

Running Head: EDUCATIONAL HIP HOP

Educational Hip Hop Music in the Classroom:
Activating Minds in Creative Ways

by

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Dedication

To my wonderful parents who have always been there
Given me guidance and wisdom they've shared
To my professors and teachers, we share the same dreams
Thanks for all your support, glad your all on my team

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Table of Contents

	Page
Dedication	1
Acknowledgements	2
Table of Contents.....	3
Abstract	4
Chapter One: Introduction	5
Chapter Two: Review of Literature	11
Chapter Three: Methodology	18
Chapter Four: Results	23
Chapter Five: Discussion	32
References	36
Appendix A: Hip Hop Lesson Plans for Grades 2, 5, 7 and 9	40

Abstract

Music is good for you - physically, emotionally, and spiritually. It can strengthen the mind, unlock the creative spirit, and, miraculously, even heal the body. The purpose and product of this project was to develop a handbook for teachers to be motivated to and learn how to use Hip Hop in education. The handbook offers four Common Core-referenced mathematics lessons that serve as samples and inspiration for teachers as well as web-based resources that incorporate lessons, raps, and worksheets teachers can use in their own teaching. The resources and lesson included in the handbook are intended to be used in any educational setting at any grade level.

Keywords: Hip Hop, Educational Hip Hop, Flow, Instructional Scaffolding, Mathematics Instruction, Motivation, Multiple Intelligences and Pedagogy.

Chapter 1

Introduction

Music for many, happens to be one of the many joys in peoples lives, so bringing it into the classroom allows teachers to make it one of the joys for student learning as well. Research suggests that “music training does for the brain what exercise does for body fitness.” It helps improve certain memory capabilities outside of music. Congruently, much research shows that learning through music, facilitates learning other subjects and enhances skills that children inevitably use in other areas.

Not only can music promote learning but it has the power to activate students mentally, physically, and emotionally. According to Author Chris Boyd Brewer who wrote the book, *Music and Learning: Integrating Music in the Classroom*, “Music greatly affects and enhances our learning and living” (1995, para. 4). Congruently, music has the ability to stabilize mental, physical, and emotional rhythms which ultimately help attain a state of deep concentration and focus in which large amounts of content information can be processed and learned.

In an article that as written in *Psychology today*, research found that music could be used to help people remember learning experiences and information (Klemm, W. 2010.) Just as incorporating music into the classroom helps enhance brain development, physical coordination, language, memory, and visual and aural skills, it is a powerful tool that helps our students appreciate and enjoy its simplicity and enhancement of life.

Contextualizing Background

“Music has the power to bring life into the classroom to engage, educate, and promote student understanding” (Brewer, C. 1995). “The magic of music to be able to take listeners on a

journey to places they may have never imagined, or to give the listener an in-depth look into the soul of the person or persons making the music” (Beachum & Mccray 2011). Teaching educational Hip Hop in the classroom can not only help students learn new terminology and new concepts in any given subject, but it can also serve as a model to help develop student memory and enhance student processing. According to Professor Paula Chesley from the University of Alberta, “hip-hop music could actually help children and young adults learn new language.”

Numerous genres of music have been around for decades, though it was the emergence of Hip Hop that started to materialize in the early 1990’s. The art of Hip Hop music started with beats and was capitalized over the years with lyrically empowering flows. The transformation of Hip Hop to rap has evolved rapidly over time and many educators today are using it to teach, promote, and expand the knowledge of student learning in the classroom. Preliminary research is suggesting that educational Hip Hop can be used help with information processing and can be a key factor in helping with student memorization. Furthermore, there are many websites that promote student learning through educational Hip Hop that teachers can use as viable resources in their classroom to educate the minds of 21st century future learners.

Statement of Problem/Research Question

What is a useful resource for teachers to integrate educational Hip Hop music in the classroom?

The use of Hip Hop in the classroom promotes new learning and deeper leveled thinking while getting students motivated and keeping them engaged. Reyhan Harmanci, journalist of the article *Academic Hip Hop? Yes, Yes, Y’all* notes, “with hip-hop itself hitting its third decade, hip-hop has become one of the most explosive subjects to hit academia in decades.” With this, I

have a created a handbook for teachers to explore that incorporates numerous ways in which a teacher can use educational Hip Hop in the classroom to promote deeper leveled thinking and to help with their memory, information processing, while learning understanding new pedagogy and math concepts.

Purpose of Project

The purpose of the study is to show how the progression of Hip Hop in the classroom has emerged over the years, while emphasizing the motivation it may provide for students, and to provide teachers with different resources they can use in their own classroom to implement and promote educational Hip Hop. “Pedagogies based upon Hip Hop aesthetes are simply one emerging set of resources that educators can draw from for different purposes” (Pechauer, 2012, p.153)

There are numerous resources for teachers today that promote educational Hip Hop in the classroom. One website entitled Flocaubulary introduces students to more contemporary concepts thorough educational rap songs. Flocaubulary presents academic content in the areas of math, science, and language arts and fulfills the class with its highly-engaging videos to promote students with both visual and aural exposure.

YouTube, a national broadcasting network that can be utilized for sharing or watching videos, is another great resource that teachers can use to implement the art of educational Hip Hop in the classroom. Many teachers have gotten their own students involved to create educational songs and raps to help one another learn. One San Diego teacher by the name of Alex Kajitani, also known as the “rappin mathematician”, has created many YouTube and non YouTube videos to “provides teachers, students and parents with hip, cool rap songs about core

math concepts, and living a positive life in his classroom.” Another LA Middle school teacher named Lamar Queen calls himself the “rappin mathematician” and uses educational Hip Hop through standards-based songs and videos to promote deeper leveled thinking and keep students engaged while reviewing important math concepts.

Another and more “modern” tool that teachers can explore in promoting educational Hip Hop in the classroom is through a newly developed twitter app named #HipHopEd. Created by a Christopher Edmid, an associate professor of science at Teachers College at Columbia University, started a conversational based discussion on twitter that focused on the intersection of Hip Hop music and culture with education. The conversation transformed rapidly into a weekly chat engaging educators and Hip Hop fans around the world. “These Twitter chats offer techniques to incorporate hip-hop in the classroom, lesson ideas for covering diverse topics, and reflections on culture from hip-hop enthusiasts and educators”. (Chertock, 2014). Accordingly, The chat's goal is "to promote, preserve, and protect hip-hop and inspire, initiate, and intellectualize hip-hop as a means of sustained education and youth development" (Edmin, 2014).

Definition of Terms

Cypher. In the Hip Hop world, if you are freestyling (rapping of the top of your head), you rap in a cypher (one person going after the other).

