

“Musical Mathematics”

Goal

To expose teachers to musical mathematics activities



Presenters:
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Portia Teal
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OBJECTIVES

- Show how to use music as a tool in transition to set the tone for learning.
- Show how to use the mathematics in music as a timing tool.
- Show how to creatively use music in curriculum as a teaching strategy.

Brief Historical Bond of Music & Math

- Music and math have been important to each other as far back as the Pythagoreans. Pythagoreans made a remarkable discovery about numbers dealing with the dependence of musical intervals upon numerical ratios such as $4/4$, $3/4$, $6/8$, $3/8$

WHEN AM I EVER GOING TO USE THIS?

("SO YOU WANT TO BE A RAPPER?")

- Mathematics is used in the composition of music to enhance the marketing of songs.
- Timing and words per seconds are calculated in lyrics.
- Types of words for smooth flow of rhythm are considered.

Everything is Everything

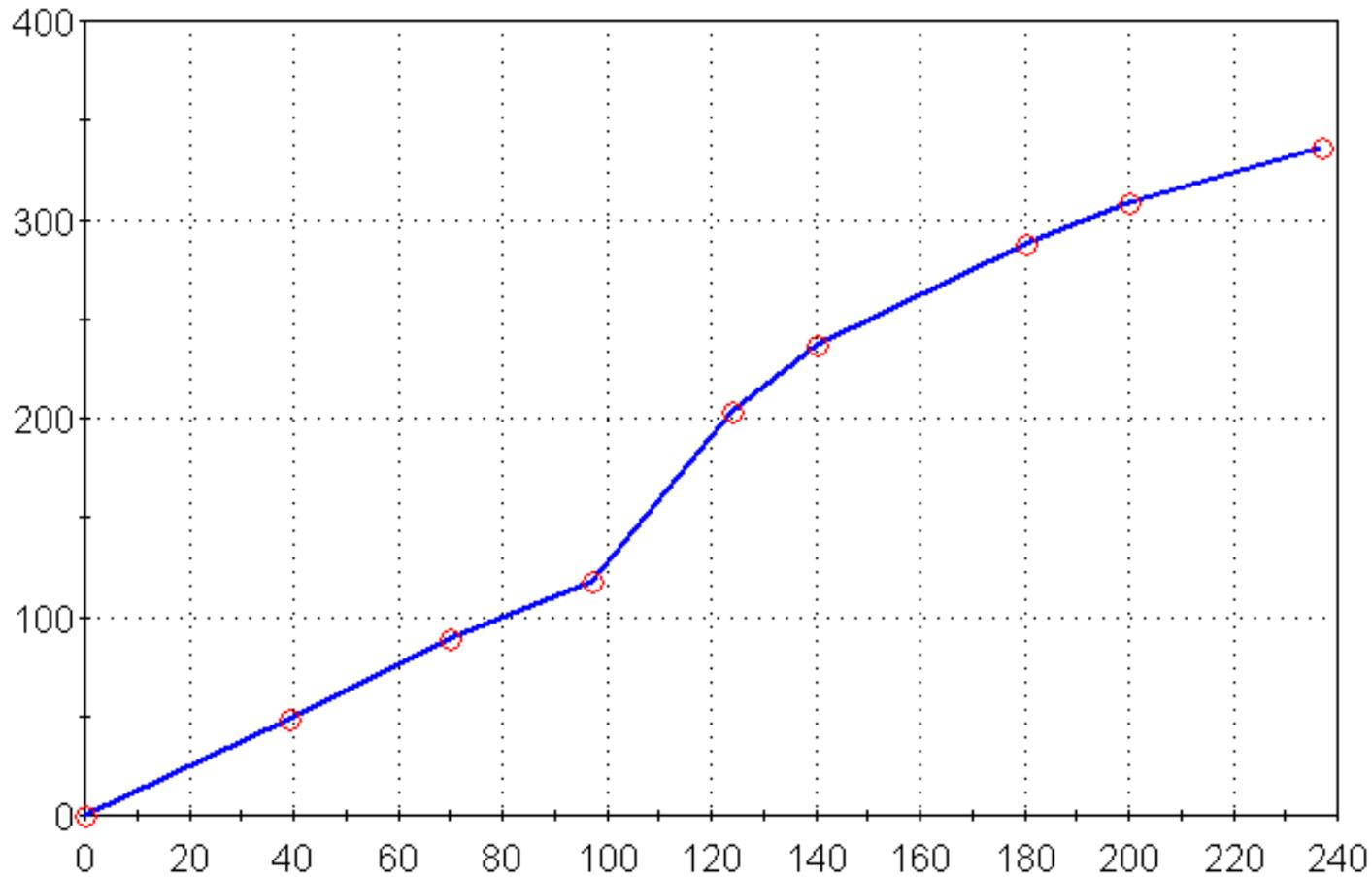
by Lauryn Hill

- Everything is everything
What is meant to be, will be
After winter, must come spring
Change, it comes eventually
(2x)
- I wrote these words for everyone
Who struggles in their youth
Who won't accept deception
Instead of what is truth
It seems we lose the game,
Before we even start to play
Who made these rules? We're so confused
Easily led astray
Let me tell ya that
Everything is everything
Everything is everything
After winter, must come spring
Everything is everything
- I philosophy
Possibly speak tongues
Beat drum, Abyssinian, street Baptist
Rap this in fine linen
From the beginning
My practice extending across the atlas
- I begat this
Flippin' in the ghetto on a dirty mattress
You can't match this rapper / actress
More powerful than two Cleopatras
Bomb graffiti on the tomb of Nefertiti
MCs ain't ready to take it to the Serengeti
My rhymes is heavy like the mind of Sister Betty
L. Boogie spars with stars and constellations
Then came down for a little conversation
Adjacent to the king, fear no human being
Roll with cherubims to Nassau Coliseum
Now hear this mixture
Where hip hop meets scripture
Develop a negative into a positive picture
- Now, everything is everything
What is meant to be, will be
After winter, must come spring
Change, it comes eventually
- Sometimes it seems
We'll touch that dream
But things come slow or not at all
And the ones on top, won't make it stop
So convinced that they might fall
Let's love ourselves then we can't fail

Everything is Everything
(Continued)

- Let me tell ya that,
Everything is everything
Everything is everything
After winter, must come spring
Everything is everything
- Everything is everything
What is meant to be, will be
After winter, must come spring
Change, it comes eventually

