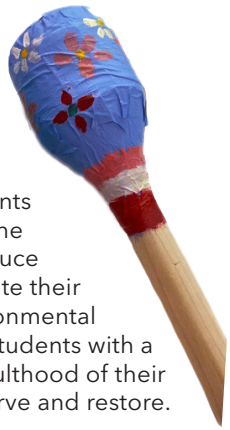
Reduce, Reuse, and Recycle with Music

Students create musical instruments from recycled objects

Climate change is one of the most urgent issues for many students, who recognize the importance of recycling and other green initiatives. In this project, music students utilize their creative talents as they develop a deeper understanding of environmental issues. They learn about current factors that affect the earth's longevity, strategies they can implement at the micro-level to promote positive change, and new products they can design using recyclable materials. Inspired by the "Trash Orchestra" in Paraguay, where musical instruments were created out of recycled materials, students investigate the science of sounds and what components are needed to produce pitched or unpitched sound. Using this information, they create their own musical instruments and write songs that promote environmental initiatives. Adaptable to all subject areas, this project leaves students with a vibrant educational experience that will remind them into adulthood of their accountability on the environment and their mission to preserve and restore.



CONTACT INFORMATION
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DOWNLOAD PROJECT INFO AT EDUCATIONFUND.ORG

STANDARDS

MUSIC
MU.912.H.2.1: Evaluate the social impact of music on specific historical periods.

MU.912.H.3.1: Apply knowledge of science, math, and music to demonstrate, through an acoustic or digital performance medium, how sound production affects musical performance.

SCIENCE
SC.912.L.17.20 - Predict the impact of individuals on environmental systems and examine how human lifestyles affect sustainability.

GENERAL
G.K12.5.3.3d - Use information systems to identify and analyze trends and events in order to forecast future implications.

"My students are promoting a positive message through songwriting."

WORKSHOP INSTRUCTION – WHAT TEACHERS LEARN

Use the teacher platform to promote positive change
Sustainability practices for school and home
The role that artists and educators play in promoting issues for advocacy

STUDENTS

Adaptation: Any age level, can be implemented with large or small groups
Students who participated: High school, 200 students, met twice a week for a month

MATERIALS & RESOURCES

Materials: Recyclable materials with sound potentials are collected throughout the school year by teacher and students - paper towel rolls, cardboard, various bottles (glass and plastic), other found items
Resources: Ecological book and websites (see Idea Packet on website).

ABOUT THE TEACHER

David Cruz is in his sixth year as a music teacher. He received his master's degree in Music Education from the University of Illinois, Urbana Champaign and his bachelor's degree from the University of Miami, Frost School of Music. David earned Rookie Teacher of the Year in 2016, the Adrienne Arsht "Music Teachers that Rock Award" in 2019, and has presented at district, state, and national conventions on Music Education strategies.

To register for this workshop, visit www.educationfund.org

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Reduce, Reuse, and Recycle with Music

REDUCE, REUSE, AND RECYCLE WITH MUSIC

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Lesson plans

Goals and Objectives:

The purpose of this project is to promote global awareness on the importance of reducing, reusing, and recycling products to encourage green initiatives. Our shared planet is reaching its capacity in terms of resources; there are currently close to seven billion human inhabitants competing for the same resources as the plants and animals. As educators, we always teach more and beyond the concepts and skills listed in our curriculum and standards. Therefore, we must acknowledge the influence we play in shaping the future and longevity of our planet. As a result of this project, students will develop Eco literate goals such as (1) developing empathy for all forms of life, (2) Embracing sustainability as a community practice, (3) Making the invisible visible, (4) Anticipate unintended consequences, and (5) Understand how nature sustains life (Goleman, Bennett, & Barlow, pg. 10-11). The activities highlighted in this curriculum have an emphasis on sound, music, and collaboration since I am a music teacher. The activities shared can be adapted and used in other classroom settings. I believe that as educators we should use our discipline to instill these values that are universal and interdisciplinary. In the environment everything connects and interacts with each other, likewise in education our diverse subjects can work together to promote environmental sustainability.

