POWERS

CCSS 8.NEEE.1 Know and apply the properties of integer exponents to generate equivalent numerical expressions.
For example, 3^2 × 3^-5 = 3^-3 = 1/3^3 = 1/27

Yeah, yeah, it's time to learn about powers
Powers are made of a base and exponents
The base is on the bottom, that's the big number
And the exponent is on the top, in space

Verse 1
5 to the power of 2 or 5 squared
This is real easy, let me make it clear
5 is the base and 2 is the exponent
Multiply the 5 two times, yeah you on it
5 x 5 that's 25, but if the exponent has a negative sign
Just take 1 and divide it by the base
Make the exponent positive time to set it straight
4 to the power of negative 2
That's just 1 over 4 squared
Which means 1 over 4 x 4 that's 1/16
One more to be clear yes, 5 to the power of negative 3
That's just 1 over 5 cubed
That's just 1 over 5x5x5 which is 1 over 125 smooth

Hook (x2)
Powers, exponents, and base
Base on the bottom and exponents in space
Base is what you're multiplying
Exponents tells the number of times

Verse 2
9 to the power of 4, times 9 to the power of 6 to solve, do it like this
Multiplying powers with the same base
All you do is add the exponents, keep the base the same
9 to the power of 4 + 6, that's 9 to the power of 10, yes
Since the base are the same just add the exponents
Do the same if the base was an "x" yes
Take x squared times x cubed, that's x to the power of 2+3
That's x to the 5th that's it
Now let's try y to the 3rd times y to the 6th
Y to the power of 3+6
That's y to the 9th that's it, yes
If the base are the same just add the exponents
Keep the same base ya'll that's it yes

Hook (x2)

7 to the power of 10 divided by 7 to the power of 4
Ready? Let's go
When dividing powers with the same base
Subtract the exponents and keep the base the same
7 to the power of 10 minus 4 that's 7 to the power of 6 yes
We can do the same with a variable for sure
So first off let's start with an x, yes
Take x to the 5th divided by x to the 3rd
Don't be scared,t hey have the same base
So you gotta subtract the exponents you'll get x squared yes
D to the 9th divided by D to the 8th
They have the same base
So you have D to the power of 9-8
That's D to the first, yo I stay in first place

Hook (x2)

APPROXIMATIONS

CCSS 8.NAS.2 Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., $\pi 2$).

Hook (x2)
Approximations get you close to, not exact
Compare rationals to irrationals, get ya answers like that
We can do decimals or radicals like pi or the square root of 2
On a number line they're between two rational numbers this is true

Verse 1
It's time for some action, let's walk to a boxing ring
Area 240 feet squared
Can you find the length of the sides of the ring?
Find the square root of 240
List perfect squares that's close to 240
That's 225 and 256, in between them is 240
So the square root of 225 is less than the square root of 240
And the square root of 240 is less than the square root of 256
Now the square root of 225 is 15, yes it's 15
And the square root of 256 is 16, yes it's 16
Square root of 240 is in between so it's between 15 and 16
Therefore size of the ring is between 15 and 16 feet
When you're trying to find the square roots
That don't have perfect squares
Your answer will be between the square root of two perfect squares

Hook (x2)

Let's write square roots with a decimal, yo I got what you need
Already showed the square root of 240 was between 15 and 16
We need to write a fraction
Listen up, yo, don't be scared gotta
Bring back 225 and 256, our 2 perfect squares, yeah
Subtract the given number
And the smallest perfect square for your numerator
Subtract the largest
And smallest perfect squares for your denominator
240 – 225, that's 15 for your numerator
256 – 225, that's 31 for your denominator
15 over 31 divide, you'll get .5 when rounded
To the nearest tenth
We're almost done, don't look so astounded
Your whole number's 15 and your decimal's .5
So the square root of 240 is approximately 15.5

Hook (x2)

Let's do an irrational number, popular one is pi
Let's look at the two integers 3 and 4, in between them you'll find pi
Pi is greater than 3 and pi is less than 4
So pi squared is greater than 3 squared but not the square of 4
So pi squared is greater than 9 but smaller than 16
Let's try another one like 5 times pi
Is it greater than 15?
Since pi is greater than 3, multiplying both sides by pi
Get 5 times pi is greater than 3 times 5 and that's 15
Let's do another one, 36 over pi
Don't trip, just follow me
Just start off with your pi which is between 4 and 3
4 fits into 36 9 times, 3 into 36 is 12
So 36 over pi is greater than 9 but less than 12

FRACTIONS TO DECIMALS

CCSS 7.NAS2.D Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.