"Everything is Everything" by Lauren Hill



Linear Reg. Model $y = 1.5485x - 5.9146$

Quad. Reg. Model $y = -0.00101x^2 + 1.78827x - 14.7839$

I Ain't No Joke

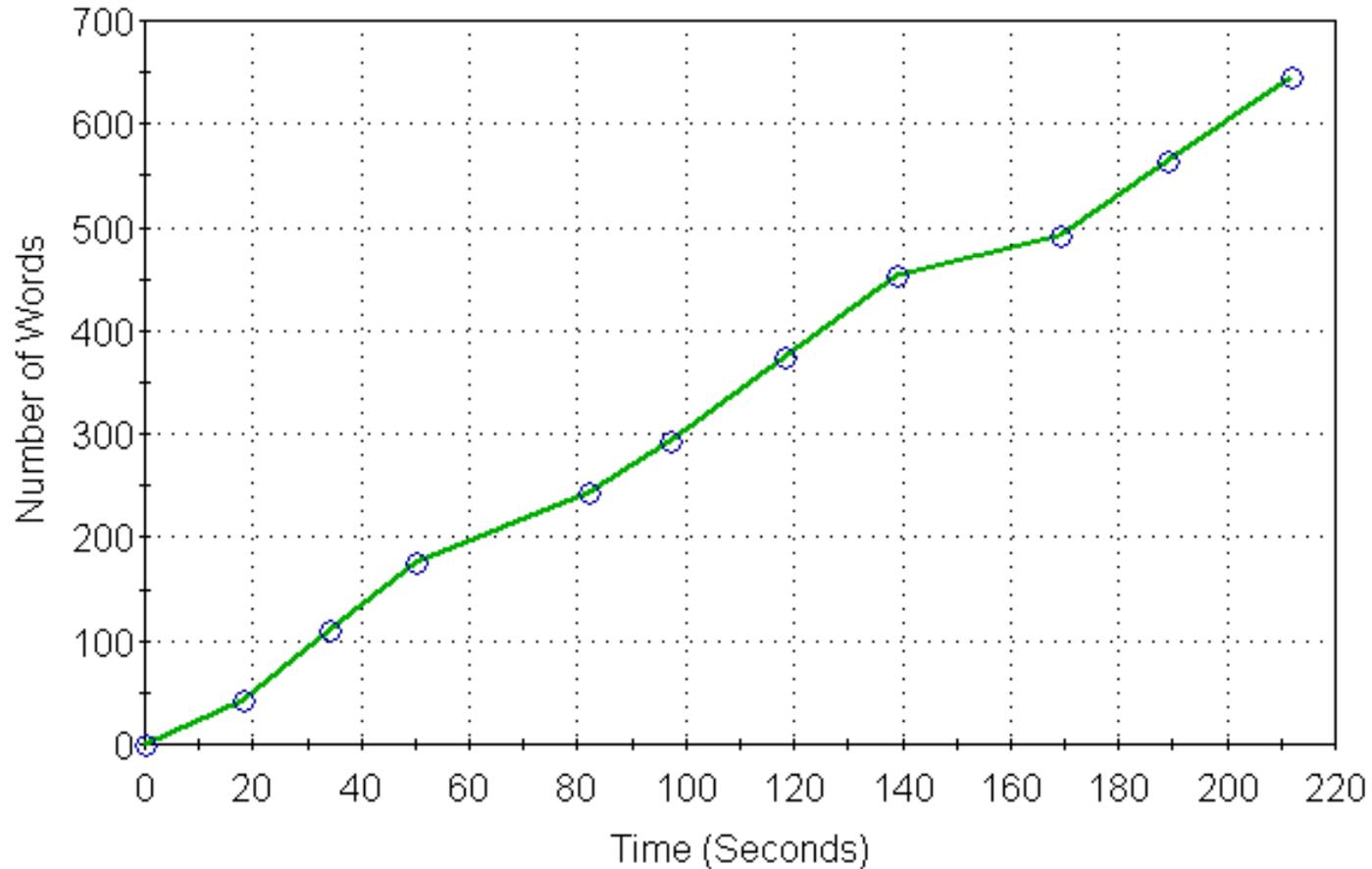
by Rakim (Book Of Life)

- I ain't no joke, i use to let the mic smoke
Now i slam it when i'm done and make sure it's broke
When i'm gone i wrote this song cuz i won't let
Nobody press up and mess up to seen i set
I like to stand in a crowd and watch the people wonder
damn
Bu think about it then you'll understand
I'm just an addict addicted to music
Maybe it's a habit, i gotta use it
Even if it's jazz or the quiet storm
I hook a beat up convert it in a hip-hop form
Write a rhyme in graffitti in every show you see me in
Deep concentration cuz i'm no comedian
Jokers are wild if you wanna be tame
I treat you like a child then you're gonna be named
Another enemy, not even a friend of me
Cuz you'll get fried in the end if you pretend to be
?can be? cuz i just put your mind on pause
And i can beat you when you compare my rhyme wit yours
I wake you up and as i stare in your face you seem stun
Remember me, the one you got your idea from
But soon you start to suffer but you only get rougher
When you start to stutter that's when you had enuff of
Biting it, i make you choke, you can't provoke
You can't cope, you should of broke cuz i ain't no joke
- I got a question, it's serious as cancer
Who can keep the average dancer
Hyper as a heart attack nobody smiling
Cuz you're expressing the rhyme that i'm styling
This is what we all sit down to write
You can't make it so you take it home, break it
and bite
- Use pieces and bits of all the hip-hop hits
Get the style down pack then it's time to ?swit?
Put my tape on pause and add some more to
yours
Then you figure you're ready for the
neighborhood chores
The e-m-c-e-e don't even try to be
When you come up to speak, don't even lie to
me
You like to exaggerate, dream and imagnate
Then change the rhyme around, that can
aggravate me
So when you see me come up, freeze
Or you'll be one of those 7 mc's
They think that i'm a new jack but only if they
knew that
They who think wrong are they who can't do that
Style that i'm doing, they might ruin
Patterns of paragraphs based on you and
Your offbeat dj, if anything he play
Sound familiar, i'll wait til e say
Play 'em, so i'ma have to dis and broke
You could get a smack for this, i ain't no joke

I Ain't No Joke (Continued)

