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Theatre Kids! Presents *Schoolhouse Rock Live! Jr.*

Lyrics by Bob Dorough  
Music by Bob Dorough  
Lyrics by Dave Frishberg  
Music by Dave Frishberg  
Book by George Keating  
Lyrics by George Newall  
Music by George Newall  
Lyrics by Kathy Mandry  
Music by Kathy Mandry  
Book by Kyle Hall  
Lyrics by Lynn Ahrens  
Music by Lynn Ahrens  
Book by Scott Ferguson  
Lyrics by Tom Yohe  
Music by Tom Yohe

Based on the ABC-TV educational animated series which aired from the 1970's -1980's

**One Act, Pop / Rock, Revue, Rated G**

Broadway Junior Version

The Emmy® Award-winning Saturday morning educational cartoon series and pop culture phenomenon is now the basis for one of the most fun and easily mounted musicals ever to hit the stage, *SCHOOLHOUSE ROCK LIVE! JR.*

A loose, revue-like structure allows for a great deal of flexibility in staging and cast size in this energetic musical, which follows Tom, a young school teacher who is nervous about his first day of teaching. He tries to relax by watching TV when various characters representing facets of his personality emerge from the set and show him how to win his students over with imagination and music. Memorable songs as “Just A Bill,” “Lolly, Lolly, Lolly,” and “Conjunction Junction” bring his lesson plans vividly to life. *SCHOOLHOUSE ROCK LIVE! JR.* is a surefire hit amongst actors and audiences alike!
Louisiana Educational Content Standards and Benchmarks

The arts facilitate interconnection. They provide tangible, concrete opportunities for students and teachers to explore academic concepts. Academic concepts are strengthened when learning integrates academic subjects like English language arts with arts. In 2016 a system of Grade Level Expectations and Standards and Benchmarks replaced the Common Core standards used since 2010 to measure student achievement. Here is some background information:

**LOUISIANA STATE STANDARDS**

In March, 2016 The Louisiana Board of Elementary and Secondary Education (BESE) approved the Louisiana State Student Standards in English language arts and mathematics. This action by BESE replaces the Common Core State Standards with unique state standards developed through a collaborative statewide process. Please visit these sites for more information:


http://www.louisianabelieves.com/academics/louisiana-student-standards-review

All Louisiana State Standards were retrieved from:
https://www.louisianabelieves.com/academics/academic-standards

Common Core Standards were retrieved from:
http://www.corestandards.org/ELA-Literacy/W/4/
Musical Multiplication Tables: 20 years before “Schoolhouse Rock”

I have a theory about record collecting. It was a theory I once postulated when I wrote for the music collector’s magazine Goldmine many years ago. It starts when our parents buy us our very first 45s. They might have a label on them like Disneyland or Peter Pan or Cricket, but these records were our treasure troves as we grew up. These were the records we could play on the big phonograph when our parents were done listening to their Limelighters or Chad Mitchell Trio or “Sing Along With Mitch” albums. And we could sing along with the songs too – all the Disney songs like “Heigh-Ho,” or “Cruella De Vil,” or “Zip-A-Dee-Doo-Dah,” or the very same “knock-off” recordings from the Cricket or Simon Says labels.

Over the years, there has been a rise in collecting “school-related educational materials.” Much of the learning tools available for children in the 1950s, 1960s and 1970s were items that one would find in the “open classroom,” where instead of your teacher lecturing on reading, writing and arithmetic for four hours before recess, and for three hours after that, the teacher might have specialized reading or listening materials available for children to improve their mental stabilities.

One of the unique children’s classroom tools that I recall – and was glad to find many years ago at a yard sale – brought me back to my days as an elementary school student in upstate New York. I actually think that I heard these records for the first time in third grade at Corinth Elementary School (or as I would call it, School #5 on my dozen schools from kindergarten to high school). Since my third-grade teacher often needed a break from screaming 8-year-olds, she pulled out this box of records and hooked up an industrial-strength phonograph with a built-in monaural speaker that had two settings – loud and louder. Being the record collector that I was at the time, I thought we were going to hear some Disney music or stuff from Romper Room.
No, instead the records the teacher played were part of a teaching guide called “Musical Multiplication Tables.” The concept was that if you sang along with the narrator on the records, you would learn your times tables by memory. In fact, during math tests later in the day, I swore I heard kids humming the song as they tried to remember the multiplication lyrics. Okay, this wasn’t the same as “Three is a Magic Number” from the Schoolhouse Rock TV series, but at least we didn’t need a melody to memorize the Preamble to the Constitution, like those kids in the other classroom.

The discs were created by a company near Chicago called “Bremner Multiplication Records, Inc.” Originally custom-manufactured by RCA and sold to schools in 1956, the boxed set consisted of six seven-inch small-holed 78’s (although some copies exist in 45 and 33 RPM formats), with each disc side featuring actor-singer Billy Leach as he ran through the drill of multiplication. Also included were some flash cards, advertising for a box of phonics records, and some testimonials from parents, teachers and principals about the discs.

First Leach would sing some goofy song about memorizing a specific times table. Check out these lyrics:

If parakeets can learn to talk  
And cats can have nine lives  
I’m sure that you are smart enough  
To learn the Table of 5s

Then Billy would sing the table of 5s, while you tried to sing along. Trust me – this guy was no Johnny Mathis. Then he would do the times tables again – but this time, he’d leave the answers blank. We poor children had to sing the responses before Billy went to the next math problem, or you’d have to start the record all over again.

The price for these discs was pretty steep at the time – $9.95 for six records and 11 quiz cards – but as the box said, by 1956 it was used in over 1000 schools and in thousands of homes. And just listen to the testimonials in each package! “Our children like the records and are taking new interest in learning their
Multiplication Tables," said A. Blair-Owens, then the principal of Lewistown (Pa.) Elementary School. "Your records have a unique teaching approach … an excellent investment for schools and parents."

Somebody out there must have liked the discs, as they stayed in print throughout the 1960s and 1970s (Capitol Records took over the pressing of the discs in the 1960s, and the format was changed to five small-holed seven-inch 45s, although the tracks remained the same). Within ten years, Bremner boasted that the discs were now in over 60,000 schools and over 150,000 homes. Bremner’s advertising also proclaimed that the multiplication discs were great for the “New Math” programs that were part of the 1960s school curricula.

Bremner ended production of the discs in the early 1970s, for reasons unknown to this day. Perhaps television shows like “Schoolhouse Rock” found a new way to teach kids their times tables – which would you rather have, Blossom Dearie explaining that figure eight is a double four, or Billy Leach singing “In days of old, the pirates bold / Buried Pieces of Eight with pleasure / But when you learn the Table of Eight / You’ll have a richer treasure!”

Okay, you think I’m making this stuff up. Click on this – does this sound like I’m making anything up?

A few years after I re-acquired these corny classics, I tried to test them out. Not being a licensed teacher myself, I decided to “home-school” my seven-year-old daughter Cassandra with these records, hopefully to help her grades get above water – or at least above “C” level. We barely got through the first record, the table of 2s, before Cassandra’s older sister Sonya started teasing about how much trouble Cassie was having with the times tables. And of course, when big sister starts teasing little sister, little sister can cause damage to something of big sister’s – and then it’s on. Somehow I don’t think Billy Leach ever anticipated that.

Surprisingly, these discs have found a home with music collectors, as well as kitsch lovers and remixers, who can use Billy Leach’s lock-step singing as part of a rap track or breakbeat. The 1950s RCA versions of “Musical Multiplication Tables” are harder to find, and can run as high as $40-$50 with all the flash cards, advertisements and testimonials intact. The more recent Capitol series is worth about $10-$15 with all the paper information included. Be aware that these prices are for near-mint condition copies of “Musical Multiplication Tables,” as most copies out there have gone through several years of classroom torture – er – um – educational use.

Setting Lessons to Music--How an Idea Evolved

February 03, 1997/CYNTHIA KELLY

Usually when kids have trouble remembering their multiplication tables, the result is a bad report card. When little Davey McCall couldn’t remember his, the result was "Schoolhouse Rock."

While on vacation in the early ’70s with his son at a dude ranch in Wyoming, David McCall noticed that his son could spout lyrics to one rock song after another, yet he couldn’t remember how much six times nine was.

McCall, then president of McCaffrey & McCall advertising agency, reasoned that if information were set to a tune that was catchy enough, kids could remember anything, even multiplication tables. After vacation, he approached two of his company’s advertising executives, Tom Yohe and George Newall, with the idea for an album and workbook for use in schools. They were enthusiastic.

"I had noticed the same thing in my kids," Yohe said.

McCall commissioned a jingle writer at the agency; the syrupy song he got was less than he had hoped for.

Newall suggested giving jazz musician and songwriter Bob Dorough, known for his innovative lyrics, a shot. They instructed him not to write down to listeners.

Dorough came back with "Three Is a Magic Number."

"It was just the kind of approach I like, and I knew it was [an] important assignment, so I took a couple of weeks to think it through," Dorough said in a phone interview from his home in Pennsylvania.

"I just kept searching for an idea that would be far beyond the multiplication table and got the idea that three is the magical number," he said, citing his admiration for architect Buckminster Fuller, who maintained that a triangle is stronger than a square. "I just got to thinking: Every triangle has three sides, the Trinity, man and woman had a little baby and it all fell together . . . kind of a transcendental solution to the problem."

Yohe found the lyrics so visual that he suggested they do an educational film as well as a record album.

He designed a storyboard featuring a magician; McCaffrey & McCall account executive Radford Stone suggested they take it to ABC, where current Walt Disney Co. Chairman Michael Eisner was working as a vice president of children’s programming.
"[Animator] Chuck Jones happened to be with Eisner" when he came in for the meeting, Stone said by phone from his home in Connecticut. "Eisner turned to Jones and said, 'What do you think?,' and Jones said 'This would be a good thing to have.'"

Musician Dorough, now 73, says he's still bowled over by the response he gets when he plays his "Schoolhouse Rock" tunes.

"I've had people come up to me and say 'You got me through school,'” he said.

"It's been a very gratifying thing."

RETRIEVED FROM: http://articles.latimes.com/1997-02-03/entertainment/ca-24944_1_multiplication-tables
Gene Seymour is a film critic who has written about music, movies and culture for The New York Times, Newsday, Entertainment Weekly and The Washington Post. The opinions expressed in this commentary are solely those of the author.

