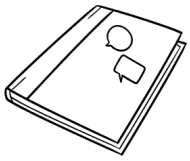
MODULE 1: Introduction

Module Structure

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Icons on slides

 in the bottom right corner indicates a coding activity students can complete. Instructions for coding activities are in the Student Coding Activities Workbook

 in the bottom right corner indicates a writing activity students can complete. Instructions for writing activities are in the Student Writing Activities Workbook

Module Overview

In Module 1, students learn about the connections between coding and music, create an EarSketch account, learn about the Digital Audio Workstation (DAW), and have a little fun with tempo!

Students will learn about Indigenous topics throughout this program while celebrating Indigenous artists, activists, and entrepreneurs. While the developers tried to include representation from various nations and territories, we encourage teachers to localize the curriculum by prioritizing local artists, activists, entrepreneurs, Elders, and Knowledge Keepers.

Objective & Key Areas of Learning

Upon completion of Module 1, students will understand:

- How to navigate the EarSketch platform and run a basic script.
- There are many connections between coding and composing music.
- A computer algorithm is a set of instructions executed by a computer. Computer algorithms are written using code.
- Digital Audio Workstations (DAWs) are specialized computer software for recording, editing, and playing digital audio files or clips.
- EarSketch is a DAW that allows audio clips to be placed on a timeline using code.
- The basics of the setTempo() function

Module Resources

- Slides for Module 1
- Digital Student Notebook - Printable Student Notebook
- Videos:
    - (41) Sam Aaron live coding a DJ set with Sonic Pi - YouTube
    - Spring 2022 Competition Grand Prize Winners
    - Cha-Cha Slide (optional)
    - Producing from your laptop (Warren "Oak" Felder)
    - Set Your Own Tempo
    - Creating an account and creating a Script in EarSketch
    - Getting started with EarSketch and using setTempo()
- Articles:
    - Why Every Band Needs a Computer Coder
    - Composing Code: Why Musicians Make Great Software Developers
    - Composing in Code: Musician-Programmers are Changing the Way Music is Made

1. THE CODING & MUSIC CONNECTION

Activity 1: Coding and Music - What is the Connection? (5 minutes)

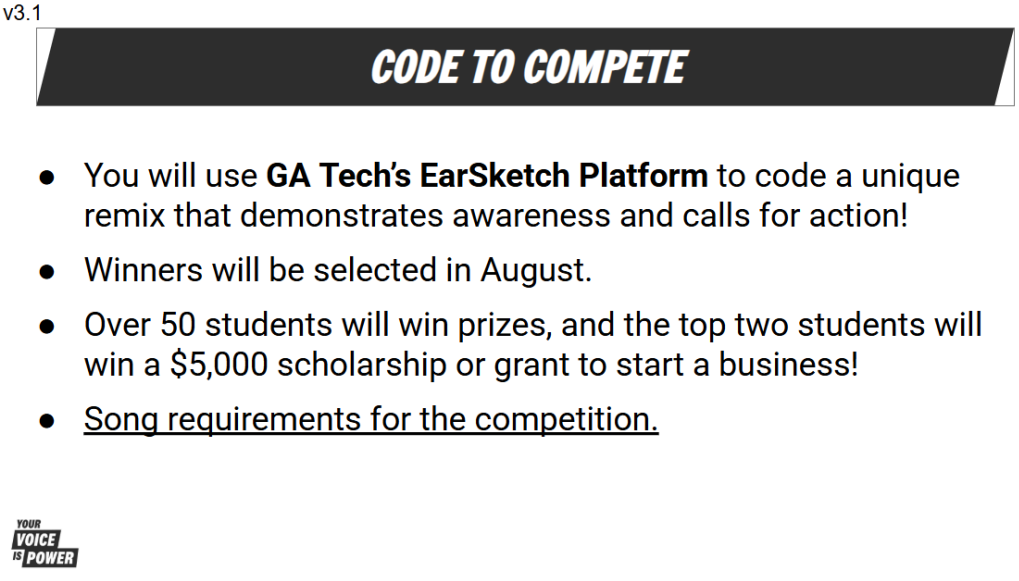
Slide 1



Instructor Dialogue

*"Welcome to **Your Voice is Power**!"*

Slide 2



Instructor Dialogue

Would you like to use your voice to inspire change and have the opportunity to win a $5000 scholarship?

Here is your chance - In the Your Voice is Power Competition, you have the opportunity to remix beats from Indigenous recording artists to create your own unique song.

You won't create this remix in a recording studio or in your school's band room.

Instead, you'll be composing on the computer using code.

50 students will win prizes, and two top students will win a $5000 scholarship or grant to start a business!

(Song requirements for the competition.)

Wait, Code?

Yes, code... the music industry is infused with computer programmers, from sound engineers to streaming site developers.

Combining music and computer science is the next step in recording innovation and creativity.

Slide 3

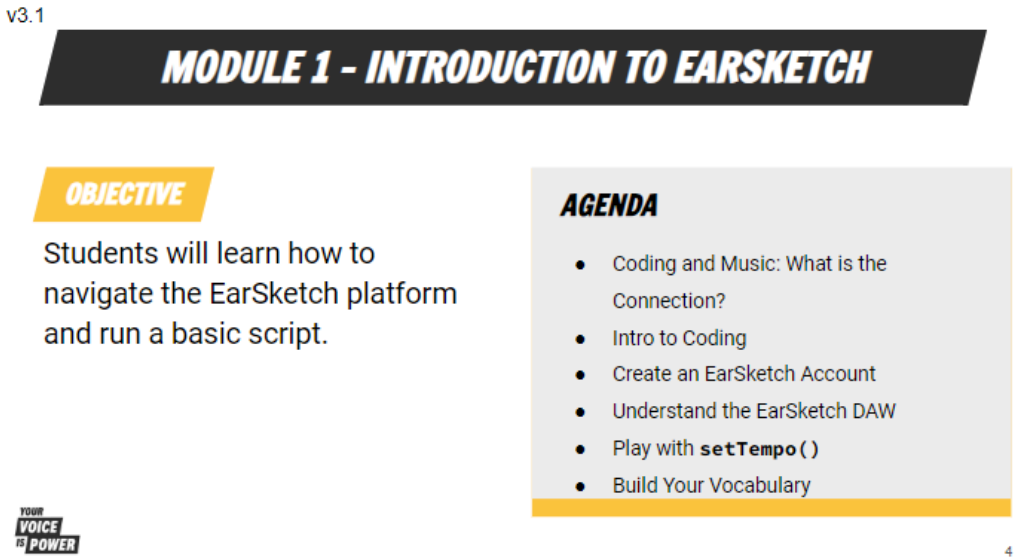


Instructor Dialogue

Do you want to remix beats from inspiring Indigenous artists?

We are going to spend the next few days exploring how you can use music, computer science, activism, and entrepreneurship to promote racial equity and social justice!

Slide 4

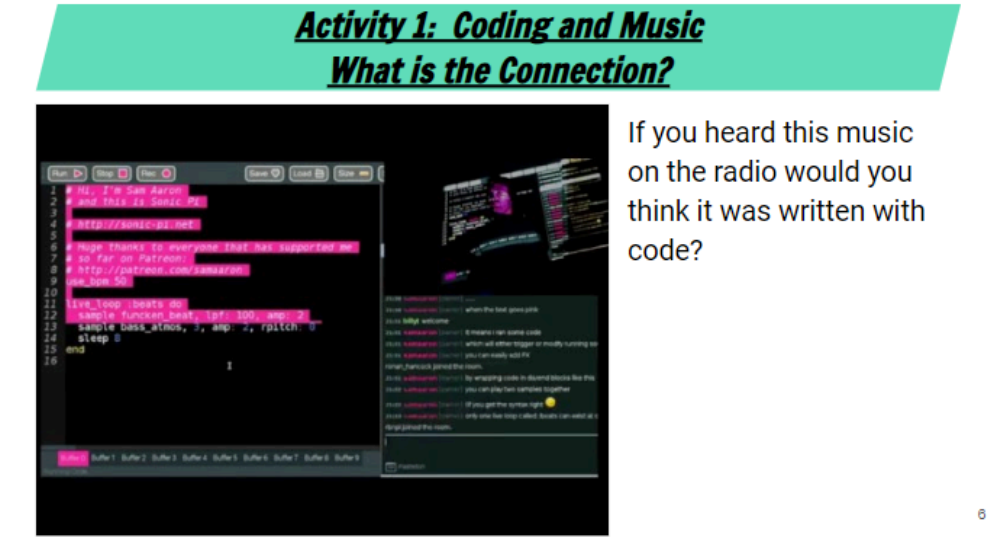


Instructor Dialogue

Today, you will learn how to navigate the coding platform we will use to remix music and write a basic script.