Verse 1
Say you got a dollar, want to share it with your 3 friends?
Yo, it's 4 of you, let's see what you each get
1/4 TIBO time, top in bottom out
Long division's what we talkin' bout
1 goes in, the 4 is out
Now check to see if 4 can fit into 1
It can't, so you gotta add a decimal up top
And put a zero on the back of 1
Now the 1 becomes 10
4 divides 10 two times
Put the 2 up top then multiply
2 x 4 is 8, put it under 10 then subtract
You'll get 2 then check again
Can 4 divide 2? No
So add another zero, now 2 becomes 20
Can 4 divide 20? Yes
5 times, put the 5 up top and multiply
5 times 4, yo, is 20
Put it under 20
Subtract, you'll get zero
Answer is .25
¼ is .25
Since we said money, what it represents?
That each of your friends gets 25 cents

Hook
Top in, bottom out
TIBO time, division's what we're talking about
Numerator in, denominator out
NIDO time division's what we're talking about
1/5, .20, 1/2, .5, 1/3, .3, 9/10, .9
Take a fraction to a decimal, let's work it out
Long division's really what we're talking about

Verse 2
Say you throw a party, got 3 sodas and 4 people
How much soda do they get to make their cups equal?
3/4, let's write it as a decimal
NIDO time, the way to change a fraction to a decimal
Numerator in, denominator out
3 is the numerator, so the 3 goes inside the house
Denominator 4 Is outside
Got our problem set up, it's time to divide
Check if 4 can fit into 3
It can't, put a decimal up top
And put a zero on the back of 3 to make it 30
4 goes into 30 7 times
7 goes up top, now it's time to multiply
7 and the 4
28 drop it under 30, subtract you'll get 2
Can 4 divide 2? No it can't so add a zero to the 2
And make it 20, now 4 divides 20
5 times, put the 5 up top
Multiply by 4 you'll get 20 now drop it under 20
Subtract you'll get zero, answer is .75
They get 3/4 of a soda which is .75

ADD AND SUBTRACT FRACTIONS

CCSS 5.NAF.1 Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators.

Verse 1
Let's look at 2 pizzas
Student A ate 2/5, student B ate 1/3
How much did they eat together?
Wanna add these fractions?
Make the bottoms match first
Take both denominators, list the multiples
Take the first one, they have the same
This is how you find the Least Common Multiple
New denominator: 15, now they are the same
5 goes into 15 three times, multiply 2/5 by 3/3
3 fits into 15 five times
Multiply 1/3 by 5/5
2/5 = 6/15, 1/3 = 5/15
Bottoms match, now add the numerators
Amount of pizza ate was 11/15

Hook (x2)
LCM, least common multiple is where you begin
Bottoms must be the same
Denominators need to be the same
To subtract or add fractions

Bridge
Make the bottoms match, gotta make the bottoms match
Make the bottoms match, gotta make the bottoms match
Make the bottoms match, gotta make the bottoms match
Make 'em match, now it's time to subtract

Verse 2
3/4 of your birthday cake
You wanna give one half of that away
Imma show you how to figure out what you have left
Make the bottoms match, no LCM let's try another way
Multiply your denominators, get 4 x 2, yo is 8
Then cross multiply 2 times 3
And 4 times 1 for your new numerators that's great
Get 6/8 – 4/8 answer is the left over cake, cake
Since the bottoms match subtract the numerators
Amount of cake, cake left yo is 2/8
It's your birthday, day is all yours but 2/8
Must be simplified, of course
Divide 2/8 by 2/2, amount of birthday cake left is 1/4

Hook (x2)

Verse 3
Yo, let's hit the track, say I ran 5 ¼ you ran 2 ½ laps
Total distance of that
Add the two mixed numbers for the total laps on the track
First add the whole numbers: 5 and 2, that's 7
Yeah, that's a lot of laps, but you can't quit, no restin'
Time for some action, now we gotta add the fractions
1/4 + 1/2 LCM of 2 and 4 yo is 4
1/4 stays the same but one half we gotta change
Equivalent fractions is the way, multiply 1/2 by 2/2
Get 2/4 you know what to do, add 1/4 and 2/4
Get ¾ and the total laps ran was 7 ¾

Hook (x2)

MULTIPLYING AND DIVIDING FRACTIONS

CCSS 6.NSA.1 Create a story context for (2/3) ÷ (3/4) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3.