Differentiation. Differentiated instruction in education is a framework or philosophy for effective teaching that involves providing different students with different avenues to learning. differentiation may be used in helping students acquiring new content, with processing, constructing, or making sense of ideas.

Hip Hop. Hip Hop, also spelled hip-hop, is a music genre consisting of a stylized rhythmic music that commonly accompanies rapping, a rhythmic and rhyming speech that is chanted. Even while it continues in contemporary history to develop globally in a flourishing myriad of diverse styles, these foundational elements provide stability and coherence to the culture. For the purposes of this project, except for direct quotes, the Hip Hop spelling with capitalization and no hyphen will be used throughout the paper.

Educational Hip Hop. Educational Hip Hop is the term the author has coined to represent Hip Hop-based education, especially the use rap songs and lyrics, as curricular resources. Bringing Hip Hop to educational environments to connect with today's youth is becoming a popular approach that some teachers have decided to take to motivate students and connect them with the content through musical and rhythmic ways.

Flow. The word MC's use for synching their voice in rhythm to the beat.

Instructional scaffolding. Instructional scaffolding is a learning process designed to promote a deeper level of learning. Scaffolding is support given during the learning process tailored to the needs of the student with the intention of helping the student achieve his/her learning goals.

Mathematics instruction. In contemporary education, mathematics education is the practice of teaching and learning mathematics, along with the associated scholarly research.

Motivation. The general desire or willingness of someone to do something.

Multiple Intelligences. Howard Gardner (Gardner, 1983) has forwarded a theory of Multiple Intelligences that assumes that all humans are intelligent in different ways and in different degrees in eight dimensions. Gardner views intelligence as multidimensional rather than

a single general ability. Gardner's eight current identified intelligences are: Visual-Spatial, Bodily-Kinesthetic, Musical, Interpersonal, Intrapersonal, Linguistic, Logical-Mathematical, and Naturalistic intelligences.

Pedagogy. Pedagogy refers both to the profession of teaching and the science and art of education.

Chapter 2

Review of the Literature

Hip Hop, is not only a genre of music, but also a complex system of ideas, values and concepts that reflect newly emerging and ever-changing creative correlative expressive mechanisms including but not limited to song, poetry, film and fashion.

(Taylor, 2014, para. 4)

As Taylor suggests, Hip Hop can be used in the classroom for educational purposes. Hip Hop can be use to teach lessons. It can be incorporated through films. It can be used to promote higher leveled thinking and motivate student learning. This author's thesis that is that "educational Hip Hop" (the author's term for the use of Hop Hop in education) can be integrated into classroom instruction in numerous ways and used as a means to fulfill students minds with joy, inspire student growth and foster future learning. The purpose of this chapter is to examine what the literature says about Hip Hop that relates to education and educational goals and instruction. The chapter investigates ways suggested for teachers to use Hip Hop to enhance instruction

Beuchum (2011) notes that the future of Hip Hop is "open-ended, just like the future of our students in our schools" (para. 12). Although there are numerous ways to help teachers introduce new concepts, there is some evidence that shows how music can impact some students' learning. In today's generation of 21st century learning, students are introduced to many new learning tools that help them comprehend material in more engaging and stimulating ways rather

than just textbooks and paper work. Many resources have been made available for teachers to use that can help introduce students to new concepts in rhythmic and musically enhanced ways. Websites such as Flocabulary (www.flocabulary.com), educationalrap.com, and YouTube are three of the many engaging and interactive resources that teachers can use to stimulate class learning and promote student understanding. Furthermore, “understanding hip-hop as a culture and rap music as a language challenges teachers to consider how rap music can be a tool or resource in schools, where cultural work is done to maintain dominant cultural values, including language” (Brown, 2012, para. 6).

Stimulating Memory Through Hip Hop

Because the art of Hip Hop music uses much repetitive language, it can be a great tool to help students memorize problems, terminology, and equations in math. A study that was done in 2011 found that Hip Hop music could actually help children and young adults learn new language. “Associating language with a melody is generally beneficial to memory,” (Chesley, P. 2011, para. 6). Congruently, many teachers around the US are using educational math raps to teach their students new concepts and new vocabulary. One Math teacher in Michigan by the name of Daniel Joseph Duey notes that “The repetition and rhyme help with memorization, and students connect with the lesson.” Furthermore, according to Chris Brewer, author of *Music and Learning*, “when information is put to rhythm and rhyme these musical elements will provide a hook for recall” (1995).

Promoting Information Processing Through Hip Hop

Comprehension is critical to all learning. Brewer (1995) states that “music stabilizes mental, physical and emotional rhythms to attain a state of deep concentration and focus in

which large amounts of content information can be processed and learned” (para 11). According to Author Zaretta who wrote an article entitled Strange Bedfellows: Hip-Hop, Vocabulary Development, and the Common Core, “information processing cannot occur without paying attention in a focused and deliberate way.” When educators get students to focus, they enable students to penetrate certain information which allow the brain to recognize patterns and build relationships between words and new meanings. Furthermore, “with Hip Hop, the growing body of empirical evidence indicates that there is much educational vitality in Hip Hop that can improve teaching and learning” (Pechauer, 2012, p.153).

Poetry and its Correlation with Hip Hop Music

Poetry for many is self expression, just like the musical culture of Hip Hop. Just like Hip Hop, poetry is a form of spoken literature that often times uses rhythmic qualities of language to prevail inspirational and self expressive messages to its audience. “Thanks to the engines of global commerce, rap is now the most widely disseminated poetry in the history of the world” (Sanneh, 2010, p. 8). With this, many educators have taken their own rhythmic and written poetry, putting to beats and incorporating it as educational Hip Hop tool to utilize in the classroom. According to an article from the Kennedy Centers ArtsEdge resource page “Analysis of hip hop music and lyrics can provide students with a greater understanding of rhythm, form, diction, and sound in poetry”.

As noted earlier, Hip Hop can be seen as a spoken form of poetry with its engaging and self expressive language that often times tells a story. “The ancient Greeks called lyrical poetry ta mele, which means “poems to be sung” (Sanneh, 2010, p. 18). Often times, poets, Hip Hop artists, and songwriters will intertwine both poetic lyrics and music into their artwork. “Like all

poetry, rap is not speech exactly, nor is precisely song, and yet it employs elements of both” (Sanneh, 2010, p. 18). Because Hip Hop music does express innovative and creative stories in a rhyming form, in essence Hip Hop is a form of poetry.

