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PLTW

Music Making Facilitator Guide Overview

The focus of this experience is for learners to develop a STEM mindset. Students will use design thinking, creativity, problem-solving, and procedural skills to create a music mix track. This activity – which uses a tablet or smartphone and a free app – helps students develop a STEM mindset. It is important to allow students to work through the process as independently as possible with the facilitator acting only as a guide.

Materials

Music Maker JAM app, available free in the App Store or Google Play store, and installed on a mobile device. (Note that if a student wants to share their resulting mix tracks, they will need to create an account.)

Preparation

- 1. To best prepare for this experience, read through the facilitator and learner guides and documents.
- 2. Ensure each student has a tablet or smartphone.
- 3. Install the Music Maker JAM app on each device.

Essential Questions

- How do you use the Design Process to design and make a music mix track?
- In what ways are music mix tracks uniquely suited to meet a person's need or want?

Session Length

60 minutes

Facilitation Notes

Begin by watching the Music Mixing video. Students learn how a professional music producer or sound engineer uses a music mixing tool to assemble and edit mix tracks.



STEM Mindset

Invite students to follow the directions in the Student Guide to learn how the Music Maker JAM app works, and to learn how to produce a music mix track. Stress that this is a new learning experience. Let the students know that evaluation does not solely rely on the track they produce, but – more importantly – on how they participate in the learning process. You will need to model a STEM mindset by stressing the idea that effort builds skill.

Phrases to use with students who struggle despite strong effort:

- Mistakes are expected. This is new material. We learn by fixing our mistakes.
- You are not there, yet.
- You might be struggling, but you are making progress.
- Do not give up until you feel proud.
- You can do it. It can be tough or confusing, but you are making progress.
- I admire your persistence.

When students need help with solutions, give them strategies to help themselves (do not always just tell them how to solve the situation):

- Which part is not working as expected? What was the expected behavior and how is it different from what is happening right now? What can be causing the issue?
- What part is difficult for you? Let's look at it.
- Let's think together about ways to improve this.
- Let me add this new bit of information to help you solve this.
- Here is a strategy to try so that you can begin to figure this out.
- Let's ask ______ for advice. S/He may have some ideas.

Explore

Students should tinker with the features of Music Maker JAM using the Reference Sheet as a guide. Encourage them to add (or remove) as many loops as they want, analyzing the impact of both individual loops and the resulting mix track. As they explore, they should respond informally how each attribute affects an individual loop, and how additional adjustments impact the entire mix track.



Attributes affecting loops:

a. Genre: Pop or Rock.

How would you describe the "feel" of each genre?

- Answer: Pop has a brighter, peppier vibe, while rock is more powerful and driving.
- Instruments or vocals: Guitars, keyboards, drums, sound effects, ... etc.
 Where would you use a specific instrument or vocal in a song throughout the mix, or just in short sections?

Responses vary; vocals are typically used in short sections.

- c. Style: Each instrument or vocal offers choices, featuring different styles
 How do different styles affect the unique sound of an instrument or vocal loop?
 Answer: Variations of an instrument provide different nuances in sound; a "guitar" can have many variations, producing many different sounds.
- d. Volume: Loud, medium, or soft.

How does volume affect the impact of a particular instrument or vocal

Answer: Louder volumes bring a loop to the forefront of a mix track, while softer tracks provide a "foundation" or "highlight" to louder tracks, giving the entire mix track a richer, more developed feel.

Adjustments impacting entire mix track:

a. Equalizer/Add FX:

How does the addition of effects (FX) change the overall mix track? Answer: It alters which sections of the track the audience hears by changing the experience as the audience listens to the track.

b. Chord keys: Major keys (letters without a sharp or flat sign) sound bright or relaxing while minor keys sound dark or ominous

How does changing the chords affect the mood of the overall mix track? Answer: Students with a music background will likely experience greater success with adjusting chord keys; beginners may want to limit or skip this section.

- Master volume: Loud, medium, or soft
 How does overall volume of the mix track affect the listener?
 Answer: Loud tracks can sometimes evoke power, action, success, celebration, or anger; while soft tracks can convey to the listener a sense of peace, love, sadness, or fear.
- d. Tempo (in Beats Per Minute): Set the number for the BPM How does speed affect the feel of the track?
 Answer: Tracks with faster BPMs usually convey speed and action, while slower BPMs convey a sleepier or more leisurely feel.



Create

The Instant Design Challenge clearly states the purpose of this exercise in its title – an "Instant" or quick application of the skills they acquired in the Explore section. While some students might want to linger for more than 5 minutes to create their quick track, remind them that they will need enough time to work on an original track in the next section. The goal of the Instant Design Challenge is to learn how to analyze and share the quick tracks they made using Music Maker JAM.

The Produce a Mix Track steps students through the design and production of a mix track via the framework of the Design Process. Students may use any individual (including themselves) as the "client," or they may choose one of the characters shown in the student guide. Ultimately, the goal of this activity is to culminate the session with a somewhat authentic experience of working as a music producer and/or sound engineer, using a software application to model sample products which meet a client's needs or wants.



Standards

Next Generation Science Standards (NGSS)

MS-ETS 1-1 Engineering Design

Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

MS-ETS1-3 Engineering Design

Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

MS-ETS-1-4

Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

ELA Common Core Standards

CCSS.ELA-LITERACY.RI.6.7

Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.

CCSS.ELA-LITERACY. SL6.1, 7.1 and 8.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly.

CCSS.ELA-LITERACY.SL.6.2

Interpret information presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how it contributes to a topic, text, or issue under study.



CCSS.ELA-LITERACY.RST.6-8.3

Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical task.

CCSS.ELA-LITERACY.RST.6-8.4

Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topic.

CCSS.ELA-LITERACY.RST.6-8.7

Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

CCSS.ELA-LITERACY.RST.6-8.9

Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

Computer Science Teachers Association Standards (CSTA)

3A-IC-27

Use tools and methods for collaboration on a project to increase connectivity of people in different cultures and career fields.

3B-IC-25

Evaluate computational artifacts to maximize their beneficial effects and minimize harmful effects on society.

3B-IC-27

Predict how computational innovations that have revolutionized aspects of our culture might evolve.

