General Music Creating through Responding Unit
High School Proficient Level
Technology's Impact on Music

A Curriculum Project of
the National Association for Music Education (NAfME)
and the Library of Congress of the United States

Teaching with Primary Sources

National Association for Music Education

LIBRARY OF CONGRESS TEACHING WITH PRIMARY SOURCES Consortium Member

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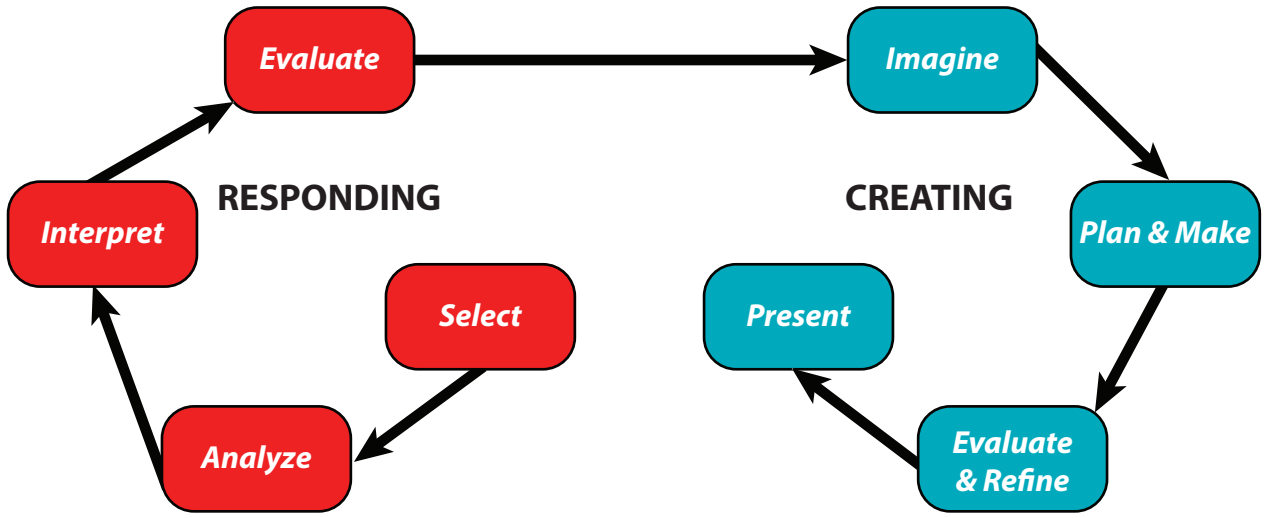
OVERVIEW OF NAfME/LIBRARY OF CONGRESS RESPONDING UNITS

This unit is based on the 2014 National Music Standards (**nafme.org/standards**). These Standards are all about music literacy, since they emphasize conceptual understanding in areas that reflect the actual processes in which musicians engage; they cultivate a student's ability to carry out the three Artistic Processes of Creating, Performing, and Responding while aligning with the ideal of Connecting to their world and the world around them. These are the processes that musicians have followed for generations, even as they connect through music to themselves and their societies.

OVERVIEW OF GENERAL MUSIC CREATING THROUGH RESPONDING UNIT, HIGH SCHOOL PROFICIENT LEVEL

This Library of Congress Teaching with Primary Sources (TPS) Unit is aligned with the Artistic Processes of (1) *Responding*, defined as understanding and evaluating how music conveys meaning, and (2) *Creating*, the application of musical concepts to develop original musical ideas. Through application of inquiry-based instructional strategies linked to essential questions embedded in the Responding (Select, Analyze, Interpret, Evaluate) and Creating (Imagine, Plan and Make, Evaluate and Refine, Present) Process components, students understand how creators manipulate the elements of music to convey expressive intent related to specific contexts (social, cultural, historical). Acquisition of music knowledge and skills leads to students' becoming independent thinkers and creators.



The Responding and Creating Process components are often linear in instruction and student learning, as shown in the diagram above, but need not be; rather, components can be presented in an order appropriate to the integration of specific content and knowledge as determined by each grade level and curricular focus.

Music has been influenced by many technological advances. The ability to perform to a large audience, record, and distribute music has shifted the medium from a performance-based and group activity to a highly-individualized experience in all three processes; creating, performing, and responding.

The lessons in this unit last approximately 35–45 minutes each and covering six to ten class periods can be taught as a whole, supplemented with other technological advances, or taught piece by piece over the course of a longer period.

While this unit focuses mainly on the technological advances themselves, those advances shaped how music was experienced and created, which should remain the focus of the discussion in the music classroom. Possible STEAM cross-curricular applications abound and should be explored as desired.

Lesson	Title	Estimated Duration	Description
1	Pre-electric Amplification	45 min	The origins of amphitheater setups and performance masks
2	Microphone	45 min	Development of the microphone and amplified sound
3	Wax Cylinder	45 min	Development of the wax cylinder and how recorded sound changed music consumption
4	File Sharing	45 min	Instantly downloadable music and the impact on the recording industry
5	Final Project	2 x 45 min	Create a final product discussing each innovation and how it changed music forever
6	Extension: Composition Project	3 x 45 min	Create a final composition using each innovation to demonstrate the technology

PREREQUISITE KNOWLEDGE AND SKILLS FOR THIS UNIT

For students to be successful in this unit, they will need knowledge and experiences in the following areas:

- This curriculum is designed for entry-level high school students, including the ability to read and write, infer, and explore.
- Students understand how music is limited and enhanced by the technology of the time.
- Students have skills to create the final writing project, which could include artistic, speaking/recording, and/or writing skills.
- Students have a basic understanding of sound and music in the world around them. Music vocabulary such as timbre, articulation, and dynamics are a must.
- Basic research skills to access and select relevant information from online sources.

INSTRUCTIONAL GOALS

Using Library of Congress primary source material, students will:

- Discuss multiple sound innovations and infer how they impacted music in earlier times to the present.
- Infer and discuss how one piece of technology has changed how they interact with music.
- Apply and present their understanding in the completion of a culminating activity.

EMBEDDED INQUIRY MODELS

In this unit, students have the opportunity for inquiry—observing, reflecting, and questioning:

- Each of the first four lessons ask students to observe a primary source from the collection from the Library of Congress, reflect on that information, and wonder about further questions they could answer on the topic.
- In the final activity (or activities), students will synthesize their understanding through application of their knowledge.

For more information, visit the Library of Congress website: **http://www.loc.gov/teachers/usingprimarysources/resources/Analyzing_Primary_Sources.pdf**

PROCESS COMPONENT/ENDURING UNDERSTANDING/ ESSENTIAL QUESTIONS/ STUDENT "I CAN" STATEMENTS

The *Responding* Process addressed in this unit is detailed below.

***Select:* Choose music appropriate for a specific purpose or context.**	
Enduring Understanding	Individuals' selection of musical works is influenced by their interests, experiences understandings, and purposes.
Essential Question	How do people choose music to experience?
Performance Standard	**MU:Re7.I.T.Ia—**Cite reasons for choosing music based on the use of the elements of music, digital and electronic aspects, and connections to interest or purpose.
Student "I Can" Statement	I can name and describe the purpose of the technological innovations..

***Analyze:* Analyze how the structure and context of varied musical works inform the repsonse.**	
Enduring Understanding	Response to music is informed by analyzing context (social, cultural, and historical) and how creators and performers manipulate the elements of music.
Essential Question	How does understanding the music help us make decisions about it?
Performance Standard	**MU:Re7.2.T.Ia—**Explain how knowledge of the structure (repetition, similarities, contrasts), technological aspects, and purpose of the music informs the response.
Student "I Can" Statement	I can explain how the elements of music are manipulated by the innovations.

***Interpret:* Support interpretations of musical works that reflect creators'/performers' expressive intent.**	
Enduring Understanding	Through their use of elements and structures of music, creators and performers provide clues to their expressive intent.
Essential Question	How can we tell what the composers and performers mean to say through their music?
Performance Standard	**MU:Re8.1.T.Ia—**Explain and support an interpretation of the expressive intent of musical selections based on treatment of the elements of music, digital and electronic features, and purpose.
Student "I Can" Statement	I can describe the innovators' intent with their innovation. I can explain how the innovators' intent has been altered since creation.