(CNN) Millions of Americans, and many more throughout the world, just lost their favorite civics teacher.

Bob Dorough died Monday at age 94. Although nobody who watched "Schoolhouse Rock" animated shorts on Saturday mornings beginning in 1973 knew his name, they knew their times tables, their American history and their grammar because of the songs he wrote.

At a time when education has been under siege as never before, especially from Washington, don't you think there's a desperate need for teachers on the airwaves -- and the internet -- to make memorization fun? The hipper, the better.

"Conjunction Junction (What's Your Function?)," "My Hero Zero," "I'm Just a Bill," "Three is a Magic Number," "Electricity, Electricity" and more.
Admit it. You're singing along, right? There are some earworms you don't mind being stuck in your head for a while. Dorough wrote most of them. (The original series lasted until 1985.)

Before "Schoolhouse Rock" lessons popped up throughout ABC's weekly cartoon lineup, the only way for you to have known about Dorough was if you were a jazz aficionado. By the 1970s, Bob Dorough's was a name -- and a voice -- well known through the groovy corridors of the Very Hip.

Since the 1950s, he'd played the piano and sung with such modern jazz giants as Miles Davis, with whose ensemble he'd recorded his original vocal compositions "Blue Xmas" and "Nothing Like You" in 1962. By that time, the Arkansas-born Dorough had recorded many LPs under his own name. The first one, "Devil May Care," was released in 1956 on the Bethlehem label.

His voice was thin and soft, almost lighter-than-air in tone. But it was limber enough to bend any syllable or phrase into shapes that could be happy, sad and all the emotions in between. It was the perfect instrument for conveying his dry, witty and deceptively simple lyrics.

There were many other singers who enjoyed letting Dorough's words roll around in their throats, including Tony Bennett, Blossom Dearie, Al Jarreau and, more recently, the critically acclaimed young vocalist Cecile McLorin Salvant, who, as a card-carrying millennial, more than likely first heard Dorough's voice through her TV set riffing through the times-two tables.

Most of Dorough's career was spent as a cult hero, a "songwriter's songwriter" as much as a "singer's singer." He never seemed to have a really dry spell in the professional music vineyards.

But it was sometime in the mid-1990s, when "Schoolhouse Rock" was revived for a new generation, that Dorough's name was also brought to light as the man behind the "Rock." Blue Note Records signed him to a contact in 1995 and he subsequently recorded three albums for the legendary jazz label.

He was a master musician, intelligent and resourceful, honored in all echelons of the jazz world, whether cabaret, bebop or avant-garde. Yet Dorough, especially late in life, knew what really rang bells with the people who attended his live gigs, and he never failed to give them a taste from the "Schoolhouse Rock" songbook.

"I'm cool with it being the first thing people see in my obituary," he told this reporter almost 30 years ago. And so it is -- including this one.

Bob Dorough of 'Schoolhouse Rock!' fame still performing around region, world

NOTE: Bob Dorough of 'Schoolhouse Rock!' Fame passed away in April of 2018

By Tom Shortell | The Express-Times
on August 21, 2011 at 4:58 AM

Bob Dorough was writing jingles for a New York ad agency in the 1970s when the company's president approached him for a special project.

The man's son was having a difficult time learning his multiplication tables, but the father noticed the boy knew all the words to his Beatles songs. The president asked Dorough to write rock songs that reviewed his son's math lessons.
Dorough, now of **Upper Mount Bethel Township**, was an accomplished jazz pianist, but he gave educational music a shot. The result was "Schoolhouse Rock!," the series of educational shorts that have taught generations of school children about math, science and history.

"**It was a bolt of lightning coming down,**" Dorough said of the series, which aired on ABC during the 1970s, 80s and 90s.

It was a drastic turn of events for the now 89-year-old musician. Dorough had achieved mild fame as a jazz performer in the 1940s and 1950s. He lived in New York City, but he toured the continent and Europe as part of various bands and groups. He was even the musical director for the brief entertainment career of boxing legend Sugar Ray Robinson before his dancing act bombed in Paris.

Music changed in the 1960s. Rock bands like The Beatles and Jimi Hendrix became mainstream, and the demand for jazz dropped off for anyone who wasn't a household name. With the suburbs around New York City too expensive, Dorough moved his family to Upper Mount Bethel, where his daughter, Aralee, started school. Dorough took the job for the ad agency and commuted to New York City as a way to pay the bills.

"**I was just trying to make a living. My jazz career in the 60s and early 70s was kind of meager,**" he said Monday at the Deer Head Inn in Delaware Water Gap, where he's performed for decades.

The idea of Math Rock! quickly changed that. Recordings of his math songs were presented to ABC to air as a possible educational cartoon. Chuck Jones, the legendary animator who directed Looney Tunes and Tom and Jerry, and Michael Eisner, then the head of ABC’s daytime programming, quickly signed off on the project. Parental groups had been storming the networks for years, pressuring them to provide more quality programing for children. The cartoons fit the bill perfectly, Dorough said.

"**It was an easy sell,**" he said.
Bob Dorough is an 89-year-old Upper Mount Bethel Township resident whose music has national recognition.

It took Dorough two years to write 11 songs about numbers and math. While the songs centered on situations children would recognize, not every song was on the grade school level. The song "Little Twelvetoes" tells how an alien with twelve fingers probably counts. The math lesson in the song focuses on Base 12, a counting system where the numbers 10 and 11 are single digits. Dorough said the agency had to confirm the math with a college professor before approving it as it was.

"I'm something of an amateur mathematician," said Dorough, who took an advanced math course while studying at Colombia University on the GI Bill.

Even Aralee got in on the action. Dorough said he was stumped trying to come up with a song for the number four. One day Dorough went on a walk with Aralee and her friend, and the girls suggested a song about a four-legged zoo.

"I didn't know quite what that was, but I liked the sound of it," Dorough said looking back. He ran with the idea, and it became the song "The Four-Legged Zoo," which names about 70 quadrupeds in three minutes.

Math Rock! caught on, and more cartoons focusing on history, grammar and science were soon ordered under the name "Schoolhouse Rock!" A team of song writers came on board, and they produced music faster than the animators could draw the shorts, Dorough said. He would regularly tune in with Aralee to watch the new material air, he said.
"Imagine me. I'm already 50 years old and I'm watching Saturday morning cartoons," he said.

ABC kept playing the shorts into the 1980s, and a new batch was ordered in the mid-90s. The cartoons have also been put onto DVDs so new generations can learn about sentence structure and the American Revolution, among other topics.

These days, Dorough is still going strong. He's performing at a jazz festival in Norway this weekend and next month he's the headliner for the Delaware Water Gap's Celebration of the Arts. Erin Harper, the producer behind the independent film "My Best Day," is also working on a documentary on Dorough's career.

Dorough said people will still sometimes approach him at performances and ask him why his voice sounds so familiar. When word gets out he's the man who wrote "Lolly Lolly Lolly Get Your Adverbs Here" and other songs, he usually gets a few "Schoolhouse Rock!" requests. He enjoys it for the most part, but he admitted it can be distracting when people request songs about pronouns when he's at a jazz club.

"Sometimes it does grate on my nerves," he said.

Even with those passing moments of aggravation, Dorough said he's happy to be working the career he chose as a high school student. He's traveled the world and is still willing to, though he's not sure if he'd go as far as Asia for a gig.

"I'd go anywhere if the money was right," he said.

'I'm just a bill:' Schoolhouse Rock, 40 years later, still teaches generations
By Kevin Bohn, CNN
updated 12:09 PM EST, Tue January 15, 2013

Washington (CNN) -- "I'm just a bill. Yes I am only a bill. And I'm sitting here on Capitol Hill."

"Conjunction Junction, what's your function." "My hero, zero." "Lolly, Lolly, Lolly get your adverbs here."

These are some of the lyrics that live on 40 years after they premiered on Saturday mornings on ABC television as part of "Schoolhouse Rock."

They were animated videos and songs invented by a jazz musician who wanted to help children learn math.

Kids never really had any idea they were learning how a bill becomes a law or proper grammar while watching the three-minute shorts between cartoons.

Jazz pianist and vocalist Bob Dorough was approached in 1971 by a New York advertising executive whose sons could not multiply. He asked him to set the multiplication tables to music.

Dorough ended up writing "Three's a Magic Number" and other well known videos. He also voiced many of them.
Dorough, who is 89 and still performs, said he gets requests from adults to sing some of the bits because they grew up on them -- often times recognizing his voice.

"I am not surprised at all (that the videos still resonate)," Dorough told CNN. "I learned, when performing at elementary schools, that they were 'getting through,' so to speak, and the children would readily recognize my voice on such vocals as 'Three is a Magic Number,' and others that I sang.

"However, what surprised me most was the impact of network television, which kicked in years later, after we'd been on air at ABC-TV. Thirteen years, plus a second round, helped us to reach literally thousands, in a rather broad age spectrum."

"Schoolhouse Rock" premiered on Jan. 13, 1973, and ran on ABC from 1973-1985. It came back in the 1990s for five more years. More than 30 million people have now watched some of them on YouTube, showing that Dorough’s work still resonates.

It is not just the catchy words that connected with kids. They were combined with interesting visuals.

One spot featured a talking "bill" that explained to a boy how he could only become a law by passing both houses of Congress and then going to the White House hoping the president would sign him.

"Conjunction Junction" used train cars named "and," "but" and "or" that illustrated how a conjunction connected words.

Asked why the videos connected, Dorough said, "The melodies, words, arrangements, and players. That is to say, even though they were in a 'rock' or 'pop' bag, my jazz sensibilities and the fine musicians I used for the audio recordings made the songs seem unusual to the Saturday morning cartoon listeners."

Just last week, there was a vivid example of just how popular the videos remain.

More than a thousand people -- adults who wanted to relive part of their childhood and parents who wanted to share the fun with their kids -- jammed into the lobby of the Kennedy Center to hear Dorough sing "Three's a Magic Number" and "Figure Eight is Double 4."

"I came because I had such fond, intense memories," said Amy Augenblick, who brought her 9-year-old daughter, Elizabeth. "I could sing all of it without the words."

RETRIEVED FROM: http://www.cnn.com/2013/01/14/politics/schoolhouse-rock-40
Schoolhouse Rock is an educational series first produced in the 1970’s. They are short animated videos set to catchy music that have inspired generations of kids to learn math, history, grammar, science, economics, and civics. Schoolhouse Rock endeavored to teach kids content during the Saturday morning cartoon lineup on the ABC network. The series taught an entire generation of kids that “Knowledge is Power,” and today they still are used to inspire learning through engagement and repetition.