Top times top, bottom times bottom
All you need to do when you multiply fractions
Top times top, bottom times bottom
But don't forget the rules when you divide fractions

Verse 1
In a class of 30 students, 2/5 wanna rap
And 2/3 of those students also want to act
What fraction of the students wanna rap and act?
And how many students both wanna rap and act?
Gotta multiply the fractions
2/5 x 2/3, yo its time to get it cracking
Top times top, bottom times bottom
Get 4/15 try to simplify the fraction
You can't, so out of 30 students
4/15 the fraction of those that wanna rap and act
Now take 30 which is 30 over 1
Times it by 4/15 you're almost done
Top times top, bottom times bottom
Get 120 over 15 like that
Divide you'll get 8 it's a wrap
8 is how many students out of 30 that wanna rap and act

Hook
Top times top, bottom times bottom
All you need to do when you multiply fractions
Top times top, bottom times bottom
But don't forget the rules when you divide fractions
Switch division make it multiplication
Then flip the second fraction
Don't forget to flip the fraction
Then top times top, bottom times bottom
Real easy but one thing about fractions

Bridge
Gotta simply, don't forget to simplify (x2)

Verse 2
If you have 4/5 of a gallon of juice
How many jars will be used?
If each jar can hold 1/10 of a gallon of juice the word
Each is a real important clue
It means divide, 4/5 divided by 1/10
There are some real important rules that you can't forget
When dividing fractions gotta change division
To multiplication, please pay attention
Then flip the 2nd fraction which is known as reciprocal
4/5 divided by 1/10 becomes 4/5 times 10/1
It's that quick, multiplying these fractions is not difficult
Top times top, you'll get 40
Bottom times bottom, you'll get 5
Now you must divide
40/5 is 8 and that's the number of the
1/10 of a gallon jars it would take

Hook

Bridge

LINEAR SYSTEMS

CCSS 8.EE.C.7A Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions.

Verse 1
Solving a system using a graph, see where the two lines intersect
Get the values for x and y, ordered pair
Your solution still gotta check
Make sure that your ordered pair satisfies not just one,
But both equations
Let's take ordered pair (4, 1) plug 'em in
Now let's solve these equations:
x – y = 3 and x + 2y = 6
Replace x with 4, y with 1
Start with x + 2y = 6, you'll get 4 + 2 times 1 = 6
That's 4 + 2 = 6
6 = 6, check, not done yet! Must check both equations, yes!
x – y = 3, replace the y with 1 and 4 for the x
Now that's 4 – 1 = 3
Solve, you'll get 3 = 3, check
Your ordered pair satisfies both so it's a solution yes!
Plug in the values for x + y
Don't forget both equations must be checked, yes!

Hook (with Ms. Co)
If two lines intersect, then you know they have, one solution, yeah
If two lines are parallel then they have, no solution, yeah
If two are the same then you have infinitely many solutions, yeah
Use elimination and substitution to find solutions, yeah

Verse 2
Say you have 2 equations, one way to solve, use elimination
2x + y = 9 and 3x – y = 6
Key to this concept is cancelling
Make ya terms line up, time to get to it
Add these equations to eliminate y get 0 when you add –y and y
Now 2x and 3x, that's just 5x
What's next? Now add 9 and 6, that's 15, so 5x = 15
Solve for the x, divide by 5, x =3, not done yet!
Pick an equation, plug in your x and solve for the y
Yes y'all no sweat, yes! 2x + y = 9, for x gotta plug in the 3
So that's 2 times 3 plus y equals 9 so 6 + y = 9, so easy
Yeah, now subtract 6, get y = 3, yes, that's it
Work's all done, now I know you can see your solution is (3,3)