Poetry like Hip Hop too, strives to fill the same demands of its audience, satisfaction. In the book *The Anthropology of Rap*, both authors Adam Bradley and Andrew Dubois note that “every rap lyric must fulfill certain demands, the dominant ones being the listeners expectations of rhyme and the rhythmic strictures of the beat” (p. 33).

Multiple intelligences and Educational Hip Hop

In 1983, psychologist and professor of neuroscience, Dr. Howard Gardner, published his first book on theory of intelligence which he called Multiple Intelligences (MI) (Gardner, 1983). According to Gardner, human beings have eight different areas of intelligence that reflect different ways of interacting with the world. One of these eight intelligence's is music. Gardner defines the Musical Rhythmic Intelligence as “the capacity to think in music; to be able to hear patterns, recognize them, and perhaps manipulate them”. People who have strong musical intelligence remember music more easily and use it as a means to create, inspire, and live with. Additionally, people who have strong musical intelligence share a sensitivity to rhythm and sound and ultimately love music. Often times they are also sensitive to sounds in their environments, may study better with music in the background and can be taught by turning lessons into lyrics, speaking rhythmically, and tapping out time.

Many educators these days are devoting more and more time in coming up with creative and inventive ways in how to teach their students with how they learn best. For students who are musically intellectual, they should be encouraged to make up rhymes and catchy rhythmic

phrases that contain the material they need to study. According to Adam Bradley, rhythm is raps reason for being (2009, p. 3). Many of these musically inclined students may even enjoy teaching rhythmic patterns, vocal sounds, and musical tones to their peers. Numerous suggested activities that strive to bring this intelligence out in students include: writing original songs, raps, jingles, and/or cheers, identifying rhythmic patterns in music or poetry, and/or performing raps or songs that summarize information learned from their past or present curriculum.

To understand additionally how the culture of hip-hop fits into the larger scheme of the educational process, it is beneficial to integrate the work of Howard. There are different elements that can be associated with the genre of “Hip Hop”, but rapping is just one of them. Howard Gardeners linguistic component of intelligence focuses on using words effectively. Often times people who are more linguistic learners, they have highly developed auditory skills and often think in words. These individuals enjoy reading, playing word games, and making up poetry or stories. Linguistic intelligence therefore relates to rapping and rhyming. “The ability to formulate multisyllabic word schemes and use clever metaphors to illustrate and make points is the definition of a “dope MC” (exceptional rapper)” (Daudi, A. 2007, para. 3) For educators, their goal is to obtain maximum effectiveness of students learning through their teaching. Educators therefore can use educational hip-hop as a formal means of academic curriculum thats aligned with academic knowledge and influenced by human interests. “Using the culture (Hip Hop) as a conceptual tool to critically examine and debate these points provides unlimited potential for knowledge construction in the learning environment, while simultaneously achieving academic benchmarks and standards” (Daudi, A. 2007, para. 8).

Schools Adaptation with Music and Educational Hip Hop

There are many schools who adapted the art of music and Hip Hop education in their schools. “The High School for Recording Arts (HSRA) in St. Paul, Minnesota has been dubbed “Hip Hop High” because of its deep embrace of hip hop culture and its innovative approach to education” (Seidel-Steinberg, 2009, para. 6). This innovative charter school was originated out of a recording studio and founded by a professional rapper. “The school works with youth who have dropped out or been pushed out of traditional schools—and even some alternative programs by offering a remix of established alternative education models and its own unique contributions” (Seidel, 2011, para. 2). The educators at this school credit each student’s strengths and encourage them to develop independent projects where in turn, they receive academic credit. “Allowing students to play such an active role in their education demonstrates confidence in students’ ability to take responsibility for their own learning” (Seidel-Steinberg, 2009, para. 7). HSRA has become portrayed as the next level of hip-hop education, transcending from classroom-based hip-hop interventions to whole school reform.

On May 20th, 2014, CBS (www.cbsnews.com) displayed a news broadcast about Michelle Obama's enthusiastic dedication for the arts of education in schools. “Making a forceful plea about the role of arts in education, first lady Michelle Obama argued arts education isn't something to be introduced in schools after student test scores go up, but is a critical part of better test performance in the first place” (CBS.com, 2014, para. 1). Michelle Obama took a group of selected students from 8 low performing schools around the the to country (Iowa, Massachusetts, Connecticut, Louisiana, Oregon, Montana, Colorado and Washington, D.C.) to participate in the President's Committee on the Arts and the Humanities Turnaround Arts program. Michelle Obama, a supporter of arts education, said the program has helped students at

these schools become "engaged in their education like never before" (2012, para. 6).

Furthermore, this article noted that math and reading scores increased in these schools, attendance went up, enrollment blossomed, parent engagement increased, suspensions plummeted, and two of the schools in their pilot improved so dramatically that they were no longer in turnaround status. "Making connections with students' lives, listening to our students, challenging them to apply their own creative ideas to more complicated concepts make learning a life changing experience, for all students" (Brown, 2012, para. 9).

Chapter 3

Methodology

Many educators strive to make learning enjoyable while providing their students with fun and engaging lessons. Engagement and creativity, themes in which all teachers should strive for, go hand in hand with the creation of educational Hip Hop. Its progression has emerged rapidly, and over the years teachers have used it to piggyback on numerous topics teaching through its beats and advanced lyrics to help students learn. The teachers educational Hip Hop handbook in which I created, was designed to educate teachers about the foundation of Hip Hop while providing them with lesson plans that they can use as guide in creating their own lessons, all the while promoting deeper thinking learning with their students. The following information regarding the project methodology will include: An introduction to educational Hip Hop and why teachers should use it, curriculum based concepts that can be taught through its usage, some common core standards related to the lesson plans, four ready to go math lesson plans which include educational Hip Hop songs, along with reliable and well designed educational Hip Hop websites appropriate to teach and stimulate the student mind.

Handbook Design Decisions and Features

The teachers educational Hip Hop handbook was created to assist teachers with new ways of how they can use Hip Hop in the classroom to teach new concepts and language, promote new learning and deeper leveled thinking, and how to get students motivated while keeping them engaged. It has been noted that “hip-hop music could actually help children and young adults learn new language” (Conley, M. 2011, para. 2). Therefore, this author’s handbook is intended to

be an example of how to help teachers understand what it means to teach educational Hip Hop in the classroom and what that looks like.