- I hold the microphone like a grudge
B'll hold the record so the needle don't budge
I hold a conversation cuz when i invent
I nominated my dj the president
When i'm see i'll, people freestyle, going steadily
So pucker up and whistle my melody
But whatever you do, don't miss one
They'll be another rough rhyme after this one
Before you know it, you're following and fiending
Waiting for the punchline to get the meaning
Like before the middle of my story i'm telling
Nobody beats the r so stop yelling
Save it, put it in your pocket for later
Cuz i'm moving the crowd and be a record fader
No interruptions and the mic is broke
When i'm gone, then you can joke
Cuz everything is real on a serious tip
Keep playing and i varies quick
And take you for a walk through hell
Feed your dome then watch your eyeballs swell
Guide you out of triple stage darkness
When it get dark again then i'ma spark this

"I Ain't No Joke" by Eric B. & Rakim



Linear Reg. Model $y = 3.0108x + 5.7345$

Quad. Reg. Model $y = -0.0013x^2 + 3.2872x - 2.63$

Microphone Fiend

by Eric B. and Rakim

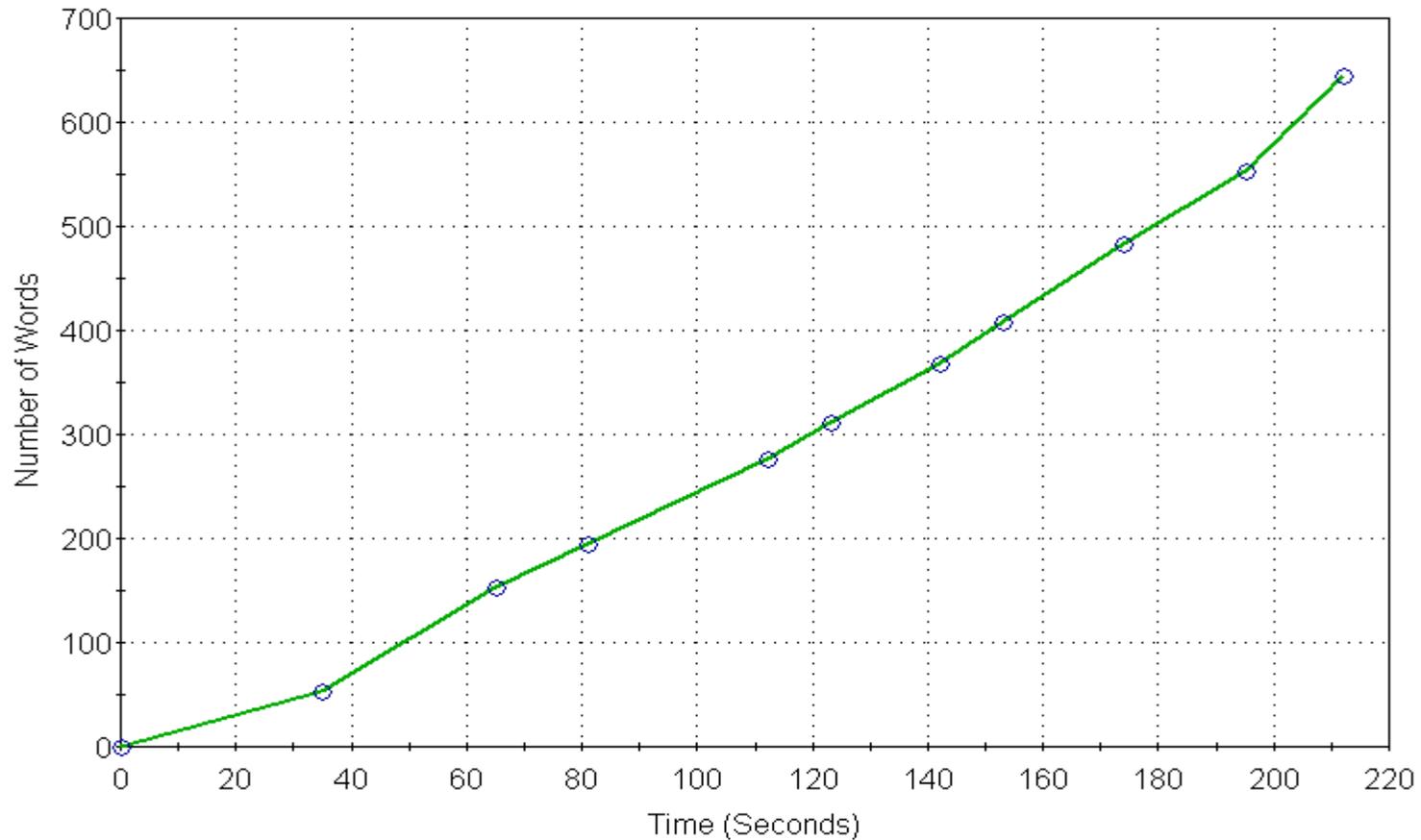
- I was a fiend before I became a teen
I melted microphone instead of cones of ice cream
Music orientated so when hip-hop was originated
Fitted like pieces of puzzles, complicated
'Cause I grabbed the mic and try to say, " Yes y'all!"
They tried to take it, and say that I'm too small
