|  |  |  |  |
| --- | --- | --- | --- |
| **Topic/Duration** | Randomness in EarSketch / 60 mins | |  |
| **Priority Standards** | **Georgia Music Technology Standards:** | |  |
|  | **1.** | [**MSMTC6.CR.1**](https://case.georgiastandards.org/f3b94c72-9c0d-11e8-b85c-3b1a3079ae6e/0b28edda-fc39-11ea-a8d1-0242ac150004/1932) Generate musical |  |
|  |  | ideas for various purposes and |  |
|  |  | contexts. |  |
|  | **Georgia Computer Science Standards** | |  |
| **Supporting Standards** | Georgia Music Technology Standards: | |  |
|  | 1. | [**MSMTC6.CR.2**](https://case.georgiastandards.org/f3b94c72-9c0d-11e8-b85c-3b1a3079ae6e/437e30dc-fc39-11ea-becb-0242ac150004/1934) Select and develop |  |
|  |  | musical ideas for defined |  |
|  |  | purposes and contexts. |  |
|  | 2. | [**MSMTC6.CR.3**](https://case.georgiastandards.org/f3b94c72-9c0d-11e8-b85c-3b1a3079ae6e/85317462-fc39-11ea-aa0f-0242ac150004/1936) Evaluate and |  |
|  |  | refine selected musical ideas to |  |
|  |  | create musical work (e.g. |  |
|  |  | arrangement, composition, |  |
|  |  | improvisation, mixed-media |  |
|  |  | project, orchestration, sound |  |
|  |  | design) that meet appropriate |  |
|  |  | criteria. |  |
|  | Georgia Computer Science Standards | |  |
|  | 1. | [**MS-CS-FCP-4.1**](https://case.georgiastandards.org/00fcf0e2-b9c3-11e7-a4ad-47f36833e889/ac4b16a7-8293-41d0-b699-3bcc99695fd0/569) Develop a |  |
|  |  | working vocabulary of |  |
|  |  | programming including |  |
|  |  | flowcharting and/or storyboarding, |  |
|  |  | coding, debugging, user interfaces, |  |
|  |  | usability, variables, lists, loops, |  |
|  |  | conditionals, programming |  |
|  |  | language, and events. |  |
|  | 2. | [**MS-CS-FCP-4.8**](https://case.georgiastandards.org/00fcf0e2-b9c3-11e7-a4ad-47f36833e889/82d5d495-4977-4fb6-af1a-3f74fba6e5bf/576) Create a |  |
|  |  | computer program that implements |  |
|  |  | a loop. |  |
|  |  | |  |
| **Student Facing Goals** | Students will be able to... | |  |
|  | ● | use Soundtrap to write a melody |  |
|  |  | and import it to EarSketch. |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  | ● utilize a third parameter for the | | | | | |  |
|  |  |  |  |  |  |  | range() function to control the | | | | | |  |
|  |  |  |  |  |  |  | incrementing of a for loop. | | | | | |  |
|  | **Essential Question & Enduring** | | | | | **How do we implement randomness in** | | | | | | |  |
|  | **Understanding** | | | | | **our scripts in a way that meaningfully** | | | | | | |  |
|  |  |  |  |  |  | **contributes to the music?​** | | | | | | |  |
|  |  |  |  |  |  | *As long as the pulse of the song is* | | | | | | |  |
|  |  |  |  |  |  | *maintained, randomness allows us to* | | | | | | |  |
|  |  |  |  |  |  | *introduce variation and surprise in our* | | | | | | |  |
|  |  |  |  |  |  | *songs.* | | | | | | |  |
|  |  | | | | |  |  | | | | | |  |
|  | **Evidence of Learning** | | | | |  | **Formative**: Students will create a script | | | | | |  |
|  |  |  |  |  |  |  | implementing shuffleString() | | | | | |  |
|  |  | | | | |  |  | | | | | |  |
|  | **Materials** | | | | |  | EarSketch | | | | | |  |
|  |  |  |  |  |  |  | Soundtrap | | | | | |  |
|  |  |  |  |  |  |  | Coins for students (real or [virtual](https://g.co/kgs/ENhPLw)) | | | | | |  |
|  |  | | | | |  |  |  |  |  |  |  |  |
|  | **Vocabulary** | | | | |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **Resources** | | | | |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | [Coin flip drum beat activity](https://earsketch.gatech.edu/earsketch2/?sharing=n8N7UAW7ysy1gMu3c_77mg) | | |  |  |  | [Improvisation explanation video](https://www.youtube.com/watch?v=_fHDoJdtWwE) | | | | | |  |
|  | [Example script 1](https://earsketch.gatech.edu/earsketch2/?sharing=FsIcdBTCPPMOPAZtgMv7vQ) | | | | |  |
|  |  | [Shimon performance](https://www.youtube.com/watch?v=l9OUbqWHOSk) | | |  | | |  |
|  |  |  |  |  |  |  |  |
|  | [Example script 2](https://earsketch.gatech.edu/earsketch2/?sharing=n9hDKpwPFqI4PYfmi2dpJw) | | | | |  |
|  |  |  |  |  |  |  |  |  |
|  |  | [The Verge article on Spotify’s shuffle](https://www.theverge.com/23653818/spotify-shuffle-button-music-history) | | | | | |  |
|  |  |  |  |  |  |  |  |
|  | [Template script for activity](https://earsketch.gatech.edu/earsketch2/?sharing=pcCMDHBvykfiHkMsr-9urg) | |  | | |  |
|  |  |  |  |  |  |  |  |  |
|  | [Completed activity example](https://earsketch.gatech.edu/earsketch2/?sharing=eXDPWPlZQViz4pjw68ngVQ) | | | | |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |

**Teacher Preparation**

1. Become familiar with the example and template scripts.

2. Read The Verge’s article on Spotify’s shuffle function in order to prepare for a discussion regarding “pseudo-randomness.”

Lesson Implementation

**Engage / Explore: Making Connections** **Time: 10 Minutes** **Slides *4-7***

**Section Goal:** Students will learn about and discuss randomness in music/improvisation.

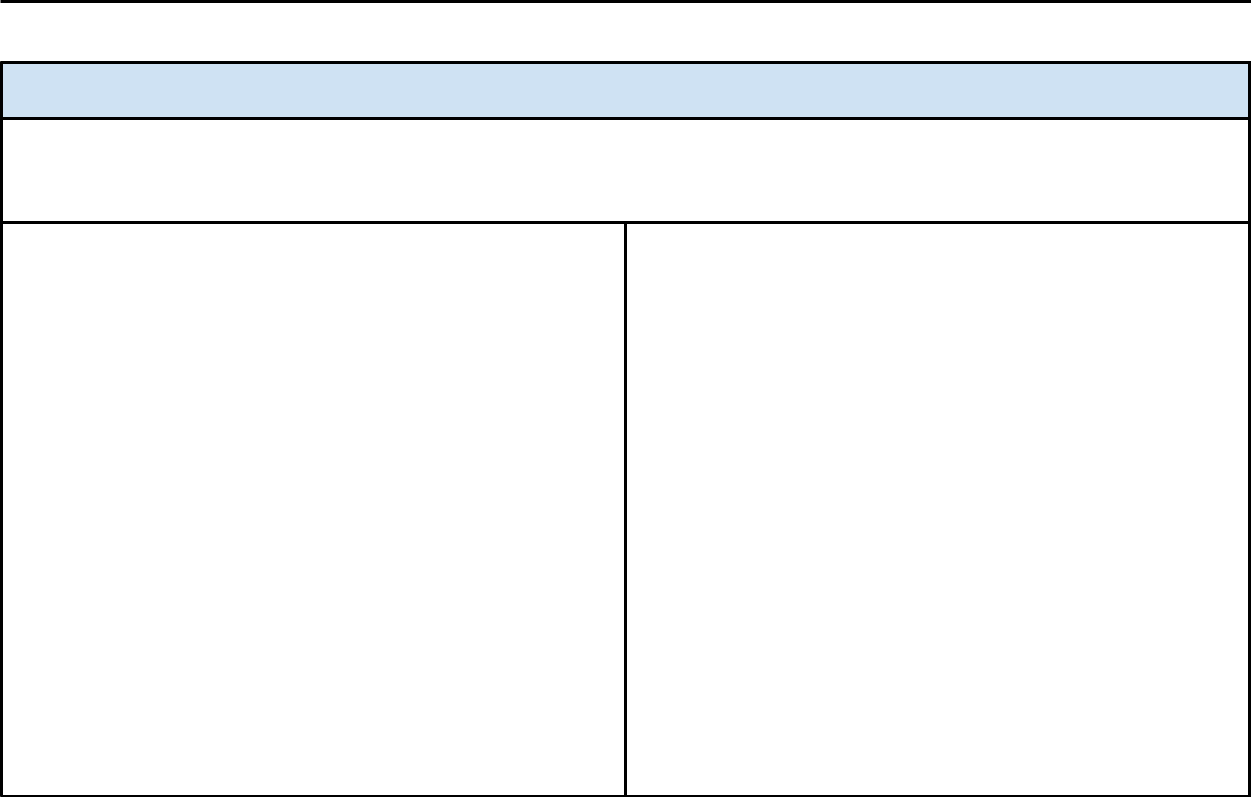
**Student Activities**

* Students participate in a discussion about the possibilities of randomness in music.

**Teacher Activities**

* Facilitate discussion about randomness in music. Feel free to offer topics of discussion such as: Why is randomness used in music? Can students think of any examples or experiences they’ve had with randomness in music? When is randomness appropriate/inappropriate? Etc.
* Show videos on improvisation and Shimon’s performance (Slides 5-6).
* On Slide 7, facilitate discussion about Spotify’s shuffle function. Ask students how many of them use shuffle when listening to their music library and whether or not it “feels” random. Do students notice that they hear certain artists or songs more than others?

**Coding Connections: N/A**



**Explain: Understanding** **Time: 20 Minutes** **Slides *8-14***

**Section Goal:** Students will learn the basics of randomness in EarSketch and will be introduced to the shuffleString() function.

**Student Activities**

* Learn about randomness and shuffleString() by following along with example code
* Complete the coin flip drum beat activity: [template script](https://earsketch.gatech.edu/earsketch2/?sharing=n8N7UAW7ysy1gMu3c_77mg)

**Teacher Activities**

* Go over basic real world examples of randomness (ex: dice rolling, coin flipping, Slide 8).
* Guide students through the coin flip drum beat activity, making sure it doesn’t take longer than ~5 minutes (Slide 9).
* Introduce students to the shuffleString() function, running the [example script](https://earsketch.gatech.edu/earsketch2/?sharing=FsIcdBTCPPMOPAZtgMv7vQ) a few times to show the possible variations (Slides 10-11).