The approach in which the author took in developing this teachers handbook to assist educators in their classroom stemmed from my own interest in educational Hip Hop, music, and motivational strategies in the classroom. Other considerations that came to mind when planning curricula based lesson plans and elements to include in the handbook came from my own personal experience with 21st century learning with my upper elementary school students, and my own enthusiasm and interest in rap music. Being an enthusiastic and motivated educator, the author became highly intrigued with what innovative and creative strategies teachers could use to implement educational Hip Hop into their own teaching styles. The author gathered much imperative research and other studious materials, organizing them into a four-chapter handbook. The first chapter serves as an introduction to educational Hip Hop along with why teachers should use it. The second examines curricula that can be taught through Hip Hop and some common core standards aligned with my lesson plans, Chapter four math standardized based lesson plans which include educational Hip Hop songs, and a section that includes reliable and well designed educational Hip Hop websites.

The author decided that the first part of the handbook provides educators with basic Hip Hop information; namely, answering the questions: What is Hip Hop? And Why should it be implemented in the classroom? Yuxi (2013) observed that “any educators and teaching artists within the past decade have been implementing the art of hip-hop to increase the relevance and reflection of students’ experience in the current education system” (p. 6). Improvements in the teachers’ ability to connect lessons to what matters to the students, through measures such as

engaging students in a creative and innovative curriculum and selecting topics pertinent to students' experiences, have measurable positive impact on the students' overall academic performance and motivation for higher pursuits.

The author decided that the second part of the handbook should focus upon math concepts, new learning skills, and terminology that educators can teach through the use of educational Hip Hop in their classrooms. Many "rappin mathematicians" who have been highly recognizable, highly acclaimed, been nominated teachers of the years, and who have produced many cd's, have shared with fellow educators and students just a few of the many math concepts that can be through the use of educational Hip Hop. I was fortunate to have met two of the three gentlemen in which I used as my examples in this section. Lamar Laqueen and Alex Kajatani are two mathematics teachers who live in California known as the "rappin mathematicians." Both men teach mathematics in engaging ways and promote new mathematical concepts through their CD and YouTube video productions. Having met them both and through ongoing emailing during this project, the author was able to get pertinent information from them for this section of the project.

The author decided that the third part of the handbook should tie in some common core standards directly related to four lesson plans created and presented in Appendix A. With common core standards now being used as the means for academic achievement, I have provided one standard that is aligned with one math lesson activity for grades two, 5, 7 and 9. "To ensure all students are ready for success after high school, the Common Core State Standards establish clear, consistent guidelines for what every student should know and be able to do in math and

English language arts from kindergarten through 12th grade” (Common Core State Standards, 2014 para.1).

The author decided that the fourth part of this handbook should provide teachers with sample math lesson plans aligned with the Common Core Standards in mathematics. The author wanted to include lessons at multiple levels - lower elementary, upper elementary, middle school, and high school - that teachers could use as models for designing their own lessons and/or implement with their students in their classroom. These four sample lesson plans would include an educational math rap theme that educators could use as warm ups, teach students new math concepts, cover previous material, or teach students upcoming math lessons.

The author decided that the final chapter of this handbook should provide educators with resources where they can find educational Hip Hop songs they can use in their own teaching lessons. Educationalrap.com is a creative and innovative resource that provides educators with engaging and lyrically stimulating educational Hip Hop songs, accompanied by worksheets for teachers to use. Alongside, this website has won two Parents' Choice Awards. Flocabulary (www.flocabulary.com), an educational Hip Hop website that has integrated the common core standards, presents academic content in a highly stimulating and contemporary format. Covering numerous topics such as math, science, language arts, and social studies, this website provides students with both visual and aural exposure with highly entertaining and buoyant videos that work to introduce new topics and review them.

Summary

Improvements in the teachers’ ability to connect lessons to what matters to the students, through means such as engaging students in creating their curriculum,

project-based learning, and selecting topics relevant to students' experiences, have measurable positive impact on the students' overall academic performance and motivation for higher pursuits.

(Lui, 2013, p. 6)

Through researching and developing an educational Hop Hop handbook, the author concluded that many educators might find Hip Hop based educational lessons beneficial as a part of today's 21st century learning, understanding the positive benefits Hop Hop might have on student memory and motivation. Furthermore, this handbook can work as a guide in providing advanced and less advanced educators with beneficial resources and lesson plans that they can use in their classrooms with whatever grade level they are in. Just as students are given opportunities to explore with learning materials, this handbook allows educators to do the same.

Chapter 4

Results

What follow are the four chapters of the product of this project, an Educational Hip Hop Handbook for Teachers. Presented in Appendix A are the four sample lessons for grades 2, 5, 7 and 9 referenced in Chapter 3, which illustrate the use of Hip Hop in mathematics instruction. These lessons are referenced to the California Common Core State Standards for mathematics. Lesson Plan 1, is for early elementary, 2nd Grade Mathematics entitled Interpreting Problem Solving Situations. Through this lesson students will see what it means to understand word problems and how reading can help them with math. This lesson will also allow students to retell problems in their own words.

Lesson Plan 2, is for upper elementary, 5th Grade Mathematics entitled Comparing the Value of Digits in a Multiple-Digit Whole Number. Through this lesson students will compare the value of the digits in a whole number by representing the number with models using their knowledge of place value.

Lesson Plan 3, is for Middle School, 7th Grade Mathematics entitled The number System. Through this lesson students will apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. Additionally, students will be able to identify and use additive inverses when adding and subtracting rational numbers.

Lesson Plan 4, is for High School, 9th Grade Mathematics entitled Addition of Rational Numbers. Through this lesson students will obtain a feeling of how numbers are related to each

other and determine whether a number is rational or irrational while being able to order rational and irrational numbers on a number line be able to locate square roots on a number line.

Educational Hip Hop Handbook for Teachers

by

Jessica Hanan, Education Specialist

Chapter 1: What is Educational Hip Hop? Why Implement Hop Hop in My Classroom?

Hip Hop music originated in the 1970's as a music genre of its own that consisted mostly of a stylized rhythmic pattern of beats. Alongside this creative and instrumental style of music, it was its accompanied by its partner rapping, a rhythmic and rhyming form of speech that is chanted over the Hip Hop beats and music. Over time, the progression and revelation of Hip Hop expanded and became an imperative part of the African American culture, a markable form of music, and a new teaching tool for many educators. Additionally, the lyrics from Hip Hop songs became a poetic means of expressing the cultural narrative of the generation it took hold in.

“Hip-Hop, once limited to urban music and dance has become a widespread form of communication exhibited and enjoyed by young people throughout the world” (Taylor, 2014, para. 1).

Hip Hop used in education - Educational Hip Hop - is like 21st century curriculum. It has changed and expanded over the past 25 years. In alignment with the high demands with which educators recently have been faced, many have started to question their methods of teaching and ways of keeping their students engaged. According to renowned professor, Ernest Morell, author of *Critical Literacy and Urban Youth*, “hip-hop lyrics help deepen students' understanding of established literary” (Morell, 2008, para. 3).