In 2009 Schoolhouse Rock created an entire new series reflecting recent current events called Earth Rock, which will continue to inspire the next generation of kids to learn about recycling, global warming, and energy. Many of the videos are available for free access on Youtube and Teacher Tube or the 30th Anniversary collection can be purchased on Amazon.

I choose to post the Schoolhouse Rock video Counting by Fives, because it is one of my favorites. It is part of the math series which I remember from my childhood. Along with impatiently waiting for the clips to air when I was watching cartoons as a child, my parents bought me the record Multiplication Rock. I would spend hours listening, singing, and dancing around to the record, not realizing that I was learning my multiplication tables at the same time. As scratched and warped as this record is today, it is so loved that 35 years later I still own it! Recently I bought the entire series on DVD so I can share the fun and magic with the future students in my own classroom.

My 10 year old niece was recently visiting me in Texas from Minnesota. As she was rummaging through my videos she came across the Schoolhouse Rock DVD, across the house I could hear her squeals of delight as she came running to me exclaiming,
“Auntie can we watch this video? I love these, my teacher uses these. I love the math and conjunction ones!” She sat (directly in front of the TV) singing while automatically remembering the words to many of the songs. When the Counting by Fives video ended she told me that when she plays hide and go seek outside with her friends, she convinces them to count by twos, fives or tens as they all scurry to find hiding places. It is inspiring to find a resource that kids not only can be prompted to learn by, but a resource that they are motivated to use in their daily lives.

**Web comments about Schoolhouse Rock:**

“When My son was in College in a Business English class, the Professor asked the class what an Interjection was…..silence! Leave it to my son; he started singing the Schoolhouse Rock jingle of Interjections! He proudly told me as I am writing this, “I got it right!” with a smile in his voice. He also said he was embarrassed, but he was the only one that got it right!”-Kathy Pukeko (home school teacher).

“I recently picked up the Schoolhouse Rock! retrospective DVD for my five year old and we got hooked into watching all 46 lessons. Beyond being hit by a nostalgic blast from the past, I was struck by how, after all these years, I instantly remembered all the songs and was able to sing along. But what really blew me away was the shows effect on my son. He was completely riveted and now, after watching just a couple of times, he walks around singing his times tables, telling everyone how the nervous system works, and reciting the preamble to the Constitution.”- Inspired Parent

“One idea to try with your students is to let them watch a particular video three or four times. For example, when my third graders were learning their times tables, they used the “Three Is a Magic Number” to help them out. I divided them into groups and let them come up with a routine to the song, and they made “music videos” to go with each song, which I recorded with my flip camera. They did an awesome job, not to mention mastered their three’s times tables!” -Kelly Hines 3rd grade teacher from NC.
Here are a few links to the Schoolhouse Rock EARTH ROCK videos:

http://www.youtube.com/watch?v=GWLlunokwCs

http://www.youtube.com/watch?v=ZOxO10XT8c0

https://www.youtube.com/watch?v=yvZ4vAOen78&list=PLL7mmD41rayLA1KkuG-WL-EDitXGjsicK&index=1

http://www.youtube.com/watch?v=JPncpeFYgi0

https://www.youtube.com/watch?v=phtq940SVYI&list=PLL7mmD41rayLA1KkuG-WL-EDitXGjsicK&index=4

https://www.youtube.com/watch?v=-GXNHQx11LY&list=PLL7mmD41rayLA1KkuG-WL-EDitXGjsicK&index=5

http://www.imdb.com/video/screenplay/vi796656409

https://www.youtube.com/watch?v=-GXNHQx11LY&list=PLL7mmD41rayLA1KkuG-WL-EDitXGjsicK&index=5
"Schoolhouse Rock" For A New Generation

By KC Ifeanyi

KlabLab takes the age-old musical learning formula and gives it a modern twist. But does "Cell City" measure up to "I’m Just A Bill?"

Even among those who aren’t super old there are many people who probably can’t help thinking "junction" when they hear "conjunction." Such was the cultural impact of Schoolhouse Rock, that musical liberal arts education that included such classics as "I’m Just A Bill," "3 Is A Magic Number," and "I Unpacked My Adjectives."

Classics all, but Bay Area-based company KlabLab has a whole new curriculum for today’s kids.

Spearheaded by musicians at heart Joe O’Loughlin, Dave Haberman, and Doug Allen, KlabLab’s raison d’être is to make educational, music-based content with a contemporary sound-something O’Loughlin, executive producer at KlabLab, feels is lacking in the current market. "The initial question we asked when we started KlabLab was, 'How are we going to get kids to buy into this?' because when we started looking around and found out what others were trying to do with music and creativity, it was very spoon-fed," he says. "They were guys my age using music of our generation and for kids there’s a total disconnect."

After dabbling around with the idea, the trio started KlabLab last year and collaborated with local teachers on lesson plans to produce a string of music videos with educational lyrics over tracks that sound like today’s top hits. Much in the vein of Schoolhouse Rock, videos like “Cell City” and “Preposition Punk” ingrain the basics of a subject in impressionable memory banks through repetition, catchy tunes, and splashy visuals. But, as O’Loughlin mentions, the question of how effective this method truly is reared its doubtful head when dealing with particularly skeptical administrators.

To quell the naysayers, the KlabLab crew immediately took to the classrooms this year with The Sound of Knowledge Tour, driving across California throughout the spring in a bus/mobile recording studio to allow elementary to high school students to write and record their own songs and prove that they’re learning the material themselves, teaching their classmates, and actually having fun with it. The Sound of Knowledge Tour will make its way through northern and southern California this spring, break in the summer, and regroup in the fall, leaving the West Coast to embark on a cross-country excursion.

As an incentive to increase participation, KlabLab created a contest involving groups of students from various schools uploading their creations to the KlabLab site where users vote for their favorites with the winning team being awarded $10,000 to have a multi-media studio built in the their school and each member receiving an iPad. O’Loughlin says the reason for the money going toward a studio is the hope that the school will continue to incorporate the KlabLab method in their lesson plans long after their tour is over.
Though paved with good intentions, yet another question arises when discussing an endeavor like KlabLab: How will students today respond to videos and workshops where the overarching message of learning something is barely veiled by modern music? Dealing with a generation where cynicism is practically a virtue, it’s easy to imagine kids and teens being wary of education sugarcoated as “fun”--a situation O’Loughlin is fully aware of. “We talk to kids like their mature individuals--we don’t talk down to them,” he says. “Going into a classroom and saying, ‘Hey! We’re making learning cool again and you get to sing about it!’ you get looks like what is this? So it’s kind of a slow process.”

In order to speed things up, KlabLab has also opened up audio and video submissions on their site to the general public to establish a community of creative edifiers and expand their library of content. Users can create completely original tracks or use the available background music templates to present a lesson in six subjects however they see fit.

Whether through the content on their site or The Sound of Knowledge Tour, KlabLab is looking to revolutionize the educational system by not only presenting classroom lessons in a digestible format, but also allowing kids to become part of the solution by getting them to create their own content. “Hopefully the teachers and students will appreciate what we’re doing in trying to bring creativity back into the learning process,” says O’Loughlin.

Okay, fine, but let’s see which songs mix education and entertainment best. Here, a selection of Klablab’s updates lessons pitted against a *Schoolhouse Rock* classic. Will your kids start busting a move when they hear "golgi apparatus" a few years down the line?

Klablab’s "Cell City": [https://www.youtube.com/watch?v=2C6riGxRh2I](https://www.youtube.com/watch?v=2C6riGxRh2I)


Klablab’s "Parts of Speech": [https://vimeo.com/34924035](https://vimeo.com/34924035)

Klablab’s "PEMDAS": [https://www.youtube.com/watch?v=6Z_IOsddQOM](https://www.youtube.com/watch?v=6Z_IOsddQOM)

RETRIEVED FROM: [https://www.fastcompany.com/1680469/schoolhouse-rock-for-a-new-generation](https://www.fastcompany.com/1680469/schoolhouse-rock-for-a-new-generation)

Klablab’s "Solar System": [https://open.spotify.com/album/77KqcYr7jJgtyvIDhnymuR](https://open.spotify.com/album/77KqcYr7jJgtyvIDhnymuR)

**More of Klablab’s videos:**
[https://www.youtube.com/channel/UCv0ZOi4LHYtjh5NfsGE10g](https://www.youtube.com/channel/UCv0ZOi4LHYtjh5NfsGE10g)
The Play
SCHOOLHOUSE ROCK LIVE! JR. opens at 6 a.m. as Tom Mizer, a young teacher, wakes up on his first day of work. As his alarm goes off, Tom enters and begins to rehearse his teaching technique. Soon, Tom's thoughts begin to take life around him. In an attempt to calm himself, Tom turns on the T.V. What's on this morning? Why, it's Schoolhouse Rock! As Tom gets drawn into the show the first song begins. Tom thinks he may be losing his marbles and attempts to turn off the T.V. His various alter egos convince him that he is O.K. Each one of them is a part of Tom's mind. They’re every person, place and thing he has ever seen. Tom is still quite unconvinced that he is has not lost his mind. Undaunted, the ensemble sings, "A Noun is a Person, Place, or Thing."

Tom tries to move into his day by looking over his lesson plan, which he feels will be a tough job. George and the rest of the company assure him that with their help, it will be as easy as one, two, "Three Is a Magic Number." The song tells the tale of the magic number three and it’s almost magical qualities. After the number about the number Tom remarks that it was, "...the coolest song." Which leads right into, "Unpack Your Adjectives." Shulie and company describe the descriptive qualities of adjectives.

After "Unpack Your Adjectives", Tom begins to accept the fact that his thoughts have taken on human form and loosens up a little. He pleads that he has to teach other subjects like Social Studies and his new-found helpers are right there for him with, "Just a Bill." George, dressed as a "bill" tells the story of a bill and it’s journey towards becoming a law. The song reminds Tom just how much he remembered of, "Schoolhouse Rock", and Shulie reminds Tom that, "The Preamble" was another shining example of the series educational value. Each character remembers sitting taking a test and singing the tune that made the Preamble to the Constitution unforgettable.

