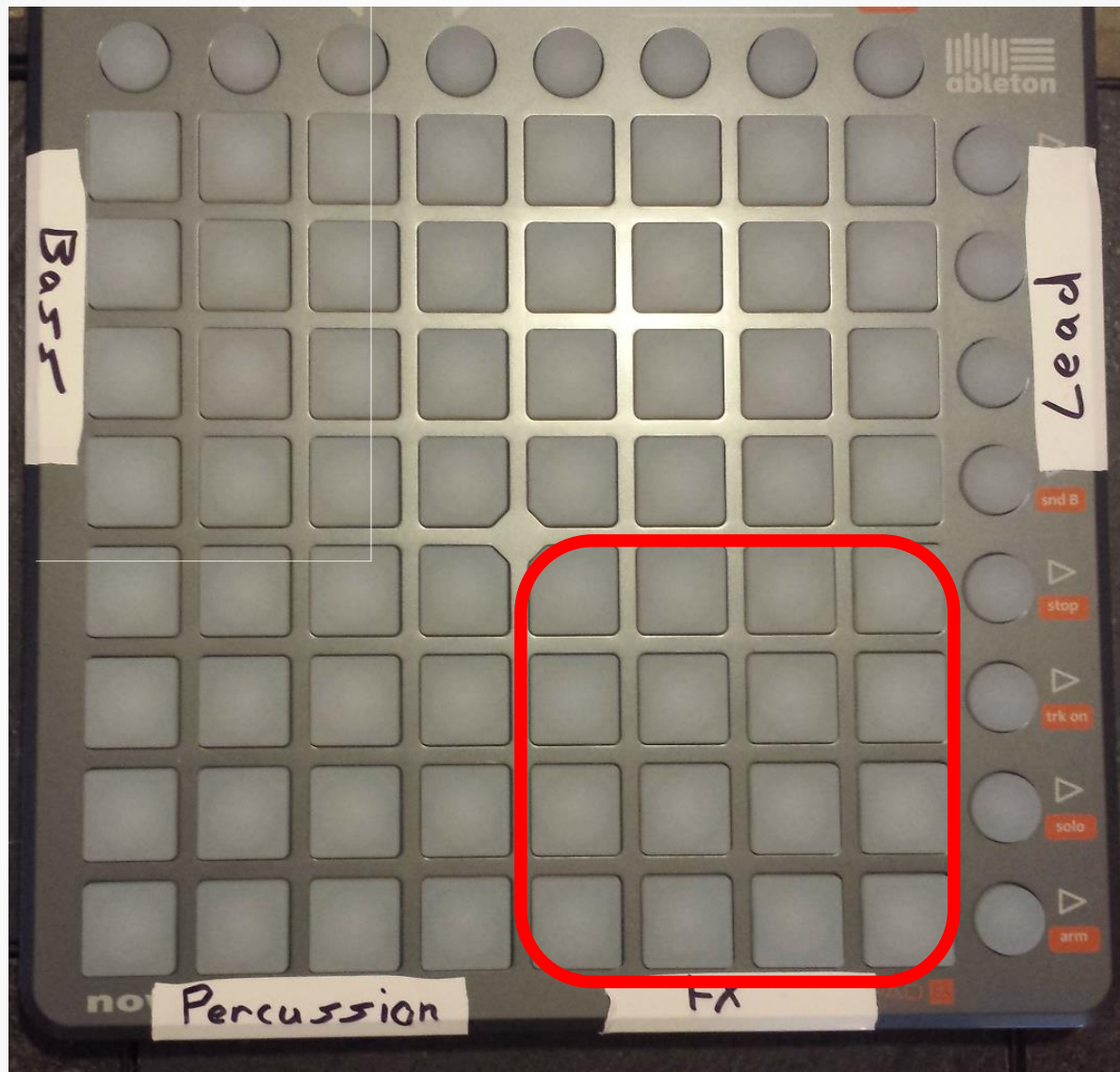
Bass



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Lead



FX



# Some other presentations on this topic

- ▶ 8-bit composition unit? Composing for old school video games
- ▶ Creating 8-bit
- ▶ Engaging with popular and participatory cultures: Implications for teaching and learning
- ▶ From large ensembles to video games: Technology in music education
- ▶ Interacting with 8-bit
- ▶ Modern video game projects
- ▶ Multimedia ensemble: Performing live music with live video games
- ▶ Old school video game projects
- ▶ Sonic modding: Modding video game music and sound
- ▶ Video games in music education