“Hip-hop has become relevant to the field of education because of its implications for understanding language, learning, identity, curriculum, and other areas” (Petchauer, 2009, para. 1). Today many educators are experimenting with using Hip Hop’s poetic and lyrical form of music to teach new concepts, generate new ideas, and enhance student learning. “Hip-Hop, is not only a genre of music, but also a complex system of ideas, values and concepts that reflect newly emerging and ever-changing creative correlative expressive mechanisms including but not limited to song, poetry, film and fashion” (Taylor, 2014, para. 4). Furthermore, educational Hip Hop allows educators to expand on their positive teaching methods, as students have the opportunity to be fully engaged with this form of learning they can relate to.

Implementing educational Hip Hop into the classroom presents a context for learning that has the potential to provide great gains for students. As Morrell (2008) states, “students are more motivated to engage in work that is socially valuable and the socially valuable work provides the entire context that educators need to develop the individual learning skills that the students need in order to succeed academically and to contribute as engaged and thoughtful citizens” (p. 111). When students find relevancy in the content they are studying, they will become more engaged in the curriculum and be more willing to think deeply. Educators can use educational Hip Hop lyrics as text in the classroom, as material and vernacular that is familiar to the students, and scaffolds their skills for later use. Furthermore, using educational Hip Hop in the classroom can help foster a positive relationship between teachers and their students leading to many positive learning experiences in and out of the classroom (Brock, 2013). Lastly, researchers have found a positive relationship between educational Hip Hop and student learning. Educators today are using it in classrooms to connect with student’s interests and musical and rhythmic intelligences,

promote new concepts, help students brush up on old learnings, and stimulate student engagement.

Chapter 2: Curriculum Through Concepts - That's What's Up

Not only can teachers implement educational Hip Hop as a means to help students with curriculum based instruction but it can be used to help teachers introduce new concepts in different areas of study. Additionally, because the art of Hip Hop music uses much repetitive language, it can be a great tool to help students memorize problems, terminology, and equations in math. Listed below are a few known and recognized California Rapping educators who have not only taught their students content through educational Hip Hop, but who have performed many of their rap songs throughout the state, have created their own websites and YouTube forums, and have been recognized and appreciated in the schools in where they teach.

One eighth-grade Los Angeles Mathematician, Lamar Laqueen, uses educational Hip Hop in his classroom to teach new math concepts and to help with student memorization. When Lamar was first recognized on YouTube (www.youtube.com/watch?v=8h8sem0Qzuk&list=PLJttYQYcIRGIzpgzjCJiaKbwGCuX0q, www.youtube.com/watch?v=wXmhXR3gC0I&index=5&list=PLJ9ttYQYcIRGIzpgzjmjCJiaKbwGCuX0q), he already had a whole text book worth of songs, which he had written and used throughout his teaching. His methodology of teaching students includes writing and performing songs to reinforce the math lessons he teaches his students. Laqueen even created an educational music company, *Music Notes* (www.musicnoteonline.com), with the goal of increasing student engagement, teaching new math concepts, and to helping with student memorization. *Music Notes* offers high quality educational music and videos made specifically for educators and their students, which promote the development of numerous math concepts such as adding and subtracting, basic counting skills, measurement, multiples, and more. Furthermore, In his raps, LaQueen defines math

concepts and works through sample problems, step by step. Although Lamar Laqueen is an 8th grade math teacher, he also provides standards-based songs and videos that are made applicable for students across the grades, Kindergarten through middle school.

Another influential and well-known “rappin mathematician” is a San Diego-based middle school teacher, Alex Kajitani, who knows what it is like to inspire, create, and motivate. Nominated in 2009 to be the San Diego-area teacher of year, Alex Kajitani has his own blog page ([URL here](#)). He has created numerous educational Hip Hop CDs, given many keynote speeches and teacher trainings, and provides many teachers with the resources they need in order to do what he does, while motivating and getting his students involved in his YouTube rap videos. Some of the concepts he explores are fractions, decimals, negative numbers, increase/decrease, geometric shapes, math vocabulary, types of lines, order of operations and parts of a circle.

Currently living in the San Francisco bay area, a eight-grade biology teacher by the name of Tom McFadden, often referred to as “the Rhymeosome,” uses educational Hip Hop in his classroom to help encourage young students to explore science through music. This Stanford graduate and Fulbright Scholar, uses his interest in Hip Hop to teach students complicated science subjects by creating rap videos with a scientific twist. Because music and rap are effective tools for communication, Tom makes his own rap videos using science concepts such as healthy eating, the water cycle, fire flies, and more to promote his science knowledge. Furthermore, Tom hopes that teachers and students across the world will utilize, remix, and reinvent these videos, making science history rap music videos the new fad.

Chapter 3: Sample Hip Hop Mathematics Lessons Across the Ages

Presented in Appendix A are four sample lessons the use Hip Hop to teach mathematics concepts and operations. The lessons are anchored to a grade-level Common Core State Standard (CCSS) in mathematics. The grade levels, topics, and Common Core standards included in the lessons are described here.

Lesson One: Lower Elementary – Second Grade

Topic: To represent and solve problems involving addition and subtraction

CCSS.MATH.CONTENT.2.OA.A.1

Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

Lesson Two: Lower Elementary – Fifth Grade

Topic: To write and interpret numerical expressions

CCSS.MATH.CONTENT.5.NBT.1

Compare the value of the digits in a multi-digit whole number.

Lesson Three: Middle Level – Seventh Grade

Topic: To apply and extend previous understandings of operations with fractions

CCSS.MATH.CONTENT.7.NS.A.1

Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.

Lesson Four: High School – All Grades

Topic: To use properties of rational and irrational numbers

CCSS.MATH.CONTENT.HSN.RN.B.3

Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.

Chapter 4: Educational Hip Hop Resources: Websites, Blogs, and Books

Not only are there are many educators who have turned to the use of educational Hip Hop in their classrooms but over the years many educational Hip Hop websites have been created as means to help educators pursue different topics of rap in their classrooms. No matter what concept a teacher is teaching, educational Hip Hop can be used to help students explore the new possibilities of “getting into” their curriculum in an engaging, simulating, and motivated manner. What is offered in Chapter 4 are website and blog as well as print resources for educators interested in using Hip Hop in their teaching as well as learn more about the theory of Multiple Intelligences.

