Teaching Through Music in the Elementary Classroom

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Chapter One: Introduction

Sixth grade teacher, Mrs. Edwards, was all set to begin a lesson with her students about state capitals. As the lesson began, it became apparent to Mrs. Edwards that many of her students were having a hard time recalling the names of the states, let alone their capitals. So, Mrs. Edwards stopped the lesson and decided to assess what her students already knew. She instructed them to get out a piece of paper and write down the names of as many U.S. states as they could. One by one the students brought her their work. Some children had remembered ten names and others up to thirty. But when the last little girl brought up her work, the student had not only written down all fifty of the states, she had recorded them in alphabetical order. Mrs. Edwards looked at the girl in amazement. "Ellie," said Mrs. Edwards. "How did you remember all of this and so quickly? Have you been studying at home?" Ellie replied, "No. A few years ago, at my old school, we all learned a song about the states. It lists them by name. It's a really catchy song, so I guess I never forgot it."

As this story I created from a similar experience of my own illustrates, the power of song is an amazing thing. Music can affect our mood, stimulate movement, and, like in Ellie's case, improve our memory. In virtually every culture from the beginning of known history, music has been found in some form. Its cultural significance cannot be disputed. It is often the result of collaborative work and participating in music can be a social event, leading to movement and dance, as well as inspiration. But just how effective is music when used as a learning tool? The subject is one of debate within public schools today. And many wonder if incorporating music into lessons will really

increase information absorption and retention to a high enough degree to make it worth including in lessons.

Nature of the Problem

"Most classrooms today give the impression that music has never been invented, yet no culture on this planet is without music." *Thormburg, 1989*

Incorporating music into lessons may be the only way in which some students are exposed to it. As the stress to improve scores in other content areas grows across the country, many schools are cutting out the arts (Donahue & Stuart, 2010). The cuts include topics like art, musical theory and band, as well as dance. So, integrating music into study might be the only way in which to expose some students to such an important topic.

The reasoning behind cutting arts instruction is often to provide more time for the study of core subjects like math, English, and reading. The assumption is that more time spent on these subjects will increase student test scores and overall intelligence. However, studies have shown that students who are educated in the arts tend to have higher scores in other subjects (Cornett, 2003).

The results continue to suggest that in many cases music does indeed aid in the learning process. But what type of music works best and how is such a lesson constructed? Are the students singing about content or just listening to music? Do the students get to create their own songs? Does experience with playing a musical instrument aid in the learning process? These are all questions to be investigated in bringing music into the classroom.

Thesis Statement

The incorporation of music into elementary lessons covering the topics of math, social studies, and language arts will increase the content learned and the retention of such material.

Rational

Many studies have been done in recent years to investigate this topic. One study found that listening to music for one hour per day may actually reorganize the way the brain functions (Cornett, 2003). Other studies have shown that children with early experiences with music often have better communication and perception skills than other children not exposed to music (Cornett, 2003).

Key Terms

The Arts: Within American elementary education, the arts are those subjects more closely related to creative thinking and expression. The arts include the subjects of choir, band, orchestra, art, and dance. The most common core subjects that are not considered arts courses are English, literature, math, science, foreign language, and social studies (Donahue & Stuart, 2010).

Attention: According to Neville et al. (2008), researchers in the cognitive and neurocognitive field have come to a general consensus that attention is "1) a basic level of arousal and alerting; and 2) a selective focus on specific stimuli and signals, to further process these signals either transiently or in a sustained manner." (p. 107)

Conventional Methods: Within this study, teaching strategies that do not implement the arts or require extensive creativity to implement or complete will be referred to as

conventional. Conventional teaching examples include reading a text, fill in the blank, Q&A, read and complete, and lecture (Donahue & Stuart, 2010).

Information Retention: This is the amount of information that students are able to recall and express after a lesson (Jonides, 2008). Within this study, I will measure the amount of information retained immediately after the lesson, as well as the amount retained after one week.

Mnemonics: When teaching through song, teachers are in effect using mnemonics. A mnemonic device is a means of compartmentalizing information into more easily recalled groups. It is a shortcut for remembering things. With song, the mnemonic devices used are rhyme and perhaps some imagery. Relating information to a beat can help the brain to recall it when replaying the tune (Psych Central, 2010).

Music: The definition of music is more than just sound. Music is noise that is created with pattern and for the intention of making a rhythmic sound (Cornett, 2003).

Delimitations

My testing will consist of three separate fourth grade classes at one elementary school. The classes consist of 23, 24, and 25 students, with a mix of both genders; however, there will be more boys than girls. As a result, my findings may not be applicable to all elementary-aged students, and they may not hold true for students in all parts of America. The age range of the study will be limited as will the diversity of the population.

Procedures

I intend to focus my research on the question of whether elementary students will noticeably benefit from music being used as part of instruction. Music may be

incorporated into a lesson in many ways. Such instruction would include sing-a-longs, song writing, or music about historical events or from historical periods. While investigating these types of learning activities, I also plan to discover whether or not certain lessons are more effective than others. For example, is learning content through a song more effective than studying while listening to classical music?

Through research and a group subject study, I intend to show that elementary aged students will learn subject matter more effectively, and retain the information for a longer period, when the lesson includes music. The opposing lessons will not have any musical influence. These control lessons will be referred to as standard method or conventional lessons. Research will be done through interviews with teachers and students as well the study of various texts. I will teach three different lessons to three fourth grade classrooms. The first lesson will be on the same topic, but class A will be taught using text, Class B will be taught using information set to a popular tune, and class C will be taught in a similar fashion to class A, but with classical music playing throughout the lesson. The following two lessons will also be on different topics, but the style of teaching will be rotated so that every class will experience one lesson with text only, one with a popular tune, and one in which they hear classical music. Before each lesson a short pre-assessment will be given. Immediately after each lesson, an assessment will be given to test short-term retention. After one week, another assessment will be given to test long term retention. I believe that research will show not only positive academic results, but also exert positive influence on student behavior, socialization, and physical activity during the lesson and immediately following.

Organization of the paper

In Chapter Two, I will detail the findings of previous studies covering the topic of music integration. I will also discuss findings about the effect of music on brain functioning and development.

In Chapter Three, I will report and discuss the results of my class research. I will give a detailed account of the methods used.

Chapter Four will be a summary of my findings overall.

Chapter Two: Review and Analysis of Literature

Much has been written concerning learning through music at the elementary level. Most studies indicate that using music in a lesson benefits students, not only academically, but also emotionally, socially, and developmentally.

Music and Mnemonics

To understand how music may be considered a mnemonic device, one must first know the different types of mnemonics. Ashcroft (2006) dubs these mnemonics formal and informal. Ashcroft states that a formal mnemonic will rely on a well-known set of memory aids as well as repetition of the content to be learned. One example of this is the popular device "ROY-G-BIV" in which the first letters of the rainbow rearranged to create a sort made-up word. An informal mnemonic is more personal and tends to be simpler as well (Sims, 2008). For example, I remember the letter part of my license plate with the sentence "Go To Bed!."

According to Rainey and Larsen (2002), setting information to music is not a better way for students to retain information in the short term (Sims, 2008). In the first of two studies, Rainey and Sims found that students studying information set to music learned the same amount and in the same time as the students who studied using prose. However, the second study showed that learning the information as a song helped students to store and recall using long-term memory. After one week, only 2.8 percent of the one hundred subjects in the control group could recall the entire list of information. Compare this to 6.8 percent of students from the test group. Rainey and Sims also found that the subjects on the test group were able to re-learn the information more quickly than the students who had learned using prose (Sims, 2008).

Four studies conducted by Wallace (1994) showed that the type of tune used when learning information about a text can make a difference in recall (Sims, 2004). Studying the text using a familiar tune can provide a framework about the text. It helps to recall the passage length, sentence structure, which syllables are stressed, and the order of words and phrases (Sims, 2004).

Strategies for Integrating Music

Although studies suggest that music integration has positive impact on learning, studies have also shown that the majority of teachers without musical backgrounds do not feel comfortable teaching a topic through the use of music (Burke & Colwell, 2004). Many of these elementary teachers feel that they are inadequate to teach using music because they don't understand musical theory (Cornett, 2003). However, many schools have at least one music teacher on staff whose job it is to teach the technical aspects of music. For teachers at those schools Cornett (2003) suggests that "[…] it is recommended that they view music integration as an experience to be offered, rather than a subject to be taught." (p. 335)

To investigate this phenomenon, Price and Burnsed (1989) conducted a survey of elementary educators. The teacher sample was divided into two groups: those who use music within the classroom and those who do not (Burke & Colwell, 2004). When asked to rate the importance of music skills, both groups rated singing and playing an instrument as the most important and both groups placed music theory as least important. When asked to rate music teaching techniques, singing once again rated the highest. However, the group that used music in their classroom rated music integration at a greater importance than the group that did not teach with music in their classroom (Burke

& Colwell, 2004). In essence, those teachers that had more experience with music tended to use it more often in the classroom and also place more value on the importance of music integration in the core curriculum.