Hook (with Ms. Co)

Verse 3
Two equations, y = 2x +1 and y = 2x + 4
Want to know if they're parallel? Just look at the slopes
Both equations have a slope of 2
And since these are the same, both lines are parallel
Graph them, they won't intersect
So no solution for lines that are parallel
But if two lines are the same, solutions are infinite
Two more equations to picture it. Take 2x + 2y = 6 and x + y = 3
If you divide equation one by 2, you get x + y = 3
See, they are the same, you ain't gotta ask
They will lie on each other if you put them on a graph
Each point on the first line will be the same
As the points on the second line, therefore there are infinite solutions
Not much to do to find your solutions
If two lines have the same slope
They're parallel and have no solutions
If two lines are the same line
Then you know they have infinite solutions

POLYNOMIALS

CCSS HSA.APR.A.1 Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.

Hook
Multiplying polynomials is easy, don't quit
The distributive property is how you do this
Multiply all the terms on the outside
By all of the terms on the inside
Multiplying polynomials is easy don't quit
Multiply coefficients then add exponents
Multiply all the terms on the outside
By all of the terms on the inside

Verse 1
Polynomials
We're multiplying polynomials
It's easy, here's the way to go
Just listen up, I got you
Yeah, here's what you do
Take some notes from Mr. Q
Let's say you have a monomial
Multiply it by a trinomial, look
It's easy see
Use the distributive property
Multiply the terms on the outside by all the terms on the inside
Let's say you have $3x(4x^2 + 2x – 3)$
You get $12x^3 + 6x^2 – 9x$
Let's see what's next, come on
Let's see what's next, all right?

Polynomials
We're multiplying polynomials
It's easy, here's the way to go
Just listen up I got you

Hook
Multiplying polynomials is easy, don't quit
The distributive property is how you do this
Multiply all the terms on the outside
By all of the terms on the inside
Multiplying polynomials is easy don't quit
Multiply coefficients then add exponents
Multiply all the terms on the outside
By all of the terms on the inside

Verse 2
Multiply the terms on the outside
By all the terms on the inside
Here's the insight that you need right
Just listen up I got you
Yeah, let's take a binomial
Multiply it by a trinomial
$(4g - 3)(2g^2 + g – 6)$
Do 4g times the second poly
Get $4g^3 + 4g^2 – 24g$
Now -3 times the second poly
You get $– 6g^2 – 3g + 18$
Now combine like terms
You get $4g^3 - 2g^2 - 27g + 18$

Hook

ABSOLUTE VALUE

CCSS 6.NS.C7 Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. For example, for an account balance of -30 dollars, write |-30| = 30 to describe the size of the debt in dollars.

Hook
We can go up and down, left or right
Talking absolute value, number's not 0
They're positive never negative
Cause it's just the distance from 0

Verse 1
Absolute value of 5 is 5
'Cause it's just 5 spaces from 0 on a number line
Absolute value of -5 is 5
'Cause it's 5 spaces from 0 on the number line
Absolute value is just distance, it is so easy if you just listen
The absolute value of y is y
'Cause it's just y spaces from 0 on a number line
2 boys from the same house drove 10 miles
But one went left and one went right
If they drove on a number line
The boy that went to the left is negative
And positive to the right, so we're at 10 and -10
If you took the absolute values tell me what you get?
Both answers give 10
Means that they're equal 'cause each boy drove 10 miles away from 0

Hook

Verse 2
One day ya boy went to the bank, I had to go get me some bread
I need money, I put the code in
Before I could blink, checked the screen
This is what it read: You're in debt
Negative 50 what is this?
Does it mean I have 50 in the bank?No
So that means I owe 50
What I gotta do to have some money in the bank?
Yo, I owe 50.Need to add 50 to get back to 0
Gotta pay 50, absolute value of -50 is 50
It's the distance from 0 and the absolute value of 50 is 50
It's the distance from 0, absolute values of -50 and 50 are equal
They have the same distance from 0

Hook

Verse 3
Let's solve an expression: absolute value of -9 + 5
The numbers have opposite signs
So the rules say you gotta subtract, that's right
Absolute value of -4 that's 4 spaces from 0 so the answer is 4
Let's try out an equation, absolute value of x - 5 is 4
Write it out 2 times
Since we're talkin' about distance
One answer positive and one negative
Get x – 5 = 4 and x – 5 = -4
Now you gotta answer them, first equation is 9
Value for your x, take a short breath
And the second equation you get x is 1
So 1 and 9 are answers for your x

FUNCTIONS

CCSS 8.F.A.1 and 8.F.A.2 Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.