Flocabulary. Flocabulary is an educational Hip Hop website that presents academic content in a highly-engaging and contemporary format that teaches new concepts and providing ongoing enrichment. Flocabulary videos include a variety of educational rap songs with a variety of different subjects while providing students with both visual and aural exposure. Furthermore, teachers and students can review key concepts with challenge questions, as a class, in groups, or individually. This option on the website allows students to hone in on specific details and review key points from the song in a flashcard format.

Educationalrap.com. Winner of two Parents' Choice Awards and created in 2007, Educationalrap.com has created numerous educational rap and Hip Hop songs for teachers who need something fun and engaging to use in their class. Additionally, every song comes in multiple versions and includes free worksheets for extra student engagement and review.

YouTube. YouTube.com, an online public communications site, was launch for public consumption in February 2005. YouTube provides a forum for people to connect, inform, and inspire others across the globe and acts as a distribution platform for original content creators and advertisers large and small. Many educators, advertisers, professional, and nonprofessional artists post their own videos, advertisements, and songs to share with the public audience. This site is open to the public and anyone who goes to the site can view the videos that are posted on this site.

#HipHopEd. The blog, #HipHopEd, founded in 2011, started as a chat between two educators who were having a conversation on twitter about their educational theory preferences. As their conversation progressed, so did the twitter thread, and soon permitted other educators to collectively become involved and expand on this conversation. The theoretical foundation of #HipHopEd is referred to as “reality pedagogy.” As the site blossomed, it began to attract Hip Hop fans – purists, practitioners, thinkers, and educators of various ages, ethnicities, and locales from all around the world. #HipHopEd has become a platform for professional development for educators and to others; it is a weekly think tank for the analysis and evaluation of Hip Hop culture.

Hip Hop Genius: Remixing High School Education. Hip Hop genius: Remixing High School Education, authored by Samuel Seidel (2011) looks deeply into how Hip Hop affects

student learning in urban schools. Seidel focuses upon how the resourceful creativity and swagger of Hip Hop has become a global force that can lead to a fundamental remix in the way of how educators think of teaching, school design, and leadership. Because many educators already know that Hip Hop can be an influential tool for engaging students, Seidel asks his readers to explore what Hip Hop education really is and to ponder its implications and what that means for teaching and learning experiences. This book is great read for all educators who are searching for new, creative, and innovative strategies of how to keep Hip Hop alive and how to promote it inside the classroom.

Urban Science Education for the Hip Hop Generation. *Urban Science Education for the Hip Hop Generation* is a book written by author Christopher Emdin, which explores the author's own experiences as a student, teacher, administrator, and researcher in urban schools and the connection he finds between Hip Hop cultural and science education discovered at every stage of his own academic and professional journey. This autobiography, findings of his research results, theoretical explorations, and portrayals of students' experiences in schools to cast light on the causes for the lack of educational achievement of urban youth from the Hip Hop generation.

Multiple Intelligences: New Horizons in Theory and Practice. Howard Gardner does a through job in his ground-breaking book *Frames of mind: The theory of Multiple Intelligences* and subsequent texts and research papers explaining the theory of Multiple Intelligence (MI). According to Gardner, human beings have eight different kinds of intelligence that reflect different ways of interacting with the world. Gardner views intelligence as multidimensional rather than a single general ability. Gardner's eight currently identified intelligences are: Visual-Spatial, Bodily-Kinesthetic, Musical-Rhythmic, Interpersonal, Intrapersonal, Verbal-Linguistic,

Logical-Mathematical, and Naturalistic intelligences. Hip Hop clearly represents and connects with the Musical-Rhythmic intelligence and, because of the creativity and playfulness of the language use, Verbal-Linguistic intelligence.

Chapter 5

Discussion

Educational Hip Hop uses much repetitive language and music which may help students process and learn new information through its lyrics and repetition and help with solving problems, new terminology, and learning of equations in math. The rhythm, rhymes and lyrics associated with educational Hip Hop are factors that can help stimulate students' memory and help students succeed. Research has begun to tie quality music education instruction with improved academic performance. The theory is that music's physical vibrations, organized patterns, engaging rhythms, and subtle vibrations interact with the mind and body in ways that naturally altering the brain in a manner that one-dimensional learning cannot. Students benefit greatly from opportunities when they are able to explore it's melody, lyrics, and rhythms. Just as students are given opportunities to explore with varied hands-on learning materials, they also need regular opportunities to explore with sound, which educational Hip Hop affords.

Project Summary

The purpose of this project was to create a handbook for educators on how to implement educational Hip Hop into their curriculum. Based on many articles and books that have been researched thus far, educational hip hop is an important element in teaching that can be incorporated in the classroom to educate students in a more creative manner and that is paired up with 21st century learning. Additionally, many educational Hip Hop websites have been created to help students learn new vocabulary, turn students on to new pedagogy, and provide teachers with additional engaging and interactive material that students can relate to. Many educators too

have implemented the use of educational Hip Hop in their classrooms to teach new learning concepts and keep their students interested.

The four lessons that have been prepared for the handbook incorporate four educational Hip Hop rap songs related to each lesson. Educators can use rap songs to introduce new lessons, use at the end of lessons, use a guide for a follow up lesson, or use to help students get involved with individual or collaborative activities. “Research shows that hip hop breeds a healthy environment for group activities which are influential in the identity formation of adolescents and educators now have the option of tuning into hip-hop beats to reignite the spirit for learning” (Yuxi, 2013, p. 35).

Limitations

A major limitation to this project is that the handbook was developed solely by the author, based upon the author’s personal experience and research into the limited research and resources on the use of Hip Hop in education. A second limitation is that the information included in the handbook has yet to be field tested by educators or students. Further, it has yet to be demonstrated through valid research methodologies whether student will learn from the use of Hip Hop in mathematics or other content areas for some or many students.

Next Steps

There are many additional improvements and furthered steps the author would take to increase this projects potential influence. A first step I would take is to try implementing the use of educational Hip Hop in my own classroom with my own students in order to assess first hand from my own students in what works and what does not. Additionally, I also plan to share the

lessons I would use with it with my colleagues, allowing them to see if this is something that may be interested in using.

One additional step to further this project would be to create a website where additional materials could be made accessible to educators with just the click of a button. This website would allow educators to feel out and test the site to see if Hip Hop might be a tool that would work for them. As the author continue in the field of education, the author hopes to spark students' interests, continue to generate engaging and interactive activities that will benefit all students using Hip Hop

Conclusion

It is the supreme art of the teacher to awaken joy in creative expression and knowledge.

Albert Einstein (2008, page 57)

We live in a musical world, and music is all around us. Just like our oceans, music carries a current, and it should be spread into the classroom to create, teach, and provide for students future growth.