# Upcoming publications on this topic

- ▶ O'Leary, J. & Tobias, E. (in press). Sonic Participatory Cultures within, through, and around Video Games. In *The Oxford Handbook of Music Making and Leisure*, edited by Roger Mantie and Gareth Dylan Smith. Oxford: Oxford University Press.
- ▶ Tobias, E. & O'Leary, J. (in press). Video Games. In *The Routledge Companion to Music, Technology & Education*, edited by Andrew King, Evangelos Himonides, and Alex Ruthmann. New York: Routledge.



# Music & coding

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# Music & coding

- ▶ [youtube.com/OCPDMusic](https://youtube.com/OCPDMusic)
- ▶ Playlists
  - ▶ Music & Coding



<https://goo.gl/lbMvyt>





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```

25 live_loop :floor do
26   bd_arr = [(ring 10, 5, 10), (ring 6, 10, 6)]
27
28   4.times do
29     bd_unquant = rrand(0, master_unquant)
30     sleep bd_unquant / 2
31
32     sample :drum_bass_hard, amp: rrand(0.75, 1.1), rate: rrand(0.999, 1.001) unless one_in(10) || count > 3
33     sample :drum_bass_hard, amp: rrand(0.75, 1.1), rate: rrand(0.999, 1.001) if one_in(3) && count == 4
34     sleep s - (bd_unquant / 2)
35
36     3.times do
37       bd_unquant = rrand(0, master_unquant)
38       sleep bd_unquant / 2
39       sample :drum_bass_hard, amp: rrand(0.25, 1), rate: rrand(0.999, 1.001) if one_in(count == 4 ? bd_arr[1].tick : bd_arr[0].tick)
40
41       sample :drum_splash_soft, amp: rrand(0.25, 1), rate: rrand(0.999, 1.001), release: 0.3 if one_in(6) && count == 4
42       sleep s - (bd_unquant / 2)
43     end
44   end
45 end
46
47 live_loop :hhat do
48   hh_amp = (ring 0.4, 0)
49   hh_arr = [(ring 20, 10), (ring 10, 12, 20, 12), (ring 5, 12), (ring 1, 8)]
50   hh_r = (ring 2, 4)
51
52   if one_in(2)
53     sample :drum_splash_hard, amp: rrand(0.2, 0.7), rate: rrand(0.999, 1.001) if one_in(2)
54   else
55     sample :drum_splash_soft, amp: rrand(0.2, 0.7), rate: rrand(0.999, 1.001) if one_in(2)
56   end
57
58   32.times do
59     if one_in(2) && count > 1
60       2.times do
61         hh_unquant = rrand(0, master_unquant)
62         sleep hh_unquant / 2
63         sample :drum_cymbal_closed, amp: (rrand(0.15, 0.4) + hh_amp.tick), rate: rrand(0.999, 1.001) unless one_in(hh_arr[count - 1].ti
64         sleep t - (hh_unquant / 2)
65

```

SCRATCH File Edit Tips About

Beatbox Machine by DTTechnology

Scripts Backdrops Sounds

Motion Looks Sound Pen Data Events Control Sensing Operators More Blocks

Stage selected: No motion blocks

X: 240 y: 79

Sprites New sprite: [ ] [ ] [ ]

Stage 4 backdrops New backdrop: [ ] [ ] [ ]

when clicked switch backdrop to backdrop1

when space key pressed repeat 4

- switch backdrop to Boom
- play sound kick drum
- wait 0.25 secs
- switch backdrop to Tss
- play sound high hat
- wait 0.25 secs
- switch backdrop to Gat
- play sound snare drum
- wait 0.25 secs
- switch backdrop to Tss
- play sound high hat
- wait 0.125 secs
- switch backdrop to Gat
- play sound kick drum
- wait 0.125 secs

switch backdrop to backdrop1

when left arrow key pressed stop other scripts in this script switch backdrop to play sound kick drum wait 0.5 secs switch backdrop to

when q key pressed forever if key a switch back play sound if key w switch back play sound

This code will set the backdrop to a blank backdrop at the start of the program.

When the spacebar is pressed, this code will repeat the following sequence four times: Switch the costume and play a sound when it switches, then pause a small amount before moving to the next sound and costume in the sequence. Notice to make the last two sounds twice as fast, I had to make the wait twice as small. What other beats, sounds, or costumes, could you create or add to this code?

The code above will s "stop other scripts in s could you use to make