***Evaluate:* Support evaluations of musical works and performances based on analysis, interpretation, and established criteria.**	
Enduring Understanding	The personal evaluation of musical work(s) and performance(s) is informed by analysis, interpretation, and established criteria.
Essential Question	How do we judge the quality of a musical work or performance?
Performance Standard	**MU:Re9.1.T.Ia—**Evaluate music using criteria based on analysis, interpretation, digital and electronic features, and personal interests
Student "I Can" Statement	I can explain why these innovations have been identified as meaningful and quality.

The **Creating** Process addressed in this unit is detailed below.

Imagine: **Generate musical ideas for various purposes and contexts.**	
Enduring Understanding	The creative ideas, concepts, and feelings that influence musicians' work emerge from a variety of sources.
Essential Question	How do musicians generate creative ideas?
Performance Standard	**MU:Cr1.1.T.Ia—**Generate melodic, rhythmic, and harmonic ideas for compositions or improvisations using digital tools.
Student "I Can" Statement	I can generate melodic passages using multiple versions of the same technological advance to show differences

Plan and Make: **Select and develop musical ideas for defined purposes and contexts.**	
Enduring Understanding	Musicians' creative choices are influenced by their expertise, context, and expressive intent.
Essential Question	How do musicians make creative decisions?
Performance Standard	**MU:Cr2.1.T.Ia—**Select melodic, rhythmic, and harmonic ideas to develop into a larger work using digital tools and resources.
Student "I Can" Statement	I can arrange melodic passages together into a cohesive composition using digital software.

Evaluate and Refine: **Evaluate and refine selected musical ideas to create musical work(s) that meet appropriate criteria.**	
Enduring Understanding	Musicians evaluate and refine their work through openness to new ideas, persistence, and application of appropriate criteria.
Essential Question	How do musicians improve the quality of their creative work?
Performance Standard	**MU:Cr3.1.T.Ia—**Drawing on feedback from teachers and peers, develop and implement strategies to improve and refine the technical and expressive aspects of draft compositions and improvisations.
Student "I Can" Statement	I can listen to feedback from peers and teachers to refine my arrangement.

Present: **Share creative musical work that conveys intent, demonstrates craftsmanship, and exhibits originality.**	
Enduring Understanding	Musicians' presentation of creative work is the culmination of a process of creation and communication.
Essential Question	Whenis creative work ready to share?
Performance Standard	**MU:Cr3.2.T.Ia—**Share compositions or improvisations that demonstrate a proficient level of musical and technological craftsmanship as well as the use of digital tools and resources in developing and organizing musical ideas.
Student "I Can" Statement	I can share my arrangement in class or in another public setting.

FORMATIVE AND SUMMATIVE ASSESSMENTS

There are assessments at the end of each lesson for that particular lesson, as well as formative assessment during class discussions.

At the end of the unit, there is a summative assessment on the content of the innovations discussed in the unit. A rubric is provided for student personal reflection and/or teacher evaluation.

MATERIALS AND LIBRARY OF CONGRESS RESOURCE LINKS

Materials needed for the unit include:

- Handouts (embedded in lesson plans)
  - –"How was sound amplified before microphones were invented?"
  - –"The invention of the microphone"
  - –"Capturing Sound: How technology has changed music—microphones excerpt"
  - –"How wax cylinder recordings literally changed music"
  - –"Phonograph and recorded sound" T-chart reflection
  - –"Capturing Sound: How technology has changed music—file sharing excerpt"
  - –"File sharing wonder sheet"
  - –"Music and audio innovations: final written project"
- Internet Access for readings and videos and/or printed copies of the Library of Congress primary sources
- Device with speakers (such as a computer, laptop, or tablet) to access the videos or readings.
- Writing utensil
- Materials for final project, differentiated on student preference (Art supplies, recording software with microphone and headphones, or other suitable materials)

LIBRARY OF CONGRESS LINKS

PRE-ELECTRIC AMPLIFICATION

- Greek Theatre (Photo)
  https://www.loc.gov/item/2018650395/
- Greek Theatre (Photo)
  https://www.loc.gov/item/93505014/

MICROPHONES

- First Microphone, 1877 (Photo)
  https://www.loc.gov/item/berlp0210/
- Who Invented the Microphone? (Article)
  https://www.loc.gov/resource/berl.02010202/
- Capturing Sound: How Technology Has Changed Music
  (VIDEO) **https://www.loc.gov/today/cyberlc/feature_wdesc.php?rec=3825**
  (TEXT) **https://www.loc.gov/today/cyberlc/transcripts/2005/051109katz.txt**
- Emile Berlioner & the Birth of the Recording Industry Collection
  https://www.loc.gov/collections/emile-berliner/about-this-collection/
- Library of Congress Discussion: Emile Berliner & the Birth of the Recording Industry
  (VIDEO) **https://www.loc.gov/today/cyberlc/feature_wdesc.php?rec=5194**
  (TEXT) **https://www.loc.gov/today/cyberlc/transcripts/110517ame1200.txt**
- Emile Berliner Materials or Teachers
  https://www.loc.gov/teachers/classroommaterials/connections/emile-berliner/
- Library of Congress Digital Items Search: "Microphone"
  https://www.loc.gov/collections/emile-berliner/?fa=subject:microphone

PHONOGRAPH/WAX CYLINDER

- Caapturing Sound: How Technology Has Changed Music
  (VIDEO) **https://www.loc.gov/today/cyberlc/feature_wdesc.php?rec=3825**
  (TEXT) **https://www.loc.gov/today/cyberlc/transcripts/2005/051109katz.txt**

FILE SHARING

- Capturing Sound: How Technology Has Changed Music
  (VIDEO) **https://www.loc.gov/today/cyberlc/feature_wdesc.php?rec=3825**
  (TEXT) **https://www.loc.gov/today/cyberlc/transcripts/2005/051109katz.txt**

LESSON 1: PRE-ELECTRIC AMPLIFICATION

"I CAN" STATEMENT

- I can list multiple ways to amplify sound over a large space without electricity.
- I can develop and test my own systems for amplifying sound without electricity.

MATERIALS

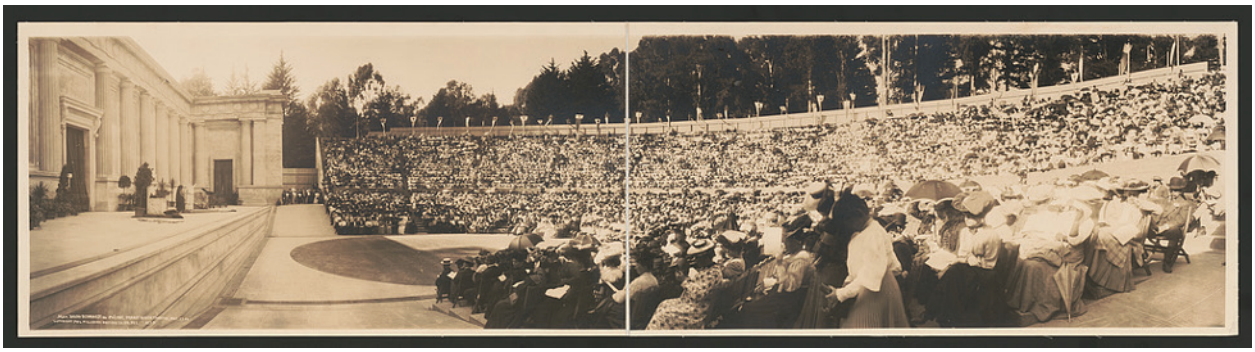
- Copies of "How was sound amplified before microphones were invented?" worksheet
- Writing utensils

PROCEDURES

- In pairs/groups, invite students to complete the "How was sound amplified before microphones were invented?" worksheet
- Compile a class list from all the smaller lists with ways to amplify sound through a space without microphones/amplifiers/electricity.
- Spread out in the classroom or another acoustically sufficient space. Provide individual lines of text from a classic play to each student and have them proclaim the text, amplifying their voice by cupping their hands around their mouth in different shapes.
- Extension idea: have students create amplification masks and test them in different acoustical spaces; auditorium, cafeteria, hallways, outside, in the pool area, in the library, etc., with and without audience members if possible. As students design their masks, allow them to communicate their wonder about how the design will impact their sound projection, then reflect on the results.