Educational Hip Hop has evolved over recent years and can be a part of new generation of learning to help students learn new concepts, new vocabulary and new learning skills. Preliminary research findings suggest that there can be direct relationship between students' interests and their performance in school. Furthermore, music education instruction has been associated with improved academic performance (Cerbasi, 2012). The rhymes, beats, and lyrics of educational Hip Hop music have the potential to improve student learning and performance via the music's physical vibrations, organized patterns, engaging rhythms, and subtle vibrations

that one-dimensional learning does not. It is the author's position that just as students need to be given opportunities to explore varied learning materials, they also need opportunities to explore with sound as part of their learning experience. There are multiple ways teachers can use educational Hip Hop in the classroom to teach and help students explore dimensions of academics.

In summary, based upon articles and books examining the benefits of music, rhythm, activation of Musical Intelligence, and educational Hip Hop, it is important to consider Hip Hop as a tool in teaching that can be incorporated in the classroom to educate students in a more creative manner that is relevant to the 21st century learning of youth in the YouTube and digital age. The author hopes soon to use educational Hip Hop employed in many classrooms. t in the classroom.

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Appendix A

Hip Hop Lesson Plans for Grades 2, 5, 7 and 9

LESSON PLAN 1

Early Elementary: 2nd Grade Mathematics

Interpreting Problem Solving Situations

<p>Title of the Lesson</p> <p>Using visualization, acting out, and retelling to interpret problem solving situations.</p>	<p>Common Core Content Standard(s)</p> <p>IV. CCSS.MATH.CONTENT.2.OA.A.1</p> <p>-Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.</p>
<p>Learning Goal(s) - lesson Objective</p> <p>* Students will see what it means to understand word problems and how reading helps us with math.</p> <p>* Students will retell problems in their own words.</p>	<p>Assessment(s) Teacher will do a formative assessment with the students through process monitoring, making sure students can retell problems in their own words.</p>

Instructional Strategies	Student Activities
<p>Into: Teacher will start the lesson off by introducing the educational rap song “Math term party” (www.flocabulary.com.math-terms). The teacher will remind students that though word problems look different, many can be solved the same way as any other problem. “Math term party” defines the terms sum, difference, term, product, and variable while providing some examples of these terms in action.</p>	<p>Into: Students will listen to the educational rap song “meth term party” understanding that though word problems look different, many can be solved the same way as any other problem.</p>
<p>Through: For guided instruction, the teacher will have students listen to a story problem, visualizing, not solving, the action of the problem. The teacher will have students close their eyes while reading this word problem slowly:</p>	<p>Through: Students will once again listen to a story problem given by the teacher. They will close their eyes and visualize what is happening in the story.</p>
<p>It is recess for Grade 2. Ms. Smith’s class is lined up at the swings. There are 8 children in line at the swings. Mr. Rogers’ second grade class comes out to play too. They decide to play on the jungle gym. There are 9 children on the jungle gym. How many children are at the playground?</p>	
<p>Students will open their eyes being asked What they visualized when the teacher was reading the word problem?</p>	
<p>Students will think-pair-share (t-p-s) what they think is happening in this word problem.</p>	
<p>Beyond: For independent practice, students will work within a group to create a picture representation of a word problem. Everyone will choral read the word problem together</p>	<p>Beyond: Students will work within a group to create a picture representation of a word problem. Students will read the word problem silently and then one member of their group</p>

Vocabulary:

Sum: The action or process of adding something to something else.

Difference: The process or skill of taking one number away from another.

Word Problem: A mathematics exercise presented in the form of a hypothetical situation that requires an equation to be solved.

Term-a single number or a variable

Product-The answer when two or more numbers are multiplied together.

Variable-A symbol for a number we don't know yet. It is usually a letter like x or y.

Differentiation:

*For advanced learners: After the retell of the story, these students can act out what is happening in the word problem and look at the list of words they listed for addition describing in detail what happened in the word problem.

*For struggling students: For the students who have a hard time visualizing the problem, the teacher can guide them with questions while their eyes are still closed; Examples- Can you see the swings in your mind? Can you see the Mrs. Smith's class of children at recess? How many can you see? Can you see Mr. Roger's students coming out to play at the jungle gym? How many children are at the jungle gym?

LESSON PLAN 2

Upper Elementary, 5th Grade Mathematics

Comparing the Value of Digits in a Multiple-Digit Whole Number

<p>Title of the Lesson</p> <p>Compare the value of the digits in a multi-digit whole number.</p>	<p>Common Core Content Standard(s)</p> <p>IV. CCSS.MATH.CONTENT.5.NBT.A.1</p> <p>-Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.</p>
<p>Learning Goal(s) - lesson Objective</p> <p>* Students will compare the value of the digits in a whole number by representing the number with models and using their knowledge of place value.</p>	<p>Assessment(s) Teacher will do a formative assessment with the students through process monitoring, making sure students understand the place values of multi digit numbers.</p>

Instructional Strategies	Student Activities
<p>Into: Teacher will start math lesson by showing students a rap YouTube video “the place value rap” (www.YouTube.com/watch?v=u94DV3x3EDqI). He/she will then do a warm up his/her students. An example may be: How would the value of 5 change in 124,359 if it shifts two places to the left? During this time, the teacher will discuss the value of a digit change when moved one place to the left asking his/her students asking what they think might happen when we move the number two places to the left?</p>	<p>Into: First students will watch a place values rap video and start by working on the warm up activity allowing them to evaluate the change in the value of a digit needing to be moved over two places.</p>
<p>Through: As part of lesson the teacher will ask students what the digits in the number 448 represent? the teacher will then show a number sentence that adds up to the values of both 4/s and 8. Teacher will then ask the students what they can multiply the value of the 2 on the right by to get the value of on the left?</p>	<p>Through: At their table,students will work in finding that $400+40+8$ will equal the sum value of each digit equaling 448. (Students many use pictures to help them).</p>
<p>Beyond: Furthered, the teacher will ask the students in the number 4,342, what is the value of each 4? She/he could follow up by asking what they would multiple the smaller value by to get the larger one and what it has to do with the of number of places they are apart from one another.</p>	<p>Beyond Students will continue to work independently, identifying the correct answers while explaining the pattern that led to them to their answer.</p>

Vocabulary:

Place value- In our decimal number system, the value of a digit depends on its place, or position, in the number.

