

Building a  
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music and  
mathematics: a  
perspective in  
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## Building a Relationship between Music and Mathematics: A Perspective in Instruction

### Introduction

As a teacher of mathematics in the earliest parts of my career, one of the most challenging aspects of my work was in getting students to understand basic mathematical while using that understanding in building a bridge leading to the outside world. In other words, making mathematics real and relevant to students in their daily lives. One way I went about doing so was to incorporate things they knew, understood, and most of all were interested in, and one of those things was music. While principal of a middle school in the South Bronx, I worked closely with the mathematics teachers and included the two music instructors, choral and instrumental, in incorporating mathematics in their classes and rehearsals. The results were surprising. Students in these classes showed an increase in mathematical ability.

Upon entering 3<sup>rd</sup> grade, my mother decided to send me for music lessons as I had expressed an interest in learning how to play the trumpet. Though I was a good student and did not have any significant challenges beyond age-appropriate academic matters, I believed taking music lessons would be fun. I was not aware at the time that my foray into music would translate into a series of personal improvements which included an increase in achievement in mathematics.

Parents today are not as focused on the arts as they were some years ago as the push for the future appears to be STEM related subjects. Adults often

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have difficulty finding the time to participate in arts related activities, and children, with the advent and ever-growing popularity of video games and apps tend to be seemingly less interested in art or music, save for what they have on their cellular devices.

The incorporation of music and the arts in education is a long-debated and controversial topic; however, those students who have both the arts and academic mix tend to perform better academically than those who do not. While multiple studies have shown this, schools and parents alike do not appear to be interested in or focused on changing the paradigm. Regarding mathematics specifically, as young children we learn how to count, which leads to identifying shapes and ramping up to multiplying and dividing and then onto more abstract concepts like finding the value of 'X'.

It has always been believed that the relationship of arts to instruction is best achieved when it is provided to very young children. According to Brown and Sax (2013), children that receive such instruction and integration are more excited and interested in learning. Students taking classes without arts integration tend to show the typical academic struggles and do not fare as well as their counterparts.

The interconnectivity of music and mathematics has its beginnings in ancient Greek and Roman cultures. In my undergraduate years, I learned that Pythagoras was primarily responsible for building the understanding of music as a mathematical constant as well as his belief that the planets and other heavenly bodies emit musical tones; NASA and other space agencies do not disagree. In 1999, I spoke directly with an astronaut who claimed to hear '

sound' in the vacuum of space while conducting an EVA (spacewalk) outside of the Shuttle Discovery.

The thinking behind this is to help reinforce concepts because it is also believed that the inclusion of music and music activities makes school more enjoyable to young children. Music, as many people know, is universally accepted as something that is enjoyable to people of all ages and from all walks of life. What is not generally accepted or even understood is how music is, in and of itself, a mathematical exercise.

As we consider the connection of music to mathematics, it may be further interesting to investigate and understand the effect of music on the brain and how it may connect music and mathematics. As a young musician, I learned that music is a series of mathematical patterns that combine to create sound. Music is a timed activity. Melody, or the theme of music, is a series of timed notes put together to create rhythmic sound. That sound, once it hits our ears causes stimulation of the brain and we will either enjoy the sound or not.

Music and math go together in more ways than you may think. Using a holistic approach, math teachers can use musical lessons to illustrate the patterns and graphing of numbers. Middle school students, who already may be adept at basic mathematical concepts, can be further stimulated by music to recognize more complex equations involving permutation and fractions (Harkins, 1991).

How is art engagement/integration defined? One of the more interesting findings in these studies suggests when students began to generate <https://assignbuster.com/building-a-relationship-between-music-and-mathematics-a-perspective-in-instruction/>

knowledge during music and mathematics lessons rather than simply receive it, teachers began to see the educational process as less didactic and more student-centered and open-ended. (Charland, W. 2011) The study outlines the integration of the arts in changing school culture. It was undertaken at a K-6 magnet school and used Visual Thinking Strategies.

Continuing with this theme, when a school commits to fully integrating the arts in academic subjects, there is an immediate shift in paradigm that offers both students and teachers an alternative to traditional classroom teaching. In mathematics courses, particularly those in the lower grades, music becomes a companion course that offers the younger students a fun alternative to traditional classroom instruction, thus changing the air in the room.

Schools can achieve such integration and improvements with the use of partnerships. As principal of a performing arts school in New York City, the school had not ever had any connection with any arts professionals so the school was a PA school in name only. Upon taking the helm of the school, I consulted with CBS and NBC in order to consider the viability of a real, working partnership between a school and a large media company. To my surprise, both companies agreed and that began a six year relationship with seven different music and entertainment entities.

In Chicago, the examination appears since the production of *Champions of Change: The Impact of the Arts on Learning* (Fiske, 1999), inquiry about has progressively analyzed the relationship between special learning and general understudy accomplishment (Deasy and Fulbright, 2001; Various, 2000). Arts

education in its various forms—from traditional art classes to extracurricular arts activities, from music to drama to visual arts—consistently associates with higher individual achievement. At the school level the marvel remains constant: the 1999 assessment of expressions incorporation that shows up in Champions of Change found that Chicago Arts Partners in Education CAPE schools indicated development along a few distinct proportions of understudy accomplishment. What's more, when contrasted with different schools in Chicago serving practically identical understudy populaces, CAPE schools accomplished more grounded state sanctioned test score increments after some time on the city's government sanctioned test scores (Catterall & Waldorf, 1999).

In conclusion, with or without music as an assistance in instruction, the goal is to raise achievement beyond what test scores may show. It is further important to consider that a major impediment to the integration of music/arts into any instructional program is not a lack of resources or even finance(s), but belief and commitment to a process that takes time to develop. Our 'add water, microwave for two minutes and stir' society has given rise to the unrealistic expectation of instant results, which is antithetical to the mission of education.

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