HOW WAS SOUND AMPLIFIED BEFORE MICROPHONES WERE INVENTED?

1. Observe the following photos of Greek (and Greek-style) amphitheaters.



Above: Greece. Delphi, the theatre, Temple of Apollo on left. [Photo taken between 1950 and 1960]

Above: Mme. Sarah Bernhardt in Phédre, Hearst Greek Theatre [1906]

What do you notice about each amphitheater?

_____

_____

_____

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_____

2. Observe the following photos of Greek (and Greek-style) performance masks.

Left: Mask dating from the 4th/3rd century BC, located in the Stoa of Attalos, a stoa (covered walkway or portico) in the Agora of Athens, Greece. It was built by and named after King Attalos II of Pergamon.

Above: Roman tragic and comic masks

What do you notice first about each the masks?

_____

3. What are some ways we amplify sound today without using microphones?

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4. How does the ability to hear a performer limit the performance space and costume?

_____

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5. When you want to be louder to be heard over a distance, what do you do to help the listener hear you?

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LESSON 2: MICROPHONES

"I CAN" STATEMENT

- I can discuss the development of the microphone.
- I can name one style of music that could not exist without microphones.
- I can articulate how microphones have changed the musical relationship between listeners and performers.

MATERIALS

- "The invention of the microphone" worksheet
- Access to Wi-Fi and computer to read or copy of transcript text for "Who invented the microphone" **https://www.loc.gov/resource/berl.02010202/**
- "Capturing Sound: How technology has changed music—Microphones Excerpt" worksheet
- Access to Wi-Fi and computer to play video for "Capturing Sound," if desired, "Microphone Recording Extension Activity" sheet, if desired.
- Writing utensil

PROCEDURES

- Have students read "The invention of the microphone?" and observe the photo of the first microphone from 1877 from the Library of Congress archives.
- LOC blog post: **https://www.loc.gov/resource/berl.02010202/**
- After reading, have students observe the microphone picture from the LOC archives on the worksheet and write thoughts.
- Have students use the guided questions to inquire about what changed with the invention of the microphone.
- Have students watch the video "Capturing Sound: How technology has changed music" (or read the transcript) and fill out the corresponding observation worksheet. [13:48 timestamp mark of video]
- Play some examples of crooners, a style of singing mentioned by the video speaker, Dr. Katz. Bing Crosby and Frank Sinatra are typically seen as the most successful of the group but many others exist. Direct students to answer written questions during the listening activity on the "Capturing Sound" worksheet.
- Extension Activity: Have several independent microphones set up at different intervals in an auditorium or large classroom. Record a quiet conversation near one end of the room and compare the recordings to show how the sound travels to each recording device. The activity is designed to show how the intimacy of a recording changes with the distance between the speaker and the microphone.

LESSON 2: THE INVENTION OF THE MICROPHONE

1. What do you immediately notice about the microphone in the picture?

_____

_____

_____

2. What do you wonder about how the invention of the microphone changed the relationship between the listener and the performer?

_____

_____

_____

3. What do you wonder about how the invention of the microphone changed the relationship between the listener and ensembles?

_____

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4. What do you wonder about how the invention of the microphone changed the relationship between the listener and performers in a large, live performance?

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5. What do you wonder about how the microphone itself physically works?

_____

_____

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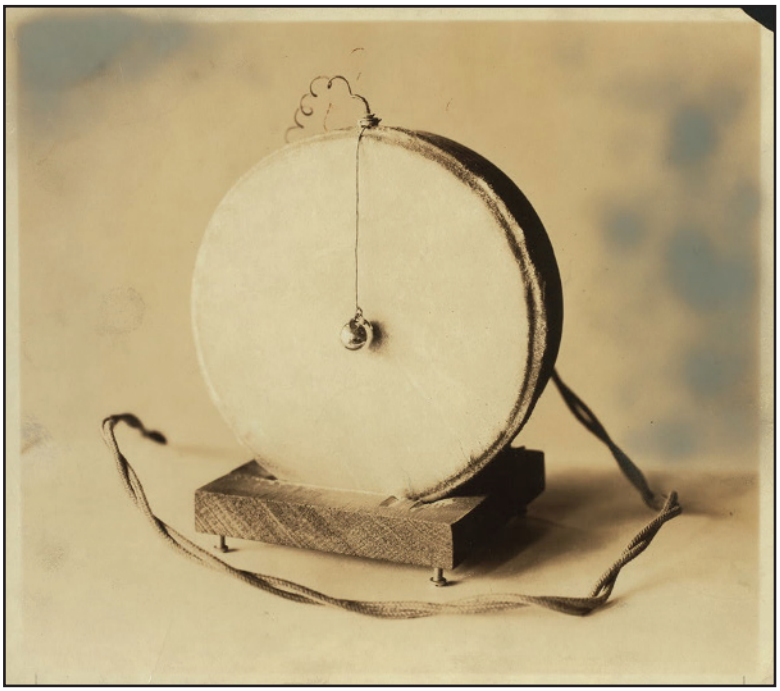

Photo: Microphone of March 4, 1871. Library of Congress

CAPTURING SOUND: HOW TECHNOLOGY HAS CHANGED MUSIC

Microphones Excerpt

Video: **https://www.loc.gov/today/cyberlc/feature_wdesc.php?rec=3825**

In this excerpt from his talk at the Library of Congress, Dr. Mark Katz explains how the invention of the microphone not only transformed recording, but allowed for brand-new styles of singing and performance.

Solitary listening then may be considered a phonograph effect. Now, an example of what might be called a performative phonograph effect is crooning. Crooning, common to popular music of the 1920s to 1950s and we still hear some of it today, was a technique in which a vocalist sang softly and very closely to the microphone to get a smooth mellow sound ...

Now it's important to realize that crooning was really only possible with the electronic amplification of the microphone. For without amplification, it would be expressively flat and nearly inaudible. So crooning was developed in response to a possibility of recording technology not available in acoustic live performance. Interestingly, crooning can also be understood as a response to another distinctive aspect of recording, the separation of performer and listener, in which the musicians are invisible to and physically distant from their audience.

Crooning is akin to whispering, which under normal circumstances, can only be heard when one is physically very close to the person speaking. Crooning thus provides a sense of intimacy between our distant audience, collapsing the technologically imposed distance that would seem to preclude such a relationship.

READING QUESTIONS

1. What one thing did you notice in the reading that stood out to you? Find something small but interesting.

_____

_____

_____

2. What do you wonder about the applications of the microphone outside of music?

_____

_____

_____

CROONER LISTENING ACTIVITY

We are going to listen to examples of crooners, a style of singing mentioned by Dr. Katz in his talk. As you listen, answer the questions below.

1. What do you notice about the crooner performing in this example? Find something small but interesting. List several.

_____

_____

_____

2. What do you notice that you might not have heard earlier, specifically about the amplification?

_____

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3. What questions do you have about crooners or the performance style of crooning?

_____

_____

_____

MICROPHONE RECORDING EXTENSION ACTIVITY

In this activity, we are going to set up several recording devices around the room and record a quiet conversation at different intervals of space.

1. After you listen to the recording from the microphone closest to the conversation, do you feel like you were present during that conversation? What makes you feel that way?

_____

_____

_____

2. As we listen to recordings made further away from the conversation, do you feel the same level of connection with the conversation? Why or why not?

_____

_____

_____

LESSON 3: WAX CYLINDERS AND PHONOGRAPH

"I CAN" STATEMENT

- I can identify one way the phonograph changed how music was consumed.
- I can identify one example of how and why music was changed because of early recording technology.