Slide 5

v3.1



Instructor Cue

Play approximately one minute of this video:
(41) Sam Aaron live coding a DJ set with Sonic Pi - YouTube

Instructor Dialogue

If you just heard that song on the radio, would you believe that it was code?

Musicians and coders are working together more and more to produce some of today's top hits.

Instructor Cue

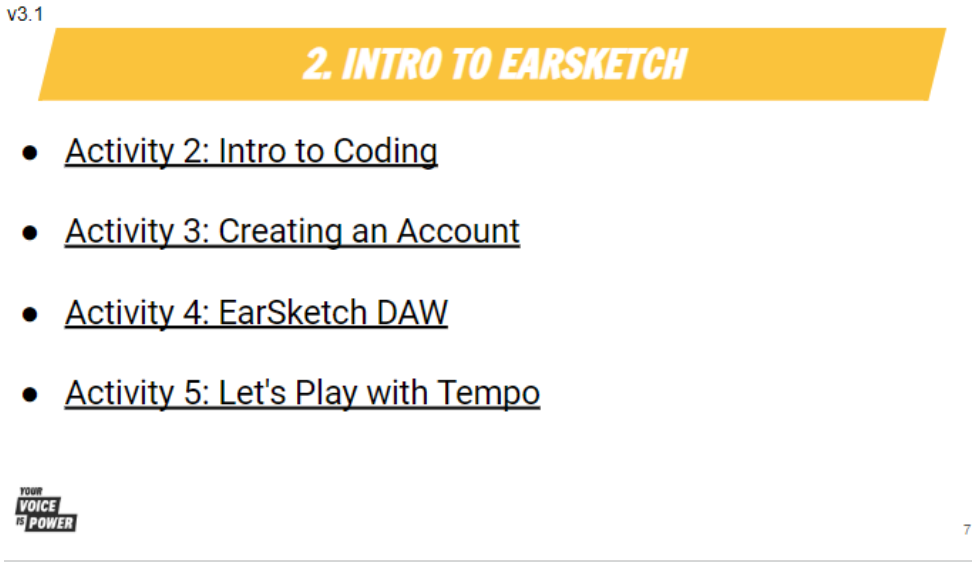
Extension A below provides more opportunities on this topic: "Why is coding important to the future of the music industry?"

NOTE: Many modules have optional **EXTENSIONS**. These are optional activities for teachers/students who want to dig deeper or spend additional time on a particular topic

2. INTRO TO EARSKETCH

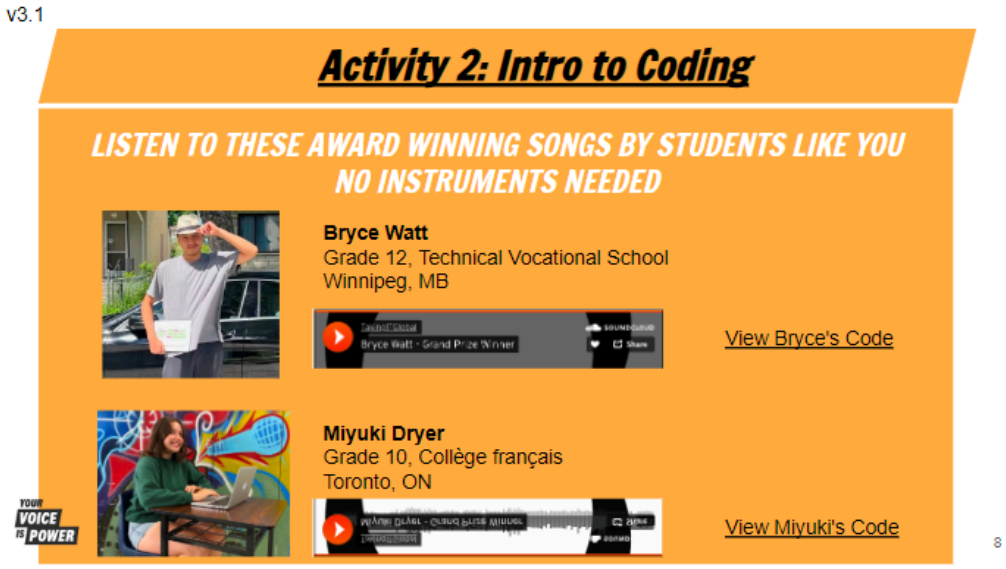
Activity 2: Intro to Coding (10 minutes)

Slide 7 & 8



Instructor Cue

Extension B below provides an optional unplugged introduction to coding activity



Instructor Dialogue

It is possible to be both a programmer and a rock star. So, let's get started coding and composing.

You will be using a platform called EarSketch to get started on this journey.

What is EarSketch? What is code?

"In the past few years, students have remixed the songs of current music artists!

This year, you can remix songs from an Indigenous artist, plus many more!

To get an idea of what you'll create, let's listen to one of the songs that won!

Instructor Cue

Play winning songs by students from previous years: Spring 2022 Competition Winners.

Instructor Dialogue

"Here is your challenge this year!

Weren't those songs awesome?

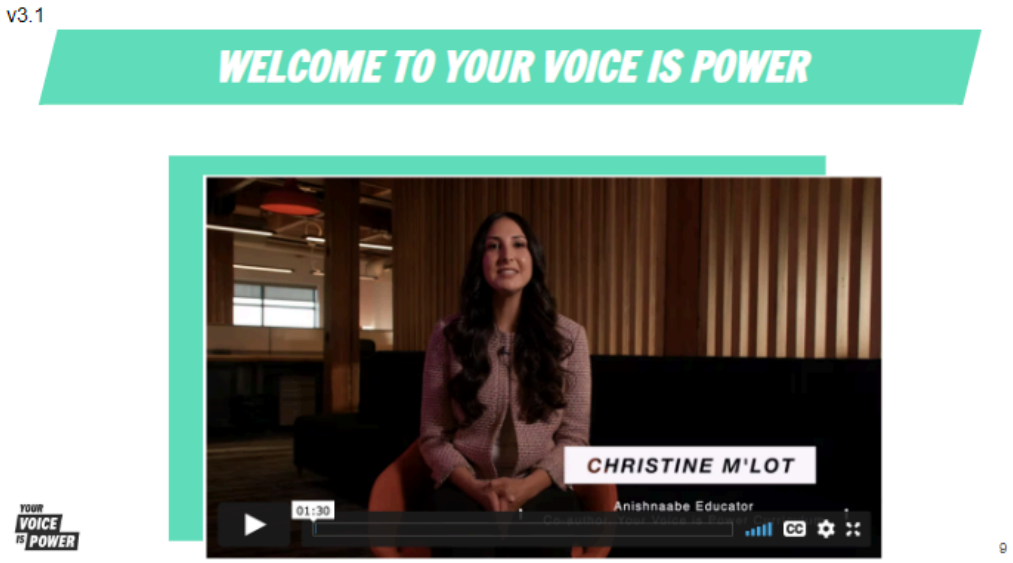
These were the Canadian grand prize winners from the Spring 2022 Your Voice is Power Competition.

These songs were composed entirely through code on the EarSketch platform using audio clips from recording artists.

You can check out their code at that link as well."

Are you ready to try out your coding skills to compose some awesome beats just like you just heard?

Slide 9

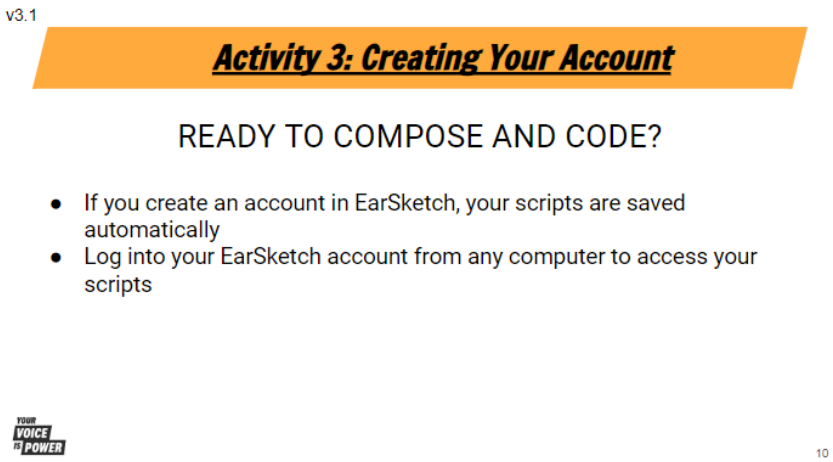


Instructor Cue

Go to the Your Voice is Power website at www.yourvoiceispower.ca
Play the Introduction Video on the homepage to learn about the program.