In an interview of 18 teachers (grade one, three, and six) from an urban school in the Midwest 16 of them had taken at least one music course in college (Giles et al., 2004). However, despite these teachers feeling more comfortable with their musical abilities, only two of the 16 were using techniques learned from that course in their elementary classrooms and half of all participants said they use music in their classrooms less than 15 minutes per week. The number one reason given as to why they don't incorporate music more was time (Giles et al., 2004). This stresses the importance of integration into current curriculum as opposed to teaching and listening to music as a separate entity.

There are many ways to instruct a class. A typical teacher might use methods like worksheets, videos, lecture, or reading. Music should be considered just as valuable a method as these traditional ways to teach. In fact, research supports using music as a way to help students focus attention and gain motivation for learning the content (Lazar, 2004). It is also effective because people remember information more often when they find it interesting and entertaining (Lazar, 2004).

So what does teaching with music look like? There are many differing sources that can be implemented according to subject. An elementary reading lesson might have physical text to follow along with as well as musical portions. For example, *Rockin' Readers K-3* is a series of books that contain CDs with narrative reading and song lyrics (Lazar, 2004). Another popular source is the *Schoolhouse Rock* series, which has catchy

songs about many subjects. The *Grammar Rock* portion would be an excellent tool for teaching literacy though music (Lazar, 2004). Story ballads are another great way to teach literacy. With a ballad, a story is told through song and words. Students can turn a familiar story into a story ballad and act it out. Operettas are similar. Operas are stories told with song only. Students can listen to a kid friendly opera or perform one as a class (Cornett, 2003).

The *Schoolhouse Rock* series also has many math lessons, including the number zero and multiples of five. Other methods for math could be chanting facts or multiples to a rhythm, or even using music theory to teach the concept of fractions (Lazar, 2004). A whole note can be divided in to two half notes, four quarter notes, eight eighth notes, or sixteen sixteenth notes. Comparing notes to fractions allows students to "hear" the fraction. They can make a connection between splitting up beat and splitting up tangible things. Other sources include texts with lesson ideas accompanied by musical arrangements. One such book by Head, Pollett, and Arcidiacono (1991) includes multiple lessons on counting by twos, threes, etcetera. Attached to each lesson is a musical composition with lyrics that recite the newly learned skills.

There are also many sources available for science, history, and social studies using music. Of course, *Schoolhouse Rock* has many songs for these subjects, as well as *Bill Nye the Science Guy*, to name a few popular entities. One technique for social studies is to pair the lessons with a popular song from or about that time period (Lazar, 2004) with the intention that students will be able to relate to the event more personally and hopefully view music as a fun detour from the norm of study. Music can even be used as

simple way to make transition times more fun or peaceful. You don't always have to be teaching content to have music being integrated into the class (Stone, 1999).

Another approach to music integration includes gathering specialists to participate in local schools to promote use of the arts. One such example is the non-profit program known as Education Through Music. This program sends 27 arts education specialists to eight different schools throughout The Bronx, Manhattan, and Newark, NJ. In this way, music integration is able to reach 4,000 underprivileged elementary and middle school students (New NYC Music Program Aims to Help At-Risk Students, 2000).

Music and Emotion

It is commonly accepted among researchers that emotions change with development. The ability for individuals to identify as well as experience varying emotions increases with age. So too, does their ability to draw emotion from music. Multiple studies performed from 1988 to 1993 showed that children could identify feelings provoked by music (Juslin & Sloboda, 2001). The test subjects consisted of children from toddlers through school aged. As they listened to music, they were shown images of faces expressing different emotions and asked to select the face that most closely matched the tone of the music. The results showed that as young as three and four, children could match the emotions more effectively than chance and that the ability increased the older the subjects got (Juslin & Sloboda, 2001).

Music in Early Childhood

Everyone is introduced to music the same way. In the womb, the mother's heart beat provides a steady and comforting rhythm. The fetus will also be sensitive to varying sounds such as the consonant /t/, /p/, and /f/ and express physical reactions to them. If the

fetus is exposed to enough music during this time of brain development, the brain will actually structure itself to reflect it (Cornett, 2003). Even after birth and into adulthood, music affects the brain. As Malyarenko reported in 1996, listening to music at least one hour per day will actually influence the way that the brain is organized (Cornett, 2003).

Investigations done by Coleman et al. (1997) and Trehub (2000), show that infants have preferences in music and sound. These studies support the beliefs that infants react more positively to lullabies than to other music, prefer a female voice over a male's or an instrument, and enjoy live music more than recorded (Berger & Schneck, 2006). Results were measured by the infants' physiological responses when exposed to music. Coleman et al. and Trehub found significant changes in heart rate, oxygen levels in red blood cells, intake of calories, respiration, and weight-gain after birth. All differences were positive with the exposure to music (Berger & Schneck, 2006).

In a study done by the University of Oregon, 3 to 5 year-old children were found to gain greater non-verbal IQ and more advanced cognitive abilities in numeracy and spatial cognition when exposed to music (Neville et al., 2008). The study included 88 children of low socio-economic status from Head Start preschools, all being right handed, free of any brain disorders, and only English-speaking. The experimental group consisted of 26 children meeting in small groups within the regular class for 40 minutes each school day, for a period of eight weeks. This group was broken into smaller groups of five, where the instruction was heavily music-oriented. They danced, sang, listened to music and made music. There were three control groups. Group A participated in regular Head Start instruction, and consisted of 19 students. Group B had 20 students, which were instructed regularly, but in smaller groups of one teacher to five students. Group C,

23 participants, received specialized instruction on detail awareness and focusing attention (Neville et al., 2008). The post-testing of the groups revealed that the small groups receiving musical instruction, as well as the groups being trained in focus and detail, made significantly higher gains in non-verbal IQ , mathematical awareness, and receptive and expressive language skills. Group B, made higher gains than group A, but not to the same extent (Neville et al., 2008). We can see by this study, that not only does more focused adult attention improve intelligence, but musical instruction can make gains just as significantly as specialized instruction in cognition.

Other research may suggest that music is not only good for developing spatial awareness and speech, but also motor skills. Think of the importance in obtaining the ability to synchronize your body parts. As a young child, developing sense of rhythm could be an important part in being able to perform motor tasks (Burton & Taggart, 2011).

Music and Memory

Many studies over the years have shown that people who not only listen to, but also practice and perform music tend to have better long term memory. A study done by Jonides (2008) of the University of Michigan showed such results. The study consisted of college-aged participants of similar demographics, GPA, SAT score, gender, and outcome on the Raven's Test of Advanced Progressive Matrices. Half of the participants had more than 10 years of musical experience, and practiced for 10 or more hours per week. The other half did not practice music and had less than one year of musical experience throughout their lifetime (Jonides, 2008). The result: when tested on long term verbal memory, the musicians scored better. However, when denied of musical rehearsal,

the musicians' advantage vanished. Jonides also found evidence that the musicians had greater verbal working memory, and attributed this difference, not to the musicians having a greater memory capacity, but rather to the fact that the musicians were using rehearsal skills much more frequently.

Music and Creativity

As babies, we first begin to create music through babbling songs. It is a form of expression. As we grow older, we can learn to express ourselves and better sort out feelings using music (Cornett, 2003). Listening, reacting to, and performing music are all experiences that stimulate creativity. These tasks help promote problem solving skills as well (Cornett, 2003). In fact, according to Gardner (1999), music is a distinct human intelligence. This means that it is one of eight ways that humans "know" (Cornett, 2003).

Before the age of technology and the importance of higher-level education, more people could measure success through manual or physical labor. However, according to Pink (2005), developed countries have now created a climate where high pay and a good career path means pursuing "knowledge-based" jobs such as engineering, accounting, and health. This type of cognitive ability relies heavily on left-brain thinking. But Pink predicts a shift to right-brained thinking becoming the more valued asset in the future. This means that creativity will be highly valued in the societies of tomorrow (Pink, 2005). So, what does this have to do with music integration in the elementary classrooms? Instead of producing a generation of left-brain thinkers, music can be used to help develop left-brain thinking due to the fact that music is most often processed here.

Music and Brain Function

As previously stated, the influence of music can change the way in which the brain operates. With the development of the EEG and MRI scanning, we can study the effect of music on the brain by actually observing brain activity. Studies done through other forms of assessment may also suggest that music influences the operations within the brain.