MATERIALS

- "How wax cylinder recordings changed music" worksheet
- "Phonograph and recorded sound" T-chart worksheet
- Writing utensil

PROCEDURES

- Have students read the "How wax cylinder recordings changed music" worksheet and answer the observation questions.
- Teacher asks students to reflect how frequently they listen to recorded music (whether on the radio, streaming, or at home). Write down some answers on one side of a T-chart individually, in pairs, or in groups.
- On the other side of the T-chart, reflect on the amount of live performances the class hears in person, on television, or on the radio.
- Point out how frequently students interact with music, but note how infrequently it's with live music.
- Brainstorm a list of ways people were able to participate in music before the invention of recordings. Focus on items not mentioned by students on the previous list of what they do now: (performing it themselves, listening to live performances in parlors, going to see big events).
- Once you have a list, come up with a wonder list of what people did before recorded sound in that space. (For instance, what did people do on the commute to work before the radio?)
- Extension Activity: Wonder a list of possible uses for the first recording technology and compare to Edison's list from 1877: **https://www.loc.gov/collections/edison-company-motion-pictures-and-sound-recordings/articles-and-essays/history-of-edison-sound-recordings/history-of-the-cylinder-phonograph/**
- Extension Activity: There are multiple ways out there to DIY a phonograph. You can attach aluminum foil or balloons to a tin can and affix a needle to form a speaker off a thrift store album. If you have a lot of time, you can record your own foil recordings if you build a recorder. Do a web search for "Make Your Own Phonograph" and explore. Here's one we found: **http://www.creative-science.org.uk/RS2phono.html**

HOW WAX CYLINDER RECORDINGS CHANGED MUSIC

Excerpt:

History of the Cylinder Phonograph from The Library of Congress **https://www.loc.gov/collections/edison-company-motion-pictures-and-sound-recordings/articles-and-essays/history-of-edison-sound-recordings/history-of-the-cylinder-phonograph/**

Standard-sized cylinders [in the 1890s], which tended to be 4.25" long and 2.1875" in diameter, were 50 cents each and typically played at 120 rpms [revolutions per minute]. A variety of selections were featured on the cylinders, including marches, sentimental ballads, minstrel dialect songs, hymns, comic monologues and descriptive specialties, which offered sound reenactments of events.

The early cylinders had two significant problems. The first was the short length of the cylinders, only 2 minutes. This necessarily narrowed the field of what could be recorded. The second problem was that no mass method of duplicating cylinders existed. Most often, performers had to repeat their performances when recording in order to amass a quantity of cylinders. This was not only time-consuming, but costly.

A process for mass-producing duplicate wax cylinders was put into effect in 1901. The cylinders were molded, rather than engraved by a stylus, and a harder wax was used. Sub-masters were created from the gold master, and the cylinders were made from these molds. From a single mold, 120 to 150 cylinders could be produced every day. By mid-1904, the savings in mass duplication was reflected in the price for cylinders which had been lowered to 35 cents each. Beveled ends were made on the cylinders to accommodate titles.

In terms of playing time, the 2-minute wax cylinder could not compete well against competitors' discs, which could offer up to four minutes. In response, the Amberol Record was presented in November 1908, which had finer grooves than the two-minute cylinders, and thus, could last as long as 4 minutes.

Capturing Sound: How technology has changed music

Video: **https://www.loc.gov/today/cyberlc/feature_wdesc.php?rec=3825**

Transcript: **https://www.loc.gov/today/cyberlc/transcripts/2005/051109katz.txt**

People have long suspected that the violinist Fritz Kreisler [1875–1962] who composed a lot of little violin showpieces was writing for the phonograph. In the Fritz Kreisler collection, I discovered something very interesting: In the manuscript of his work "Caprice Viennois," he had scratched out a whole section of the piece, the portion that caused the work to go over the four-minute mark. When he realized that the music wouldn't fit on one side of a cylinder, or he would have put the remainder on another side, he shortened it.

HOW WAX CYLINDER RECORDINGS CHANGED MUSIC

1. Throughout the history of recorded music, there have been limitations set by the recording device, the playback device, and other factors. What is one way described in the reading that music was altered on wax cylinders?

_____

_____

_____

2. What is one thing about wax cylinders that you read that you didn't expect? Be specific in your observation.

_____

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_____

3. Can you think of a more recent time music has been constrained by the method of recording or playback?

_____

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_____

4. What is one wonder you still have about wax cylinders you'd like to investigate further?

_____

_____

_____

PHONOGRAPHS AND RECORDED SOUND: REFLECTION

1. Where do you listen to recorded music? Make a list on the left side of the T-chart.

2. Where do you listen to live music? Make a list on the right side of the T-chart.

Recorded Music	Live Music

3. Using not just the number of different ways, but amount of time, which side do you spend more time on: recorded music or live music?

_____

_____

_____

4. Rewrite your list, mentioning only the things that you use recorded music for that they weren't able to use before recorded music. What did people do during those times that you're now listening to music? For instance, what did people do on their commute to school/work before popping in their earbuds to listen to music?

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_____

5. What do you wonder about the creation of the wax cylinder? Where or how can you answer this?

_____

_____

_____

6. What do you wonder about the evolution of recorded music from the wax cylinder to streaming music today? Where or how can you answer this?

_____

_____

_____

LESSON 4: FILE SHARING

"I CAN" STATEMENT

- I can discuss in detail how file sharing and digital music fundamentally changed the music industry in the late 1990s and 2000s.
- I can discuss issues of copyright in digitally distributed works and both positive and negative impacts caused by file sharing.

MATERIALS

- Access to Wi-Fi and computer to play video or copy of transcript text for "Capturing Sound: File sharing"
- "Capturing Sound: File Sharing" worksheet
- Writing utensil

PROCEDURES

- Have students watch the video clip or read the transcript of the excerpt from "Capturing Sound: How technology has changed music," and fill out the corresponding worksheet. (20:30 timestamp mark)
- Hand out the "File Sharing: Brainstorm" handout. Students will brainstorm what happened before the internet and streaming music and project the benefits and downfalls of an abundance of streaming music.
- In pairs/groups/as a class, construct a list of the possible benefits and downfalls of file sharing (and streaming music) to the music industry and musicians.
- Re-examine the positive and negative impact lists from the brainstorm session and add (and maybe subtract) ideas.
- Students complete individual reflections on file sharing and streaming services and how they have impacted the music industry. Share out as a group if desired.
- Further learning is available discussing streaming services such as YouTube and Spotify. While artists are typically being paid for plays here, it's often not much money in comparison to what they were making before digital music. Taylor Swift, Adele, Jay-Z, Beyonce, and a host of artists have tried changing the dynamic in recent years to varying levels of success.

"CAPTURING SOUND: HOW TECHNOLOGY HAS CHANGED MUSIC"

File Sharing

Video: **https://www.loc.gov/today/cyberlc/feature_wdesc.php?rec=3825**

1. What did you notice from Dr. Katz's experience about music and file sharing in the mid-2000s from this excerpt?

_____

_____

_____

2. How did Dr. Katz's story of finding and downloading the Violent Femmes song relate to your experience? How is it similar? How is it different?

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3. Dr. Katz describes MP3s as "intangible." What does he mean by that, per his explanation?

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4. What are the "two broad consequences" of file sharing to listeners?

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5. What do several respondents to Dr. Katz's survey say about file sharing in relation to CD buying?

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_____

6. What do you wonder about the impact of file sharing on the music community?

_____

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_____

REFLECTION

1. How is file sharing different than streaming using services we use today like Spotify or YouTube? You can list multiple ways.

_____

_____

_____

2. Is file sharing and the ability to download countless copies of free music good or bad for the music industry? Use supporting information from Dr. Katz's talk and your own knowledge and answer in complete sentences.

_____

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3. Before the proliferation of the internet and streaming music, how do you think people obtained the music in order to listen?

_____

_____

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4. If a person heard a song they liked but didn't know who performed it or the name of the song, how might they find it?

_____

_____

_____

5. Do writers, performers, producers, and the rest of the people who have a hand in making a song deserve to be paid for their work? Why or why not?

_____

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_____

6. In what ways does access to a huge variety of free music positively benefit the music industry as a whole?

_____

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7. In what ways does access to a huge variety of free music negatively impact the music industry as a whole?

_____

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_____

8. What wonders do you have about file sharing and the impact it had and continues to have?

_____

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_____

File Sharing

Transcript, via Library of Congress

So I'm driving down the road when a song on the radio catches my ear. It has a descending tetrachord in it and I collect descending tetra chords. Descending tetrachord is by the way a repeated descended four note phrase, and don't ask me why I collect them.