Cool, 'Cause I don't get upset
I kick a hole in the speaker, pull the plug, then I jet
Back to the lab ...without a mic to grab
So then I add all the rhymes I had
One after the other one, then I make another one
To dis the opposite then ask if the brother's done
I get a craving like I fiend for nicotine
But I don't need a cigarette, know what I mean?
I'm raging, ripping up the stage and
Don't it sound amazing 'cause every rhyme is made and
Thought of, Cuz it's sort of...an addiction,
Magnatized by the mixing
Vocals, vocabulary, your verses, you're stuck in
- The mic is a drano, volcanoes erupting,
Rhymes overflowing, gradually growing
Everything is written in the cold, so it can coincide, my thoughts to guide,
48 tracks to slide
The invincible, microphone fiend Rakim
Spread the word, 'cause I'm in
E-F-F-E-C-T
A smooth operator operating correctly,
But back to the problem, I gotta habit,
You can't solve it, silly rabbit
The prescription is a hypertone that's thorough when
I fiend for a microphone like herion
Soon as the bass kicks, I need a fix
Gimme a stage and a mic and a mix
And I'll put you in a mood or is it a state of unawareness? Beware, it's the reanamator!
A menace to a microphone, a lethal weapon
An assasinator, if the people ain't stepping
You see a part of me that you never seen
When I'm fiending for a microphone, I'm the microphone fiend...