Digit-A symbol used to make numerals is called a digit

Expanded form- a way to write numbers by adding the value of its digits.

ex. $4,265 = 4 \times 1,000 + 2 \times 100 + 6 \times 10 + 5 \times 1$ Standard form- Another name for "Scientific Notation", where a number is written in two parts: ex. $444=444$

Differentiation:

*For students that struggle with the value of a digit of a number teacher will help students learn about place value with larger numbers by using a place value chart and arrow cards.

*For students that don't understand the concept power of tens, teacher will help students learn about the relationship between digits on a place value chart by multiplying by powers of 10.

*For students struggling with a place value chart, the teacher will model and write numbers on the overhead by using base-ten blocks and place value chart.

LESSON PLAN 3

Middle School, 7th Grade Mathematics

The Number System

<p>Title of the Lesson</p> <p>-The number system</p>	<p>Common Core Content Standard(s)</p> <p>IV. CCSS.MATH.CONTENT.7.NS.A.1</p> <p>* Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.</p> <p>7.NS.1a. Describe situations in which opposite quantities combine to make 0.</p>
<p>Learning Goal(s) - Objective(s)</p> <p>* Students will apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.</p> <p>*Students will be able to identify and use additive inverses when adding and subtracting rational numbers.</p>	<p>Assessment(s) Teacher will do a formative assessment with the students through process monitoring, making sure students understand and are able to add rational numbers with and without using a number line.</p>

Instructional Strategies	Student Activities
<p>Into: Teacher will first show students the rap song inversion, teaching additive and multiplicative inverse to students. (www.educationalrap.com/song/inversion) Next, the teacher will do a warm up by asking students how are addition and subtraction different and how are they alike? Teacher will provide students with two color counters, asking them if there is a way to represent a situation where the color counters would cancel each other out?</p>	<p>Into: First students will listen to rap song rational and irrational numbers followed by working on the warm up relaying information on how addition and subtraction are different/alike. Students will use colored counters to represent the different situations which they cancel each other out.</p>
<p>Through: Here the teacher will explain how to categorize expressions, symbols, and word problems based on an unknown rule (expressions of additive inverse simplify to 0). The teacher will model categorizing note cards into two categories, “YES” (demonstrates additive inverse) or “NO” (does not demonstrate additive inverse). Next, he/she will scaffold the lesson by initially sharing the more obvious cards while giving students the same set of note cards (either individually or in pairs) to finish categorizing together. Once students have finished their sorting, each pair of students can go to the board and place one of the note cards under the categories. After each card is added, the teacher can discuss with the class whether they agree or disagree via “Thumbs Up – Thumbs Down.” and Discuss the reasoning of agreement or disagreement. Continued, students can do this with the remainder of the cards, determining the rule.</p>	<p>Through: Students will engage in a sorting activity categorizing cards based on additive inverses. They will work together deciding if they agree or disagree with their classmates responses.</p>
<p>Beyond: As an Exit pass, Teacher will have</p>	

Vocabulary:

number system: Any system using a range of digits organized in a series of columns or "places" that represents a specific quantity. The most common numbering systems are decimal, binary, octal, and hexadecimal. Learn more about numbering system in the class Numbering Systems.

Differentiation:

For advanced learners: Have students Listen to a rap song called Inversion, (an engaging rap song for teaching additive and multiplicative inverse) at <http://www.educationalrap.com/song/inversion.html>. For additional follow up, instruct students to create their own rap lyrics while combining original lyrics with a song.

For students with Special needs and ELL's: Teacher can ask students to draw picture examples of the concept of additive inverse and/or create Frayer model of examples/definitions.

LESSON PLAN # 4

High School, 9th Grade Mathematics

Addition of Rational Numbers

<p>Title of the Lesson</p> <p>Rational or Irrational? That is the question.</p>	<p>Common Core Content Standard(s)</p> <p>1V. CCSS.MATH.CONTENT.HSN.RN.B.3</p> <p>Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a non-zero rational number and an irrational number is irrational.</p>
<p>Learning Goal(s) - lesson Objective</p> <p>* Students will obtain a feeling of how numbers are related to each other and determine whether a number is rational or irrational.</p> <p>* Students will also be able to order rational and irrational numbers on a number line be able to locate square roots on a number line.</p>	<p>Assessment(s) Teacher will do a formative assessment with the students through process monitoring, making sure students can retell problems in their own words.</p>

Instructional Strategies	Student Activities
<p>Into: Teacher will first show students the rap video irrational and rational numbers. (rhymenlearn.com/math-rap/rational-irrational-number.) The teacher will then print rational and irrational number cards, handing each student one, while keeping one for themselves. The teacher will then discuss with the students the definition of rational and irrational numbers while giving examples and answering any questions the students might have about rational or irrational numbers.</p>	<p>Into: First students will listen to rap song rational and irrational numbers and will then have their own card with either a rational or irrational number on it and listen to the discussion about rational and irrational numbers.</p>
<p>Through: For guided instruction, the teacher will ask all the students holding "rational numbers" to move to one side of the room, and all the students holding "irrational numbers" to move to the opposite side of the room, making sure all students are on the correct side of the room. The teacher will then ask all the students holding integers to go to the front of the room and line up in numerical order, again checking to make sure the students have completed this step correctly. Lastly, each of the remaining students one at a time will place themselves in their appropriate location on the number line.</p>	<p>Through: Students will move to one side of the room which is dependent on the card they have. Students with integer cards will go to the front of classroom and line up in the correct numerical order. This will continue with the rest of the class lining up in the correct order.</p>
<p>Beyond: During this time, the teacher will discuss with his/her students the number line and point out any mistakes that could easily of been made. For example, graphing the square roots and fractions. The students will do a follow up worksheet on irrational and rational numbers.</p>	<p>Beyond: Students will work independently on an irrational and rational numbers worksheet.</p>

Vocabulary:

Rational numbers: A rational number is any number that can be expressed as the quotient or fraction p/q of two integers, with the denominator q not equal to zero. Since q may be equal to 1, every integer is a rational number. Ex: 1.5- This number is a rational number because $1.5 = 3/2$.

Irrational numbers: In mathematics, an irrational number is any real number that cannot be expressed as a ratio of integers. Informally, this means that an irrational number cannot be represented as a simple fraction. Irrational numbers are those real numbers that cannot be represented as terminating or repeating decimals. Ex: π (Pi) = 3.1415926535897932384626433832795. It is irrational because it cannot be written as a ratio or fraction

Differentiation:

*For advanced learners: These students may use the website www.Quia.com (Quia Algebra) and do extra practice.

*For struggling students: The teacher may need to review with students converting fractions to decimals so that will know their appropriate location on the number line. The teacher may also need to review how to determine the approximate value of a non perfect square root.