Studies performed by Crawley et al. (2002) and Schellenberg (2005), showed that musicians tend to have more enhanced selective attention on certain higher-level cognitive tasks than non-musicians (Petitto, 2008). This lead Petitto, of the University of Toronto, to investigate the effect of musical education in childhood on second language acquisition in adulthood.

Petitto's study consisted of two groups that were tested and questioned to the point that the only known large difference between them was early and continued music education versus little or no music education. Both groups were monolingual and attending the first semester of introductory Spanish or Italian. The pre- and post-testing of the groups included assessments of competence and performance abilities by native speakers of the second language. Additional comparisons to be used were class grade and self-evaluation. After the semester, neither group showed higher academic performance over the other according to the class grade, self-evaluation, or even the SAT. However, those with childhood musical training were considered significantly more competent in the language as judged by the native speakers (Petitto, 2008).

Another study linking brain development and early exposure to music was done in 1995 by the University of Konstanz in Germany. When comparing brain imaging of the

somatosensory cortex of string players to non-string players, the amount of activity in this region of the brain that was specified for the thumb and fifth-finger was much higher. Even more interesting was the fact that practice time did not affect the amount of cortex dedicated to playing, but the age at which the musician had taken up the instrument did. The musicians that had begun at an earlier age had rewired more neural circuits to be devoted to playing (Begley & Hager, 1996).

A study done by the University of California, Berkley demonstrated differences in "fast" and "slow" learning between pianists and non-pianists. D'Esposito (2008) defines fast learning as demonstrating rapid improvement of a skill to the point that the performance of the skill becomes habitual. Slow learning refers to a gradual improvement of the skill. D'Esposito hypothesizes that fast learning leads to habitual performance of the learned skill due to the strengthening of synapses in the brain.

Within his study, D'Esposito placed pianists and non-pianists under an MRI scanner while they performed sequenced tasks. The pianists demonstrated faster response time to the stimuli as well as better demonstration of the learned sequences. The MRI imaging showed that there was more widespread activation across the prefrontal-parietal lobe of the brain during the testing for pianists than for the non-pianists. This suggests that different brain mechanisms subscribe to fast learning versus slow learning and the musically trained subjects have developed their brain function to more actively use fast learning capabilities (D'Esposito, 2008).

A study conducted by Flohr and Miller (1997-98) looked at the brain activity of four- to six-year-old children while performing a visual-spatial task and simultaneously listening to music. Prior to the test, one group received 10 weeks of music training, while

the other group did not. The EEG showed increased activity in the area of the brain concerned with spatial-temporal reasoning in the subjects that had received musical instruction. In fact, these children showed similar brain activity to that of musically trained adults when listening to music (Flohr et al., 2000). Another variance between the test groups was the amount of activity in the brain occurring in the right and left posterior temporal areas. These parts of the brain are typically associated with visual information and attention. For example, these parts of the brain would aid in being able to visually complete an incomplete picture, or recognize a slight difference in two nearly identical visual representations. The test subjects exposed to music actually expressed lower activation in their Beta regions. Exhibiting less activity has been linked with higher brain efficiency (Flohr et al., 2000).

"Musical competency is a part of our biological heritage" (pg. 36) says Weinberger in a 1998 article *The Music in Our Minds*. According to Weinberger, playing or learning music does not just help to advance musical skills, but rather, strengthens synapses within the brain. A study done by Hurwitz et al., (1975) looked at whether musical training would help improve student performance in reading comprehension. An experimental group of first graders received musical training for 40 minutes a day for seven months. Although the control group did not receive musical instruction, they were similar in age, IQ, and socioeconomic status. Both groups received the same reading instruction by the same teacher. The result was that the musically trained students scored in the 88th percentile on their reading scores, while the control group only ranked in the 72nd percentile (Weinerger, 1998). Our brains are as receptive to music as they are to language (Donahue & Stuart, 2010).

Conclusions

The common denominator in all of these studies is music. Musical experience led to subjects expressing higher test scores, IQ, achievement, and memory over subjects without musical exposure. The effects do not seem to be specific to one topic of study, but many, implying a universal benefit of music to education. From the studies I have reviewed, it seems clear that listening to, and being involved with music, is beneficial at any age, but even more so during childhood. Music enhances and even changes brain activity. Musical training at an early age can have positive effects on learning years down the road, even if the individual is no longer a practicing musician. Whether playing music or simply listening to it, music is widely beneficial. I believe that my research will demonstrate further proof of this by using the same controlled techniques with and without music to teach three different subjects to my fourth grade students.

Chapter Three: Application

The information gathered by previous studies of teaching through music showed that improvement was typical across varied subjects. I designed the implementation of my research to highlight this finding. My research consisted of three separate 30 minute lessons. One lesson taught the nine parts of speech, another taught 2-digit by 2-digit multiplication, and the third consisted of information about the three historical cultures of Colorado preceding the Indians. The goal of the lessons was to show a greater degree of learning, when the information was presented through music, as opposed to more traditional "sit and get" methods. Each lesson was taught in three ways; a typical lecture style PowerPoint, the same PowerPoint but with classical music playing throughout the lesson, or the PowerPoint containing the same information, but presented through a song. Having three fourth grade classes meant that each class was exposed to each type of lesson one time. For example, the math lesson was taught to Mrs. Z's class with a song, to Mrs. K's class with a lecture including classical music, and to Ms. S's class with a lecture style only. Then the grammar lesson was taught to Mrs. Z's class through lecture only, etcetera.

Context

The setting in which research was applied was to three fourth grade classes at the same elementary school in northern Colorado Springs, CO. Most students at the school are from mid to high-income households. Students ranged in age from 8 years to 11 years, with the mean age being 9 or 10. Each class contained about the same number of students with roughly twice as many boys as girls. Mrs. Z's class consisted of 24 total students, eight of which being girls and 16 boys. Ms. S's class had 24 students, with nine

girls and 15 boys. Finally, Mrs. K's class also included nine girls and 15 boys, with a total of 24 students. Each class had varied amounts of students designated as gifted and talented, special ed., or with special needs such as autism. Mrs. Z's class had the most students designated as gifted and talented (7) and the least amount of special ed. students (1), with no special needs students. Mrs. K's class, on the other hand, had the most special ed. and special needs students (3) with the least amount of gifted and talented students (1).Ms. S's class had 5 gifted and 2 special ed. I make this distinction, because, as you will later see, these variations did not seem to affect any of the classes' results either way.

Implementation

In order to assess the effectiveness of each lesson, a short assessment was given just before and after the lesson was taught. The math assessment consisted of five two-digit by two-digit multiplication problems. The grammar assessment showed a sentence and asked students to identify the part of speech for the 12 words within it. Finally, the Social Studies assessment included a word bank and 7 fill in the blank questions. The students were also timed to see if the way in which the lesson was taught had an impact on the time it took them to complete their post-quiz as compared to their pre-quiz. There were no significant results concerning the time taken. No matter what method was used for the lesson, sometimes the class averaged longer times, sometimes shorter times, and sometimes near the same.

The scores, however, did show a positive correlation between the type of lesson it was (musical or not) and the amount of point increase. Every subject's highest increase in

scores was when music was involved in the lesson, whether through singing or classical music.

The first subject that I will discuss is Social Studies. For each of the three times taught, this lesson was the 4th of a five-day unit. Prior to this lesson, students had worked in groups to predict, research, and write about the purpose of six different artifacts found in Colorado thousands of years ago. Nothing was officially discussed before the lesson concerning the names of the different ancient tribes, where they lived, or how they came to be in Colorado.

The Social Studies lessons with classical music and with no music were taught nearly identically. The only difference was that, before the classical music lesson began, students were told that "I think that class can be more relaxing sometimes when there is some music playing, so today I will have some soft classical music playing during the lesson." In both instances, pre-tests were passed out immediately, and students were told that this is a pre-quiz and that they would have a chance at the end of class to take it again to see how much they learned. Students were also told to do their best, but that neither pre-quiz nor post-quiz would be a part of their grade. Students were given approximately 5 minutes to complete the quiz. Many finished early, with only a few in each class having to turn in their quiz at the five minute mark. See Appendix A for a copy of the pre/post-quiz given. Upon collection of the quizzes, students were directed towards the PowerPoint as seen in Appendix B. On each slide students were told to silently read the information. I would then ask some comprehension questions and we would read it again together. In this manner, all information was covered twice, as well as discussed. After

15 to 20 minutes, students were given a post-quiz to complete, and many finished much faster than they had with the pre-quiz. This was the end of the lesson.