```

57 // MARK: - Actions
58 // Pauses the music or plays it if already paused
59 @IBAction func playOrPause(_ sender: AnyObject) {
60     if player.isPlaying {
61         player.pause()
62         playPauseButton = UIBarButtonItem(barButtonSystemItem: UIBarButtonSystemItem.play, target: self, action: #selector(self.playOrPause(_:)))
63     } else {
64         player.play()
65         playPauseButton = UIBarButtonItem(barButtonSystemItem: UIBarButtonSystemItem.pause, target: self, action: #selector(self.playOrPause(_:)))
66     }
67     // Changes the look of the playPauseButton
68     toolbar.items![2] = playPauseButton
69 }
70
71 // Updates the current time to the slider's value
72 @IBAction func scrub(_ sender: AnyObject) {
73     player.currentTime = TimeInterval(scrubSlider.value)
74 }
75
76 // Changes the song when previous or next is pressed
77 @IBAction func changeSong(_ sender: UIBarButtonItem) {
78     switch sender {
79     case nextSongButton:
80         currentSong += 1
81     case previousSongButton:
82         // If we are less than two seconds through the song, this will simply restart the song by setting it to 0; otherwise, this will move to the previous song
83         if player.currentTime > 2.0 {
84             player.currentTime = 0
85         } else {
86             currentSong -= 1
87         }
88     default:
89         print("Something didn't work in changeSong")
90     }
91
92     // Goes to start or end of the song list depending on position in songList
93     if currentSong < 0 { currentSong = songList.count - 1 }
94     if currentSong > songList.count - 1 { currentSong = 0 }
95
96     newSong() // Switches to the new song
97     player.pause() // Pauses the song so it will start playing with the next line of code
98     playOrPause(playPauseButton) // Starts the song - could also use player.play; however, it wouldn't change the image
99 }
100
101 // MARK: - Functions
102 // Updates the slider to the current position in the song's length
103 func updateScrubSlider() {
104     scrubSlider.value = Float(player.currentTime)
105 }
106
107 // This will make it go to a random song if the user shakes the player
108 override func motionEnded(_ motion: UIEventSubtype, with event: UIEvent?) {
109     if event!.subtype == UIEventSubtype.motionShake {
110         player.stop() // Stops the music

```

# Some music created by Jared O'Leary



Partched

This is the final project for an electronic studio course I took during my doctorate. I had to compose and synthesize a piece from scratch. The name is a reference to a composer, Henry Partch, who inspired this piece.





# Some other presentations on this topic

- ▶ [A k-8 nexus between music creation, sound design, and computer programming](#)
- ▶ [Beyond linear coding: Creating and innovating in arts-based programming](#)
- ▶ [Coding in the k-8 classroom](#)
- ▶ [Coding live music with Sonic Pi](#)
- ▶ [Sonic modding: Modding video game music and sound](#)
- ▶ [Starting an after school coding program](#)

# Let's Talk

- ▶ [www.JaredOLEary.com](http://www.JaredOLEary.com)
  - ▶ Presentations
  - ▶ Emerging Music Nexuses