Verse 1
It's time to come to the table, I'm talkin X Y
Values for X is 2, 3, 4, and 5
The values for Y is 6, 7, 8, 9
This is a function, easy I'll explain why
Each value for your X only has one Y value
That it's, on to the next. Come to another table
Still talkin X Y let's get some new values for your X and Y
X is 3, 0, 3, and 6, Y, -2, 1, 4, and 1
The input or the X has 3 twice
So we gotta check their outputs known as the Y
3 give an output of 4 and also -2, every input has only one output
It's not a function every x has only one y in a function
This is how we function

Hook
Functions, relationships that you can see
On an X Y table or graphically. Is it a function? Use a VLT
And if you are confused, just listen to Mr. D
Exactly one input for one output
For each X you put in, just one Y comes out
Of the function, you know what this is all about
Just graph the ordered pair, you'll get it without a doubt

Verse 2
Bring it back to the first table
Plot the points you'll see that a line is their relation
The equation is y = x + 4, this is a function but how do you know?
Time to put it to the test, must pass the VLT
Vertical Line Test, so easy. Drop a vertical line through any X
Since it only hits one point it passes
But how 'bout a circle? Circles aren't functions
I'm telling you, drop a vertical line to see what it will do
Does it hit one point or two?
Let's take a look again at the x and the y's on table 2
You could draw a circle through the points
You would see that a vertical line can go down x = 3
Can it be a function? Please think carefully
It doesn't pass the VLT therefore it's not a function

Hook

Verse 3
Dependent vs independent, which one's the X? Which one's the Y?
Let me help you with it, the answer for your Y depends on X
So the Y is dependent and the X independent
Let's say the more time playing video games
Show your grades go down
Means that your grades are based
On the time you spent playing video games
So grades are dependent and time is independent
That's a negative rate of change
Let's take a look at one that is positive
The more days at work the more you'll get paid
So your check amount is based on the days at work
So your days at work is independent
And the total of ya check is the dependent
Now compare the two functions' rate of change
When X and Y increases, positive
When X goes up and Y down, negative

GOOD GRADES

Verse 1
You want a good job? You wanna get paid?
It starts now hit, the books hard everyday
Graduate high school and then college
You should go to, you should go to
You should go to college
Pay attention, get focused to get the job done
Go hard in the paint, shoot for the stars
Don't settle for #2, go for #1
Time is now, don't wait
You'll be great if you get A's
Get paid when you get A's
Great things when you graduate
Be a doctor or lawyer, you gotta pay the cost
Start your own company and be your own boss
I floss now, why? Because I paid my dues
Swagged out, but still got good grades in school
Never be afraid to increase your knowledge
And you can go to, you can go to
You can go to college

Hook
We getting good grades, get 'em up, keep 'em up
You wanna be paid? Hit the books everyday
Getting good grades, get 'em up, keep 'em up
You can have anything, education is the way
Get good grades, get 'em up, keep 'em up
You wanna be paid? Hit the books everyday
Getting good grades, get 'em up, keep 'em up
You can have anything, education is the way
Good grades

Verse 2
There comes a time you gotta take a stand
Want the best out of life?
Make a goal and a backup plan
Many don't understand school is what you need
Yeah, I know you wanna be a star
Go and chase your dreams
Can't ball without the grades
Wanna rap, sing, or act?
Understand you gotta read a contract
Nothing wrong with getting A's
Sometimes walls are in the way
You must learn to go beyond that
Get it poppin', move forward, keep rockin'
Let the haters talk now, later they'll be watching
You'll be rising to the top, get your study on
Education is the key, the way to get your money long
Try to make friends with positive goals
Form a super team, go for the gold
Y'all can help each other increase ya knowledge
So y'all can go to, y'all can go to
Y'all can go to college

Hook