I fumble around for a pen to make note of the song. I can't find one and take out my cell phone and call home. I then have the following slightly surreal conversation with my voice mail. "Hi, Mark, it's Mark. Okay, descending tetrachord, pretty sure it's a Violent Femmes song. The lyrics go, beautiful girl, love the dress. Got that? Okay, see you soon."

When I get home to my computer, I Google the phrase, "beautiful girl, love the dress," and the word "lyrics."

The resulting list of websites points me to some of the many lyrics databases that populate the Internet. All of them tell me what I heard was a 1983 song called "Gone, Daddy Gone" by as I suspected, the Violent Femmes. Next, I open up a program that helps me find the song on the Internet. This program searches through the computers of a few million people who have allowed others access to their digitized music collections. On this occasion, I get a list of a few dozen different computer users who have all have the song on their hard drives.

So with the double click of the mouse, I start copying "Gone, Daddy Gone," and a few minutes later I'm listening to the song. So here's a little bit of what I heard. I'll point out the descending tetrachord. [Violent Femmes music]

To my mind, this qualifies as magic. Not so much the song, which I happen to like, but the fact that I was more or less able to conjure it out of thin air. And this example is just one of many millions playing out daily across the globe. One that represents a revolution in the way music is disseminated and experienced. It is a revolution that allows nearly instant music gratification, one in which wishing virtually makes it so. But as I hope to show, the effect of this revolution, fomented by the phenomenon known as file sharing, is much more far reaching than that.

For the benefit of those unfamiliar with file sharing, let me briefly explain. It is a means of distributing digital files through networks of computers whose users have allowed others to download, that is copy, material from their hard drives. These networks are typically what are called peer-to-peer networks, abbreviated P2P, because each member of the network or peer may connect directly to each other rather than going through a central computer or server. Napster was the most famous example of a file-sharing network. And like its many successors, allowed millions of people to download files from one another.

Files of any type may be copied, but I will be talking about sound files. The most popular sound file format at the moment is MP3. And although others are in use, I'll use the term MP3 generically.

Now, as many of you know, much ink, if not yet blood, has been spilled in the debates over the ethics and legality of file sharing because millions of files are being zapped across the ether in violation of copyright, and a messy battle between the record industry and file sharers has ensued. In fact, if you read the newspapers yesterday or the day before, you see that Grokster, one of the main file sharing companies, had to shut down after the recent Supreme Court case. But rather less attention has been paid to the effect of file sharing on listeners. In fact, file sharing has had a profound influence on the ways in which tens of millions of listeners around the globe access and experience music.

My purpose in this part of the talk is to explore how listeners are integrating file sharing into their musical lives and how it has become for many a tool for living. First however, we must understand what is distinctive about MP3s and file sharing and how they differ from earlier sound reproduction technologies. There are many ways to consider the distinctive attributes of MP3 sound files, but I would suggest the most significant is that MP3s and the like for practical purposes, intangible.

MP3s are not subject to the physical control exerted over traditional recorded media. They cannot be bar-coded, price tagged, shrink wrapped, or sequestered on shelves or behind cases. To download a MP3, whether legally through a paid service or illegally over a P2P network, is not like buying a CD. For downloading involves making a copy of a file. Not moving it from one place to another.

Digital music files are also dramatically more portable than their more tangible kin. Depending on the speed of one's Internet connection, a three-minute pop song can be downloaded from anywhere in the world in a matter of seconds.

The nature of digital music files and P2P networking also affects cost. Millions are available free through file sharing. And even when paid for, they typically cost less than a dollar at the pay sites such as Apple's music store.

So digital music files, intangible, reproducible, portable, and cheap, are clearly different from traditional recording media. How did these differences then, affect the listening habits of users? I would like to explore two broad consequences, the first connected to the increased access to music that file sharing allows; the second concerns the rise of Internet music communities, specifically through what are known as MP3 blogs.

The clearest change that file sharing introduces is the possibility of an unprecedented and unparalleled access to music. This new accessibility may be understood in term of speed, ease, and breadth. The first two traits, speed and ease, maybe seen in the example that opened this paper. Or I should say this section of your paper. I hear a bit of an unidentified song in my car, a few minutes after I get home, I'm listening to it. File sharing not only makes it possible to find particular pieces quickly and easily, it also allows users to explore unfamiliar territory. If one can imagine a particular type of music, it probably exists.

If it exists, there is a good chance it could be found on the Internet. Now I should note that access varies according to style and genre. The music of rapper Jay-Z is very easy to find. The music of Alexander Zemlinsky, who I'm tempted to call "AZ" is not.

Another aspect of the accessibility of file sharing allows is the flexibility to customize one's musical experience. An oft-repeated complaint from fans of popular music is that albums seldom have more than two or three tracks that they want to listen to. Many feel that they're forced to buy entire albums for want of a single song.

Contributors to P2P bulletin boards and respondents to my surveys tout file sharing as a way to avoid the all or nothing dilemma of CD buying. They, not the artist, producer, or record company, pick out the music and only the music that they want to hear. Though satisfaction with the album format obviously preceded the advent of MP3s, file sharing reinforces what might we called singles listening.

When listeners get to know an album intimately, the end of one song of an album strongly raises the expectation of the next. For better or for worse, downloaders often miss out on the gestalt of the commercially produced album. Yet, they can decide how to group songs based on their own criteria. And these personalized compilations can generate in turn their own gestalt. MP3s, so easily moved and manipulated, allow listeners greater control over their musical experience or in the case of the shuffle feature, the paradoxical freedom to give up control as they please.

In addition to expanding one's access to and control over recorded music, file sharing has also helped bring listeners together. One of the fascinating manifestations of this phenomenon is the rise of proliferation of Internet communities whose focus is the sharing of MP3 music files. There might seem to be nothing more solitary and unsociable, if not antisocial, than sitting in front of a computer downloading music. Yet, across the globe in groups small and large, people are coming together in cyberspace because of common musical tastes and interests These are communities but certainly not in the traditional sense. Internet listening communities do not congregate in a shared physical space and their interactions are largely textural and asynchronous.

In such communities, age, class, gender and race, may be ignored or disguised allowing new hierarchies to arise and a freedom of interaction unlikely in any other way. In the last year or so, a new type of Internet musical community has flourished the MP3 blog. And I'd like to discuss the phenomenon and discuss some of the interesting questions that it raises. Blog, as many of you may well know, is short for Web log and is an Internet site typically run by a single person or small group that variously serves as a diary, scrap book, soap box, or op-ed page.

LESSON 5: CULMINATING ACTIVITY

"I CAN" STATEMENT

- I can discuss multiple sound innovations and how they impacted music.
- I can discuss how one recent piece of technology has changed how I create music.

PROCEDURES

From the list below, student chooses one final written project to demonstrate their knowledge of all four musical audio innovations from the unit:

- Create a series of billboards advertising your product to the public.
- Create a series of informational brochures advertising your product to the public.
- Create diary entries in the voice of the first person to realize how much of an impact each of these products will have in the future.
- Create a radio broadcast/podcast interviewing the creator of each product explaining how it's going to change the way people interact with audio.
- Write a letter to the creator of each innovation, explaining how it's personally impacted you with a specific example.

While the form of the project can be varied, content must be demonstrative of the learning that has taken place during the unit. See attached rubric.

MUSIC AND AUDIO INNOVATIONS

FINAL WRITTEN PROJECT

Name _____ Class _____

Directions: Choose one of the following final projects (or discuss an alternative assignment with the teacher) that demonstrates your knowledge of the multiple audio innovations we have discussed.

1. Create a series of billboards advertising each of your products to the public.
2. Create a series of informational brochures advertising each of your products to the public.
3. Create diary entries in the voice of the first person to realize how much of an impact each of these products will have in the future.
4. Create a radio broadcast/podcast interviewing the creator of each product explaining how it's going to change the way people interact with audio.
5. Write a letter to the creator of each innovation, explaining how it's personally impacted you with a specific example.