* Switch to the new [example script](https://earsketch.gatech.edu/earsketch2/?sharing=n9hDKpwPFqI4PYfmi2dpJw) on Slide 12, which adds a quarter note

pulse that will help listeners follow the

beat.

● Turn on looping in EarSketch

(highlighted in Slide 15), and click run

as it loops to show a few different

randomly shuffled beats.

**Coding Connections: makeBeat(), strings, shuffleString(), randomness. loops**

**Elaborate: Apply your Skills** **Time: 20 Minutes** **Slide: *16***

**Section Goal:** Students will demonstrate their understanding of the shuffleString() function.

**Student Activities**

* Students will add in the information necessary for the variables at the beginning of the script, then write a loop that utilizes shuffleString() to randomize their beat strings over 4 measures.
* Include both a light and a heavy sound to see how randomizing two layers of a drum beat adds complexity to the rhythm.

o light sound examples: hihat, ride cymbal

o heavy sound: snare, toms

**Teacher Activities**

* Introduce the shuffleString() activity and provide the [template script](https://earsketch.gatech.edu/earsketch2/?sharing=pcCMDHBvykfiHkMsr-9urg) for the activity
* Instruct students to add only to the variables on lines 13, 14, 17, and 18.
* Remind students that the shuffled strings should be assigned to a new variable within the for loop to avoid overwriting the original beat string
* Reference the [completed example](https://earsketch.gatech.edu/earsketch2/?sharing=eXDPWPlZQViz4pjw68ngVQ) if students need guidance

**Coding Connections: makeBeat(), strings, shuffleString(), randomness, loops**

**Evaluate:** Assessment / Wrapping Up **Time: 10 Minutes** **Slide: *17***

**Section Goal:** Students will evaluate and share their completed EarSketch scripts.

**Student Activities**

* Share completed scripts with a partner and provide each other with feedback regarding their drum beats.

**Teacher Activities**

* Play student examples on the projector and offer positive and constructive feedback.

**Coding Connections: N/A**