Elementary 7
Emerging Technology: Making Music Electronic
Steve Giddings

Grade Level/Class
Upper Elementary Grades
40 Minute Music Class (Three Day-Unit)
Cross-Curricular: Art, STEAM, Social Studies

Overall Theme
Instruments are created to serve a need and technology changes the ways in which instruments are created and used.

Essential Questions
1. How have electrical and digital technologies affected instrument development?
2. What kinds of unique instruments were developed using new technologies?
3. How can we build our own electronic musical instruments?

National Standards
Imagine
MU:Cr1.1.5a Improvise rhythmic, melodic, and harmonic ideas, and explain connection to specific purpose and context (such as social, cultural, and historical).

MU:Cr1.1.6a Generate simple rhythmic, melodic, and harmonic phrases within AB and ABA forms that convey expressive intent.

MU:Cr1.1.7a Generate rhythmic, melodic, and harmonic phrases and variations over harmonic accompaniments within AB, ABA, or theme and variation forms that convey expressive intent.

MU:Cr1.1.8a Generate rhythmic, melodic and harmonic phrases and harmonic accompaniments within expanded forms (including introductions, transitions, and codas) that convey expressive intent.

Present
MU:Cr3.2.5a Present the final version of personally created music to others that demonstrates craftsmanship, and explain connection to expressive intent.

Analyze
MU:Pr4.2.8a Compare the structure of contrasting pieces of music selected for performance, explaining how the elements of music are used in each.

MU:Re7.2.5a Demonstrate and explain, citing evidence, how responses to music are informed by the structure, the use of the elements of music, and context (such as social, cultural, and historical).

MU:Re7.2.8b Identify and compare the context of programs of music from a variety of genres, cultures, and historical periods.

Connect
MU:Cn11.0.8a Demonstrate understanding of relationships between music and the other arts, other disciplines, varied contexts, and daily life.

Student Learning Outcomes

By the end of this lesson, students will be able to:

1. Demonstrate, using various virtual instruments, how these electrical instruments work.
2. Understand how modern advancements in technology shaped the way instruments are built, played, and performed.
3. Understand how these instruments might be used in a performance setting.
4. Improvise and compose various musical ideas on various virtual or live instruments related to this lesson.
5. Demonstrate an understanding of how to build an instrument using MIDI protocol, a computer, and an invention kit.
6. Demonstrate what goes into designing and planning out a new instrument design with parameters.

Materials Needed

1. E7 Presentation
2. Craft supplies like those usually supplied in a Maker Cart or Maker Space (ie: copper tape, markers, card stock, tape, pipe cleaners, play clay, aluminum foil, etc.)
3. E7 Worksheet
4. Student Computer with Internet Access (Google Doodle and Chrome Music Lab)
5. *Optional:* MIDI Controllers

Procedures

Lesson Introduction (10 Min):

- T provides S with photos of the artifacts from Emerging Technology and invites S to point out similarities and differences between these electronic instruments.
- T leads discussion on similarities and differences.

Demonstration (15 Min):

- T invites S to watch Clara Rockmore's video, Daniel Fisher, Sweetwater Demo video, and TecBeatz Ableton Push video.
- T leads the discussion about what they observed in the videos and in what ways the performers were making music with these instruments.

Lesson Activity (45 Min):

- T facilitates time for S to explore three different virtual instruments that emulate three of the electronic instruments S has been observing.
    - Clara Rockmore Google Doodle (10 min)
    - Robert Moog MiniMoog Google Doodle (10 min) (Flash Extension for Chrome)
    - Novation LaunchPad Intro (10 min)
- T facilitates time for S to explore the virtual instruments found at Chrome Music Lab.
- T invites S to share any compositions or improvisations they came up with.
- T invites S to share what their favorite virtual instrument is and why.

Exploration 2 (20 Min):

- T introduces S to MIDI and MIDI controllers and gives time for S to explore Shared Piano on Chrome Music Lab or another virtual keyboard.
- If MIDI controllers are available, T should give time for S to explore how MIDI controllers work with Shared Piano.

Designing and Building (45 Min):

- T shows S Critter & Guitari video.
- T leads the discussion on what the instruments they made in the video were made of and what they resemble.
- T demonstrates to S, using an invention kit, how they might build their own instruments using art supplies, the MiniMoog Doodle, Novation LaunchPad Intro, and Shared Piano.
- T invites S to fill out the "Planning Your Build" think and plan worksheet.
- T facilitates S designs and builds by providing craft supplies and technical support as needed. If a Maker Cart or Maker Space exists, plan to use this equipment.

Assessment Strategies

Share and Present (20 Min.):

Invite S to show their classmates their new instrument, how it works, and what makes it unique.

Extensions/Adaptations

- Provide videos on step sequencers from the archives and explore Roland50.studio.
- Consider having Korg Little Bits and Theremin Kits on hand for students to build their own synthesizers and theremins.
- Discuss and explore how electronic instruments were used in movies for music or sound effects:
    - ARP 2600 and how it was used in Star Wars as the sound of R2 D2. ARP 2600 – R2D2 Sound Video
    - Hammond Novachord
- Discuss and Explore how the theremin was used in popular music through the song "Good Vibrations" by the Beach Boys.
- Use the basic plans for the instrument design and begin improving and adding to the original design.

- Consider designing a more fleshed-out business plan based on the student's "Plan Your Build" worksheet.

Adaptations

- Consider providing a simplified "Plan Your Build" worksheet for those students who require it.
- Consider giving extra time for builds for those learners who require it.
- Consider providing more options for presentation like a recorded video, or one-on-one presentation format for those students who require it.
- Include visuals and/or sentence stems on the "planning your build" worksheet.
- Consider sharing an example of the completed "planning your build" worksheet.
- Allow students to use text-to-speech software to listen along to the Artifact descriptions and content.
- For students who may have difficulties making choices, give a structured exploration time.
- For any technology or exploration, ensure to review norms for use (provide written norms as needed).

Spotlight on Careers in Music

This lesson plan can be tied to specific careers in music:

- Electronic music performer
- Composer, beatmaker, songwriter
- Electronic instrument builder
- Music software engineer
- Movie sound effects person
- Retailer/Music Store Owner

For comprehensive information on careers in the music industry, please visit Consider a Career in Music