Essentials: For each of the topics, name the innovation, explain when and how it was developed, and share the uses for the new innovation beyond the limits that existed previously. Explain how at least one of these innovations has personally altered your life, and in what way.

- Pre-electric amplification
- Microphone
- Wax cylinder/phonograph
- File sharing

Absent	Developing	Meeting	Exceeding
Student does not discuss all of the musical innovations. Student does not include years of innovations. Student does not give background on how music creating, performing, and responding were changed by each innovation. Student does not share personal examples of how these innovations have changed how they interact with music.	Student discusses the musical innovations, explains in what year(s) and provides basic background on how music creating, performing, and responding were changed by this innovation. Student shares multiple ways their life has been altered by each innovation, providing specific examples.	Student lists each innovation, explains in what year(s) it was developed, and informs how music creating, performing, and responding were changed by this innovation. Student shares one way their life has been altered by each innovation, providing specific examples.	Student lists each innovation, explains in detail what year(s) it was developed, and informs how music creating, performing, and responding were profoundly changed by this innovation. Student shares multiple ways their life has been altered by each innovation, providing specific examples.

EXTENSION LESSON 6: CULMINATING MUSIC CREATING ACTIVITY

"I CAN" STATEMENT

- I can create a musical idea using several different technological innovations.
- I can arrange a piece that highlights multiple technological innovations.

PROCEDURES

- Depending on the type of ensemble or class you are teaching, choose a passage your students can record on their own. It can be a passage with inter-related parts, such as a choral work with multiple past, or just a collection of related but separate ostinatos, or anything in between.
- Hand out the "Music Technology Composition Project" handout.
- Allow students time and technology to record three versions of their solo passage/ostinato using three different microphones in three different performance spaces. It is very important that students audibly count themselves in an use a silent metronome. The passages must all have the same tempo so they can be layered later. The count-in at the beginning allows for faster lining up.
- Have students rename the files how you choose, with their name, performance space, and microphone (if you wish) and then upload them to a folder or drive everyone in the class can see.
- Allow time for students to explore the other recordings, especially if each person recorded their own ostinato instead of an assigned passage.
- Direct students to arrange multiple layers of student ostinatos or passage lines to form a new arrangement. Students should play with how the performance space and microphone alter the tone color of the instrument/voice.
- When students have completed a rough draft, present the work to the entire class and allow written or verbal comments to the arranger.
- Give time for refinement of the original piece and a presentation of a finalized product in a public setting.

MUSIC AUDIO AND INNOVATIONS
FINAL COMPOSITION PROJECT

We've been studying different technological innovations regarding music; pre-electronic amplification, microphones, wax cylinder recording, and file sharing. Our culminating composition project will include aspects from all four innovations while you create a brand-new musical composition with your classmates.

PART 1—RECORDING

Your teacher will provide you with a short musical passage or ostinato to play/sing/speak. It's your job to record this passage using a few different variables from our unit:

- Make a recording in three different performance spaces to explore how that can alter the sound.
- Make those recordings using three different microphones to explore how that can alter the sound.
- (If you're looking for extra insight, record using all three microphones in all three spaces to create nine recordings.)
- Upload your musical passages to a joint folder/drive that every student in the class can access the files (but not modify them). Include in the file name information on your name, the microphone, and the performance space.

It's essential that you record using a silent metronome. Audibly count yourself in, giving one full measure of beats before you begin and *keep the count-in in your recording*. This will allow easier alignment in the later portion of the assignment.

PART 2—ARRANGING

Using simple sound editing software like Audacity or a Digital Audio Workstation, layer together a minimum of four passages/ostinatos to complete an entire work. Between you and your classmates, you will have a wide variety of recordings to choose from with variable timbres, performance spaces, and microphones (and possibly different pitches, lyrics, and multiple other variable depending on your teacher's directions). Line up the count-in at the beginning of the passages and that should align the beats in your performance if everyone used the silent metronome. Once every track is aligned, you can edit out the count-ins.

PART 3—PRESENT

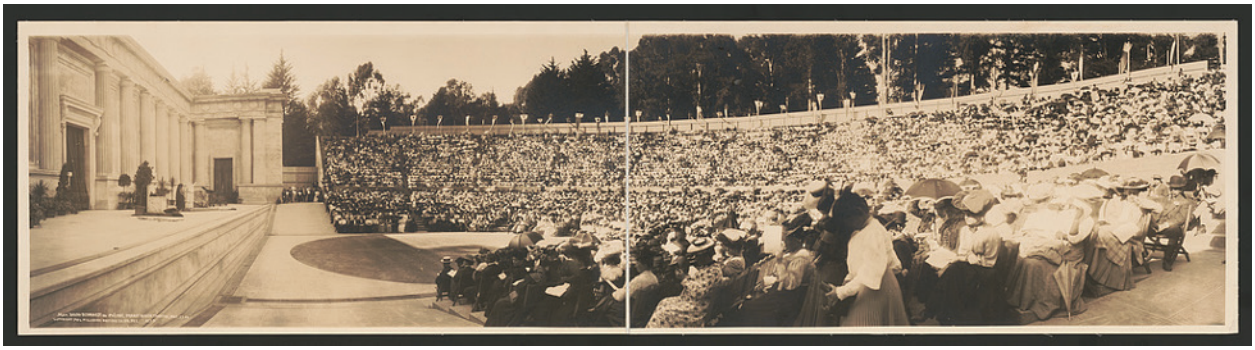
Present the arrangements to the class. Gather feedback. Refine your work. Publish it or present it to the class again.

Handouts

Beginning on the next page, all the handouts from the unit are collected and placed in order for ease of use.

HOW WAS SOUND AMPLIFIED BEFORE MICROPHONES WERE INVENTED?

1. Observe the following photos of Greek (and Greek-style) amphitheaters.



Above: Greece. Delphi, the theatre, Temple of Apollo on left. [Photo taken between 1950 and 1960]

Above: Mme. Sarah Bernhardt in Phédre,
Hearst Greek Theatre [1906]

What do you notice about each amphitheater?

_____

_____

_____

_____

_____

2. Observe the following photos of Greek (and Greek-style) performance masks.

Left: Mask dating from the 4th/3rd century BC, located in the Stoa of Attalos, a stoa (covered walkway or portico) in the Agora of Athens, Greece. It was built by and named after King Attalos II of Pergamon.

Above: Roman tragic and comic masks

What do you notice first about each the masks?

_____

3. What are some ways we amplify sound today without using microphones?

_____

_____

4. How does the ability to hear a performer limit the performance space and costume?

_____

_____

5. When you want to be louder to be heard over a distance, what do you do to help the listener hear you?

_____

_____

THE INVENTION OF THE MICROPHONE

Reading: **https://www.loc.gov/resource/berl.02010202/**

1. What do you immediately notice about the microphone in the picture?

_____

_____

_____

2. What do you wonder about how the invention of the microphone changed the relationship between the listener and the performer?

_____

_____

_____

3. What do you wonder about how the invention of the microphone changed the relationship between the listener and ensembles?

_____

_____

_____

4. What do you wonder about how the invention of the microphone changed the relationship between the listener and performers in a large, live performance?

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5. What do you wonder about how the microphone itself physically works?