The Social Studies lesson, taught through song began in the same way as the other lessons until it came time for the PowerPoint. At that time students were told that sometimes it is easier or even just more fun to learn things through singing, so we would get a chance to sing about these ancient people of Colorado. Each slide shown looked nearly identical to the slides of the non-singing lessons. The same information and pictures were shown. The language, however, was worded somewhat differently in order to go along with a melody and be able to rhyme. The song's lyrics were written and recorded by myself and set to a karaoke tune of "American Pie." This PowerPoint can be seen as Appendix C. After the PowerPoint was introduced, students were asked to follow along in their heads as they listened to each section of the song. The slide was then discussed and students were given a chance to sing along with it. This was done for each slide. Once the PowerPoint was finished, the class was able to sing straight through the entire song as I clicked through the slideshow. In this way the information was visited three times, but with less discussion than the non-singing lessons. After finishing the slide show, class ended in the same way by completing the post-test.

The second subject I will visit is Language Arts. These three customized lessons focused on the nine parts of speech. All students had been taught at least seven of the parts of speech prior to this lesson to varied degrees. Students were presented with the nine parts of speech lessons in the same manner as the Social Studies lessons I have discussed; the only big difference being content. The PowerPoint for the non-singing lessons provided the same information, but in a way that did not rhyme. The singing

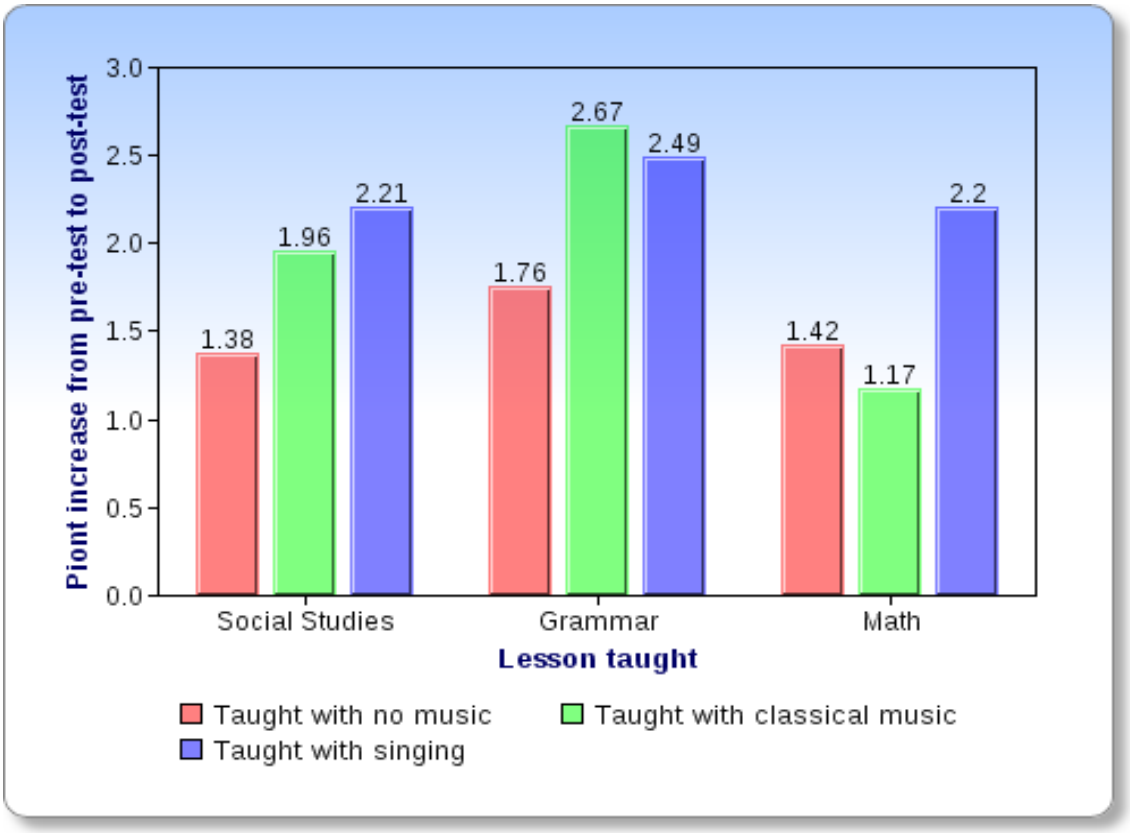
PowerPoint had a few photos that would change the video and sound on each slide played. Many of these different pictures were arranged together on the non-musical presentation so that all students still saw the same visuals. After pre-tests were taken, each slide was read, and discussed at length, until it was time to take the test again. This PowerPoint can be found under Appendix D. In addition, the singing PowerPoint can be found under Appendix E. The source of information for these PowerPoints came from a song and video on YouTube labeled under *The Grammar Song, Nine Parts of Speech*. The pre/post quiz for this lesson can be seen under Appendix F.

The math lessons were taught in much the same way as the other lessons, but with a few small variations. First of all, these math lessons taught 2-digit by 2-digit multiplication. This was the first official lesson introducing this concept to all three classes. Because of its newness and the nature of the topic, students in all three different lessons took an exceptionally short time to complete the pre-test (on average one minute) and an exceedingly long time to complete the post-test (an average of about seven minutes). This is because they had many steps to remember once they learned the process. All math lessons began with a pre-quiz, followed by the PowerPoint. The differing factor between the math lessons and the other lessons was that the math PowerPoint had fewer written words. For the non-singing math lessons, students were shown a problem and shown step by step how to complete it as the PowerPoint lit up different areas on the math problem. This was discussed and students were given a chance to try on their own while following the same steps shown on screen. The steps were repeated together and students had yet another chance to try a problem on their own. For the singing math lesson, instead of students listening to a spoken explanation of the

process the first time through, they listened to a song that explained the process, as I clicked through, illustrating the steps. The song's lyrics were written and recorded myself, and set to the karaoke tune of "Do, Re, Mi" from the musical *The Sound of Music*. Students were then able to attempt to solve a problem on their own. The steps were discussed, and students were able to sing through the song the second time around, before asked to attempt another problem. Appendix G shows the non-singing Math PowerPoint. Appendix H is the PowerPoint shown with song and the math pre/post quiz can be seen under Appendix I.

It is important to state, I think, that the songs used were by no means meant to be memorized. The songs for Language Arts, Social Studies, and Math were far too complicated to be committed to heart within a 20 minute teaching period. Their purpose was to demonstrate whether the act of singing and listening to content being sung, would help students to process more information. The rise in points from pre-test to post-test are shown in the chart on the following page.

Score Increase By Lesson



The social studies lesson taught with no music to Ms. S' class yielded a pre-test score average of 4.67 points out of 7, and a post-test score average of 6.05. The scores rose by 1.38 points. The social studies lesson taught to Mrs. Z's class with classical music rose by 1.96 points; the pre average being 3.90 and the post average being 5.86. Mrs. K's class began the social studies singing lesson with an average score of 3.67 and finished with a score of 5.88, a rise of 2.1 points.

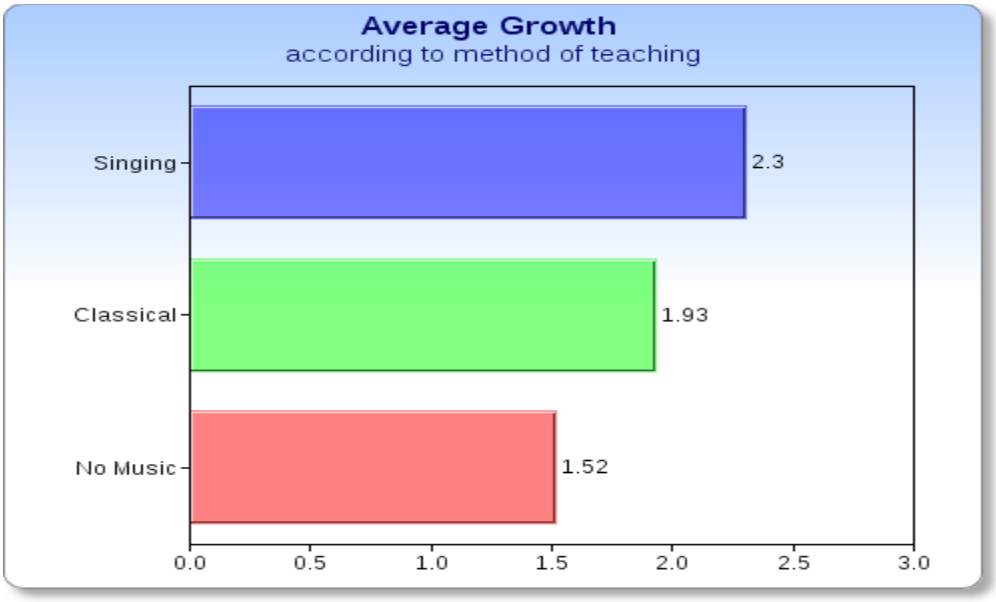
With respect to the math lessons, in which quizzes were worth 5 points, Mrs. Z's class was taught with no music. Her class had a pre score average of 0.77 out of and a post score average of 2.19; a rise by 1.42 points. Mrs. K's class, taught with classical music, rose by 1.17 points. Interestingly, this was the only case in which, the classical lesson did not outperform the lesson taught with no music. Mrs. K's class began with a

low average of 0.83, and ended with an average of 2.00. However, Ms. S's class, taught through song, still outgrew both other classes, with a difference of 2.20 points from pre to post test. They began with the lowest average of the three, at 0.35 points, and ended with the highest average; 2.55 points.

