MISSION 5: Micro Musician	Time: 30-45 minutes

Overview:

In Mission 5, students will use code to play a pre-recorded audio clip. They will display an image while the music is playing. This is a fairly short lesson, with room for expansion (see cross-curricular, remix).

Cross Curricular:

- **MUSIC:** Students play pre-recorded audio clips. Expand the lesson to discuss sound waves or the difference between mono and stereo sound.
- **TECHNOLOGY:** Go through the additional slide deck on analog and digital (remix). Have students give examples.
- Supports **language arts** through reflection writing

Materials Included in the learning portal Teacher Resources:

Mission 5 Slidedeck

The slide deck is for teacher-led instructions that let you guide students through the material using the slides. It is an alternative to the students reading a lot of instructions in CodeSpace. The slides mirror the instructions, with simplified language that is chunked into smaller sections at a time. The information is shown on slides with “Objective”. The tasks to complete are on slides with “Mission Activity''.

Mission 5 Workbook

The workbook can be used instead of slides for student-led or independent work. It is an alternative to students reading a lot of instructions in CodeSpace. It mirrors the instructions (and the slide deck), with simplified language that is chunked into smaller sections at a time. Each objective is on its own page. The tasks to complete are labeled “DO THIS” and have a robot icon next to it.

Mission 5 Log

This mission log is the worksheet for students to complete as they work through the mission. It should be printed and given to each student before the mission starts. They write on the mission log during the assignment and turn it in at the completion of the mission (assignment).

Mission 5 Lesson Plan

The lesson plan comes from the CodeX Teacher Manual and is included here for easy reference.

Mission 5 Remix

Following Mission 5, students should complete a remix of their code. Complete instructions are in the folder. The Remix Folder includes a slide deck on analog and digital, and a slide deck on uploading your own audio files. There are no instructions for creating an audio file, as this is optional.

Teacher Resources:

- CodeX mission reminders
- Mission 5 Solution (Music1)
  - A code solution to Mission 5 in a text file.
- Mission 5 Review Kahoot

Formative Assessment Ideas:

- Exit ticket
- Mission log completion
- Completed program
- Kahoot Review

Vocabulary:

- **Readability:** Making code easy to understand for humans.
- **Comments:** Notes in code that are ignored by the computer but can explain what the code does

Review (Mission 3)-sequential: Executing code line by line, one after another, in order
Review (Mission 4)-branching: Decision points in code; a condition

Preparing for the lesson:

Students will use the Codex throughout the lesson. Decide if they will work in pairs or individually.

- Look through the slide deck and workbook. Decide what materials you want to use for presenting the lesson. The slide deck can be projected on a large screen. The workbook (if used) can be printed or remain digital through your LMS.
- The last objective uses batteries and makes the CodeX portable. Decide if you will do this, and how you will handle the batteries. Do you want to put them in the CodeX yourself, have students do it, or skip this part. Will you leave the batteries in the CodeX (I do) or remove them each day?
- Decide if you want to discuss CodeX mission reminders. This is a short lesson; it may not be needed.
- Be familiar with the Mission Log (assignment) and the questions they will answer.
- Print the Mission Log for each student.
- If you have a word wall, or another form of vocabulary presentation, prepare the new terms. Review a few terms from earlier missions.

Lesson Tips and Tricks:

💡 **Teaching tip:**

You can use a variety of discussion strategies to get the most engagement from your students. For example, you can have students write their answers before asking anyone for an answer. You can use one of many think-pair-share methods. You can have students write their answer and share with someone, and then have other students share answers they heard from their peers. You can randomly select students to answer.

👫 **Pre-Mission Discussion:**

Students can write in their log first and then share, or discuss first and then write in their log. There are two questions for the pre-mission. You could discuss them together or one at a time. There aren't any "right" answers here. The purpose is to get them thinking about displaying text on the screen as well as images. Also, there are real-world applications to what they are learning.

- Can you think of any ways a musician uses a computer to create music?
- What are some ways you want to use music or sound in a CodeX program?
    - Real world applications: Musical gift cards, Ringtones, Drum Machines, Keyboard Synthesizers

💡 **Teaching tip – Reminders for the beginning of mission: (go over these if you think it will help your students)**

These reminders are organized on a short slide deck that can be shown to students at the beginning of class

💻 **Mission Activities:**

Most of this lesson is on the computer, writing code to play audio clips and display an image.

- Each student will complete a Mission Log.
- Students could work in pairs through the lesson, or can work individually.
- Students will need the CodeX and USB cable.
- Students will need 4 AAA batteries to make the CodeX portable

💡 **Teaching tip: Objective #1** -- Slides 3-6, Pages 2-5
Students find the speaker and headphone jack on the CodeX. They discover the built-in audio clips available.

💡 **Teaching tip: Objective #2** -- Slides 7-8, Page 6
Students start a new file and write two lines of code to play an audio clip.

💡 **Teaching tip: Objective #3** -- Slides 9-10, Page 7
Students learn about readability and add a blank line to their code.

💡 **Teaching tip: Objective #4** -- Slides 11-12, Page 8
Students add code to display an image while playing the audio clip. The code needs to be BEFORE the audio, because the entire song will play before the next line of code is executed. A question is added about this in the log. Students can try it out -- switch the two lines of code and observe that the entire song plays before the image is displayed. Therefore, the best order is to display the image and then play the song. At this time, there is no way to break out of a song, other than clicking the “stop running” button.

💡 **Teaching tip: Objective #5** -- Slides 13-15, Pages 9-10
Students learn about comments and then add three comments to their code. Students write definitions in their mission log.

💡 **Teaching tip: Quiz** -- Slide 16, Page 10
Students take a ❓ short quiz making a prediction. The 2 Quiz questions are below. You can decide if you need to go over the question with your students.

💡 **Teaching tip: Objective #6** -- Slides 17-19, Page 11
Students learn about the battery pack, located on the back of the CodeX. Optional: give students batteries, or put them in the CodeX yourself, and have students run the program disconnected from the computer. The program must be run first through the computer, and then the code is loaded to the CodeX and can be portable.

💻 Mission Complete:

This mission ends with a completed, working (short) program. You need to decide how you will use the program for assessment. You could:

- Go to each student and check-off their code
- Have the students download their code to a text file and turn it in using your LMS
- Have students print their code (either download and then print the text file, or print a screenshot)
- Have students switch computers and run each other’s code. Fill out a simple rubric and turn in to teacher
- Any other way that works for you

👫 Post-Mission Reflection:

The post-mission reflection asks students two review questions and one reflection question. The review questions have correct answers, and the reflection question is up to each student. You can change the questions if there is something else you want to emphasize with your students.

- What are two ways you can hear sound from the CodeX?
- What are two ways to make your code readable to people?
- What are two ways you want to use sound or audio files in a program?

End by collecting the Mission Log and any formative assessment you want to include.

💻 IMPORTANT Clearing the CodeX:

The students have already created a “Clear” program. Students should open and run “Clear” at the end of each class period.

SUCCESS CRITERIA:

- ❏ Create a program that plays an audio file on the CodeX
- ❏ Add readability to your program by adding blank lines and comments
- ❏ Debug any errors in the code
- ❏ Clear the CodeX of meaningful code

❓ Quiz Questions