Florida State Standards:

MU.912. H.2.1: Evaluate the social impact of music on specific historical periods.
MU.912. H.3.1: Apply knowledge of science, math, and music to demonstrate, through an acoustic or digital performance medium, how sound production affects musical performance
MU.912. J.3.2: Combine personal interest with skills and knowledge from a non-music class to explore, design, and present a music-based or music-enhanced topic of interest to demonstrate the ability to make transfers across contexts.
MU.912. S.1.6- Synthesize music, MIDI, podcasting, and other similar technology-based skills to share knowledge
MU.912.S.1.8- Record, mix, and edit a recorded performance
SC.912. L.17.20 - Predict the impact of individuals on environmental systems and examine how human lifestyles affect sustainability.
SC.912. L.17.12- Discuss the political, social, & environmental consequence of sustainable use of land.
SC.912. L.17.14 - Assess the need for adequate waste management strategies.
SC.912. L.17.15- Discuss the effects of technology on environmental quality
SC.912.CS-CC1.2- Develop a collaborative digital product using collaboration tools
G.K12.5.3.3d - Use information systems to identify and analyze trends and events in order to forecast future implications
WL. K12.IH.1.2-Demonstrate understanding of the main idea and supporting details
LAFS.910.RI.2.6- Determine an author's point of view or purpose in text
SP.PK12.US.9.2.a- Select and engage in volunteer activities in school or community, such as recycling, litter patrol, or collecting money for a charity
VA.912.H.1.1- Describe social, ecological, economic, religious, and/or political conditions reflected in works of art.

Course Outline:

Students will analyze the lyrics of eco-related songs, create their own musical instruments using recycled material, and create Soundscapes to promote environmental initiatives that address climate change. This STEAM lesson combines the science of sound with creativity, sustainability practices, and uses the teacher platform to promote and change. As a result of this project students will learn about the current environmental factors that affect the earth's longevity, strategies they can implement at the microlevel to promote a positive change, and design new products using recyclable materials.

The unit starts with an introduction of the problem and brings awareness to the students that we must take action to protect the environment. The first activity is a song analysis. During the song analysis the teacher leads and then guides the students into breaking down songs that have an ecological focus and encourage students to understand the purpose and influence of music in a social and historical context.

The "Trash orchestra" in Asuncion, Paraguay created well-built musical instruments out of recycled materials that they use to teach music, this served as an inspiration for one of the classroom activities. Additionally, instrument creation provides an opportunity to discuss the science of sounds and components needed to produce sound. Although we created musical instruments in the music class, this activity could be adapted to other classes to engineer and create other products made of recycled materials specific to another content. This specific component includes the Science, Engineering, and Arts component of STEAM.

The last activity of the unit is recording and designing Soundscapes. Soundscapes are similar to landscapes in which they paint a picture of a moment in time however in a soundscape the students will capture and recreate the sounds of the environment. During this lesson, students will learn about sound ecologists and what the sounds around us can tell us about the environment. Students will use technology to record the sounds as well as to recreate, mix, edit, and alter sounds using available digital audio workstations. In addition to their soundscape compositions, the teacher can encourage writing song lyrics or poems to accompany their soundscape so that there is a literal message shared similar to writing a song. This would make a great extension for a Language Arts, Foreign Language, or English-Language Learners class.

Lesson 1: Earth Week Song Analysis

"The future depends on what you do in the present" -Mahatma Gandhi

Goals:
WL. K12.IH.1.2-Demonstrate understanding of the main idea and supporting details
LAFS.910.RI.2.6- Determine an author's point of view or purpose in text
MU.912. H.2.1: Evaluate the social impact of music on specific historical periods.

Objectives:

- Students will identify the social impact of music on specific historical periods
- Students will complete a song analysis on a specific song
- Students will identify the main idea of the song
- Students will recognize how musicians can use their medium to share a message

Materials:

- Song Analysis Digital Worksheet (see attachment)
- Access to YouTube, Spotify, Apple Music, or other music streaming service
- Student tablets or devices with access to the internet to research

Procedures:

1. Teacher will introduce environmental concerns by highlighting facts related to global warming, pollution, deforestation, and other ecological damages affecting the environment. Teacher will pose question "What are ways that we can increase awareness and promote positive change?" The teacher can encourage students to provide various responses. The teacher should transition and mention that musicians and artists can also use their medium to address climate change and advocate for environmental awareness.
2. Teacher will share the song analysis worksheet digitally with students to reduce paper waste and lead a song analysis as a group by playing a select song on the board. Teacher should select one of the recommended pieces (see attachment) and play for the whole class to analyze. When possible, display a video that also shows the lyrics so that students can read the text and become familiar with the explicit and implicit message.
3. After listening to the piece, the teacher should lead the group analysis using the attached lyric analysis. If necessary, play the song again so that students can gather more information. Some details will require additional exploration that students can complete using their devices.
4. Following a group lyric analysis, the teacher will then break students into smaller groups and assign a song to each group. The group should analyze the assigned song and complete the song analysis digital worksheet using their tablets and other resources so that they can then share with the class their findings.
5. The students will share their assigned song with the class and report their findings including details about the song, main idea, purpose, and interesting facts.
6. At the conclusion, the teacher may summarize and emphasize that everyone inhabits the earth and we should all work together to ensure that we can share the resources. Our collective goal should be to help make a difference in the sustainability and longevity of the earth.

Lesson 2: Create your own Musical Instrument using Recycled Materials

"One man's trash is another's treasure

Goals:

MU.912.H.3.1: Apply knowledge of science, math, and music to demonstrate, through an acoustic or digital performance medium, how sound production affects musical performance

SC.912.L.17.14 - Assess the need for adequate waste management strategies.

SP.PK12.US.9.2.- Select and engage in volunteer activities in school or community, such as recycling, litter patrol, or collecting money for a charity

Objective:

- Students can describe how to measure pitch and intensity of sound using decibels and hertz
- Students will identify necessary components of sound production and instrument families
- Students will recognize a strategy to reduce, reuse, and recycle material through music

Materials:

- Various recycled materials including:
  - Paper towel rolls
  - Assorted bottles
  - Rubber bands and string
  - Cardboard boxes
  - Tin cans
  - Plastic jugs
  - Glue
  - Construction paper
  - Scissor

Procedures:

1. Teacher will share presentation highlighting how instruments make the sound including the science of sound. [https://docs.google.com/presentation/d/1TR36w-PVZXbMQe5gXiuuvnZeNpy0RcFUAsQr_RnOtyo/edit?usp=sharing]
2. Teacher will share clip from the 60 minutes video on the "Recycled Orchestra." https://www.youtube.com/watch?time_continue=1&v=YxUuKthY1dQ&feature=emb_title If the video is unavailable the class can read the transcript together available here: https://www.cbsnews.com/news/recyclers-from-trash-comes-triumph-2/ After watching the video or reading the teacher should ask the following follow-up questions:
   a. Describe what recycled materials used served as a vibrating and resonating source for these recycled instruments?
   b. How did the people find a positive way to reuse and recycle the trash?
   c. What are some other ways that we can reduce, reuse, or recycle trash?
3. Teacher will then encourage students to synthesize the information about how instruments make sounds and use the materials available to create their own unique instruments. For suggestions and ideas on making specific instruments see list below.
   a. https://www.cbc.ca/parents/play/view/activity_musical_instruments
   b. https://www.pbs.org/parents/crafts-and-experiments/create-a-cardboard-guitar
   c. https://redtri.com/homemade-instruments/slide/22
4. After the students finish creating their instruments, they should share with the class and present a demonstration of their instrument including how it makes sound, what instrument family it might belong to, and what materials they used to make the instrument.

Lesson 3: Create your own Soundscape

"The music is all around us, all you have to do is… listen." -August Rush

Goal:
MU.912.S.1.8- Record, mix, and edit a recorded performance
SC.912. L.17.15- Discuss the effects of technology on environmental quality
SC.912.CS-CC1.2- Develop a collaborative digital product using collaboration tools
MU.912. S.1.6- Synthesize music and other similar technology-based skills to share knowledge

Objectives:
- Students will use technology to create, record, and manipulate sounds
- Students will identify the role a soundscape ecologist plays in preserving the environment

Materials:
- Tablets with internet access to a digital audio workstation
- Recording microphone when possible or mobile device