Activity 3: Creating an Account (5 minutes)

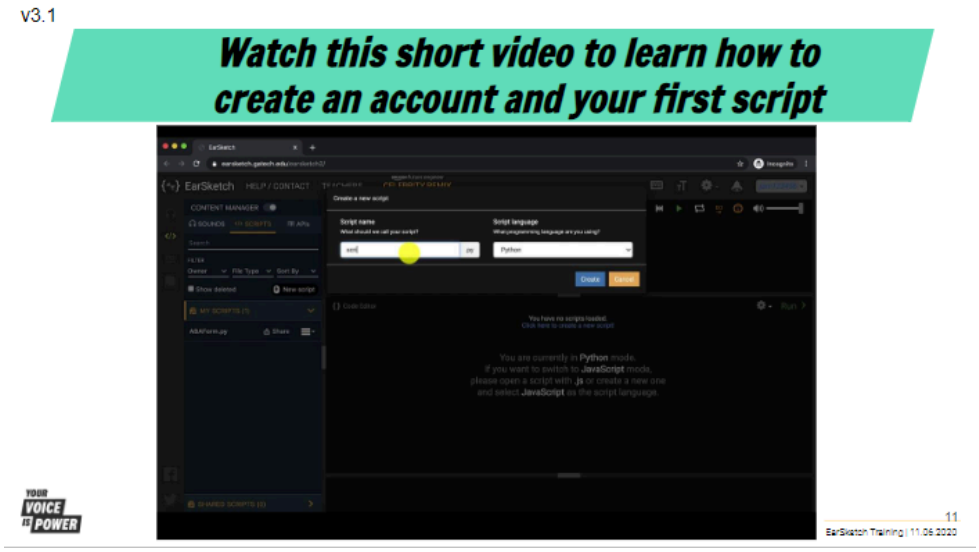
Slide 10 -14



Instructor Dialogue

Hopefully, you are inspired by listening to some great songs created by students just like you.

If you create an account in EarSketch, your scripts are saved automatically and you will be able to access your scripts for any computer by logging into your account.

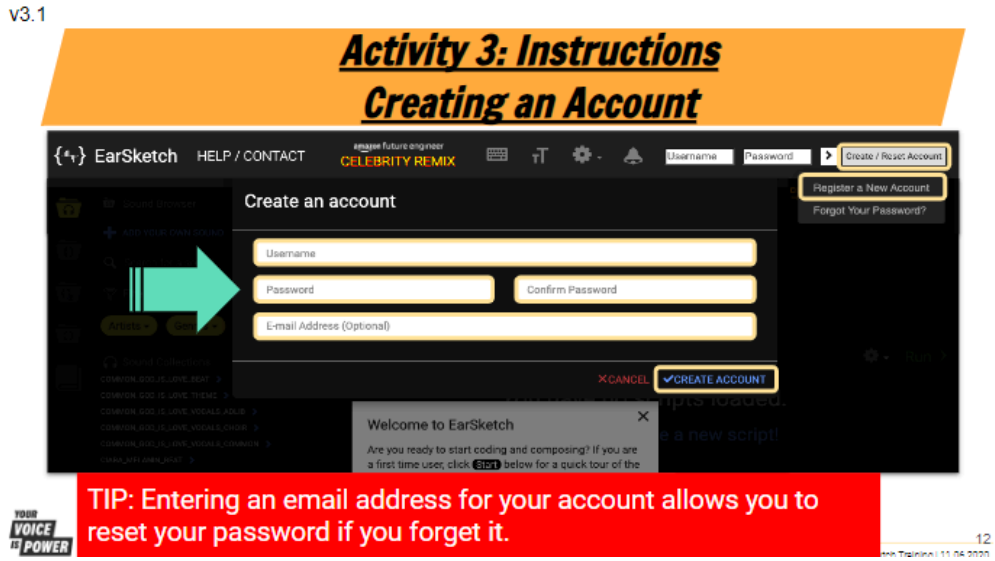


Instructor Dialogue

Let's learn how to create an account in EarSketch

Instructor Cue

Play this short video to show the students how to create an Account in EarSketch
Creating an account and creating a Script in EarSketch



Instructor Cue

If your students do NOT have school email addresses, since not having an email address results in having no way to access your account if you forget your password, consider having all the students use the same "class password" so no-one is locked out of their accounts because they forget a password.

Instructor Dialogue

IF STUDENTS HAVE SCHOOL EMAIL ADDRESSES

When you create the account you have the option to add an email address, use your school email, this will allow you to reset your password and access your account if you ever forget your password.

IF STUDENTS DO NOT HAVE SCHOOL EMAIL ADDRESSES

When you create your account, everybody use the following password <choose a password for the class to use> make sure you use this password because since we are leaving the email address blank we can't reset the password if we forget it.



Instructor Dialogue

> *Follow the directions on the slides or in your **Student Coding Activity Workbook: Module 1 - Activity 3: Create an Account** to create an account in EarSketch. If you already have an account, please login.*

Instructor Cue

> All students should create an EarSketch Account. When you create an account in EarSketch your Scripts (code) is saved automatically.
>
> Have the student complete ***Module 1 - Activity 3: Create an Account*** in their Student Coding Activity Workbook

DO I HAVE TO CREATE AN EARSKETCH ACCOUNT TO USE EARSKETCH? You can use EarSketch without an account, but then your work is not saved when you close the browser or turn off the computer.

DO I HAVE TO ENTER AN EMAIL ADDRESS WHEN I CREATE AN ACCOUNT? Email addresses associated with accounts are used to retrieve passwords. If you have a school email address, use it. If you do not associate an email address with your account and you forget your password you will not be able to reset your password and will be locked out of your account

---

Student Coding Activity: Module 1 - Activity 3: Create an Account

Students should follow the instructions in their Student Coding Activity Workbook

Related Video tutorials:

- Creating an account and creating a Script in EarSketch

Create an account in EarSketch by following the steps below:

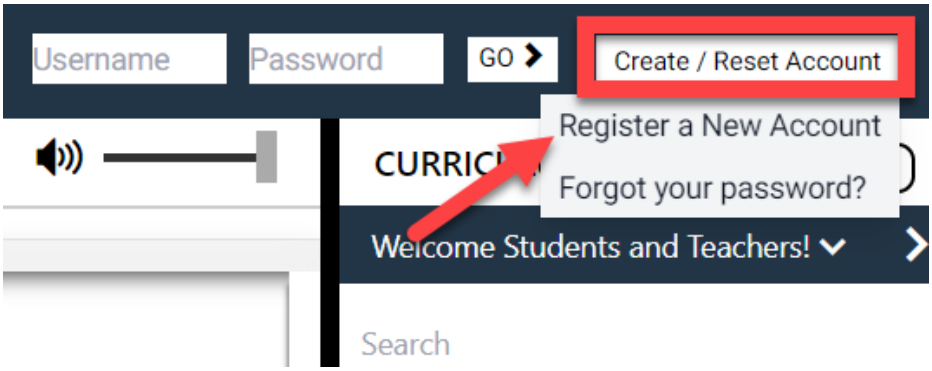
1. Go to the Your Voice is Power website (www.yourvoiceispower.ca) (Use Chrome or Firefox.)
2. On the Homepage, in the top right corner, select the **Start Coding** button.



3. When EarSketch launches, it offers a Quick Tour, Select **Skip**. We'll do that later!



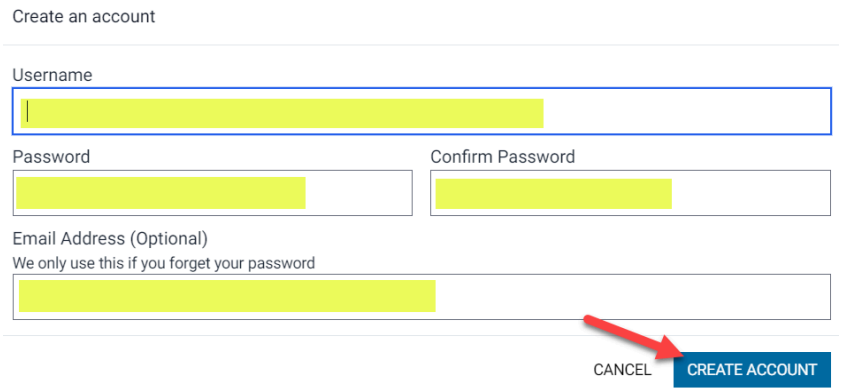
4. In EarSketch, in the top right corner, select **Create/Reset Account.**
5. Select **Register a New Account** from the drop-down menu.