The results from the grammar lessons showed less growth when taught with no music, compared with singing or classical music. The non-music lesson, taught to Mrs. K's class, averaged a pre score of 6.10 points out of 12. The post-test yielded an average of 7.86 points, a gain of 1.76 points. Ms. S's class was taught using classical music, and grew by 2.67 points, the greatest growth of the three classes for the grammar lesson. They began with an average of 6.67 and ended with 9.33. Mrs. Z's class was a close second with an average rise of 2.49 points. Her class was taught with singing and began with 5.21 points and ended at 7.70 points.

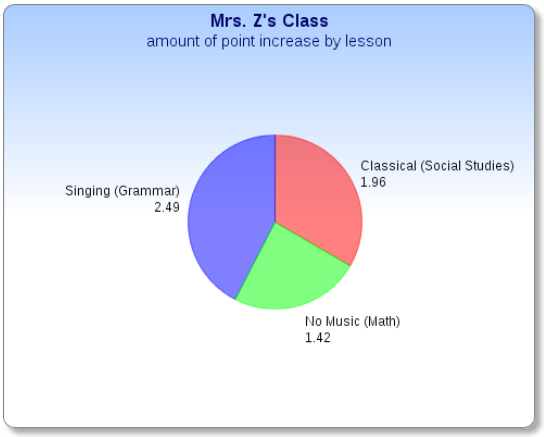
When averaging the rise in test scores of all lessons taught in that manner, the results are thus:

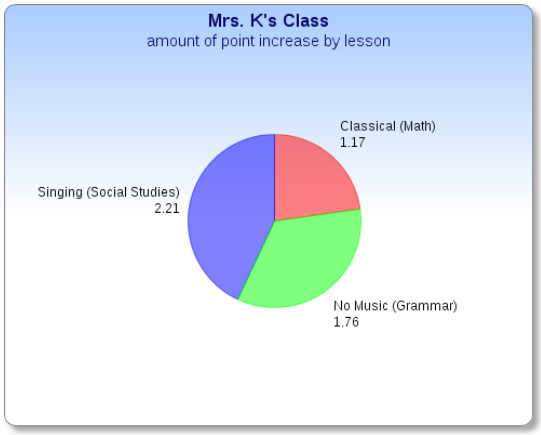
Average Growth By Method

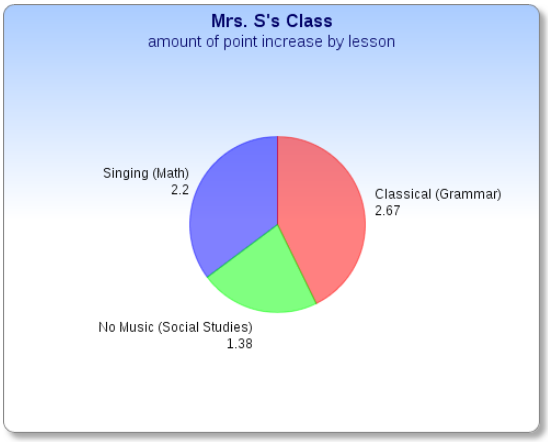


As past research in the area of music and learning would suggest, the lessons taught through song had the greatest gain overall, and the lessons taught with stimulating background music, also showed a greater gain in scores than a typical, lecture without music.

Within each class, the lessons which were taught with music, regardless of the content being taught, had the highest gains when the material was taught through song or with classical music ambiance. The following charts illustrate this point.







It could be argued that the point growth is skewed considering that the three tests were not worth the same amount of points. The reasoning behind this, however, had to do

with the complexity of the material and the amount of previous exposure the students had to that topic. Multi-digit multiplication was a completely new concept, involving multiple steps of processing, which is why the students were only given five problems to work through. The nine parts of speech, on the other hand, was a topic the students were aware of, but had not mastered. I expected students to perform the best on this pre-test. The lesson taught for Social Studies had very new material, but was less complex than multi-step multiplication; therefore the students were given 7 problems, rather than 12 or five. This said, the average increase of scores for all tests still ended up being within one to three points.

What now?

Through my research, the general conclusion I have come to is that lessons are more effective when presented with music. This is true whether the material is completely new or more of a review. This also holds true whether the information is complex or simply a matter of rote memorization. This means that my classroom will not be one of the majority according to Thormburg.

"Most classrooms today give the impression that music has never been invented, yet no culture on this planet is without music." *Thormburg, 1989.*

I envision my future classroom as a place in which music is fully present and relevant. New concepts will often be introduced through song and repeated often. Background music will be a tool to set the mood of the class as well as to stimulate their young minds.

Drawing from this experience, I would design future musical lessons in a similar way to the three I conducted for my research. I would give a pre-quiz as well as a post-quiz. Although in the future this data would not be necessary for a research paper, I believe that the data can be used to assess the effectiveness of instruction. In addition, most students expressed positive feedback about the pre and post-exams, stating that they liked knowing where the lesson was going and what to look for. A future lesson would also be about 15 minutes longer, allowing more time for practice or discussion of the material and time to sing the material multiple times. I found that the majority of students wanted to sing the content many more times than time allowed for.

This hypothetical lesson would be a recurring instance in my classroom, with some sort of music being played every day. A schedule of a hypothetical fractions lesson is as follows:

1. 8:00 – 8:05 Students take pre-quiz
2. 8:05 – 8:10 Students are asked to discuss what they already know about fractions. They will then listen to a song about what fractions are and how they are written.
3. 8:10 – 8:25 As a class, we will discuss each part of the song and have a chance to draw and label our own fractions.
4. 8:25-8:30 Students will be able to practice the song through a few times.
5. 8:30 – 8:40 Students will be given independent work to practice making and writing fractions while the song continues to play. Students are allowed to sing along as they work.

6. 8:40 – 8:45 The class will discuss interesting findings and any "aha" moments.
7. 8:45 – 8:50 Students will take the post-quiz and be able to see their growth prior to the next day's lesson.

As you can see, additional time has been included for reflection and discussion. Students also have plenty of time to practice the song and rehearse it as they apply what they have learned.

Chapter 4: Summary and Recommendations

Thesis Review

The information that I have gathered through library research, as well as through testing of my own, does indeed support the thesis stated in chapter 1: *The incorporation of music into elementary lessons covering the topics of math, social studies, and language arts will increase the content learned and the retention of such material.* Both forms of research did indeed show that students' learning increases when that learning involves music. However, my original thesis stated that students would also have better long term retention of such material. My classroom research initially included a third quiz given to students one week after the lesson was given. Unfortunately, the accuracy of these post-post-quizzes was compromised due to many factors. The lessons taught were a part of the curriculum being introduced at the time and teachers in the fourth grade would continue to teach the material in varied ways from the time that the tested lesson was given. My tested lessons were presented as part of each unit, but each unit was continued on by the class' normal teacher. In addition, the three teachers' difficult schedules did not allow for a third quiz to be given exactly one week later in every circumstance. Lastly, if quizzes were given at a later date, some students that were there for the initial lesson might be absent for the post-post-quiz. For these three reasons this part of my thesis was abandoned after only a few post-post-quizzes were administered. However, support for greater retention of information when taught through music can be found in the research information presented in chapter 2.

Reflection

To my personal joy, the study I conducted of my students did indeed confirm my thesis. I do feel that it is necessary to point out that the students studied were all of similar socioeconomic status and attended the same school. Therefore, I do not believe that this study proves universal betterment of learning through the use of music. I believe that more accurate results would be produced if the study could be expanded to different schools of varied family income and in different parts of the country.

Conclusion

My findings support music integration into the elementary curriculum. Because of the limited scope of my research, I would recommend that more research be done on how effective music is with helping children learn, especially with how singing the information might help student to retain it. While reading the studies that have been done on the effects of music on education, I found that there is a noticeable lack of information on how music as the medium of instruction helps students to learn. There is an abundance of information to support that musicians can learn better and more quickly. In addition, studies have shown increased brain activity in students when listening to music while learning. As I continue my teaching career, I envision a classroom in which music and instruction are married in a way that the benefits are apparent in my students every day. I believe that the best time to use lyrical instruction is the first time that a concept is introduced. Then, as the concept is revisited, students can listen to and practice the song over and over. Eventually, memorization of the lyrics might become possible, in addition to exercising the brain. In my classroom, the best time to use multiple genres of songs

will be to indicate a change of subject or location. For example, throughout morning routine, a fun popular song would be played, to get students excited and interested in the day. Students will learn that a different genre of music means a transition to a certain subject. To change from math to reading, a 20 second clip of jazz will be played. To get ready for lunch, students will hear an 80's rock tune. The result is easier transitions and a feeling of excitement to keep school from getting dull. Classical music will be used for quiet time activities when I expect no talking. The importance of integrating music into the elementary curriculum is that it is used to better performance. It should not be a distraction. Therefore, music that does not include subject content should be used as a form f routine. Music that is not part of the routine will deliver a specific content message.

