

Design Thinking and Integration in the Elementary Classroom -

A Musical Sound Sculpture Garden Unit Overview

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How might we bring design thinking, deep understanding, and the joy of play into our junior grade classrooms? How might we bring art, music, and design together to create deep and meaningful learning for our students? As teachers of Visual Arts and Music in a Toronto independent school, we were guided by these questions in our development of The Sound Sculpture Garden Project. This integrated project encouraged students in Grade 4 to contextualize and apply their musical, and scientific/visual arts knowledge and understanding to design and build a sound sculpture. Our objective was to ensure that students enabled their knowledge and skills to be transferable between disciplines, and that students approached new learning and life experiences using the power of a connected mindset.

Throughout this unit students were tasked with exploring materials and construction to design and build an interactive, aesthetically pleasing musical sculpture that will be available for our younger students to play with in our school's outdoor playspace. As part of the design process, students interviewed younger students in our school community, collected data, designed, tested and refined their prototypes all while discovering scientific, musical, and visual arts concepts. Having our younger students

as end users of the musical play space while designing for other ages in mind, allowed for students to practice empathy and fully engage in all stages of the design process.

This unit was taught using the shared model of integration, where both teachers instructed the majority of the unit in a co-teaching environment. By using this model, we can provide students with ongoing feedback and guidance from both artistic and musical viewpoints. This model explicitly shows the interdisciplinary nature of a large design task.

As the project began, students were tasked with the following essential questions:

- How might we take the qualities of something we know (musical instruments) to help us design something uniquely different and new (sound sculptures)?
- How might we explore a variety of materials and investigate sound (timbre and pitch) to create a sound sculpture that JK-Grade 1 (young) students can interact with in the outdoor space?
- How might we create an interactive sound sculpture that is aesthetically pleasing and that fits in with the environment?

The Process

Before the creation period begins, we ask the students to think about their school environment and the role visual arts and music could play in enhancing their day to day interactions with these spaces. To engage students in the creative process, we start by asking them to design a variety of quick sketches of sound sculpture ideas in their visual arts sketchbook. Students create a variety of images, building on their own knowledge and experiences in art and music as the starting point of the creative process.

Together as a class, we then explore a variety of provocations, looking at whimsical instruments created by artist/musicians and exploring existing musical playgrounds in our local community. We listen to a variety of recordings and view artists performing on their instrument or sound sculptures. One such provocation is *Landfill Harmonic*, a film that follows the journey of the *Recycled Orchestra of Cateura*. This is a Paraguayan musical group that creates instruments entirely out of their local garbage supply. Another provocation we used were eccentric musical inventions, such as *Marble Machine X* by Wintergatan. We discuss the specific aesthetic choices the artists and designers made, and what potential challenges could be experienced when attempting to build a similar sound sculpture. We also question what is logistically possible to create in our school culture and community.

To encourage ideation, we journey into our outdoor space and ask students to locate a space on the school grounds that is meaningful to them. They proceeded to sketch a variety of ideas in their sketchbooks that fit into their chosen space. Students are tasked

with thinking critically about how their sound sculpture ideas add to the environment it will be placed in.

This unit also complements and expands on the learning already taking place in the music and science classrooms. Students have engaged throughout the year with music listening in order to learn to identify the elements of timbre, pitch, harmony, and dynamics. They are encouraged to experiment with materials available for their sculptures to understand the musical quality of different materials and forms, and how they can manipulate these materials to change the quality of the instrument. This leads into discussions of the science behind these differences such as the relationship between length, tension and pitch, the effects of echo and resonance, and the source of sound itself. These concepts are developed through student-focussed investigation and play. They are then summarized with students in qualitative, age appropriate concepts, such as “shorter lengths make higher pitches”, “larger things tend to be louder” or “simple ratios make nice harmonies”.

Together teachers and students co-constructed success criteria to guide their creations, drawing upon classroom discussions and suggested prototypes drawn in their visual arts sketchbooks. Teachers and students engage in dialogue, and debate what criteria are most vital moving forward with the creation period.

Co-constructed Success Criteria

- Aesthetically pleasing (sculptural)
- Site-specific
- Safe
- Resilient to wear and tear by children
- Age-appropriate
- At least 3 different pitches (tones)
- At least 3 different timbre (quality of sound)
- Appealing to our younger school community members (colour, themes, design)

Throughout the project, the teacher is part of the cooperative learning environment, sitting around the table with students and discussing ideas or helping to solve problems when students are facing a specific design challenge. Each individual member created a custom watercolour painting of their designs to assist in explaining ideas and design challenges. Each group or individual student presented their proposal to the larger group, and received critical feedback which helped them move forward with their project

in a more confident and well thought-out manner. The setting is one where students feel safe to be vulnerable in their thinking and ask questions. This is integral to the creative process; discussing and supporting one another with the development of ideas before production begins.



Throughout this project, students work through the creative process, constantly reviewing and refining their work based on peer and teacher feedback. Students, teachers, and members of our school community collect and bring recycled materials and supplies to create their sculptures. Peering into the classroom, one can see students cutting PVC piping, nailing pieces together with a hammer, or filling containers

with rice or pasta. The classroom is a space of collaboration and problem solving. Students are engaged in critical talks about their sculptures and revisiting the data collected about their younger community members to ensure design choices will appeal to them.



When the works and or installations are complete students receive feedback from our younger members and classmates, test their final products, and made changes based on this feedback. Once their final design is finished, students give a short demonstration using proper musical terminology to explain how to interact with the sculpture and what sorts of sounds can be created with it. They also submit an Artist Statement explaining the musical and artistic aspects of their sculpture. This artist statement explains not only the aesthetic of their work, but also the musical design that took place to create the specific sound quality of their sculpture. Final sculptures are installed in the outdoor space in time for Arts Week. To honour the process, the watercolour proposals are hung on a clothesline in the outdoor space with their artist statements. Students, families, and teachers enjoy exploring the sculptures and reading about design challenges and decisions in our outdoor playspace.



Conclusion

We hope to engage our students with a variety of creative experiences, and cultivate a great enthusiasm for learning across all areas of arts education. Having a wide range of options and experiences is so important for our students, as it allows them to learn and deepen their understanding of complex artistic concepts, while exploring diverse instruments, performing styles, and cultures from around the world.

Suggested Resource

Ceceri, K. (2017). Make: Musical Inventions DIY instruments to toot, tap, crank, strum, pluck and switch on. San Francisco, CA: Maker Media Inc.

Link to Online Provocations and Inspiration for Instrument Design in the Elementary Classroom:

<http://www.landfillharmonicmovie.com/>

<https://www.youtube.com/user/wintergatan2000>