Microphone Fiend (Continued)

- (Verse 2:)
After 12, I'm worse than a Gremlin
Feed me Hip-hop and I start trembling
The thrill of suspense is intense, your horrified
But this ain't the cinemas of "Tales From the
Darkside",
By any means necessary, this is what has to be
done
Make way 'cause here I come....
My DJ cuts material....
Grand imperial.
It's a must that I bust any mic you're hand to me,
It's inherited, it's runs in the family
I wrote the rhyme that broke the bull's back,
If that don't slow 'em up, I carry a full pack.
Now I don't want to have to let off, you should of kept
off
You didn't keep the stage warm, step off!
Ladies and Gentleman, You're about to see
A pasttime hobby about to be
Take it to the maximum, I can't relax see, I'm
Hype as a hyperchondriac 'cause the rap be one-
Hell of a antidote, something you can't smoke
More than dope, you're trying to move away but you
can't, you're broke
More than cracked up, you should have backed up
For those who act up need to be more than smacked
up
Any entertainer, I got a torture chamber
One on one and I'm the remainder!
So close your eyes and hold your breath,
And I'm a hit'cha wit the blow of death
Before you go, you'll remember you seen
The fiend of a microphone, I'm the microphone fiend

The microphone fiend...

"Microphone Fiend" by Eric B. & Rakim



Linear Reg. Model $y = 2.8908x - 31.6065$

Quad. Reg. Model $y = 0.0041x^2 + 2.0851x - 6.6177$

WHY SING ABOUT IT?

- Music has usually played a part in the learning of preschool and kindergarten concepts. I.e. “The ABC Song”.
- Music can actually serve as a teaching method in mathematics curriculum units with a little creative planning.
- Music is viewed as a multi-sensory approach to enhance retention of academic skills.
- Music can energize and inspire students to learn.



The Rappin' Mathematician

The Rappin' Mathematician provides teachers, parents and students of all ages with cool, hip rap songs about math and living a positive life!

Know a kid who loves math?

Know one that hates math?

They'll all be math-rappin' soon!

Modern, hip and professionally recorded.