Music is a large part of human life; it could and should be a large part of human learning.

Appendix A

Social Studies Pre and Post Test

Name _____ Date: _____ S.S. Pre-test

Use the words below to complete the sentences. **Not all** of the words will be used.

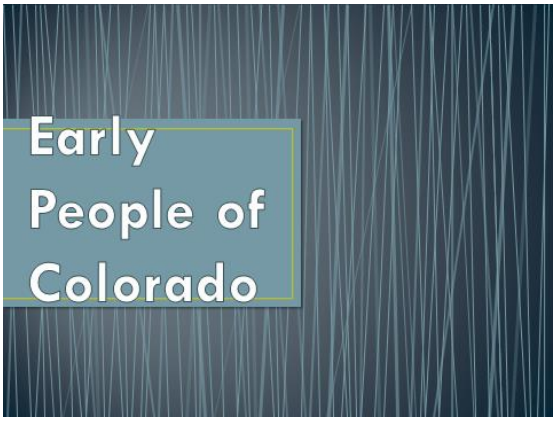
Rocks **Neolithic** **Bering Strait** **Spear Points** **Clay Pots**

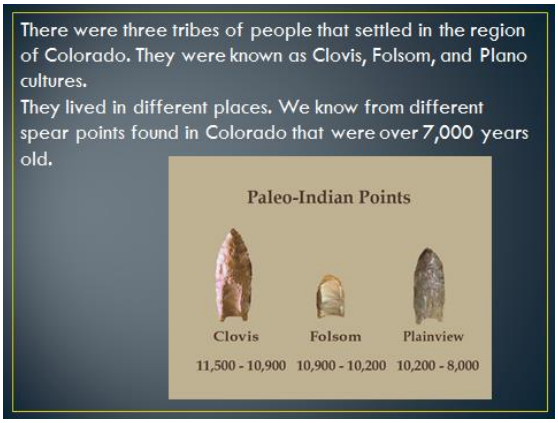
Archaic **Clothes** **Bows and Arrows** **Animal Skins** **Bones**

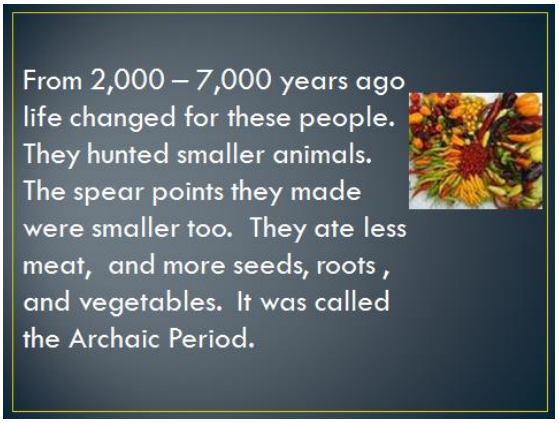
1. Over 18,000years ago the Paleo Indians crossed over an ice bridge called the _____.
2. Archaeologists knew there were three tribes, Folsom, Plano, and Clovis, because of the different _____ they found.
3. During the _____ Period, life changed, and the people ate smaller animals, and more seeds, roots, and vegetables.
4. Archaeologists believe that the Plains Woodland Culture used _____ for hunting.
5. From 2,000 to 700 years ago, all of the cultures in the Colorado area made _____ for cooking and storing food.
6. The Plains Woodland Culture and Upper Republican Culture lived in low huts covered with _____.
7. The Apishapa Culture was different because they made their large homes out of _____.

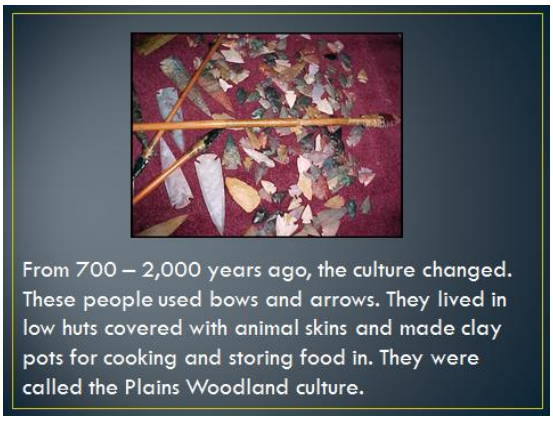
Appendix B

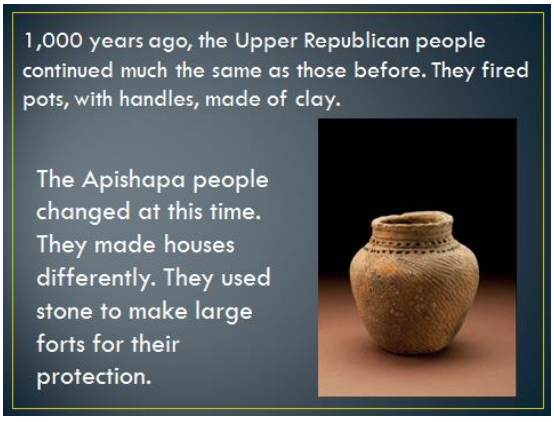
Social Studies PowerPoint without Singing