6. Choose a username and password.

   NOTE: You have the option to enter an email address. If you have a school email address, use it. Email addresses are used to retrieve your password if it's forgotten.

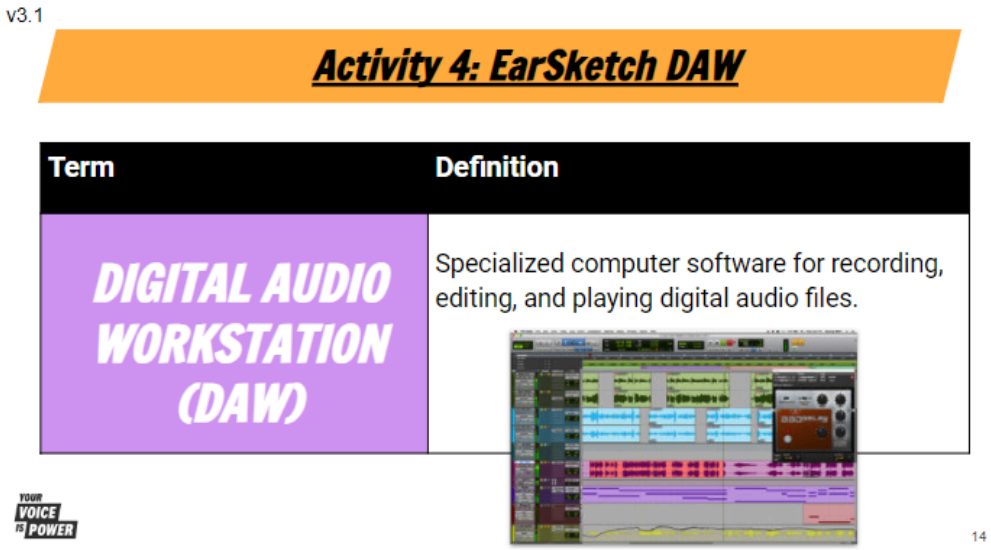
7. Select **CREATE ACCOUNT**.



8. Write down your username and password.

Activity 4: EarSketch DAW (20 minutes)

Slide 14



Instructor Dialogue

You will learn all about the connections between code and music, and as you explore EarSketch, you will learn more.

EarSketch is a Digital Audio Workstation (DAW) with special tools that allow audio clips to be placed on a timeline using code.

A DAW is often the main tool for producing music on a computer. Most recording studios use a DAW.

A DAW is specialized computer software for recording, editing, and playing digital audio files.

Musicians use DAW Pro Tools in their studios. You may have heard of Garage Band or Logic Pro. These are examples of other DAWs.

Instructor Cue

Extension C below provides an optional video called **Producing from Your Laptop** which shows how a top music producer uses a DAW and his laptop to mix and record songs from some of the most popular musical artists.

Quick Tour of the EarSketch DAW

Slide 15



Instructor Dialogue

A laptop is a pretty powerful tool to produce music.

Let's look at the EarSketch DAW and see how you can apply your creativity to be the next great music producer.

Follow the directions on the slides or in your Student Coding Activity Workbook: ***Module 1 - Activity 4: Complete the EarSketch Quick Tour***

Instructor Cue

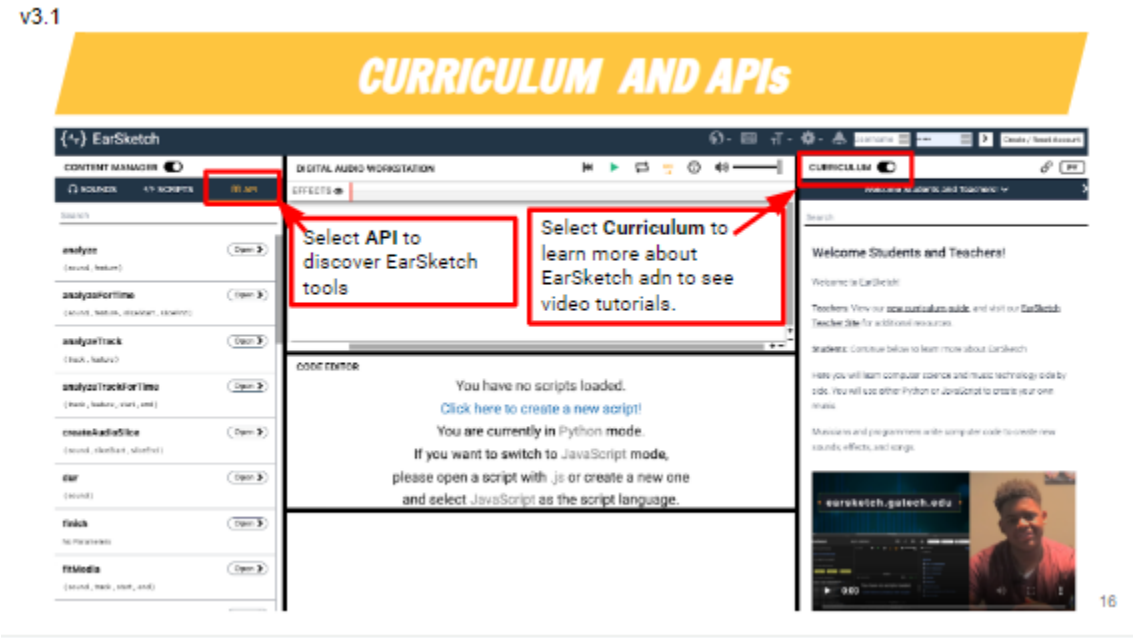
Have the student complete **Module 1 - Activity 4: Complete the EarSketch Quick Tour** in their Student Coding Activity Workbook. Give students 3–4 minutes to go through the Quick Tour.

Students will click through a series of 8 pop-up windows to view the different areas of the EarSketch Workspace.

Ask students if they have any questions about the EarSketch workspace.

If students want to know more about the workspace, you can direct them to the Curriculum tab on the right side of the EarSketch Workspace that has a longer video tour and additional descriptions, by selecting the down arrow and then "Unit 1".

Slide 16



Instructor Dialogue

If you want to learn more about EarSketch, there is additional documentation built into the platform:

- ***API documentation:*** *Select the API open book to view.*
- ***Built-in curriculum****: Select the Curriculum tab on the right of the code editor. The Curriculum tab will open the curriculum where you search by topic to watch videos and tutorials on EarSketch content.*

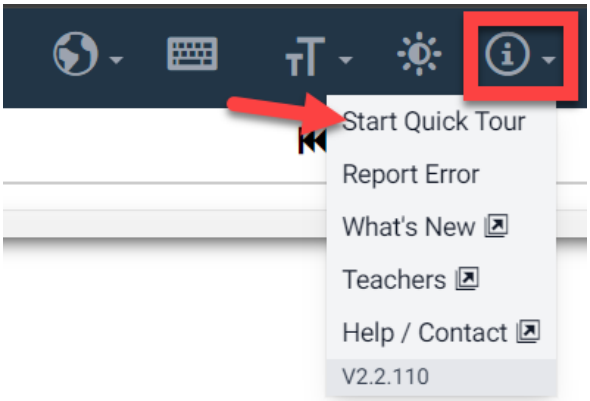
Student Coding Activity: Module 1 - Activity 4: Complete the EarSketch Quick Tour

Students should follow the instructions in their Student Coding Activity Workbook

Related Video tutorials:

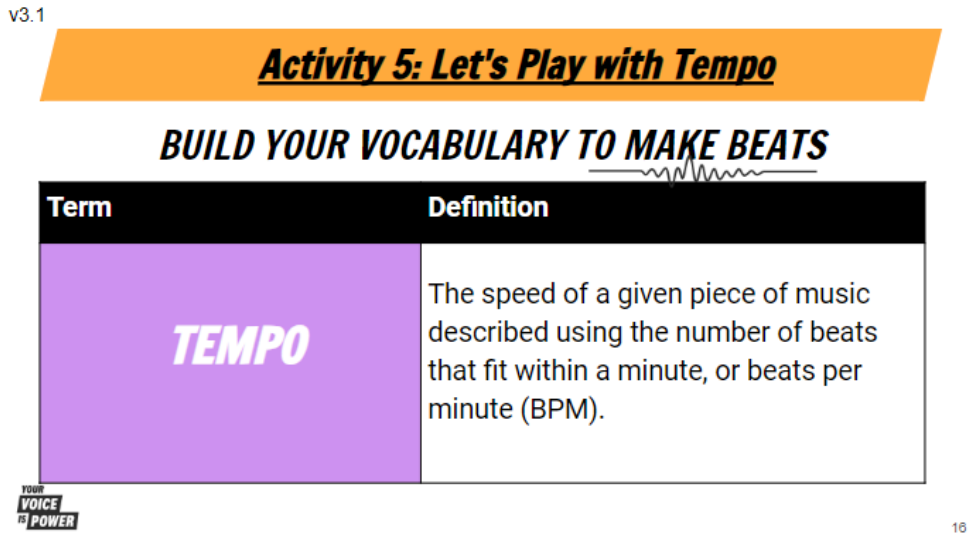
- Getting started with EarSketch and using setTempo()

1. In EarSketch, select the information icon in the top right of your screen (right next to the bell).
2. Select **Start Quick Tour** and follow the instructions to complete the Quick Tour.



Activity 5: Let's Play with Tempo (10 minutes)

Slide 17



Instructor Dialogue

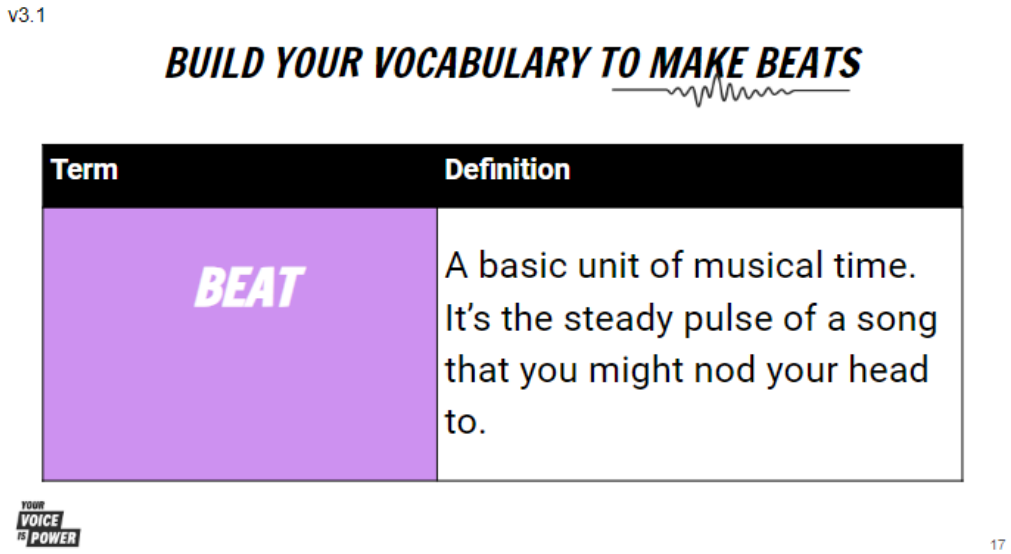
> *While we are here with the script in the Quick Tour, let's do some playing with an important **function** called setTempo()*
>
> *We will experiment with it first; then we'll **briefly** explain what **functions** are and how we will use them throughout Your Voice Is Power! In the next module, we'll dive more deeply*

*into functions. Then, in a later module, you will **write your own function**! That's **real** coding!*

What is *tempo*?

Tempo is the speed of a given piece of music or the number of beats per minute.

Slide 18



Instructor Dialogue

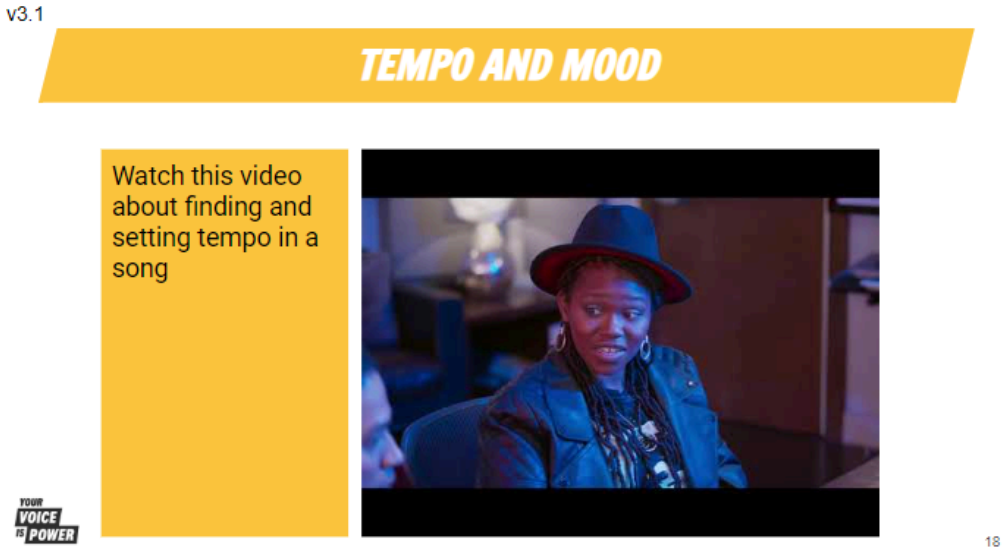
What is a *beat*?

A beat is the basic unit of musical time. Beats give your song rhythm and let you move and dance to the feel of the music! The faster the beat, the higher the tempo! Slower beats have a slower tempo. Beats and tempo determine the mood of a song!

Instructor Cue

Extension D below provides an optional unplugged tempo activity.

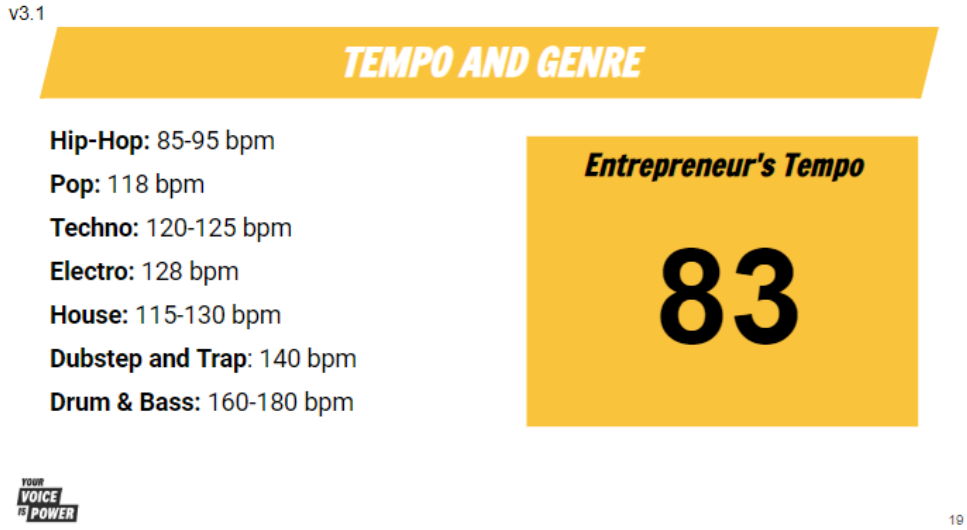
Slide 18



Instructor Cue

Watch the video: [Set Your Own Tempo](#) (0 - 1:20)

Slide 19

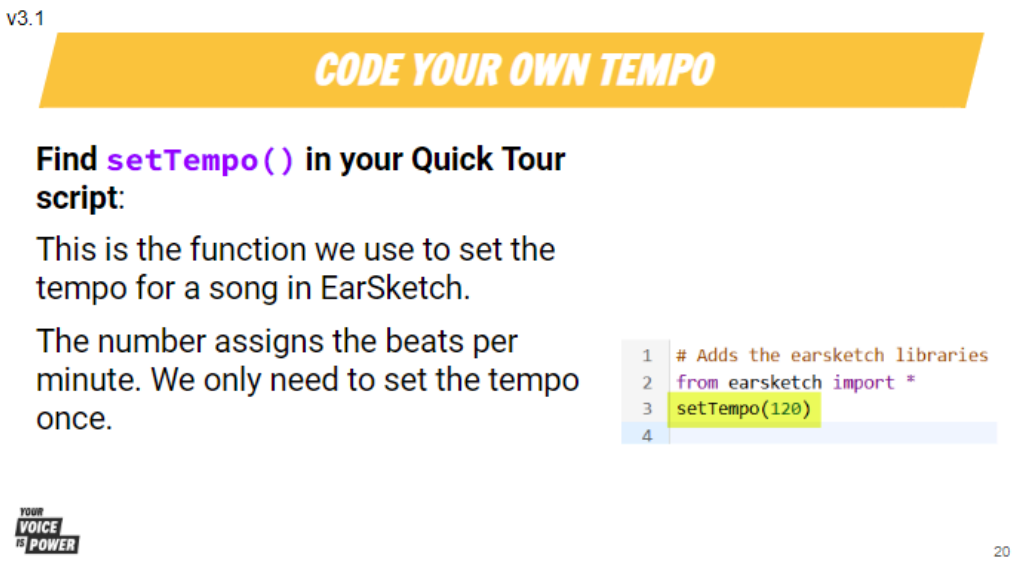


Instructor Dialogue

Different music genres often have different tempo ranges. Here are a few examples.