Tom’s having fun now, keeping things upbeat, the company moves into a rousing, "Circulation" detailing the circulatory system through a dance craze. Hot on the heels of medical science, it’s back to grammar with one of the favorites of the show, "Conjunction Junction" delivered with the help of word signs with conjunctions on them making living sentences on stage. Leaving "Conjunction Junction", Tom is reminded of trains which reminds Dina of planes, boats and, finally, spaceships. Shulie's interest is sparked as she sings the up tempo pop song, "Interplanet Janet." The company forms with costumes and props the solar system as Shulie assumes the role of Janet.

The company feels that they have done their duty and that Tom is ready to teach. Tom’s ready to teach, but not quite ready to leave his new friends, so he requests his personal favorite, "Interjections", which ends the show.
Character Breakdown

CHOIR (BOYS)  Using a choir for the ensemble singing parts is a great way to use everyone who auditions for your show. Any young person who can at least carry a tune could be cast in your ensemble choir, and you can utilize the choir in staging the larger numbers as well.
Bb3 - D5
Baritones-Tenors

CHOIR (GIRLS)  Using a choir for the ensemble singing parts is a great way to use everyone who auditions for your show. Any young person who can at least carry a tune could be cast in your ensemble choir, and you can utilize the choir in staging the larger numbers as well.
A3 - G5
Altos-Sopranos

DINA  Dina is Tom's mature side. She is thoughtful and grounded. Dina take the lead on "Interjections." Your Dina should be a good, strong singer with an ability to sing harmony.
A3 - E5
Mezzo

DORI  Dori takes the lead on "A Noun is a Person, Place or Thing", and "The Preamble". She needs to be a strong singer who can lead the entire ensemble. She is the silly, goofy side of Tom.
G4 - C5
Alto

GEORGE  George is a marvelous character role. George takes the lead on, "Three Is a Magic Number", and "Just a Bill." Your George should be a good singer and a great character actor. He is the romantic, caring and in control part of Tom.
Bb3 - D5
Baritone-Tenor

JOE  Joe is the cool side of Tom. He's laid back and fun loving. Try to cast a Joe that can deliver the great, "Conjunction Junction" with the right growl.
Bb3 - F5
Tenor

SHULIE  Shulie is the ingenue. She is Tom's sweet, genuine side. Shulie takes the lead on "Unpack your adjectives", and "Interplanet Janet". Your Shulie should be a strong singer and a likable character actor.
G4 - G5
Tom is the idealistic young teacher, the hero of our story. You may want to cast a young teacher from your school or community who fits the role and cast the rest of the ensemble of kids around him. Or, cast a mature young performer. In any case, your Tom should be an amiable, likable, charming performer. Tom doesn't sing much solo stuff, so go with your best actor.

Bb3 - D5
Baritone-Tenor

(NOTE: This is the only approved non-young person casting choice that may be made.)
Schoolhouse Rock

Multiplication Rock: The Songs
Schoolhouse Rock, Multiplication Rock Lyrics
This section provides the lyrics for all of the Schoolhouse Rock math songs.

Key:

- Words in "{}" brackets are spoken.
- Words prefaced by "\}\}" are sung by back-up singers (anyone other than the lead singer).
- Words in "[]" brackets are sung by back-up singers simultaneously with whatever the lead is singing.
- Words bracketed by "\%" are questionable -- just can't quite figure them out...

The videos for each Multiplication Rock song can be viewed here:
http://www.vrml.k12.la.us/curriculum/schoolhouserock/math_shr.htm
https://www.youtube.com/playlist?list=PLqalT5yU0_OKUe4HcfM8Bu2CERdAgewi1
Schoolhouse Rock - Multiplication Rock

Zero, My Hero

Music & Lyrics: Bob Dorough
Sung by: Bob Dorough
Animation: Focus Design, Inc.

}} {Zero?}
{Yeah. Zero is a wonderful thing. In fact, zero is my hero.}
}} {How can zero be a hero?}
(Well, there are all kinds of heroes, you know.
A man can get to be a hero for a famous battle he fought.
Or by studying very hard and becoming a weightless astronaut.
And then there are heroes of other sorts,
Like the heroes we know from watching sports.
But a hero doesn't have to be a grown up person, you know.
A hero can be a very big dog who comes to your rescue.
Or a very little boy who's smart enough to know what to do.
But let me tell you about my *favorite* hero...)

My hero, zero.
Such a funny little hero,
But till you came along, we counted on our fingers and toes.
Now you're here to stay,
And nobody really knows
How wonderful you are,
Why we could never reach a star,
Without you zero, my hero,
How wonderful you are.

}} {What's so wonderful about a zero? It's nothing, isn't it?}
{Sure, it represents nothing alone.}

But place a zero after 1
And you've got yourself a 10.
See how important that is?
When you run out of digits,
You can start all over again.
See how convenient that is?
That's why, with only ten digits, including zero,
You could count as high as you could ever go...
Forever, towards infinity...
No one ever gets there, but you could try.

10 billion zeros,
From the cavemen till the heroes who invented you,
They counted on their fingers and toes
(And maybe some sticks and stones)
}} {Or rocks and bones}
(And their neighbors' toes, yeah)

And nobody really knows
How wonderful you are,
Why we could never reach the star,
Without you, zero, my hero,  
Zero, how wonderful you are.

Place one zero after any number,  
And you've multiplied that number by 10.  
See how easy that is?  
Place two zeros after any number,  
And you've multiplied that number by 100.  
See how simple that is?  
Place three zeros after any number,  
And you've multiplied that number by 1000.  
Et cetera, et cetera.  
Ad infinitum, ad astra, forever, and ever,  
With zero, my hero, how wonderful you are!

RETRIEVED FROM:  
http://www.postdiluvian.org/~gilly/Schoolhouse_Rock/HTML/multiplication/zero.html
Schoolhouse Rock - Multiplication Rock

Two Elementary, My Dear

Music & Lyrics: Bob Dorough
Sung by: Bob Dorough
Animation: Paul Kimmelman and Associates

Forty days and forty nights, didn't it rain, children?
Not a speck of land in sight. Didn't it, didn't it rain?
But Noah built the ark so tight, they sailed on, children.
And when at last the waters receded,
And the dove brought back the olive tree leaf,
He landed that ship near Mount Ararat.
And one of his children grabbed Noah's robe and said...
}} {Hey Dad, how many animals on this old ark, anyway, huh?}

Elementary, my dear, two time two is four.
Elementary, my dear, two time three is six.
Elementary, my dear, two time four is eight.
Elementary, my dear, two time five is ten.

Two times one is two, of course, and it must occur to you,
You get an even number every time you multiply by two.

Elementary, my dear, two time six is twelve.
Elementary, my dear, two time seven is fourteen.
Elementary, my dear, two times eight is sixteen.
Elementary, my dear, two times nine is eighteen.

Two times ten is twenty; eleven twice is twenty-two.
Double twelve that's twenty-four; thirteen twice is twenty-six.
Fourteen twice is twenty-eight; fifteen twice is thirty.
Now you build it up on thirty.

Sixteen twice is thirty-two, elementary.
Seventeen twice is thirty-four, elementary.
Eighteen twice is thirty-six, elementary.
Nineteen twice is thirty-eight, elementary.

Twenty twice is forty, and it must occur to you,
You can double any number, all you do is multiply by two.

Elementary, my dear, two time two is four. Woo!
Elementary, my dear, two time three is six. Yeah.
Elementary, my dear, two time four is eight. Woo!
Elementary, my dear, two time five is ten. Yeah.

{Now, if you want to multiply two times 174, or some big number like that... Two times 174 equals two times 100 plus two times 70 plus two times 4, that's all. So two times 174 equals 200 plus 140 plus 8, or, 348. It's elementary!}

Elementary... elementary...
Twice 32 is 64, elementary. Twice 33 is 66, elementary. Twice 34 is 68, elementary. Twice 35 is 70, elementary.

Yeah, yes! It's elementary, yeah....

{Now, what's two times 98?}
}} {Aww, that's hard!}
(No, it's very simple. Two times 98 equals two times a hundred, minus two times two. That's 200 minus four: 196. Elementary.)

Forty days and forty nights, didn't it rain, children?

RETRIEVED FROM:
http://www.postdiluvian.org/~gilly/Schoolhouse_Rock/HTML/multiplication/two.html
Schoolhouse Rock - Multiplication Rock

Three is a Magic Number

Music & Lyrics: Bob Dorough
Sung by: Bob Dorough
Animation: Focus Design, Inc.

Three is a magic number.  
Yes it is, it's a magic number.  
Somewhere in the ancient, mystic trinity  
You get three as a magic number.  
The past and the present and the future,  
Faith and hope and charity,  
The heart and the brain and the body  
Give you three.  
That's a magic number.

It takes three legs to make a tri-pod or to make a table stand.  
It takes three wheels to make a ve-hicle called a tricycle.  
Every triangle has three corners,  
Every triangle has three sides,  
No more, no less.  
You don't have to guess.  
When it's three you can see it's a magic number.

A man and a woman had a little baby.  
Yes, they did.  
They had three in the family.  
That's a magic number.

3, 6, 9... 12, 15, 18... 21, 24, 27... 30.  
3, 6, 9... 12, 15, 18... 21, 24, 27... 30.

}} {Multiply backwards from three times ten.}

Three time ten is... }} 30 
Three times nine is... }} 27 
Three times eight is... }} 24 
Three times seven is... }} 21 
Three times six is 18, three times five is 15 
Three times four is twelve 
And three times three is nine and three times two is six.  
And three times one is three of course.

}} {Now take the pattern once more.}  
}} {Three!}  
3, 6, 9.  
}} {Twelve.}  
12, 15, 18.  
}} {Twenty-one.}  
21, 24, 27... 30.
Now multiply from 10 backwards.

Three times ten is... } 30
Three times nine is 27
Three times eight is... } 24
Three times seven is... } 21
Three times six is 18, three times five is 15,
Three times four is twelve
And three times three is nine and three times two is six.
And three times one... {What is it?}
} } {Three!}
{Yeah} That's a magic number.

A man and a woman had a little baby.
Yes, they did.
They had three in the family.
That's a magic number.