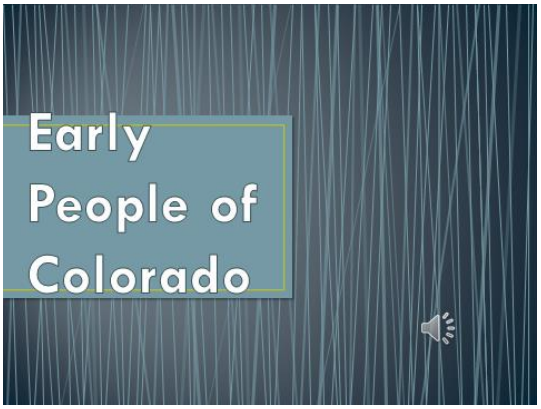






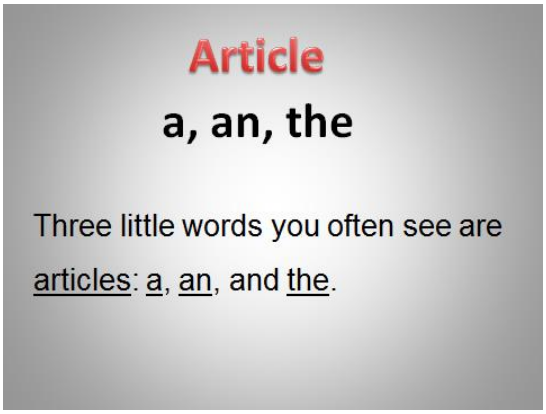
Appendix C

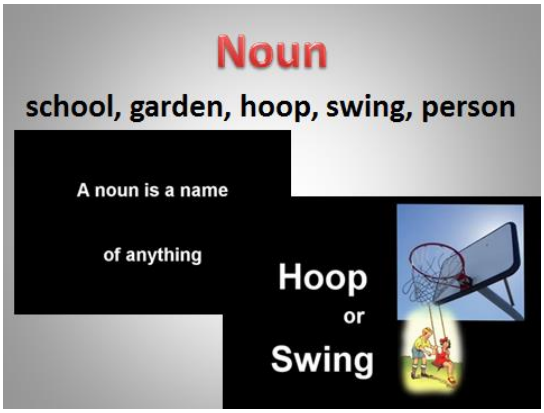
Social Studies PowerPoint with Singing

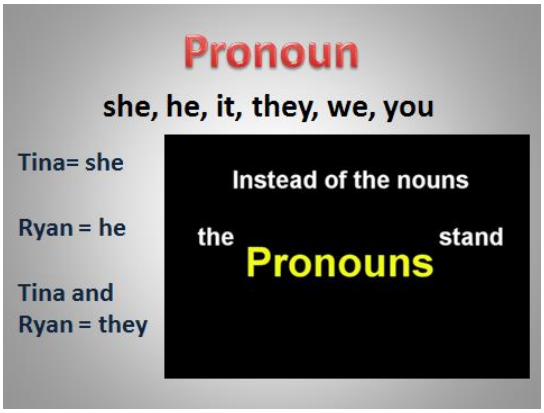


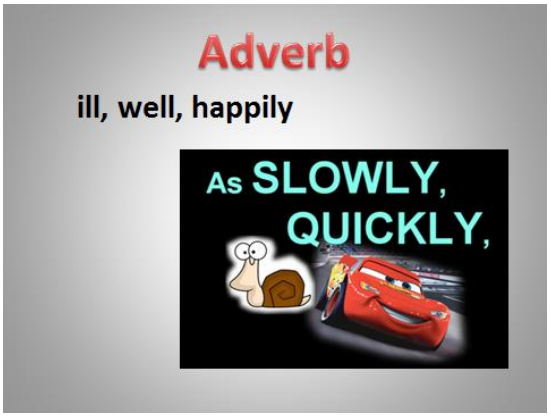
Appendix D

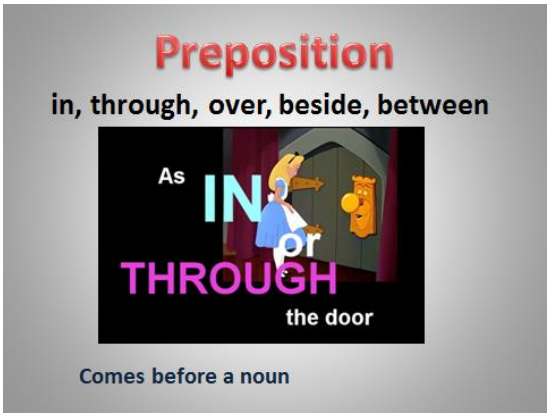
Grammar PowerPoint without Singing

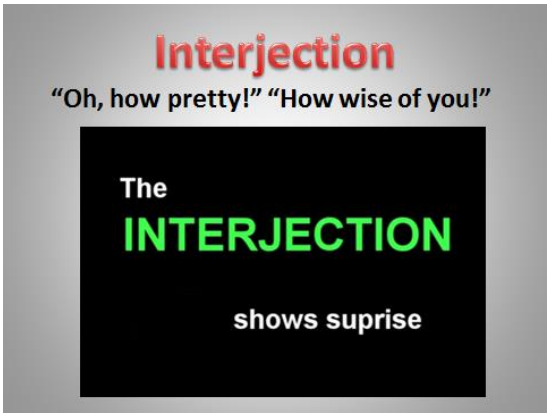


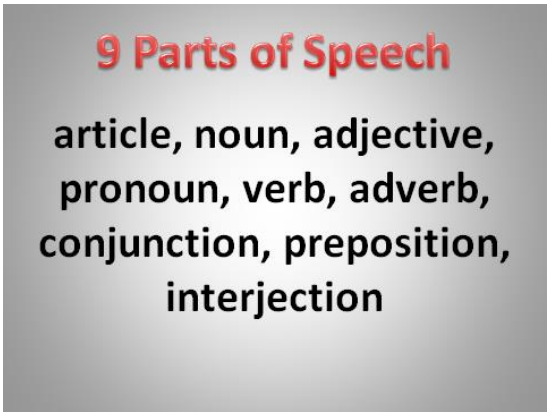








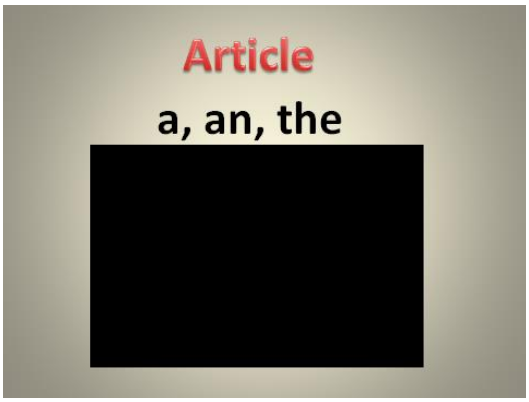


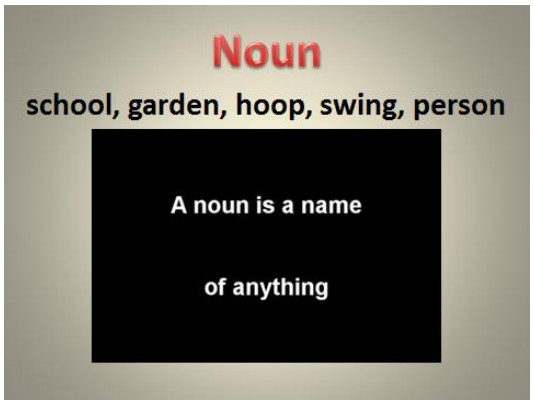


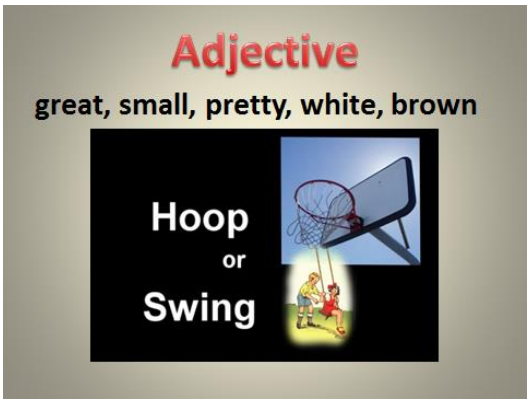
Three little words you often see are articles: a, an, and the.
A noun is a name of anything as school or garden, hoop or swing.
Adjectives tell the kind of noun, as great, small, pretty, brown, or white.
Instead of the nouns the pronouns stand. Like she and he.
Verbs tell something to be done. For example: to read, count, run, sing, laugh, or jump.
Adverbs tell how things are done; as slowly, quickly, ill, or well.
Conjunctions join the words together; as men and women.
The preposition stands before a noun, as in or through the door.
The interjection shows surprise, as "Oh, how pretty! Oh, how smart!"
The whole are called the nine parts of speech.