The song Entrepreneur by Pharrell mentioned in the video has a tempo of 83

Slide 20

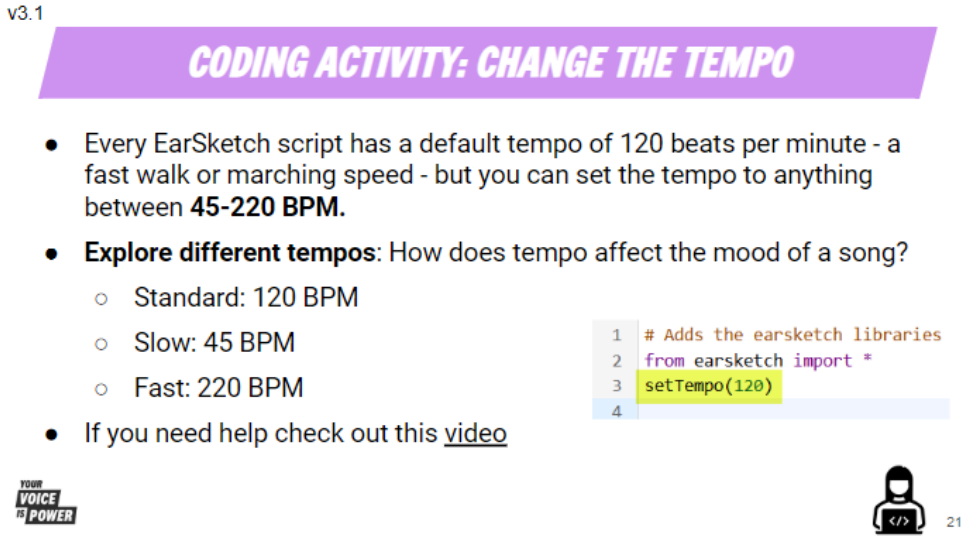


Instructor Dialogue

In your Quick Tour script (**quick_tour.py**) you will see the function setTempo().

setTempo() is an example of a function with a parameter. You will see the number 120 in parentheses after the setTempo() function. This tells the computer the number of beats per minute.

Slide 21



Instructor Dialogue

Every EarSketch script opens with a baseline tempo of 120 beats per minute—a fast walk or marching speed, but you can set a tempo anywhere between 45-220 BPM.

Explore tempo by following the directions in your Student Coding Activity Workbook: ***Module 1 - Activity 5: Let's Play with Tempo***

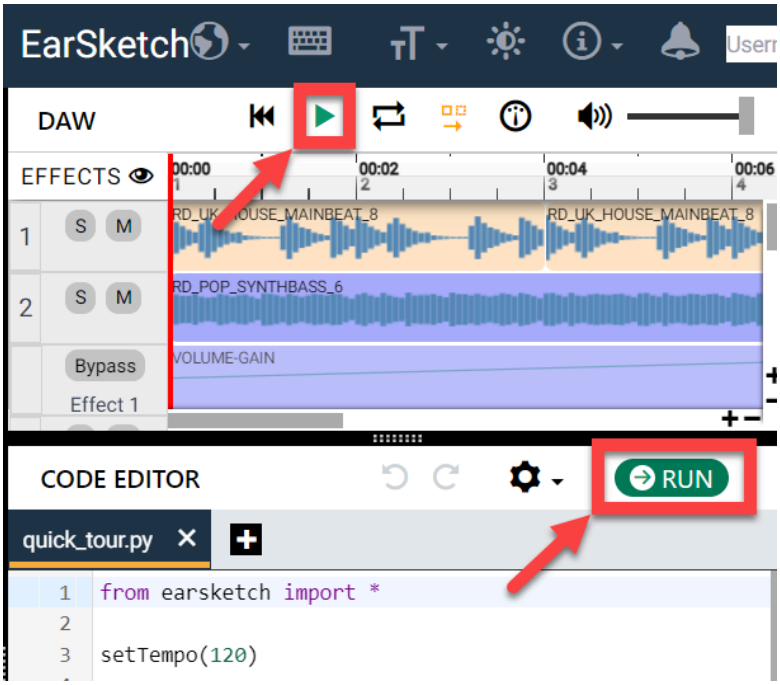
Instructor Cue

Have the student complete **Module 1 - Activity 5: Let's Play with Tempo** in their Student Coding Activity Workbook.

Student Coding Activity: Module 1 - Activity 5: Let's Play with Tempo

Students should follow the instructions in their Student Coding Activity Workbook

Change the tempo of the song:

1. Select Run and Play to listen to the song at 120 BPM.
   - 

2. Lower your tempo: Click or tap inside the `setTempo()` parentheses and set the tempo to 45 BPM.

```
1  from earsketch import *
2
3  setTempo(120)
4
5  # Add Sounds
6  fitMedia( RD_UK_HOUSE_MAINBEAT_8, 1, 1, 5)
```

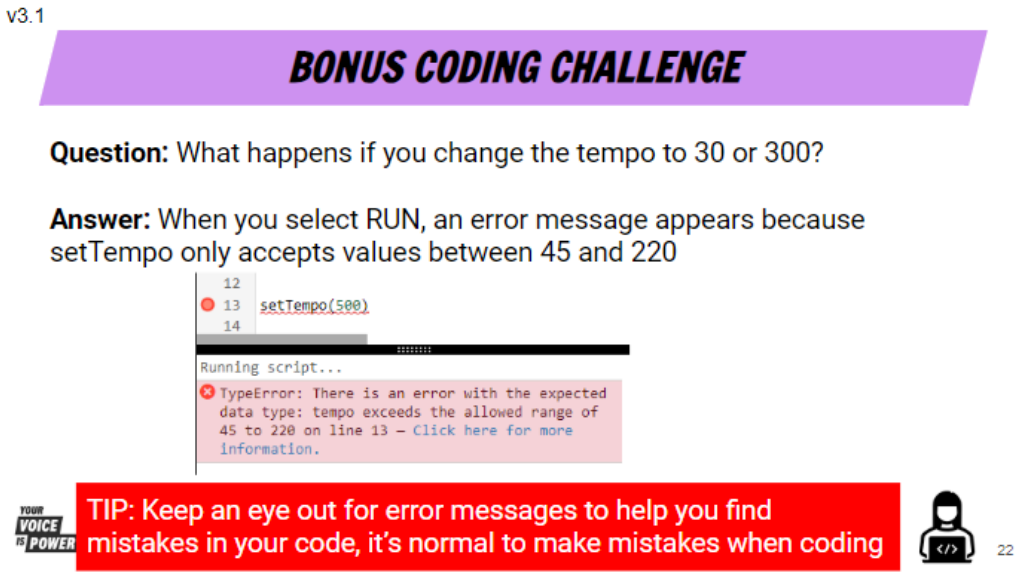
- **Run** and **Play** the song to hear how the song changes.
- How did slowing down the song change the mood? **ANSWER** answers will vary, but generally slower songs can feel sad, faster songs are happier though a very fast song can feel angry.

3. Increase the tempo: Set the tempo to 220 BPM.
   - **Run** and **Play** the song to hear how the song changes.
   - How did speeding up the song change the mood? **ANSWER** answers will vary, but generally slower songs can feel sad, faster songs are happier though a very fast song can feel angry.