RETRIEVED FROM:
http://www.postdiluvian.org/~gilly/Schoolhouse_Rock/HTML/multiplication/three.html
Schoolhouse Rock - Multiplication Rock

The Four-Legged Zoo

Music & Lyrics: Bob Dorough
Sung by: Bob Dorough
Animation: Paul Kimmelman and Associates

We went to the four-legged zoo,
To visit our four-footed friends.
}} Lions and tigers, cats and dogs,
}} A goat and a cow and a couple of hogs
A rhinoceros and of course a hippopotamus,
And, oh yes, a horse.

}} An elk and a bison and a gnu or two,
}} Giraffes and elephants, quite a few.
A llama, alpaca, vicuna too,
Zeb
ras, xe
xes, and one big kudu.
It was swell! }} (I liked the gazelles!)

}} {Now Miss Simpson said...}
}} {She teaches school, you know.}
}} {Yeah, she took us there!}
}} {Well Miss Simpson said...}
}} {If you counted every head on these quadripeds,
}} then multiplied that number by four,
}} We'd know how many feet went through the door
}} If we turned 'em all loose!}
}} {Oh no, don't do that!}
}} {It's a really groovy zoo.}
}} {But, anyway, what Miss Simpson said,
}} It was a good chance to work with our fours in our head.
}} One, two, three, four!

I'll take a lion... }} One times four
He's got four legs and maybe a roar.
}} Gimme two camels, that's two times four
}} Eight legs walking 'cross the desert floor.

A tiger and a lamb and a fat kudu
We got three times four }} Equals 12 %legs too%
But then I had to subtract when that tiger was through... Rowwwr!

Four four-footed friends, no matter who
Would have 16 legs, And it's always true...
}} That four times four equals 16.
}} Five times four is 20.

(Now a coach and six, if you were Cinderella, would have you home
by midnight, if those 24 legs ran fast as lightning...} 
}} Six times four equals 24...
}} Seven times four equals 28...
Anyone knows that, who cares about seven.

And 8 antelope have 32 legs 'cause eight times four is 32.

Here come a small herd of buffalo,
They say they're gettin' extinct, y'know.
} I can count nine, that's 36 legs, Nine times four equals 36.
} Here comes a baby buffalo.
That's good! That's ten.
And ten times four, y'know, is 40....

Eleven coyotes } Eleven times four,
Went slinking over the prairie floor on all of their legs...
} Equals 44.

Now twelve times four is as high as we go...
} Twelve times four equals 48.
But there were so very very many many more
Animals standing there by the gate.

But we'd have to use a pencil if we counted them all
And we really had fun, and we saw every one:
} A bear, a cougar, a jackal, a yak,
} A fox, some deer, and a sweet giraffe

But I can't remember how many, many more,
But we multiplied them all by four.
And some of them thanked us with a roar.

RETRIEVED FROM:
http://www.postdiluvian.org/~gilly/Schoolhouse_Rock/HTML/multiplication/four.html
Schoolhouse Rock - Multiplication Rock

Five, Ready or Not, Here I Come

Music & Lyrics: Bob Dorough
Sung by: Bob Dorough
Animation: Paul Kimmelman and Associates

(Now everybody try to find a good hiding place. 
This old tree is gonna be the base. 
I'm gonna close my eyes, and hide my face, 
And count to a hundred by fives. 
Ready, go!)

5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 
85, 90, 95, 100, ready or not, here I come.

Apples, peaches, pumpkin pie, 
Who's not ready, haller "Aye"... } } {Aye!}
{Aw, alright, I'll count it again, but ya better get hid, kid. 
Here we go:}

5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 
85, 90, 95, 100, 105, 110, 115, 120. {There.}

A bushel o' wheat, and a bushel o' rye, 
Who's not hid, haller "Aye".... 
Twenty nickels makes a dollar. 
I didn't hear any anybody haller. 
Five times twenty is one hundred, 
Everybody got to be hid. 
All eyes open, here I come. Woo!

{Multiplying by five is a little like countin' by five. In fact, 
if you counted along on your fingers as you counted out loud by 
fives, your fingers would tell you how many fives, you got. 
Ok, let's count it together. Count on your fingers, one finger 
for each count out loud. Get set, ready, go!}

5, 10, 15, 20...

{Stop! 20. You got four fingers, see, that means four times five 
is 20. Let's try another one. Get set, ready, go!}

5, 10, 15, 20, 25, 30, 35...

{Stop! 35. Seven fingers, that's right, seven times five is 35. 
Okay, let's try a longer one. Now when you run out of fingers, at 
50, you see, because ten times five is 50, then start over with the 
same fingers and remember that you owe 10. Get set, ready, go.}

5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60...
{Stop! Ten and two, right? That's twelve fingers, 12 times five is 60. See how it works?

Now you may notice that if you multiply five by an even number, your product will end in zero, and if you multiply five by an odd number, your product will end in five.

Ok, now let's do one more game of counting by fives on our fingers. This is a long one. Keep going. Get set, ready, go!

5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85...

{Stop! 85 -- seventeen fingers. Look at that boy with 17 fingers stickin' up. How d'ya do that, kid? Anyway, five times 17 *is* 85.

See, that's three fives short of a hundred. If you had three more nickels, 15 cents, then added the 15 to the 85, you'd get a hundred. Right?}

Cause five times 20 is 100, Everybody gotta be hid, it's...

5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100. Ready or not -- here I come!

RETRIEVED FROM:
http://www.postdiluvian.org/~gilly/Schoolhouse_Rock/HTML/multiplication/five.html
Schoolhouse Rock - Multiplication Rock

I Got Six

Music & Lyrics: Bob Dorough
Sung by: Grady Tate
Animation: Paul Kimmelman and Associates

I got six, that's all there is.
{} Six time one is six; one times six.

He got six. I put mine with his, and we got twelve.
{} Six time two is twelve; two times six.

I got six, you got six, she got six.
{We got eighteen altogether, if we can get 'em all together.}
{} Six time three is eighteen; three times six.

I got six in my right hand, six in my left hand, six on my head.
{You got six in your pocket. Put 'em all on the floor, that's 24.}
{} Six time four is 24; four times six.

I got six red hens, they laid five eggs each.
{All the eggs hatched out and the yard was full of 30 little chicks.}
{} Six time five is 30; five times six.

One fine day, they all started in to lay.
{I got 36 eggs, and I took 'em in the house, and I put 'em in boxes.
Six eggs each, six boxes.

}}} Oh, six times six is 36; six times six.

(Goin' to the candy store...

I'll take six of these, and six of those,
And six of them, and six of the others.
And also six of the red, six of the white, and six of the blue.
Put 'em in one bag, that's 42.)

}}} Six times seven is 42;
Seven times six.

}}} Oh, goin' downtown, pickin' up sticks!

}}} I made 8 tricks, and didn't miss a lick.
Six times eight is 48; eight times six.

Nine hungry men had six dollars each. )))Awwh!

(That's 54 bucks, but they were outta luck,
'Cause 54 bucks won't buy dinner downtown, not for nine.)
Then there were six hungry men, they had nine dollars each. )))Yeah!
(And they went downtown, and the waiter said "Sit down,"
For it makes a big difference how you spread it around.)

}}} Six time nine is 54; nine times six.

See that prince over there? )))Yeah!
The one with the fuzzy hair.
(He got six rings on every finger.
He don't wash no dishes, not with 60 diamonds.)

}}} Six time ten is 60; ten times six.
He brought along eleven camels, ain't that nice? \}}Ain't that nice?

(Each one loaded down with six casks of oil and spice.

Brought quite a price.)

\}} Six time eleven is 66; eleven times six.

He had twelve wives, he better be rich!

(Each one had six kids, six children each.)

\}} Six time twelve is 72; twelve times six.

But me, I got six. \}} I got six!

That's all there is. \}} That's all there is!

Six times one is six; one times six.

I got six! \}} I got six!

That's all there is. \}} That's all there is!

**RETRIEVED FROM:**
http://www.postdiluvian.org/~gilly/Schoolhouse_Rock/HTML/multiplication/six.html
Schoolhouse Rock - Multiplication Rock

Lucky Seven Sampson

Music & Lyrics: Bob Dorough
Sung by: Bob Dorough
Animation: Paul Kimmelman and Associates

Now you can call me Lucky 'cause Lucky's my name,
Singin' and dancin', that's my game.
I never did a whole day's work in my life,
Still everything seems to turn out right.
Like a grasshopper on a summer's day,
I guess I love to play, and pass the time away.
'Cause I was born 'neath a lucky star!

{They said I'd go far...}

Makin' people happy, that's my favorite game,
Lucky Seven is my natural name.
Slippin' and slidin' my whole life through
Still I get everything done that I got to do.
'Cause I was born 'neath a lucky star!

(School is where you are? Aww, that's not hard, lemme show ya something.)

You multiply seven time one,
I got seven days to get that problem done.
Multiply seven time two,
Take 14 laughs when you're feelin' blue.
Multiply seven time three,
A 21-day vacation, you can play with me.
Multiply seven time four,
You got 28 days, that's-a one month more,
To pay the mortgage on your store, don't worry!

(Somethin'll turn up, yeah!)

Multiply seven time five,
I don't know how you did it, but man alive, that's 35.
Multiply seven time six,
Grab a stick and make-a 42 cickety-clicks.
Multiply seven time seven,
Take 49 steps right up to seventh heaven.
Multiply seven time eight,
They got 56 flavors and I just can't wait...
Multiply seven time nine,
63 musicians, all friends of mine.
Multiply seven time ten,
And that brings you right back to 70 again.

(You know, I think that's important, there's a trick there somewhere...
Multiply seven time eleven,
Even a rabbit knows that 70 plus 7.
Multiply seven time twelve,
You got 84, and isn't that swell.
I'm gonna try seven times 13 just for fun:
70 plus 21.
Seven times 14 must be great,
Well, exactly that's-a 70 plus 28.
Seven times 15, man alive,
That's 70 plus 35, a hundred and five!

(Man, this stuff is simple, no jive, you got it! Now I gotta fly.
'Scuse me folks, I'm sayin' goodbye,
I sure do thank you for the huckleberry pie.
Take it home, boys!)
Schoolhouse Rock - Multiplication Rock

Figure Eight

Music & Lyrics: Bob Dorough  
Sung by: Blossom Dearie  
Animation: Paul Kimmelman and Associates

Figure eight, as double four.  
Figure four, as half of eight.  
If you skate, you would be great,  
If you could make a figure eight.  
That's a circle that turns 'round upon itself.

One times eight is two times four.  
Four times four is two times eight.  
If you skate upon thin ice,  
You'd be wise, if you looked twice  
Before you made another single move.