TRM In The News:

[KPBS Radio](#)
[Good Morning San Diego](#)
[San Diego Union Tribune](#)
[Teacher Magazine Web Watch](#)
[TRM Press Release](#)

Word on the Street:

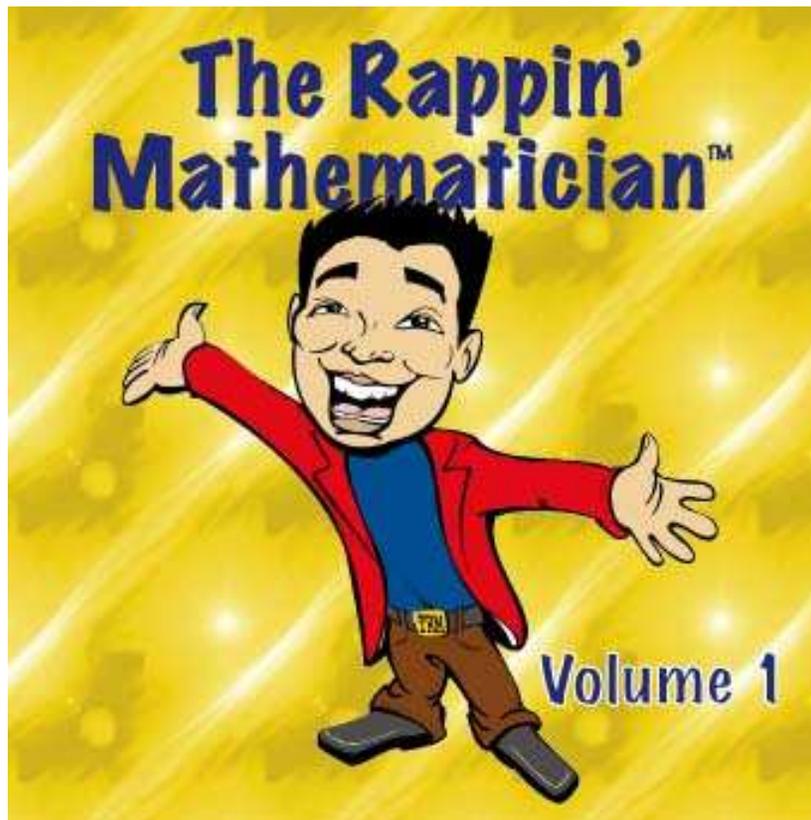
"The Rappin' Mathematician is amazing. My kids now rap lyrics that help them in school, and in life. What a refreshing change to all of the degrading lyrics on the radio these days."

- Tamara Whitney,
Teacher/Mother
Escondido, California



Volume 1 includes clever, professionally recorded rap songs about the following topics:

fractions, decimals, negative numbers, making smart decisions, increase & decrease, rectangles, spheres, saying no to drugs, sum, difference, product, quotient, test taking skills, math in the world, parallel / perpendicular / vertical / horizontal lines, not believing everything on tv, exponents, order of operations, parts of a circle, and much more!



Sample Sound Clips:

[The Itty-Bitty Dot](#)

[The Number Line Dance](#)

[Test Tiiiiime!!!](#)

[Just Because](#)

The Numberline Dance

Mathraps.com (sample)

Ah yeah!
You know!
That's right!
Let's go!

Well forget the Macadarena
Forget the funky chickn'
Cause I gotta' new dance and a beat that's kickin'
Yeah the number line dance is my finest creation.
In every math class it is sweepin' the nation
You don't need to be famous or your name on a list
It's the number line dance and it goes like this.

Negative to the left , positive to the right
It's the number line dance and I can dance all night!
Yea,Negative to the left , positive to the right
It's the number line dance and I can dance all night!

Well negative numbers ya really gotta know
And when you start at zero to the left you go....