Bonus coding challenge

4. Try a tempo number smaller than 45 or bigger than 220.
   - **Run** the code.
   - What happens? **ANSWER:** setTempo only accepts values between 45 and 220. When you try a value outside that range and press RUN to execute your code you see an error message displayed on the bottom of the screen indicating the value you provided is out of range. These error messages try to help coders find mistakes in their code.

Slide 22



Instructor Cue

Modify the tempo in a script to a value under 45 or over 200. Select RUN. You will see an error message on the bottom of the screen, now ask the students what happened.

Instructor Dialogue

What happened when you used a tempo below 45 or above 220?

*When you try a value outside that range and press **RUN** to execute your code you see an error message displayed on the bottom of the screen indicating the value you provided is out of range.*

These error messages try to help coders find mistakes in their code.

setTempo only accepts values between 45 and 220.

3. CONSOLIDATION/REFLECTION

Activity 6: Build Your Vocabulary (5 minutes)

Slide 23 & 24

v3.1

3. CONSOLIDATION / REFLECTION

- Activity 6: Build Your Vocabulary

YOUR VOICE IS POWER

23

v3.1

Activity 6: Build Your Vocabulary

Match the following terms with their definitions in your Student Writing Activity Workbook:

- **DAW**
- **Tempo**
- **Beat**

YOUR VOICE IS POWER



24

Instructor Dialogue

Match the following terms with their definitions in your Student Writing Activity Workbook ***Module 1 - Activity 6: Build your Vocabulary***

Instructor Cue

Have the student complete **Module 1 - Activity 6: Build your Vocabulary** in their Student Writing Activity Workbook

---

Student Writing Activity: Module 1 - Activity 6: Build your Vocabulary

Students should follow the instructions in their Student Writing Activity Workbook

Write the following terms beside the correct definition.

- **DAW**
- **Beat**
- **Tempo**

Term	Definition
Tempo	The speed of a given piece of music (or the number of beats per minute). It determines the mood/feel of a song.
Beat	The basic unit of musical time. Beats give your song rhythm and let you move and dance to the feel of the music! The faster the beat, the higher the tempo! Slower beats have a slower tempo. Beats and tempo determine the mood of a song!
DAW	Specialized computer software for recording, editing, and playing digital audio files

EXTENSIONS

Slide 25

v3.1

MODULE 1 EXTENSIONS (optional)

- A - Why is coding important to the future of the music industry? (15 minutes)
- B - Introduction to coding activity (40 minutes) - slides provided
- C - Producing from your laptop (20 minutes) - slides provided
- D - Optional Large Group Tempo Activity (20 minutes)

25

Extension A: "Why is coding important to the future of the music industry?" (15 minutes)

Slide 26

v3.1

A: WHY IS CODING IMPORTANT TO THE FUTURE OF THE MUSIC INDUSTRY?

Read one or more of the following articles and answer the questions in your Student writing activity notebook.

- Why Every Band Needs a Computer Coder
- Composing Code: Why Musicians Make Great Software Developers
- Composing in Code: Musician-Programmers are Changing the Way Music is Made

YOUR VOICE IS POWER



26

Instructor Dialogue

Read one or more of the following articles and answer the questions in your Student writing activity notebook ***Extension A: Why is coding important to the future of the music industry***

Instructor Cue

Have the students complete **Extension A: Why is coding important to the future of the music industry** in their Student Writing Activity Workbook

---

Student Writing Activity: Extension A: Why is coding important to the future of the music industry

Students should follow the instructions in their Student Writing Activity Workbook

Read one or more of the following articles:

- Why Every Band Needs a Computer Coder
- Composing Code: Why Musicians Make Great Software Developers
- Composing in Code: Musician-Programmers are Changing the Way Music is Made

Answer the questions below and make sure to cite at least one piece of evidence from the articles.

1. Why every band needs a computer coder

Answers will vary Engage in class discussions to share information and get feedback.

2. Composing code: Why Musicians make great software developers

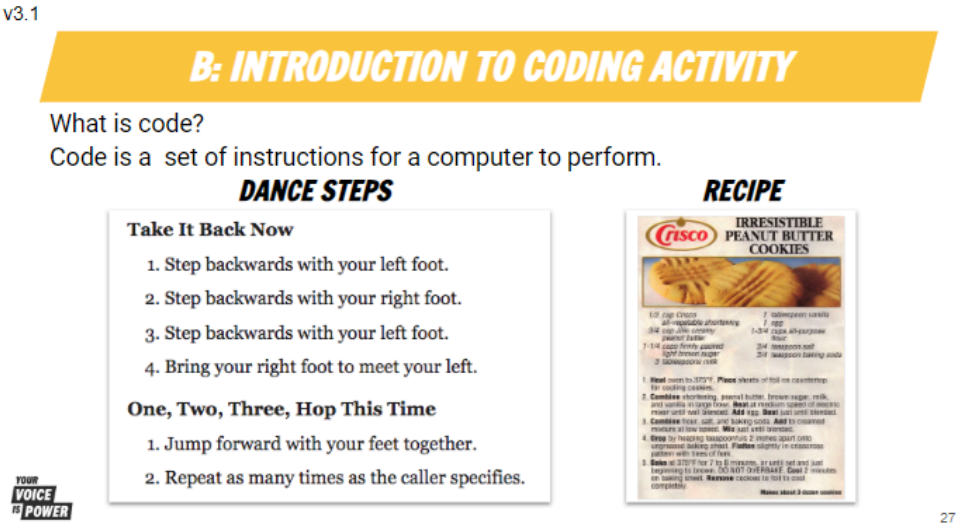
Answers will vary Engage in class discussions to share information and get feedback.

3. Composing in code: Musician-programmers are changing the way music is made

Answers will vary Engage in class discussions to share information and get feedback.

Extension B: Introduction to coding activity (40 minutes)

Slide 27



Instructor Cue

This optional activity introduces students to the basics of coding.

Instructor Dialogue

Wait, have you guys coded before?
Do you know what it means to code?
Maybe you used Scratch or Code.org before and have done some coding. If you haven't, no worries — we are going to start with something I know you do know: dancing!
Is everyone ready to see how learning the steps of a dance is like coding?
Get ready to Cha Cha!

Slide 28



Instructor Cue

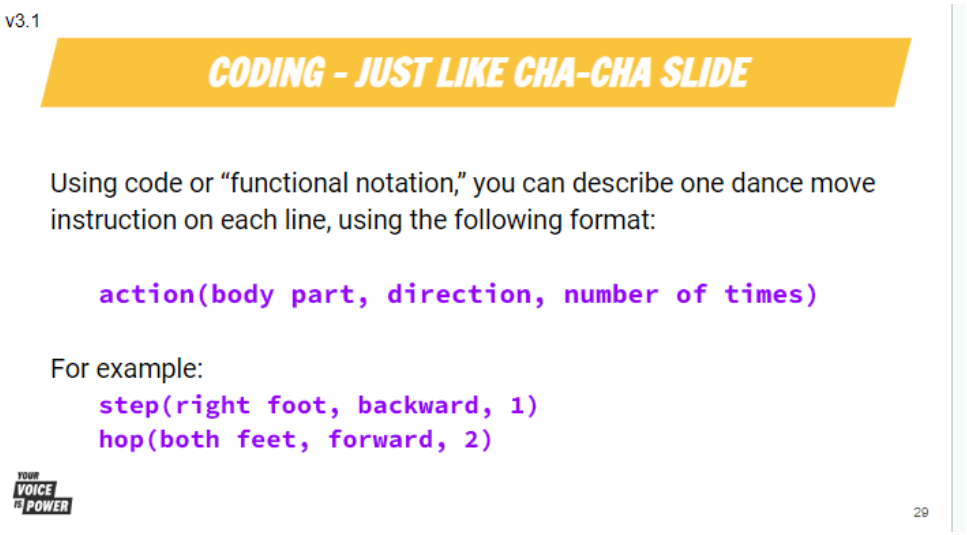
Show video: Cha-Cha Slide (3:39)

Instructor Dialogue

The Cha-Cha slide is just like Code! Code is a set of instructions for a computer to perform, and the Cha-Cha slide is a list of dance moves to perform!
Coding is also just like a recipe!
It's just a set of directions for a computer to follow.