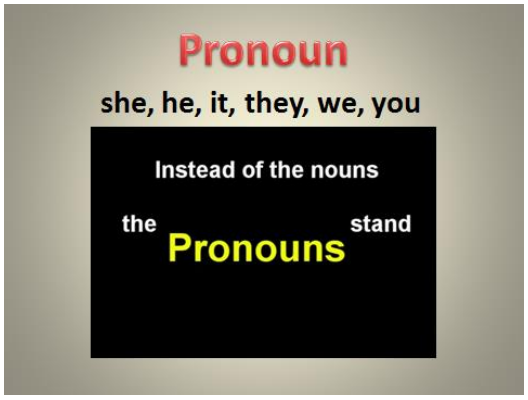
Appendix E

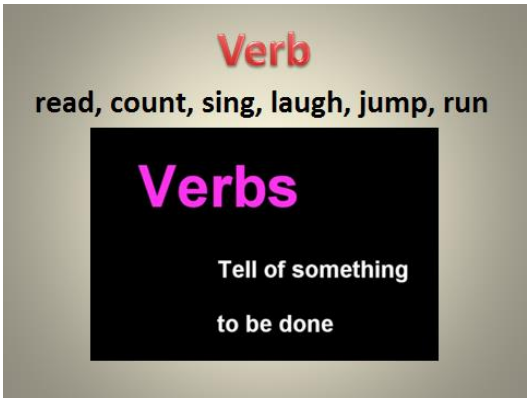
Grammar PowerPoint with Singing





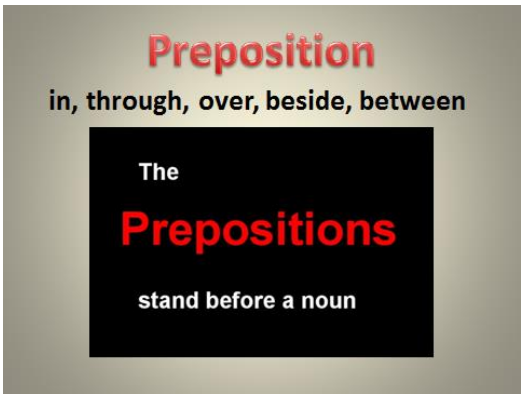


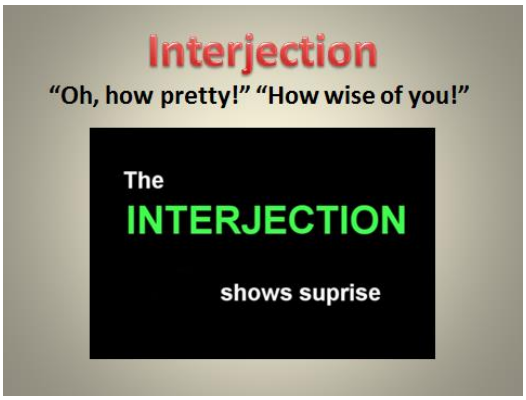


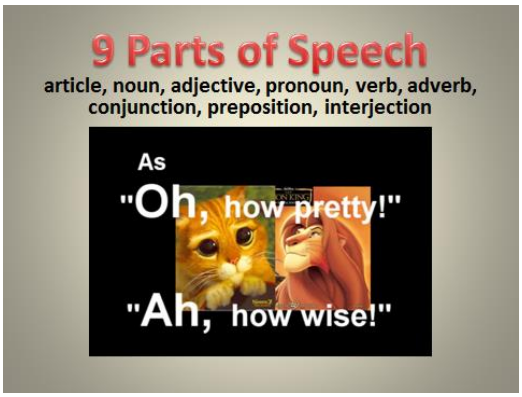

Verb
read, count, sing, laugh, jump, run
Verbs
Tell of something
to be done

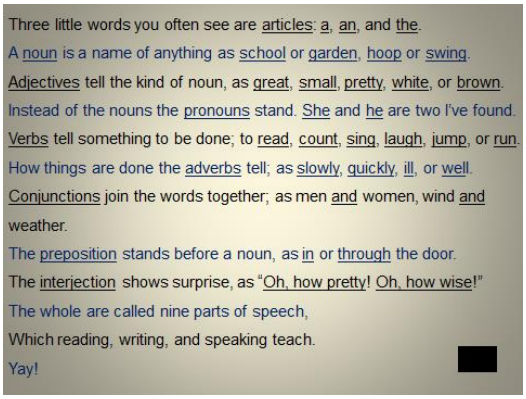

Adverb
slowly, quickly, ill, well
To read, count, sing,
laugh, jump or run


Conjunction
and, or, but
As SLOWLY,
QUICKLY,
ILL or WELL


Preposition
in, through, over, beside, between
The
Prepositions
stand before a noun


Interjection
"Oh, how pretty!" "How wise of you!"
The
INTERJECTION
shows suprise


9 Parts of Speech
article, noun, adjective, pronoun, verb, adverb, conjunction, preposition, interjection
As
"Oh, how pretty!"
"Ah, how wise!"


Three little words you often see are articles: a, an, and the.
A noun is a name of anything as school or garden, hoop or swing.
Adjectives tell the kind of noun, as great, small, pretty, white, or brown.
Instead of the nouns the pronouns stand. She and he are two I've found.
Verbs tell something to be done; to read, count, sing, laugh, jump, or run.
How things are done the adverbs tell; as slowly, quickly, ill, or well.
Conjunctions join the words together; as men and women, wind and weather.
The preposition stands before a noun, as in or through the door.
The interjection shows surprise, as "Oh, how pretty! Oh, how wise!"
The whole are called nine parts of speech,
Which reading, writing, and speaking teach.
Yay!

Appendix F

Grammar Pre and Post Test

Name _____ Date: _____ L.A. Pretest

Read the sentence and use the word bank to write the correct part of speech beside each word. Each word can be used more than once.

Word Bank:

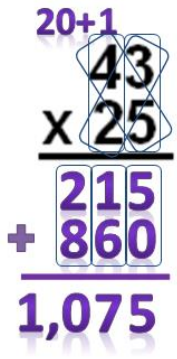
preposition pronoun adjective noun verb conjunction adverb interjection article

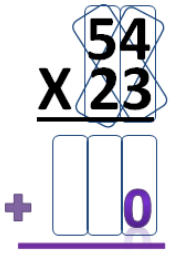
Jake walked quickly to a pretty flower in the garden and he said, “Oh how lovely!”

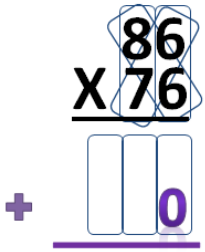
1. Jake: _____
2. the: _____
3. he: _____
4. “Oh how lovely”: _____
5. in: _____
6. quickly: _____
7. flower: _____
8. and: _____
9. walked: _____
10. pretty: _____
11. said: _____
12. a: _____

Appendix G

Math PowerPoint without Singing

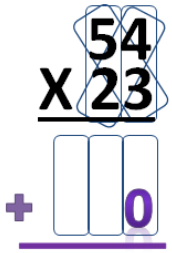






Appendix H

Math PowerPoint with Singing

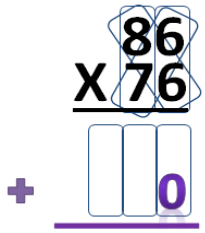


Let's start in the bottom right corner.
It's a very good place to start.
First we multiply the numbers in the ones place.
Write the answer underneath.
And carry over any tens.
If you have some.

Then go back to the ones and multiply it by the tens.
Don't forget to add anything you carried.
Then write a zero down.
And do it over again.

Always start on the bottom right, and multiply above.
Carry any tens over, just like with adding, that you love.
Once you've finished with the right, move one digit to the left.
Multiply the top again.
But don't forget to write your zero down first!

Then we add the numbers up, always starting with the right.
And you found the answer there.
Check to be sure it is right.
It's so easy to be done.
You should go and tell someone.
You can multiply across,
to find the product of big numbers!


86
X 76
0

Appendix I

Math Pre and Post Test

Name: _____ Date: _____ Mult. Pre-test

Solve the problems below using standard multiplication. **SHOW YOUR WORK**.

1)	2)	3)	4)	5)
21	57	90	20	63
X 42	X 35	X 31	X 10	X 46

References

Begley, S., & Hager, M. (1996). Your Child's Brain. *Newsweek, 127*(8), 54-63.

Burke, M., & Colwell, C. (2004). Integration of music in the elementary curriculum: Perceptions of Preservice Elementary education majors. *Applications of Research in Music Education, 23*(1), 22-33.

Burton, S., & Taggart, C. (2011). *Learning from young children: Research in early childhood music*. United Kingdom: MENC: The National Association for Music Education.

Cornett, C. (2003). *Creating meaning through literature and the arts: An integration resource for classroom teachers* (2nd ed.). Upper Saddle River, NJ; Columbus Ohio: Merrill Prentice Hall.

D'Esposito, M. (2008). *Developing and implementing neuroimaging tools to determine if training in the arts impacts the brain.* Dana Press. *The Dana Consortium Report on Arts and Cognition, ,* 71-80.

Donahue, D., & Stuart, J. (Eds.). (2010). *Artful teaching: Integrating the arts for understanding across the curriculum, K-8*. New York, NY: Teachers College Press.

Flohr, J., Miller, D., & Debeus, R. (2000). EEG studies with Young Children. *Music Educators Journal, 87*(2), 28-39.

Giles, A., & Frego, R. J. (2004). An inventory of music activities used by elementary classroom teachers: An exploratory study. *Applications of Research in Music Education, 22*(2), 13-22.

Head, D., Pollett, L., & Arcidiacono, M. (1991). *Opening eyes to mathematics through musical "array"ngements*. Salem, Oregon: The Math Learning Center.

Jonides, J. (2008). *Musical skill and cognition.* Dana Press. *The Dana Consortium Report on Arts and Cognition, ,* 11-15.

Juslin, P., & Sloboda, J. (2001). *Music and emotion: Theory and research* Oxford University Press.

Lazar, M. (2004). *Interactive music strategies for the academic curriculum.* Retrieved 08/02, 2012, from education.jhu.edu/PD/newhorizons/strategies/topics/Arts_in_Education/lazar.htm

Memory and mnemonic devices. (2012). Retrieved 08/02, 2012, from http://psychcentral.com/lib/2010/memory-and-mnemonic-devices/

Neville, H., Andersson, A., Currin, J., Lauinger, B., Sabourin, L., & Sundborg, S. (2008). *Effects of music training on brain and cognitive development in under-privileged 3- to 5-year-old children: Preliminary results.* Dana Press. *The Dana Consortium Report on Arts and Cognition, ,* 105-116.

New NYC music program aims to help at-risk students. (2000). *Curriculum Administrator, 36*(4), 19.

Petitto, L. (2008). *Arts education, the brain, and language.* Dana Press. *The Dana Consortium Report on Arts and Cognition, ,* 93-104.

Pink, D. (2005). *A whole new mind: Why right-brianers will rule the future*. New York, NY: The Penguin Group.

Schneck, D., & Berger, D. (2006). *The music effect: Music physiology and clinical applications*. Great Britain: Anthenaeum Press; Gateshead; Tyne and Wear.

Sims, W. (2008). *Music and word recall: The strength of familiar melodies as mnemonic devices.* (Unpublished Undergraduate). Ohio State University.

Stone, R. (1999). *Best classroom practices: What award-winning elementary teachers do*. Thousand Oaks, CA: Corwin Press, Inc.

Weinberger, N. (1998). The music in our minds. *Educational Leadership, 56*(3), 36-41.