One times eight is eight, two times eight is 16  
Three times eight is 24, four times eight is 32  
And five times eight is 40, you know.

Six times eight is 48, seven times eight is 56,  
Eight times eight is 64, nine times eight is 72,  
And ten times eight is 80, that's true.

Eleven times eight is 88, and twelve times eight is 96.  
Now here's a chance to get off on your new math tricks:  
'Cause twelve times eight is the same as ten times eight  
Plus two times eight:  
{80 plus 16, ninety-six!}

One times eight is eight, two times eight is 16  
Three times eight is 24, four times eight is 32  
And five times eight is 40, you know.

Figure eight, as double four.  
Figure four, as half of eight.  
If you skate, you would be great,  
If you could make a figure eight.  
That's a circle that turns 'round upon itself.

Place it on its side and it's a symbol meaning infinity.

RETRIEVED FROM:  
http://www.postdiluvian.org/~gilly/Schoolhouse_Rock/HTML/multiplication/eight.html
Naughty Number Nine

Music & Lyrics: Bob Dorough
Sung by: Grady Tate
Animation: Paul Kimmelman and Associates

Number nine will put you on the spot.
Number nine will tie you up in a knot.
When you're trying, multiplyin' by nine
You might give it everything you got
And still be stopped.

If you don't know some secret
Way you can check on,
You'll break your neck on
Naughty number nine.

(Now the first thing to keep in mind,
When you're multiplying by nine
Is that it's one less than ten.
You see, nine is the same as ten minus one.
So you could multiply your number by ten
And then subtract the number from the result,
And you'd get the same product as if you'd multiplied by nine,
And you knew it.

I mean, eight times nine is 80 minus eight,
And seven times nine is 70 minus seven,
And six times nine is 60 minus six.
You could use those tricks.)

Cause you must have some secret
Way you can beat it,
Or else you'll %need it%
With naughty number nine.

(Of course, it doesn't hurt to know the table of nines by memory.
It goes like this:)

One times nine is nine, and two times nine is 18.
Mean ol' number nine.
Three times nine is 27, and four times nine is 36.
Five times nine is 45, and six times nine is 54,
And seven times nine is 63.
Eight times nine is 72, and nine times nine is 81,
And ten times nine is 90.

{Now the digit sum is always equal to nine.
I mean, if you add two and seven, the digits, you get nine:
the digit sum. That's true of any product of nine.
If they don't add up, you've made a mistake.}

'Cause you must have some secret way you can check it
Or else you'll wreck it
With naughty, nasty, mean ol' number nine.

RETRIEVED FROM:
http://www.postdiluvian.org/~gilly/Schoolhouse_Rock/HTML/multiplication/nine.html
Schoolhouse Rock - Multiplication Rock

The Good Eleven
Music & Lyrics: Bob Dorough
Sung by: Bob Dorough

Good, good, good, good... the good eleven
It's almost as easy as multiplying by one.
Good, good, good, good eleven
Yes, eleven almost makes multiplication fun.

Some people get up at a quarter till seven
Other people I've met, till 8:45 or nine.
But I'm happy just a-hanging there till eleven.
Cause eleven has always been a friend of mine.

Good, good, good, good eleven
Never gave me any trouble till after nine.
Good, good, good, good eleven
Eleven will always be a friend of mine.

Now when you get a change to multiply by eleven,
It's almost as easy as multiplying by one.
You don't even have to use a pencil when you use eleven.
And eleven almost makes multiplication fun.
You know why?

Because you get those funny-looking double-digit-doojies as an answer.
Like 22, 33, 44 and 55.
66, 77, 88, and 99 is your answer
When you multiply 11 by 2, 3, 4, 5, 6, 7, 8 and 9.

Good, good, good, good eleven
Never gave me any trouble till after nine.
Good, good, good, good eleven
I can always get the answer easy every time.

Now eleven times ten is the same is ten times eleven.
It's 110, no matter what you do.
And 121 is the answer to eleven times eleven.
And eleven times twelve is 132.

Eleven thirteens are 143 now (that's-a 1-4-3).
Eleven fourteens are 154 (dig it, that's 1-5-4),
1-6-5 and 1-7-6 are fifteen and sixteen.
You'd better pick up on the latter 'cause I ain't got time to tell you any more.

I've got a date with the good eleven...
She never gave me any trouble till after nine.
Good, good, good, good eleven
Yes, eleven will always be a friend of mine!

RETRIEVED FROM:
http://www.postdiluvian.org/~gilly/Schoolhouse_Rock/HTML/multiplication/eleven.html
Schoolhouse Rock - Multiplication Rock

Little Twelvetoes

Music & Lyrics: Bob Dorough
Sung by: Bob Dorough

Now if man had been born with 6 fingers on each hand, he'd also have 12 toes or so the theory goes. Well, with twelve digits, I mean fingers, he probably would have invented two more digits when he invented his number system. Then, if he saved the zero for the end, he could count and multiply by twelve just as easily as you and I do by ten.

Now if man had been born with 6 fingers on each hand, he'd probably count: one, two, three, four, five, six, seven, eight, nine, dek, el, doh. "Dek" and "el" being two entirely new signs meaning ten and eleven. Single digits! And his twelve, "doh", would be written 1-0. Get it? That'd be swell, for multiplying by 12.

Hey little twelvetoes, I hope you're well.
Must be some far-flung planet where you dwell.
If we were together, you could be my cousin,
Down here we call it a dozen.
Hey little twelvetoes, please come back home.

Now if man had been born with 6 fingers on each hand, his children would have 'em too. And when they played hide-and-go-seek they'd
count by sixes fast. And when they studied piano, they'd do their six-finger exercises. And when they went to school, they'd learn the golden rule, and how to multiply by twelve easy: just put down a zero. But me, I have to learn it the hard way.

Lemme see now:

One times 12 is twelve, two times 12 is 24.
Three times 12 is 36, four times 12 is 48, five times 12 is 60.
Six times 12 is 72, seven times 12 is 84.
Eight times 12 is 96, nine times 12 is 108, ten times 12 is 120.
Eleven times 12 is 132, and 12 times 12 is 144. WOW!

Hey little twelvetoes, I hope you're thriving.
Some of us ten-toed folks are still surviving.
If you help me with my twelves, I'll help you with your tens.
And we could all be friends.
Little twelvetoes, please come back home.

RETRIEVED FROM:
http://www.postdiluvian.org/~gilly/Schoolhouse_Rock/HTML/multiplication/twelve.html
LESSONS

SCHOOL HOUSE ROCK LIVE! JR.
Schoolhouse Rock
Calculating Rates, Fractions and Graphs
BY: Karel Sloane-Boekbinder

Students will explore rhythms found in Schoolhouse Rock Multiplication Rock songs and learn how to connect these rhythms to additional concepts in mathematics.

SESSION ONE: Calculate Your Rate*

Begin by introducing students to single stroke rolls on hand drums. A single stroke roll is made up of evenly spaced notes played in an alternating fashion, i.e. Right Left Right Left, etc. The "single stroke" roll is one of the most important and perhaps overlooked rudimental drumming exercises. Development and conditioning of this roll, this ability, can be extremely beneficial to overall playing. It helps improve speed, endurance, note quality and clarity on the drums. Then introduce an algebraic formula as a way for students to analyze drumming tempo. This formula was adapted by Mat Schwarzman and the Crossroads Institute from a scientific formula used to calculate speed: Speed= Distance/Time. Using this formula, speed is directly proportional to distance when time is constant. Mat Schwarzman’s formula substitutes drum beats for distance so that speed (or rate of drumming) becomes directly proportional to drum beats when time is constant: Speed = Number of Beats/Time. Use this formula to introduce the connection between music and mathematical concepts. Next provide students with a hand drum. Then using single stroke rolls on their hand drums and the adapted formula students, ask students to calculate their drum speed over a 60 second interval of time. Ask student to record their drumming speed in their notebooks. Then ask students to complete the “Calculate Your Rate” graphic organizers (please refer to attached.)

*if you are unable to use drums, you can:
1) ask students to sit on the floor and use the floor as a drum
2) allow students to drum on the top of their desks

SESSION TWO: Graphs

Begin by reviewing single stroke rolls. Next, referring back to the algebraic formula introduced SESSION ONE, using an x y axis, ask students to graph the number of beats each person drummed over a 60 second interval. Students will use the x y axis to compare the different number of beats each person drummed in the class over a 60 second interval (please refer to attached “Circle Graphs” graphic organizer.)

SESSION THREE: Rhythms and Rhythm Comparisons, Part 1

Begin this session by reviewing the algebraic formula introduced SESSION ONE and rhythms introduced in previous sessions. Next, introduce Schoolhouse Rock Multiplication Rock songs:

Zero, My Hero

Two Elementary, My Dear
Three is a Magic Number

The Four-Legged Zoo

Five, Ready or Not, Here I Come

I Got Six

These songs all have rhythms with varying tempos. Learning rhythms with varying tempos will provide students with a sensory experience of rates.

As each song is introduced, ask students to listen specifically to the song’s rhythm. Next, ask the class to use their hands to clap the rhythm while the song plays. Then ask students to calculate their clapping speed over a 60 second interval of time. Ask students to record their answers on the “Rhythm Comparisons” graphic organizer (please refer to attached.) Students will build on the idea of rates via the tangible product: drum beats. This will give students the opportunity to explore a strategy for solving a real-life, rational-number problems.

SESSION FOUR: Rhythms and Rhythm Comparisons, Part 2

Begin this session by reviewing the algebraic formula introduced SESSION ONE and rhythms introduced in previous sessions. Next, introduce Schoolhouse Rock Multiplication Rock songs:

Lucky Seven Sampson

Figure Eight

Naughty Number Nine

The Good Eleven

Little Twelvetoes

Just as the previous session, these songs all have rhythms with varying tempos. Learning rhythms with varying tempos will provide students with a sensory experience of rates.

As each song is introduced, ask students to listen specifically to the song’s rhythm. Next, ask the class to use their hands to clap the rhythm while the song plays. Then ask students to calculate their clapping speed over a 60 second interval of time. Ask students to record their answers on the “Rhythm Comparisons” graphic organizer (please refer to attached.) Students will build on the idea of rates via the tangible product: drum beats. This will give students the opportunity to explore a strategy for solving a real-life, rational-number problems.

