

Our Musical, Mathematical Brains
Ideas to turn STEM to STEAM
NCTM Philadelphia 2016

What you heard...

Why you heard it...

Seasons of Love (the musical Rent)	Place value, dimensional analysis
Upside Down, Inside Out (Dianna Ross)	Transformations, inverse functions
I Walk the Line (Johnny Cash)	Graphing Linear Equations
It's Hip to be Square (Huey Lewis)	Area, completing the square, squaring binomials
Jeopardy Theme Song	Factoring (finding the multiplication question that produced a given product)
More (Nat King Cole)	Inequalities
Matchmaker (Fiddler on the Roof)	Functions match a member of the domain with exactly one member of the range
Accentuate the Positive (Aretha Franklin)	Integers, integer exponents
Anything by W. A. Mozart	The "Mozart Effect" on concentration and brain development
Baby, Baby (Justin Bieber)	Proportion (how many times would he sing the word "baby" in an hour?)
The 12 Days of Christmas (John Denver and the Muppets)	How many gifts in total? Can you write this using summation notation? What if the song extended to more days?
If I had \$1,000,000 (Barenaked Ladies)	What would you buy? How high a stack would it make? If you spent \$100 each day, how long before you were broke?
When I'm 64 (Beatles)	What year will it be when you turn 64? How many years from now is that? What other ages are perfect squares?

Against the Wind (Bob Seeger)

Heard it through the Grapevine
(Marvin Gaye)

The headwind/tailwind/with/against the
current Alg II word problems!

Exponential function: If you heard a rumor
and told two friends a minute later, and they
each told two friends a minute after that, etc,
how many friends would know in 10
minutes? When would the whole town
know? When would a million people know?

Defying Gravity (Wicked)

Quadratic word problems (Algebra I and II)
involving objects that are launched and then
fall to the ground—"when does it hit the
ground?"

Carwash (Rose Royce)

If it takes 15 minutes to wash one car, how
many could you wash in an 8-hour shift? If
Boo-boo can wash a car alone in 20 minutes
and Yogi can wash a car alone in 15
minutes, how long will it take together?

Midnight Train to Georgia
(Gladys Knight and the Pips)

If a train leaves Los Angeles at midnight...
all variations of distance problems!

813-mile Car Trip (They Might be Giants)

Distance problems plus many others about
pit stops, expenses, mileage, etc.

SHOUT! (The Isley Brothers)

Graphing your height as you crouch lower
and lower during "a little bit softer now..."



FiveThirtyEight (@FiveThirtyEight)

[5/29/15, 9:41 AM](#)

Headed to a wedding this weekend? Here's how to dance to that DJ favorite "Shout": 53eig.ht/1z86xX5pic.twitter.com/Vzo23z2Uzj

Quadratic Formula song

This formula can easily be sung to the tune
of Jingle Bells, Row Row Row Your Boat,
Pop Goes the Weasel, and The Macarena

One is the Loneliest Number
(Three Dog Night)

One is not prime, not composite. How
lonely!

Stayin' Alive (Beegees,
Saturday Night Fever)

John Travolta makes the shape of a cubic
function as he dances!

The Circle of Life (Elton John,

To sing as you make that "circle of logs"!

The Lion King)

The Pi Song (Pi Diddy)

Assigns each digit a note, plays the music of pi. Several youtube videos do the same.
Celebrate Pi Day!

The Twilight Zone Theme song

To remind students that strange and terrible things can happen when you divide both sides of an inequality by a negative number (must flip the inequality symbol!), or when you multiply or divide both sides of an equation by a variable (CHECK for extraneous roots), or when you square both sides on an equation (CHECK for extraneous roots)!

You Don't Mess around with Jim
(Jim Croce)

You don't tug on Superman's cape,
You don't spit into the wind
You don't pull the mask off the old Lone Ranger,
And you don't divide by zero...
Or leave radicals in the denominator...

Imagine (John Lennon)

Al G Bra's version on Youtube sings about imaginary numbers, and uses the refrain:
You may say I'm a Math Nerd,
But I'm not the only one!
I hope some day you'll join us
And find out that math is fun!

Today was a Good Day (Ice Cube)

What inspires my students!

The Birthday Song (Debbie Char)

You must have common denominators, You must have common denominators,
To ADD or SUBTRACT, You must have common denominators!

You must line up the decimal points, You must line up the decimal points,
To ADD or SUBTRACT, You must line up the decimal points!

You must have like terms, You must have like terms,
To ADD or SUBTRACT, You must have like terms!

You must have like radicals, You must have like radicals,
To ADD or SUBTRACT, You must have like radicals!

THE CONIC SECTION SONG
(to the tune of The Lion Sleeps Tonight)
Words by Debbie Char

For a function to be quadratic, a square is on the x,
With an axis of symmetry and a point called the vertex.

PARABOLA, PARABOLA, PARABOLA, PARABOLA...

There's just one with a minus sign, you should put that in your notes:
With two branches, two foci, and intersecting asymptotes!

HYPERBOLA, HYPERBOLA, HYPERBOLA, HYPERBOLA, ...

If the x and the y are squared, equal coefficients, you
Find the diameter by taking the radius times two!

CIRCLE, CIRCLE, CIRCLE, CIRCLE,...

Stretch a circle along an axis, and you will get this shape
Round the foci our gravity keeps the planets from escape!

ELLIPSE, ELLIPSE, ELLIPSE,...

Ellipse, circle, hyperbola, and parabola have shown
Just what happens when you decide to cut up a double cone!

CONIC SECTIONS CONIC SECTIONS CONIC SECTIONS...

The Fraction Song
(to the tune of On Top of Old Smokey)
Words by Debbie Char

On top of a fraction,
Above the short line,
In the numerator,
All numbers are fine.

The denominator
Lives down below
Just check to be sure that
It's NEVER ZERO!!!

POINT-SLOPE FORM

(to the tune of the GhostBusters Theme song)

words by Debbie Char

When you've got a point
And you know the slope,
Whatcha gonna use?

POINT-SLOPE FORM!!!

When you've got TWO points,
You can find the slope, then
Whatcha gonna use?

POINT-SLOPE FORM!!!

Y minus Y_1 , which is the y-coordinate,
Equals m , which is the slope, then in parentheses
X minus X_1 , which is the x-coordinate,
That's the Point-Slope form of the equation of a line!

The Slope Song

(to the tune of Blue Danube Waltz)

words by Debbie Char

A changing rate, **Rise over Run**
Slope measures it great! **Rise over Run**

How steep are the stairs? **Rise over Run**
Show trending affairs, **Rise over Run**

The hill you just climbed, **Rise over Run**
Slope's easy to find, **Rise over Run**

The difference of Y's is the RISE
And the x's make the Run!

Fraction Rap (by Gigi Shadid)

When you're adding up or taking away fractions, don't be a hater!
Bottom numbers got to be the same—COMMON DENOMINATOR!

Multiply fractions, no big problem: top times top and bottom times bottom!

Dividing fractions, easy as pie: FLIP the second and MULTIPLY!