*Or if we use coding vocabulary, the steps of the Cha-Cha slide are an **algorithm**. An **algorithm** is a set of instructions that a computer or person can follow. You use code to write algorithms. Your code is simply instructions in EarSketch that tells the computer how to play music.*

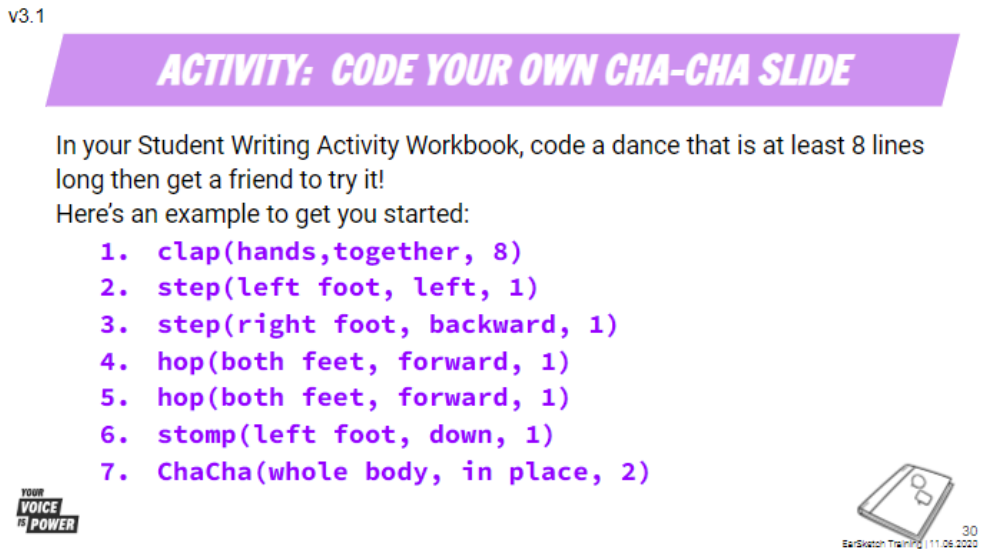
Slide 27 and Slide 28



Instructor Dialogue

We will use code to describe a dance move.

We put one instruction on each line always following the format action(body part, direction, number of times)



Instructor Dialogue

Code a dance that is at least 8 lines long in your Student Writing Activity Workbook ***Extension B: Introduction to coding activity*** *then get a friend to try your dance.*

Instructor Cue

Have the students complete **Extension B: Introduction to coding activity** in their Student Writing Activity Workbook

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Student Writing Activity: Extension B: Introduction to coding activity

Students should follow the instructions in their Student Writing Activity Workbook

Using code or "functional notation," code a dance just like the cha-cha slide.
On the lines below, describe one dance move instruction on each line using the following format:

```
action(body part, direction, number of times)
```

Come up with a dance that is at least 8 lines long. Here's an example to get you started:

Example:

1. clap(hands,together, 8)
2. step(left foot, left, 1)
3. step(right foot, backward, 1)
4. hop(both feet, forward, 1)
5. hop(both feet, forward, 1)
6. stomp(left foot, down, 1)
7. ChaCha(whole body, in place, 2)

When you are done, pass these instructions to a friend and have them follow your algorithm line by line.

Did your algorithm work as expected? If not, can you fix it?

Code Your Dance:

1. **Answers will vary, the goal is for students to learn how to write directions and see how someone else follows the directions. Computers will always follow directions EXACTLY as written that can result in some unexpected surprises.**
2.
3.

4.
5.
6.
7.
8.

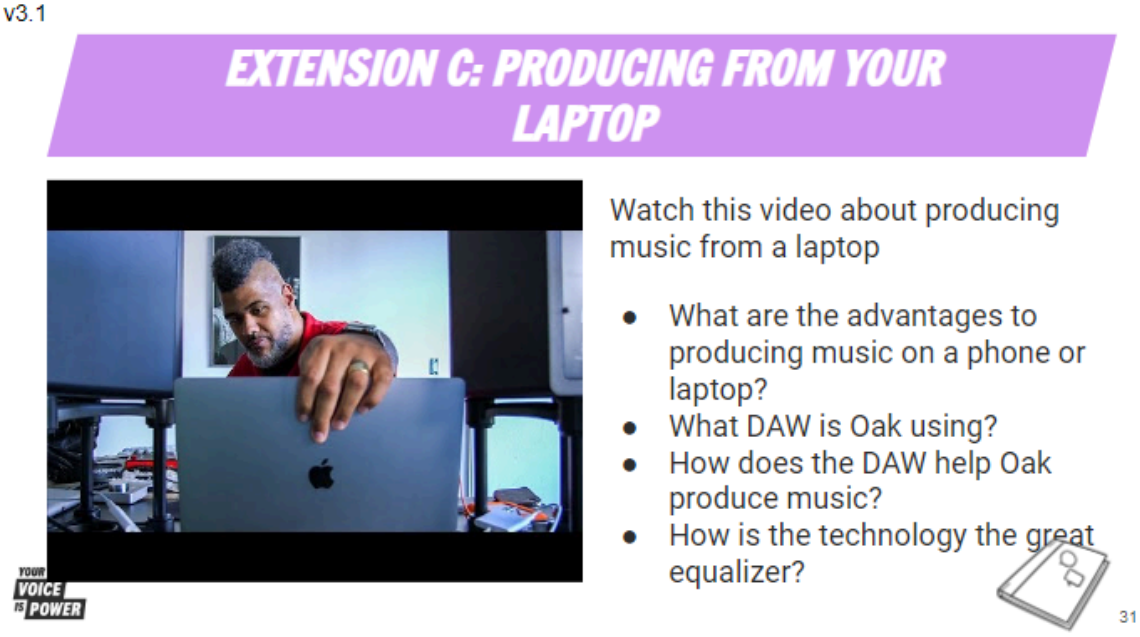
Build Your Vocabulary

Term	Definition
ALGORITHM	A process or set of rules to be carried out by a computer/person. Algorithms can be written with computer code

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Extension C: Producing from Your Laptop (20 minutes)

Slide 31



Instructor Dialogue

Watch the video "Producing from your Laptop" about producing music from a laptop then answer the questions in your Student Writing Activity Workbook ***Extension C: Producing from your laptop***

Instructor Cue

Have the students complete **Extension C: Producing from your laptop** in their Student Writing Activity Workbook

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Student Writing Activity: Extension C: Producing from your laptop

Students should follow the instructions in their Student Writing Activity Workbook

"Check out how a top music producer uses a DAW and his laptop to mix and record songs from some of the most popular musical artists."

Watch the video "Producing from your Laptop", and answer the questions below.

1. What are the advantages to producing music on a phone or laptop?

Answers will vary Engage in class discussions to share information and get feedback.

2. What Digital Audio Workstation (DAW) is Oak using?

Battery

3. How does the DAW help Oak produce music?

Answers will vary Engage in class discussions to share information and get feedback.

4. How is technology the great equalizer?

Answers will vary Engage in class discussions to share information and get feedback.

Extension D: Large Group Tempo Activity (20 minutes)

Part A

1. Find and display a large digital clock that shows the passing of seconds.
2. Have students either nod their head or tap on a surface as each second passes, noticing how fast (or slow) it feels.
3. The speed that seconds pass is exactly **60 Beats per Minute**. (Because there are exactly 60 seconds per every minute that passes)

   We will use this speed as a reference to estimate the tempo in BPM of other songs!

4. Ask students to give you the name and artist of a song they really like.
5. Make a short list of a few songs.

6. For each song:
   a. Locate the radio edits of the song either on YouTube or a streaming service.
   b. Take a first listen to a few seconds of the song and ask students to describe the song in their own words. Here are a few guiding questions:
      i. How does this song feel to you?
      ii. How does it make you want to move?
      iii. What does this song make you think of?
   c. Collect these sentiments in a list under the tempo of the song.

   d. Take a second listen to a few seconds of the song and either nod your head, or tap on a surface to find the **Beat**
   e. Ask students to estimate the tempo of the song using the seconds on a clock as a guide. Here are some guiding questions:
      i. Is the pulse of the song close to the same speed as seconds passing on a clock? **60 BPM**
      ii. Is the pulse faster than the speed that seconds pass on a clock? **Greater than 60 BPM (>60 BPM)**
         1. Are there more than 2 beats between each second? **Greater than 120 BPM**
      iii. Is the pulse slower than the speed that seconds pass on a clock? **Less than 60 BPM (<60 BPM)**

f. Share a few guesses for the BPM of the song based on how much faster (Higher BPM) or slower (Lower BPM) the beat is compared to seconds on a clock.
g. After a few guesses, search the actual BPM and Genre of the song to see how close you were.

RESOURCES

No extra resources.