_____

_____

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_____

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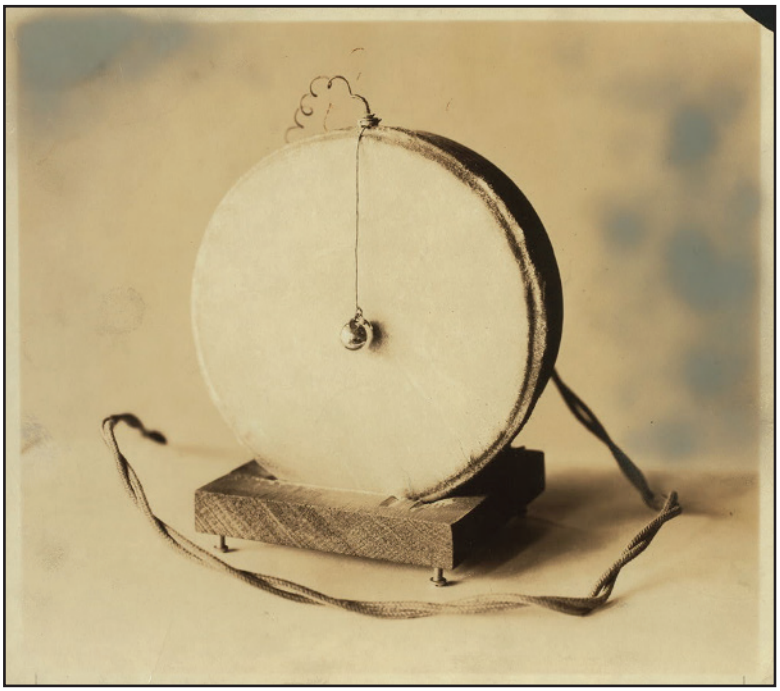

Photo: Microphone of March 4, 1871. Library of Congress

CAPTURING SOUND: HOW TECHNOLOGY HAS CHANGED MUSIC

Microphones Excerpt

Video: **https://www.loc.gov/today/cyberlc/feature_wdesc.php?rec=3825**

In this excerpt from his talk at the Library of Congress, Dr. Mark Katz explains how the invention of the microphone not only transformed recording, but allowed for brand-new styles of singing and performance.

Solitary listening then may be considered a phonograph effect. Now, an example of what might be called a performative phonograph effect is crooning. Crooning, common to popular music of the 1920s to 1950s and we still hear some of it today, was a technique in which a vocalist sang softly and very closely to the microphone to get a smooth mellow sound ...

Now it's important to realize that crooning was really only possible with the electronic amplification of the microphone. For without amplification, it would be expressively flat and nearly inaudible. So crooning was developed in response to a possibility of recording technology not available in acoustic live performance. Interestingly, crooning can also be understood as a response to another distinctive aspect of recording, the separation of performer and listener, in which the musicians are invisible to and physically distant from their audience.

Crooning is akin to whispering, which under normal circumstances, can only be heard when one is physically very close to the person speaking. Crooning thus provides a sense of intimacy between our distant audience, collapsing the technologically imposed distance that would seem to preclude such a relationship.

READING QUESTIONS

1. What one thing did you notice in the reading that stood out to you? Find something small but interesting.

_____

_____

_____

2. What do you wonder about the applications of the microphone outside of music?

_____

_____

_____

CROONER LISTENING ACTIVITY

We are going to listen to examples of crooners, a style of singing mentioned by Dr. Katz in his talk. As you listen, answer the questions below.

1. What do you notice about the crooner performing in this example? Find something small but interesting. List several.

_____

_____

_____

2. What do you notice that you might not have heard earlier, specifically about the amplification?

_____

_____

_____

3. What questions do you have about crooners or the performance style of crooning?

_____

_____

_____

MICROPHONE RECORDING EXTENSION ACTIVITY

In this activity, we are going to set up several recording devices around the room and record a quiet conversation at different intervals of space.

1. After you listen to the recording from the microphone closest to the conversation, do you feel like you were present during that conversation? What makes you feel that way?

_____

_____

_____

2. As we listen to recordings made further away from the conversation, do you feel the same level of connection with the conversation? Why or why not?

_____

_____

_____

HOW WAX CYLINDER RECORDINGS CHANGED MUSIC

Excerpt:

History of the Cylinder Phonograph from The Library of Congress **https://www.loc.gov/collections/edison-company-motion-pictures-and-sound-recordings/articles-and-essays/history-of-edison-sound-recordings/history-of-the-cylinder-phonograph/**

Standard-sized cylinders [in the 1890s], which tended to be 4.25" long and 2.1875" in diameter, were 50 cents each and typically played at 120 rpms [revolutions per minute]. A variety of selections were featured on the cylinders, including marches, sentimental ballads, minstrel dialect songs, hymns, comic monologues and descriptive specialties, which offered sound reenactments of events.

The early cylinders had two significant problems. The first was the short length of the cylinders, only 2 minutes. This necessarily narrowed the field of what could be recorded. The second problem was that no mass method of duplicating cylinders existed. Most often, performers had to repeat their performances when recording in order to amass a quantity of cylinders. This was not only time-consuming, but costly.

A process for mass-producing duplicate wax cylinders was put into effect in 1901. The cylinders were molded, rather than engraved by a stylus, and a harder wax was used. Sub-masters were created from the gold master, and the cylinders were made from these molds. From a single mold, 120 to 150 cylinders could be produced every day. By mid-1904, the savings in mass duplication was reflected in the price for cylinders which had been lowered to 35 cents each. Beveled ends were made on the cylinders to accommodate titles.

In terms of playing time, the 2-minute wax cylinder could not compete well against competitors' discs, which could offer up to four minutes. In response, the Amberol Record was presented in November 1908, which had finer grooves than the two-minute cylinders, and thus, could last as long as 4 minutes.

Capturing Sound: How Technology has changed music

Video: **https://www.loc.gov/today/cyberlc/feature_wdesc.php?rec=3825**

Transcript: **https://www.loc.gov/today/cyberlc/transcripts/2005/051109katz.txt**

People have long suspected that the violinist Fritz Kreisler [1875–1962] who composed a lot of little violin showpieces was writing for the phonograph. In the Fritz Kreisler collection, I discovered something very interesting: In the manuscript of his work "Caprice Viennois," he had scratched out a whole section of the piece, the portion that caused the work to go over the four-minute mark. When he realized that the music wouldn't fit on one side of a cylinder, or he would have had to put the remainder on another side, he shortened it.

HOW WAX CYLINDER RECORDINGS CHANGED MUSIC

1. Throughout the history of recorded music, there have been limitations set by the recording device, the playback device, and other factors. What is one way described in the reading that music was altered on wax cylinders?

_____

_____

_____

2. What is one thing about wax cylinders that you read that you didn't expect? Be specific in your observation.

_____

_____

_____

3. Can you think of a more recent time music has been constrained by the method of recording or playback?

_____

_____

_____

4. What is one wonder you still have about wax cylinders you'd like to investigate further?

_____

_____

_____

PHONOGRAPHS AND RECORDED SOUND: REFLECTION

1. Where do you listen to recorded music? Make a list on the left side of the T-chart.

2. Where do you listen to live music? Make a list on the right side of the T-chart.

Recorded Music	Live Music

3. Using not just the number of different ways, but amount of time, which side do you spend more time on; Recorded Music or Live Music?

_____

_____

_____

4. Rewrite your list, mentioning only the things that you use recorded music for that they weren't able to use before recorded music. What did people do during those times that you're now listening to music? For instance, what did people do on their commute to school/work before popping in their earbuds to listen to music?

_____

_____

_____

5. What do you wonder about the creation of the wax cylinder? Where or how can you answer this?

_____

_____

_____

6. What do you wonder about the evolution of recorded music from the wax cylinder to streaming music today? Where or how can you answer this?

_____

_____

_____

"CAPTURING SOUND: HOW TECHNOLOGY HAS CHANGED MUSIC"

File Sharing

Video: **https://www.loc.gov/today/cyberlc/feature_wdesc.php?rec=3825**

1. What did you notice from Dr. Katz's experience about music and file sharing in the mid-2000s from this excerpt?

_____

_____

_____

2. How did Dr. Katz's story of finding and downloading the Violent Femmes song relate to your experience? How is it similar? How is it different?

_____

_____

_____

3. Dr. Katz describes MP3s as "intangible." What does he mean by that, per his explanation?

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4. What are the "two broad consequences" of file sharing to listeners?

_____

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5. What do several respondents to Dr. Katz's survey say about file sharing in relation to CD buying?

_____

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_____

6. What do you wonder about the impact of file sharing on the music community?

_____

_____

_____

REFLECTION

1. How is file sharing different than streaming using services we use today like Spotify or YouTube? You can list multiple ways.

_____

_____

_____

2. Is file sharing and the ability to download countless copies of free music good or bad for the music industry? Use supporting information from Dr. Katz's talk and your own knowledge and answer in complete sentences.

_____

_____

_____

3. Before the proliferation of the Internet and streaming music, how do you think people obtained the music in order to listen?

