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| **Topic &**  **Duration** | EarSketch fitMedia & Syntax debugging / 1 Class period / 45 minutes |
| **Priority Standards** | **Georgia Music Technology**:   1. [**MSMTC6.CN.2**](https://case.georgiastandards.org/f3b94c72-9c0d-11e8-b85c-3b1a3079ae6e/6bed3ddc-fc12-11ea-912f-0242ac150004/1929)Relate musical ideas to varied contexts and daily life to deepen understanding 2. Demonstrate understanding of relationships between music and the other arts, other disciplines, varied contexts, and daily life.   **Foundations of Computer Programming Standards**   1. **[MS-CS-FCP-](https://case.georgiastandards.org/00fcf0e2-b9c3-11e7-a4ad-47f36833e889/731f5cab-5d1e-46f4-bba0-c26268b93022/565)** [3.2](https://case.georgiastandards.org/00fcf0e2-b9c3-11e7-a4ad-47f36833e889/731f5cab-5d1e-46f4-bba0-c26268b93022/565) Develop a working vocabulary of computational thinking including sequences. 2. [**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 […], debugging. |
| **Supporting Standards** | **Foundations of Computer Programming Standards**   1. [**MS-CS-FCP-3**](https://case.georgiastandards.org/00fcf0e2-b9c3-11e7-a4ad-47f36833e889/35695273-4888-4f59-89a5-45ef323b432f/563)Utilize computational thinking to solve problems. |
| **Student Facing Goals** | Students will be able to...   * Apply computational thinking with code and other computer based technologies in order to create music. |
| **Essential Question & Enduring Understanding** | **What is debugging and why is it an important part of coding?**  *Debugging allows us to make sure that our code runs the way we intend to, similar to editing/revising a written assignment. In debugging, we make sure to fix any errors that the computer can’t understand as well as confirm that everything is working correctly (ex: making sure our fitMedia() function contains the correct measures).* |
| **Evidence of Learning** | **Formative**: Debug task challenge on fitMedia()  **Summative**: Unit project |
| **Materials** | Computer or Laptop  EarSketch |
| **Vocabulary** | * **Sequence:** An order in which events follow each other. * **Data type:** A set of information that is used in computer science in the form of numbers, strings, lists, Booleans, etc. * **Debugging:** Identifying and removing errors from computer software or hardware. |

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| **Resources** | |
| * Unit 2 Lesson 3A PPT * Link 1: [Underdog video by Alicia Keys](https://www.youtube.com/watch?v=izyZLKIWGiA) * Link 2: [Happy video by Pharrell](https://www.youtube.com/watch?v=ZbZSe6N_BXs) * Link 3: **EarSketch AB form change the tempo script** <https://earsketch.gatech.edu/earsketch2/?sharing=YuiFjhvAq9NJeR2hHazBPw> * Link 4: **EarSketch debug script** <https://earsketch.gatech.edu/earsketch2/?sharing=ArtHt6fpk2GXz96B0Mmfcw> | EarSketch Curriculum Panel   * 1.1 Discover EarSketch * 1.2 Create your first script * 1.3 The fitMedia() function * 1.4 Debug your code |

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| **Teacher Preparation** |
| 1. Load videos prior to class to skip ads during class. Do not project the videos, only play their audio. 2. Identify which one or two sound samples of Alicia Keys and Pharrell you will play in the EarSketch sound browser to show the students that the stems of the songs of these artists are also in EarSketch. 3. Create a student list to write down newly created EarSketch account usernames and passwords or assign usernames and passwords to students 4. Look over the sample code and add in extra comments if needed to help explain the concepts to students. |

Lesson Implementation

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| **Engage / Explore: Name that Artist Time: *5 Minutes*** | |
| **Section Goal:** Students will receive an introduction to two of the celebrity artists in the EarSketch sound browser. | |
| **Student Activities**   * Listen to the music from the video and guess the identity of the first artist. * Listen to the music from the second video and guess the identity of the second artist. | **Teacher Activities**   * **Without showing the video on your screen: timestamp -** 55 seconds to 1 minute 10 seconds - play the Underdog video by Alicia Keys (Link 1) and see if students can guess the artist. * **Without showing the video on your screen: timestamp –** begin at 12 seconds - play the Happy by Pharrell video (Link 2) and see if students can guess the artist. * Play a couple of the sound samples of Alicia Keys and/or Pharrell to show that their music is in the EarSketch sound browser. * Explain the “What is EarSketch” slide (Slide 8). Inform students that EarSketch is a free, browser-based tool that will teach them to code in Python (or JavaScript) through music remixing. |
| **Coding Connections: N/A** | |

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| **Explain: Introducing EarSketch Time: 15 minutes** | |
| **Section Goal:** Students will demonstrate their understanding of fitMedia() by creating a script that utilizes fitMedia() and debugging their scripts. | |
| **Student Activities**   * Create an account in EarSketch. * Create their first script in EarSketch in Python. * Understand the definitions of sequence and data type. * Help the teacher debug their syntax errors. | **Teacher Activities**   * Explain the different panels of the EarSketch interface and how to create an account (creating an account is optional when trying out EarSketch. However, accounts are required to save scripts). * Demonstrate how to create a script and use fitMedia().   + Identify the code editor and select the “Click here to create a new script!” button.   + Give your script a name.   + Select Python as your programming language.   + Set a desired tempo or utilize the content manager to audition sounds. Hover the mouse over sounds you like to learn more information, and select your preferred tempo based on the tempo of your favorite stems.   + Underneath the setTempo function, utilize the fitMedia() function to play a sound. * Explain debugging and model debugging by making a 2 or 3 track script while intentionally making syntax errors so that students can help fix the errors. Try misspelling fitMedia, adding too many or too few commas, leaving out a parenthesis, etc. |
| **Coding Connections: N/A** | |

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| **Elaborate: Apply your Skills Time: 15 minutes** | |
| **Section Goal:** Students will further demonstrate their understanding of fitMedia() by intentionally creating fitMedia() mistakes for their classmates to debug. | |
| **Student Activities**   * Click on the link and import to edit. * Change the tempo of the script to make the music more exciting. * Change two lines in the script (ex: misspell fitMedia() and delete a comma). * Let a friend try to find and fix the two errors that were created. | **Teacher Activities**   * Provide the link of the AB form fitMedia() script to the students (Link 3). Instruct students to change the tempo and make two intentional errors for their classmates to debug. |
| **Coding Connections: N/A** | |

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| **Evaluate:** Assessment / Wrapping Up  **Time: 10 minutes** | |
| **Section Goal:** Students will demonstrate their understanding of EarSketch syntax by debugging three errors in a provided script. | |
| **Student Activities**   * Import the script to edit. * Find and fix the 3 errors in the script. | **Teacher Activities**   * Provide the link of the 3 track fitMedia() script to the students (Link 4). Instruct students to debug the script. Offer help and suggestions as needed. * Confirm that students were able to debug the script. Provide time for students to discuss how they approached or identified each error. |
| **Coding Connections: N/A** | |