Procedures:
1. The teacher will engage the classroom in a Soundscape activity. The teacher may choose to do this activity outside, in the classroom, or on a field trip. The teacher will share a video clip from PBS Nova describing a soundscape and what it tells ecologist about our environment: https://www.pbs.org/wgbh/nova/video/soundscape-ecology/
2. Following the video, the teacher may ask these follow up questions:
    a. In your own words, what is a soundscape?
    b. What are the three sound categories mentioned in the video? Give an example of each geophysical, biological, and humans.
    c. What information can a soundscape provide?
3. The teacher will then instruct students to work as a group or individually in recreating a soundscape by recording using microphones or audio recording equipment on their devices. They may also choose to use their own recycled instrument from lesson 2 or create sounds using the digital sound library. The students should also identify what sounds they replicated (i.e., geophysical, biological, or human).
4. Students may use a variety of digital audio workstations (DAW) to complete this project such as Garage Band, Band Lab, Audacity, or Sound Trap. All these mentioned have free versions. Sound Trap is the most accessible and teacher can create free trial versions for their classes or students can create their own personal accounts. Garage Band is free but only available on Apple devices.
5. Students will work on creating their soundscapes. When the students complete their projects, they should share with the class and describe what each sound represents, what type of sounds they used, and how they envision their soundscape to provide information.

Extension: In addition to a soundscape composition, the teacher should encourage students to write their own lyrics and either recite with their soundscape playing in the background or turn it into music. The lyrics or poem should have an ecological focus and aim to advocate for reducing, reusing, and recycling initiatives.

Shareable Google Slides Presentation Links:

Lesson 1:

Earth Day Presentation and Lyric Analysis instructions:
https://docs.google.com/presentation/d/1A7MDBWszI0nbBZXWkZPRr7XjvDgZRsCHHkP2Q_kIzAA/edit?usp=sharing

YouTube Narrated Version:
https://www.youtube.com/watch?v=g4CmUJ4ErQg

Lesson 2:

Science of Sound:
https://docs.google.com/presentation/d/1TR36w-PVZXbMQe5gXiuuvnZeNpy0RcFUAsQr_RnOtyo/edit?usp=sharing

Recommended Ecological Songs for Lyric Analysis:

Garden Song (1975) by David Mallet:
https://www.youtube.com/watch?v=y1oiVEWFHrs

This Pretty Planet (1988) by Tom Chapin:
https://www.youtube.com/watch?v=8xZf3fwmFD4

Good Garbage (1979) by Tom Chapin:
https://www.youtube.com/watch?v=TWLTRzOGmP0

Where do the children play? (1970) by Cat Steven/Yusuf:
https://www.youtube.com/watch?v=nBCJhNiKhFE

Earth Song (1995) by Michael Jackson:
https://www.youtube.com/watch?v=XAi3VTSdTxU

Heal the World (1992) by Michael Jackson:
https://www.youtube.com/watch?v=BWf-eARnf6U

Emergency on Planet (1993) by Jamiroquai:
https://www.youtube.com/watch?v=zuR5TYI5Qkg

Pollution (1950?) by Tom Lehrer:
https://www.youtube.com/watch?v=AGFbS_jdSl0

Mercy mercy me, The Ecology (1971) by Marvin Gaye:
https://www.youtube.com/watch?v=NtlV0j0uGaA

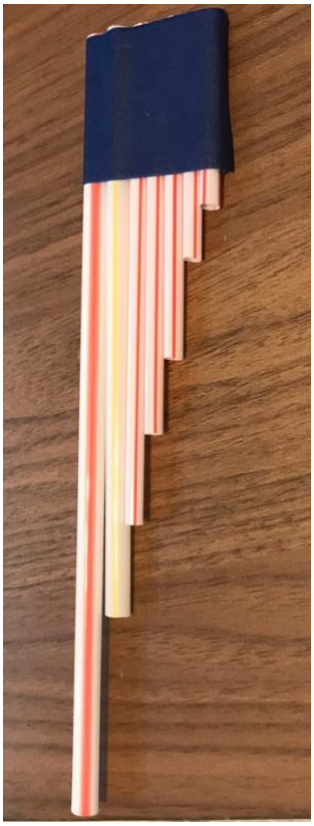
God Bless the Grass (1966) by Pete Seeger:
https://www.youtube.com/watch?v=FRZ739wbh68