_____

_____

_____

4. If a person heard a song they liked but didn't know who performed it or the name of the song, how might they find it?

_____

_____

_____

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_____

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_____

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_____

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Transcript, via Library of Congress

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When I get home to my computer, I Google the phrase, "beautiful girl, love the dress," and the word "lyrics."

The resulting list of websites points me to some of the many lyrics databases that populate the Internet. All of them tell me what I heard was a 1983 song called "Gone, Daddy Gone" by as I suspected, the Violent Femmes. Next, I open up a program that helps me find the song on the Internet. This program searches through the computers of a few million people who have allowed others access to their digitized music collections. On this occasion, I get a list of a few dozen different computer users who have all have the song on their hard drives.

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My purpose in this part of the talk is to explore how listeners are integrating file sharing into their musical lives and how it has become for many a tool for living. First however, we must understand what is distinctive about MP3s and file sharing and how they differ from earlier sound reproduction technologies. There are many ways to consider the distinctive attributes of MP3 sound files, but I would suggest the most significant is that MP3s and the like for practical purposes, intangible.

MP3s are not subject to the physical control exerted over traditional recorded media. They cannot be bar-coded, price tagged, shrink wrapped, or sequestered on shelves or behind cases. To download a MP3, whether legally through a paid service or illegally over a P2P network, is not like buying a CD. For downloading involves making a copy of a file. Not moving it from one place to another.

Digital music files are also dramatically more portable than their more tangible kin. Depending on the speed of one's Internet connection, a three-minute pop song can be downloaded from anywhere in the world in a matter of seconds.

The nature of digital music files and P2P networking also affects cost. Millions are available free through file sharing. And even when paid for, they typically cost less than a dollar at the pay sites such as Apple's music store.

So digital music files, intangible, reproducible, portable, and cheap, are clearly different from traditional recording media. How did these differences then, affect the listening habits of users? I would like to explore two broad consequences, the first connected to the increased access to music that file sharing allows; the second concerns the rise of Internet music communities, specifically through what are known as MP3 blogs.

The clearest change that file sharing introduces is the possibility of an unprecedented and unparalleled access to music. This new accessibility may be understood in term of speed, ease, and breadth. The first two traits, speed and ease, maybe seen in the example that opened this paper. Or I should say this section of your paper. I hear a bit of an unidentified song in my car, a few minutes after I get home, I'm listening to it. File sharing not only makes it possible to find particular pieces quickly and easily, it also allows users to explore unfamiliar territory. If one can imagine a particular type of music, it probably exists.

If it exists, there is a good chance it could be found on the Internet. Now I should note that access varies according to style and genre. The music of rapper Jay-Z is very easy to find. The music of Alexander Zemlinsky, who I'm tempted to call "AZ" is not.

Another aspect of the accessibility of file sharing allows is the flexibility to customize one's musical experience. An oft-repeated complaint from fans of popular music is that albums seldom have more than two or three tracks that they want to listen to. Many feel that they're forced to buy entire albums for want of a single song.

Contributors to P2P bulletin boards and respondents to my surveys tout file sharing as a way to avoid the all or nothing dilemma of CD buying. They, not the artist, producer, or record company, pick out the music and only the music that they want to hear. Though satisfaction with the album format obviously preceded the advent of MP3s, file sharing reinforces what might we called singles listening.

When listeners get to know an album intimately, the end of one song of an album strongly raises the expectation of the next. For better or for worse, downloaders often miss out on the gestalt of the commercially produced album. Yet, they can decide how to group songs based on their own criteria. And these personalized compilations can generate in turn their own gestalt. MP3s, so easily moved and manipulated, allow listeners greater control over their musical experience or in the case of the shuffle feature, the paradoxical freedom to give up control as they please.

In addition to expanding one's access to and control over recorded music, file sharing has also helped bring listeners together. One of the fascinating manifestations of this phenomenon is the rise of proliferation of Internet communities whose focus is the sharing of MP3 music files. There might seem to be nothing more solitary and unsociable, if not antisocial, than sitting in front of a computer downloading music. Yet, across the globe in groups small and large, people are coming together in cyberspace because of common musical tastes and interests These are communities but certainly not in the traditional sense. Internet listening communities do not congregate in a shared physical space and their interactions are largely textural and asynchronous.

In such communities, age, class, gender and race, may be ignored or disguised allowing new hierarchies to arise and a freedom of interaction unlikely in any other way. In the last year or so, a new type of Internet musical community has flourished the MP3 blog. And I'd like to discuss the phenomenon and discuss some of the interesting questions that it raises. Blog, as many of you may well know, is short for Web log and is an Internet site typically run by a single person or small group that variously serves as a diary, scrap book, soap box, or op-ed page.

MUSIC AND AUDIO INNOVATIONS

FINAL WRITTEN PROJECT

Name _____ Class _____

Directions: Choose one of the following final projects (or discuss an alternative assignment with the teacher) that demonstrates your knowledge of the multiple audio innovations we have discussed.

1. Create a series of billboards advertising each of your products to the public.
2. Create a series of informational brochures advertising each of your products to the public.
3. Create diary entries in the voice of the first person to realize how much of an impact each of these products will have in the future.
4. Create a radio broadcast/podcast interviewing the creator of each product explaining how it's going to change the way people interact with audio.
5. Write a letter to the creator of each innovation, explaining how it's personally impacted you with a specific example.

Essentials: For each of the topics, name the innovation, explain when and how it was developed, and share the uses for the new innovation beyond the limits that existed previously. Explain how at least one of these innovations has personally altered your life, and in what way.

- Pre-electric amplification
- Microphone
- Wax cylinder/phonograph
- File sharing

Absent	Developing	Meeting	Exceeding
Student does not discuss all of the musical innovations. Student does not include years of innovations. Student does not give background on how music creating, performing, and responding were changed by each innovation. Student does not share personal examples of how these innovations have changed how they interact with music.	Student discusses the musical innovations, explains in what year(s) and provides basic background on how music creating, performing, and responding were changed by this innovation. Student shares multiple ways their life has been altered by each innovation, providing specific examples.	Student lists each innovation, explains in what year(s) it was developed, and informs how music creating, performing, and responding were changed by this innovation. Student shares one way their life has been altered by each innovation, providing specific examples.	Student lists each innovation, explains in detail what year(s) it was developed, and informs how music creating, performing, and responding were profoundly changed by this innovation. Student shares multiple ways their life has been altered by each innovation, providing specific examples.

MUSIC AUDIO AND INNOVATIONS
FINAL COMPOSITION PROJECT

We've been studying different technological innovations regarding music; pre-electronic amplification, microphones, wax cylinder recording, and file sharing. Our culminating composition project will include aspects from all four innovations while you create a brand-new musical composition with your classmates.

PART 1—RECORDING

Your teacher will provide you with a short musical passage or ostinato to play/sing/speak. It's your job to record this passage using a few different variables from our unit:

- Make a recording in three different performance spaces to explore how that can alter the sound.
- Make those recordings using three different microphones to explore how that can alter the sound.
- (If you're looking for extra insight, record using all three microphones in all three spaces to create nine recordings.)
- Upload your musical passages to a joint folder/drive that every student in the class can access the files (but not modify them). Include in the file name information on your name, the microphone, and the performance space.

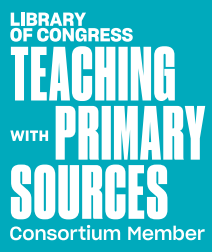
It's essential that you record using a silent metronome. Audibly count yourself in, giving one full measure of beats before you begin and *keep the count-in in your recording*. This will allow easier alignment in the later portion of the assignment.

PART 2—ARRANGING

Using simple sound editing software like Audacity or a Digital Audio Workstation, layer together a minimum of four passages/ostinatos to complete an entire work. Between you and your classmates, you will have a wide variety of recordings to choose from with variable timbres, performance spaces, and microphones (and possibly different pitches, lyrics, and multiple other variable depending on your teacher's directions). Line up the count-in at the beginning of the passages and that should align the beats in your performance if everyone used the silent metronome. Once every track is aligned, you can edit out the count-ins.

PART 3—PRESENT

Present the arrangements to the class. Gather feedback. Refine your work. Publish it or present it to the class again.



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Teaching with Primary Sources