Songs that Teach Advanced Math Facts and Concepts
Upper-Level Math, Algebra, and Geometry

ize the
vocabulary -- and the mathematical concepts as well."
Harry Guffee -- [Do the](#)

[Math! and Got Math?](#)

* **Sound clips are available from these pages.**

Advanced Math, Algebra, and Geometry Songs

[Call Me Mean \(I'm Just Average\)](#) * -- Harry Guffee

[Circle of Friends](#) * -- Harry Guffee

[Dance of the Pythagoreans](#) * (Determining the
Hypotenuse) -- Harry Guffee

[Equivalence](#) * -- Tom Griffith

[Fraction Rock](#) * -- Joe Crone

[The Fundamental Algebra Song](#) * -- Tim Pacific

[Geometry, Oh No!](#) * -- Math Rocks

[Geometry Park](#) * -- Geometry Park USA

[Good Things Happen \(Signed Numbers\)](#) * -- Harry Guffee

[The Guzinta Family \(The "Goes Into" Family\)](#) * -- Harry

Guffee

[Mathspeak \(Math Vocabulary from A - Z\)](#) * -- Harry Guffee

[Mixed Numbers](#) * -- Harry Guffee

[The Order of Operations \(PEMDAS\)](#) * -- Math Rocks

[Positive Rational Numbers](#) * -- Harry Guffee

[Rhythm of the Algorithm](#) * -- Harry Guffee

[Slip to the Side \(Rounding Numbers\)](#) * -- Joe Crone

[Use Metrics: Street Style](#) * -- Math Rocks

Miscellaneous Math Songs

[Check Your Work](#) -- Professor Larry Lesser

[The Funky Fractions Rap](#) * -- Earth Tone Productions

[The Metric Song](#) * -- Kathleen Carroll

[The Metric System Rap](#) * -- Earth Tone Productions

[The Ordinal Song](#) * -- Mr. Al

[The Prime Numbers Song](#) * -- Tim Pacific

[Smell My Feet \(The Time Song\)](#) * -- Tim Pacific

[When in Rome \(Roman Numerals\)](#) * -- Harry Guffee

Early Number and Counting Skills

Please visit our [Songs That Teach Early Number](#)

[Concepts](#) *

Addition, Subtraction, Multiplication and Division Tables

Please visit our [Mathematics Songs for Elementary](#)

[School](#) *

New: [See our Children's Music Downloads](#)

Songs for Teaching The Definitive Source for Educational Music



Downloads
are now
Available

See our
Folk Songs



Creative teachers can use music to teach content across the curriculum -- to students of all ages. A host of educational experts brings you tested ideas for using the magic of music in your lesson plans.

This site contains **thousands of pages** for you to peruse -- many with **lyrics, sound clips**, and **teaching suggestions**. The top educational pros offer practical suggestions based on the latest in brain-based learning. Innovative teachers share their classroom pointers and extension activities using children's music.

Songs from a wide variety of popular artists are presented by academic subject. See the categories below to find educational music and children's songs that complement your lesson plans.

Songs for Teaching
Using Music to Promote Learning
6632 Telegraph Rd. #242
Bloomfield Hills, MI 48301

The Order of Operations: PEMDAS

by Christina DeSanto

- Yo, listen up, here's the story
about a little thing that helps us keep order
And all day and all night, in every problem we do
We know to go from left to right...

-

- ...Chorus:

I know the order of operations
I know the order of operations
I know the order of operations
Or you can call it PEMDAS

-

P's for Parentheses
E for Exponents
M Multiplication...

- When more than one operation is used
we need to know which one goes first
We have come up with a set of rules.
It's called the order of operations...

-

- Chorus

- The order is important to find the correct answer to all our math problems.
We know if we follow this rule we will get the right answer.

- Chorus

Quadratic Formula Song

- To the tune of "Pop Goes the Weasel"
- $x = -b$
- \pm the square root
- of b^2 minus $4ac$
- all over $2a$

Internet Resources

- Eves, Howard. An Introduction to the History of Mathematics. Saunders College Publishing: 1990
- **Music and Math**
www.mathgym.com.au/history/pythagoras/pythagoreom
- Create A Graph Classic
<http://nces.ed.gov/nceskids/>
- Lyrics
www.lyrics.astraweb.com
www.geocities.com/BourbonStreet/Square
- "Students learn to rhythmic beat of rap" by North County Times
www.nctimes.com/articles/2007/03/10/news/inland
- "Songs for Teaching: Using Music to Promote Learning"
www.songsforteaching.com/recall/algebra.htm

Activities/Agenda

1. Introduction of group and subject (Portia)
2. Transition via music (Portia/Rodger)
3. Timing Tool,
“Where’s the Math in This Music” (Rodger)
4. Let’s Rap Music (Dale)
5. Closing (All)