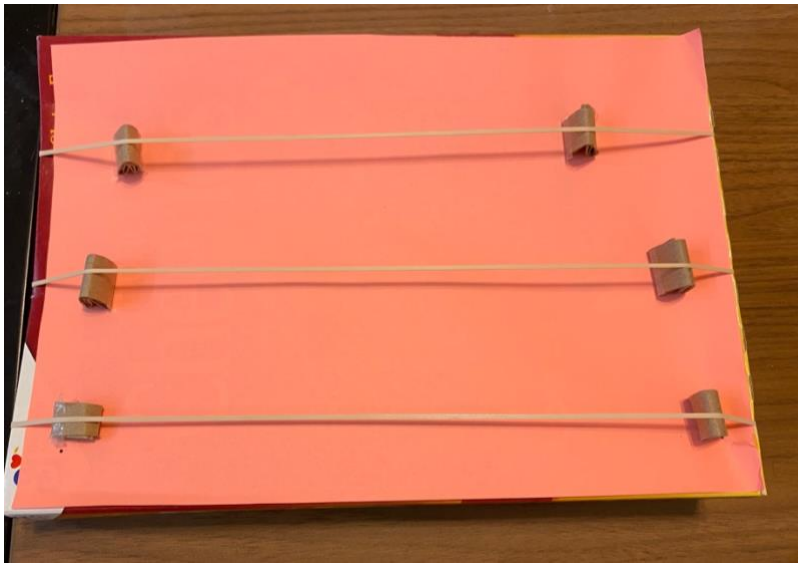
Stand Up/ Stand and Rock (2016) by Taboo:
https://www.youtube.com/watch?v=Onyk7guvHK8

Earth (2019) by Lil Dicky [Explicit]:
https://www.youtube.com/watch?v=i-RtkI8FnI0

Dragonfly (2003) by Ziggy Marley [Explicit]:
https://www.youtube.com/watch?v=KcRQp52amhA

Sample Student Instruments:





Group Member Names:

Song Lyric Analysis Digital Worksheet:

Directions: Complete the questions listed based on your assigned song. You may use available online resources to look up the lyrics, background on the artist, and any additional information you may need. Please ensure that every group member contributes and participates in the completion of this assignment.

Song Title:

Artist(s):

Year song was written:

Nationality of artist:

What is the main idea of this song?

What do you think was the purpose of this song?

How do the lyrics of this song promote environmental action or awareness?

Additional Resources

Reference List:

Currie, J. (2013, July 31). *Make your own instrument from recycled materials*. Happy Hooligans. https://www.cbc.ca/parents/play/view/activity_musical_instruments

Ellis, A. (2016, December 2). *Lyric Analysis.* Music Therapy with Adolescents. http://blogs.cuit.columbia.edu/are2126/2016/12/02/lyric-analysis/

Gillis, E. (2015, April 1). *Soundscape Ecology: What sounds can tell us about the health of an ecosystem.* PBS Nova. https://www.pbs.org/wgbh/nova/video/soundscape-ecology/

Goleman, D., Bennett, L., & Barlos, Z. (2012). *Ecoliterate: How Educators are cultivating emotional, social, and ecological intelligence.* Jossey-Bass, San Francisco, CA.

McCoy, S. (2016, April 22). *25 Earth Day Pledges. How to be a better "Earthling."* Gear Junkie. https://gearjunkie.com/25-earth-day-tips-environmentalism

Shevock, D. (2018). *Eco-Literate Music Pedagogy.* Routledge Taylor & Francis Group

Shevock, D. & Bates, V. C. (2019). A music educators guide to saving the planet. *Music Educators Journal.* 105 (*4*), 15-20.

Simon, Bob (2014, May 11). *The Recyclers: From trash comes triumph*. 60 Minutes. https://www.cbsnews.com/news/recyclers-from-trash-comes-triumph-2/

Y, Christal (2020, September 21). *23 Homemade Instruments that really work.* Red Tricycle. https://redtri.com/homemade-instruments/slide/1

Organizations:

- Before it is too late, Non-Profit Organization. http://www.beforeitstoolate.earth/
- Recycled Orchestra Cateura: https://www.recycledorchestracateura.com/

Field Trip Ideas:

- Organize a field trip to a park or beach to get ideas for a sound scape composition and also clean up the park/beach after the soundscape composition. Use the found recyclable materials to create instruments.