SESSION FIVE: Finding Fractions and Density Properties, Part 1
Ask students to review drumming techniques. Next, have students use number lines to display operations, equivalents, and solutions. Then ask students to create a box-and-whisker plot to compare the different drumming speeds of all the Schoolhouse Rock Multiplication Rock songs (please refer to attached “Finding Fractions and Density Property” graphic organizers.) The box-and-whisker plot will enable students to identify strategies for solving real-life, rational-number problems as they find the median, the lower quartile, the upper quartile and the interquartile range.

SESSION FIVE: Finding Fractions and Density Properties, Part 2
Using the “Calculating Percentages, Part 2” graphic organizer (please refer to attached) students will use simple formulas to calculate percentages for all Schoolhouse Rock Multiplication Rock songs and convert percentages to fractions. Ask students to refer to their “Finding Fractions” graphic organizers as they convert the Schoolhouse Rock Multiplication Rock songs into fractions and percentages. Students will solve real-life problems involving percentages, including percentages greater than 100.
Estimate the answer to an operation involving rational numbers based on the original numbers.

Speed = \text{Number of Beats} / \text{Time}

A rational number is one that can be expressed as the ratio of two integers such as 3/4 (the ratio of 3 to 4.) Thus any integer, any common fraction, any mixed number, any finite decimal, or any repeating decimal is rational. A rational number that is the ratio of \( a \) to \( b \) is usually written as the fraction \( a/b \).

Illustrate that a person that counted a total of 60 beats for one minute they drummed (time interval, \( \frac{60}{60} \) would equal 1, and, that \( \frac{30}{60} \) would equal 1/2 and \( \frac{15}{60} \) would equal 1/4.

1.5 beats per second can be written as the ratio \( \frac{90}{60} \). This can also be written as \( 1\frac{1}{2} \). \( \frac{90}{60} \) can also be written as \( \frac{45}{30} \), which would equal \( \frac{3}{15} \). If we calculate it the other way, for two, three, four or five minute intervals, the ratios would look like this:

<table>
<thead>
<tr>
<th>90</th>
<th>180</th>
<th>270</th>
<th>360</th>
<th>450</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>120</td>
<td>180</td>
<td>240</td>
<td>300</td>
</tr>
</tbody>
</table>

Now create your own ratios:

1) Calculate 1 beat per second over a five minute period, a 10 minute period, a 15 minute period and a 20 minute period

2) Calculate 1.5 beats per second over a 10 minute period, a 15 minute period and a 20 minute period

3) Calculate 2 beats per second over a five minute period, a 10 minute period, a 15 minute period and a 20 minute period

4) Calculate .5 beats per second over a five minute period, a 10 minute period, a 15 minute period and a 20 minute period

5) If your own drumming speed was different from the four rates listed above, calculate the number of beats per second over a five minute period, a 10 minute period, a 15 minute period and a 20 minute period
Calculate Your Rate

Name___________________

Now compare all these ratios using positions on a number line
Calculate Your Rate

Name___________________

Graph the number of beats each person drummed over a 60 second interval.
Each box equals 30 beats.
Compare the different number of beats each person drummed in the class over a 60 second interval. Create a circle graph to compare percentages: how many people drummed at least A) 60 beats in a 60 second interval, B) 90 beats in a 60 second interval, C) 120 beats in a 60 second interval, D) 150 beats in a 60 second interval or E) above 150 beats in a 60 second interval?
Calculate Your Rate

Rhythm Comparison Experiment Datasheet, 1

Directions: For each trial, record the number of clap beats over a 60 second time interval. Next, using the formula speed = number of beats/time, calculate the drum speed. Indicate a description of the speed. After you have explored all the rhythms of Schoolhouse Rock Multiplication Rock songs, rank them from fastest drum speed to slowest drum speed with the numbers 1-5.

<table>
<thead>
<tr>
<th>Trial</th>
<th>Name of Rhythm</th>
<th>Drumming Speed</th>
<th>Rate</th>
<th>Description of speed</th>
<th>Rank (1 is fastest, 5 is slowest)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Example</td>
<td>SINGLE STROKE ROLLS</td>
<td>1 beat per second</td>
<td>60 beats 60 seconds</td>
<td>Sort of fast.</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Zero, My Hero</td>
<td>beat(s) per second</td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Two Elementary, My Dear</td>
<td>beat(s) per second</td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Three is a Magic Number</td>
<td>beat(s) per second</td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>The Four-Legged Zoo</td>
<td>beat(s) per second</td>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>Five, Ready or Not, Here I Come</td>
<td>beat(s) per second</td>
<td></td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>I Got Six</td>
<td>beat(s) per second</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Calculate Your Rate

Name___________________

Rhythm Comparison Experiment Datasheet, 2

Identify missing information or suggest a strategy for solving a real-life, rational-number problem

Directions: For each trial, record the number of clap beats over a 60 second time interval. Next, using the formula speed = number of beats/time, calculate the drum speed. Indicate a description of the speed. After you have explored all the rhythms of Schoolhouse Rock Multiplication Rock songs, rank them from fastest drum speed to slowest drum speed with the numbers 1-5.

<table>
<thead>
<tr>
<th>Trial</th>
<th>Name of Rhythm</th>
<th>Drumming Speed</th>
<th>Rate</th>
<th>Description of speed</th>
<th>Rank (1 is fastest, 5 is slowest)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Lucky Seven Sampson</td>
<td>beat(s) per second</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Figure Eight</td>
<td>beat(s) per second</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Naughty Number Nine</td>
<td>beat(s) per second</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>The Good Eleven</td>
<td>beat(s) per second</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Little Twelvetoes</td>
<td>beat(s) per second</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Create a box-and-whisker plot to compare the different drumming speeds of each person in the class. First, each student calculates their speed using the formula: \( \text{Speed} = \frac{\text{Number of Beats}}{\text{Time}} \). Next, list all the speeds and arrange them from slowest to fastest and find the median \((Q_2\) or Med on the calculator\). The median is the number exactly in the middle of this ordered set of numbers. Now look at the numbers on the left side of the median. Find the number exactly in the middle of this set of numbers. This number is called the lower quartile \((Q_1\) on the calculator\). Now look at the numbers on the right side of the median. Find the number exactly in the middle of this set of numbers. This number is called the upper quartile \((Q_3\) on the calculator\). Now subtract the lower quartile from the upper quartile. This number is the interquartile range \((IQR)\).

**Box-and-Whisker Plot**

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**Speed**
List of Speeds:

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1)</td>
<td>6)</td>
<td>10)</td>
<td>14)</td>
<td>18)</td>
<td>22)</td>
</tr>
<tr>
<td>2)</td>
<td>7)</td>
<td>11)</td>
<td>15)</td>
<td>19)</td>
<td>23)</td>
</tr>
<tr>
<td>3)</td>
<td>8)</td>
<td>12)</td>
<td>16)</td>
<td>20)</td>
<td>24)</td>
</tr>
<tr>
<td>4)</td>
<td>9)</td>
<td>13)</td>
<td>17)</td>
<td>21)</td>
<td>25)</td>
</tr>
</tbody>
</table>
Using information from the box-and-whisker plot compare the different drumming speeds of the class.

First, using the number below line as an example, visually represent division of mixed numbers and fractions. As an example, if 6 divided by 3 means, “How many 3’s are in 6,” then 6 divided by 1/3 means, “How many thirds are in 6.”

Next, using the number line below, visually represent the class total drumming speed through the division of mixed numbers and fractions. As an example, if there are 25 total students in the class, and 25/25 means the total class and the median was 5, 25 divided by 5 means, “How many 5’s are in 25,” then 25 divided by 1/5 means, “How many fifths are in 25.”

Now show the density property by finding numbers between any two given numbers. For example, a number between 3/5 and 4/5 could be 7/10 because 7/10 is between 6/10 and 8/10.
Create a box-and-whisker plot to compare the different drumming speeds of all Schoolhouse Rock Multiplication Rock songs. First, record all the clapping speeds on the attached sheet. Next, list all the speeds and arrange them from slowest to fastest and find the median (Q_2 or Med on the calculator.) The median is the number exactly in the middle of this ordered set of numbers. Now look at the numbers on the left side of the median. Find the number exactly in the middle of this set of numbers. This number is called the lower quartile (Q_1 on the calculator.) Now look at the numbers on the right side of the median. Find the number exactly in the middle of this set of numbers. This number is called the upper quartile (Q_3 on the calculator.) Now subtract the lower quartile from the upper quartile. This number is the interquartile range (IQR).
List of Speeds Schoolhouse Rock Multiplication Rock songs:

1) 6) 10) 
2) 7) 11) 
3) 8) 
4) 9)
Mathematics Standards » Grade 3

Grade 3 Overview
Operations and Algebraic Thinking
• Represent and solve problems involving multiplication and division.
• Understand properties of multiplication and the relationship between multiplication and division.

Operations and Algebraic Thinking 3.OA
Represent and solve problems involving multiplication and division.
1. Interpret products of whole numbers, e.g., interpret $5 \times 7$ as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as $5 \times 7$.
2. Interpret whole-number quotients of whole numbers, e.g., interpret $56 \div 8$ as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. For example, describe a context in which a number of shares or a number of groups can be expressed as $56 \div 8$.

Understand properties of multiplication and the relationship between multiplication and division.
5. Apply properties of operations as strategies to multiply and divide.2 Examples: If $6 \times 4 = 24$ is known, then $4 \times 6 = 24$ is also known. (Commutative property of multiplication.) $3 \times 5 \times 2$ can be found by $3 \times 5 = 15$, then $15 \times 2 = 30$, or by $5 \times 2 = 10$, then $3 \times 10 = 30$. (Associative property of multiplication.) Knowing that $8 \times 5 = 40$ and $8 \times 2 = 16$, one can find $8 \times 7$ as $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$. (Distributive property.)
6. Understand division as an unknown-factor problem. For example, find $32 \div 8$ by finding the number that makes 32 when multiplied by 8.

Measurement and Data
• Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.
• Represent and interpret data.

Measurement and Data 3.MD
Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.
1. Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.
Represent and interpret data
3. Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent 5 pets.

Number and Operations—Fractions 3.NF
Develop understanding of fractions as numbers.
1. Understand a fraction $1/b$ as the quantity formed by 1 part when a whole is partitioned into $b$ equal parts; understand a fraction $a/b$ as the quantity formed by $a$ parts of size $1/b$.
2. Understand a fraction as a number on the number line; represent fractions on a number line diagram.
   a. Represent a fraction $1/b$ on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into $b$ equal parts. Recognize that each part has size $1/b$ and that the endpoint of the part based at 0 locates the number $1/b$ on the number line.
   b. Represent a fraction $a/b$ on a number line diagram by marking off $a$ lengths $1/b$ from 0. Recognize that the resulting interval has size $a/b$ and that its endpoint locates the number $a/b$ on the number line.
3. Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.
   a. Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.
#2628. Parts of speech and "grammar rock"

Language, level: Elementary
Posted Mon Jul 8 11:03:49 PDT 2002 by Lisa Wall (WineOWall@cs.com).
6th Grade, Setauket, USA
Materials Required: Dictionary and more for each table group see lesson plan.
Activity Time: 60 minutes
Concepts Taught: parts of speech and grammar

Behavioral Objectives: At the end of this lesson, the students will be able to write sentences highlighting different parts of speech. Students will to be able to:

- Apply knowledge of language structure and language conventions (i.e. spelling and punctuation) to discuss and write sentences using different parts of speech.
- Listen, read, and write for information and understanding (N.Y.S. English Language Arts Standard #1)
- Listen, speak and write for social interaction (N.Y.S. English Language Arts Standard #4)
Be knowledgeable about and make use of the materials and resources available for participation in the arts in various roles (N.Y.S. Arts Standard #2)

Materials:

- Dictionary for each table group
- Thesaurus for each table group
- Movie - School House Rock: Grammar Rock
- Film Strip packet - one for each student
- Scissors - one pair for each student
- Crayons, markers, or colored pencils - one box for each student
- Stapler - one for each table group
- Chart Paper
- Teacher markers
- Movie sheet

Anticipatory Set:

- The class will sit on the rug and watch School House Rock: Grammar Rock. The students will be told that they should take notes on the different parts of speech for an activity they will be doing later on that day (see attached).

- The teacher will hang chart paper in different parts of the room. The teacher will ask the students to recall (raise their hand and wait to be called on) the definitions of the following words: noun, adjective, adverb, verb, preposition, conjunction, article, and an interjection. On each piece of chart paper the teacher will list the word and its definition (the one the student gave).

- Next the teacher will divide the class into 8 equal groups. The teacher will model how to go to the station their group number represents. (Each piece of chart paper with a definition and part of speech is a station) Once your group is at your station you will have 2 minutes to write down, with a marker, as many words as you can that should be included in that category (part of speech).

- After the two minutes are up each group will go back to their desks for a class discussion. They will discuss each sheet and which words fit into that category and which words do not. The teacher will also ask for more examples if needed.

Procedure/Independent Practice:

- The teacher will explain they are going to make a paper film strip (to review the parts of speech).
The teacher will model how to put the film strip together (stapling it, cutting it, etc). She/he will explain if they do not follow the direction, their filmstrip will not look the same as the model.

Each student will be asked to label the front page (8 individual boxes) with the parts of speech (noun, adjective, adverb, verb, preposition, conjunction, article, and an interjection).

Along with the title (the parts of speech) they will also have to draw a picture. The picture should represent the sentence they will be writing on the second page (under the flap). Each sentence, under the first flap, should have an underlined word that represents that part of speech that is labeled on the front page of the flap.

On the front flap they should also list a brief definition of the part of speech and an example. The example should be the word that you will be using on the next page in your sentences (i.e. tall for an adjective).

The teacher will show a model of a completed filmstrip that they can look at if they are not sure what is expected of them.

The teacher will explain that the students will be graded on their spelling, punctuation, correct use of the underlined word, neatness, and effort.

Guided Practice:

The teacher will circulate and provide assistance as the students put together their film strips and start to write their sentences.

The class will have 20 minutes to work on their film strip. At the end of the allotted time, the teacher will ask for volunteers to show and explain one of their boxes of their film strip. The teacher will write the answer on the board.

Closure:

The teacher will close the lesson by reviewing the parts of speech (vocabulary) they had learned that day and answer any questions they may still have about the film strip.

Assignment/Homework:

Students should complete their film strip and hand-it in the next morning to be graded.
Assessment:

Students will be assessed on their ability to:

- Demonstrate their understanding of parts of speech taught by active participation in their group activity.

- Complete the class/homework activity correctly.

- Corrections will be made as needed (on the filmstrips), in order to hang them on the bulletin board outside the classroom.
Name_______________________

School House Rock- Grammar Rock

Write a definition for each word.

1. Noun-
2. Adjective-
3. Article-
4. Preposition-
5. Verb-
6. Adverb-
7. Conjunction-
8. Interjection-

RETRIEVED FROM: http://teachers.net/lessons/posts/2628.html
#461. Delicious Descriptive Adjectives

Reading/Writing, level: Elementary  
Posted Thu Jun 11 13:56:43 PDT 1998 by Teresa Strayer (tstrayer@hudson.k12.ia.us)  
Hudson Elementary School, Hudson, U.S.A.  
Materials Required: computer with Internet access, printer, recipe ingredients  
Activity Time: 3-4 weeks, daily 30-minute sessions  
Concepts Taught: adjectives, narrative paragraphs

INTERNET PROJECT: DELICIOUS DESCRIPTIVE ADJECTIVES  
Written by Teresa Strayer

INTRODUCTION:

Your mission for this project is to make different foods sound as delectable and as scrumptious as possible. Are you up for the challenge? Are your mouths ready to water and stomachs ready to grumble?

TASK:

1. You and a partner will be using and identifying adjectives in original sentences and paragraphs.

2. Another student and your mom or dad will be helping you with editing your work.

3. You will get to use the Internet for some of the activities.

4. You will be making a favorite recipe chosen from the Internet.

5. You will be telling the class how you made your recipe and share the finished product with us.

PROCESS:

Step 1

1. You and your partner will need one sheet of paper and a pencil. Put both of your names on the paper, and for the title put “Internet Adjectives”.


3. Scroll down with the bottom left “down” arrow, and under “Multimedia,” click on “Play the video”.

4. Be patient as it will take a few minutes for a small screen to appear in the middle of the screen. When it does, press the blue triangle on the bottom left of the small screen.

5. Listen to the song “Unpack Your Adjectives”. Listen carefully for adjectives (words that describe a person, place, or thing).

6. On the paper, list at least 10 adjectives from the song. You may play the song as many times as needed until your list is complete.

7. Rate the song at the bottom of the web page before leaving the site. If you need help listing adjectives, click on “back” at the top left of the screen, and the lyrics will appear for you to see.

8. Turn in your list to the language basket.

Step 2

1. You and your partner need a sheet of paper, a pencil, and a purple colored pencil for this activity.

2. Visit the web site (http://users.ids.net/~bvcriarc/adj.htm ). You will be completing all three exercises.

3. Click once on the blue “exercise 1”. Click once on each answer. After #10, click on “submit your answers”.

4. Click on “print” and wait patiently for a copy. At the top left of your screen, click once on “back”. Now do the same with exercise #2 and exercise #3.

5. Print out the scores for each exercise, but do not leave the web site when done.

6. Add both of your names to the score sheets, and turn them in to the language basket.

7. Return to the computer. On your sheet of paper, put both of your names and use the title “Adjective Sentences”.

8. Return to any of the 3 exercises on the computer and choose adjectives to include in original sentences.

9. You and your partner need to make up 5 sentences together and include 2 adjectives from the exercise in each sentence.

10. Circle you adjectives with a purple colored pencil. Place your sentences in your language arts folder.

11. When all students are done, the class will play “Name That Adjective” with 2 teams competing. You and your partner will each share one of your favorite sentences with the class, and they will try to identify your 2 adjectives.

Step 3
1. You and your partner will need one sheet of paper, a pencil, and a purple colored pencil. Put “Our School Lunch Menu” for the title. Include both of your names in the heading.

2. The two of you need to plan a nutritious and delicious school lunch that you would like our cafeteria workers to serve.


4. Just scroll up and down with the blue arrows on the right side of your screen. Look at all of the categories and foods there are to choose from. Decide which items will make up your scrumptious lunch.

5. On your paper, first list the items you have chosen from the given categories. (You do not need to use one item from each category.)

6. Next, you and your partner should return to one of your desks and describe your meal in paragraph form.

7. You need to use complete sentences and include as many adjectives as possible. A minimum of 10 adjectives are needed. If you would like, start out your paragraph with “Our _______ lunch includes .....” (Fill in the blank with an adjective.)

8. Please circle your adjectives with a purple colored pencil.

9. Place your menu in your language arts folder.

10. When all students have finished their menus, you and your partner will be sharing your menu paragraph with the class. All students will vote on the most delectable lunch menu. The winning menu will be shared with our principal!

Step 4

1. You and your partner will each need one sheet of paper, one evaluation form from your teacher, and a pencil.

2. Your task is to visit the following web sites and choose a recipe which sounds delicious to you. (You will choose a recipe, and so will your partner.)

3. For one of the web sites, the two of you need to complete a web site evaluation form.

Web sites to visit:

Kid Recipes @ http://www.netfix.com/poptart/recipes1.htm

Kid’s Kitchen @ http://www.scoreone.com/kids_kitchen/
Kid’s Cooking Corner @ http://www.lightcooking.com/kids.html

Cooking Kids @ http://www.studyweb.com/garden/cook/kidscooking.htm

Kid’s Honey Recipes @ http://www.honey.com/recipes/kidsrecep/

Eeyore’s Snack Page @ http://www.geocities.com/Heartland/Acres/4478/

Bugfood: Insect-themed Food @ http://www.uky.edu/Agriculture/Entomology/ythfacts/bugfood1.htm

Fun with Fruits + Vegetables Kid’s Cookbook @ http://www.dole5aday.com/COOK/COOKBOOK.html

4. You will need to print 2 copies of your recipe.

5. Return to your desk, and place one copy in your language folder.

6. With one copy of your recipe in front of you, answer the following questions about your recipe. Please use complete sentences when answering. Put your name and the title “Recipe Questions” on your paper.

1.) What is the title of your recipe?

2.) How many servings does your recipe make?

3.) For our class of 23, how many recipes will you need to make?

7. Place your second recipe copy in your language arts folder, also.

8. Turn in your answers to the language basket.

Step 5

1. You and your partner will each need one copy of your recipe, one sheet of paper, and a pencil.


3. Your job is to purchase the items needed to make your recipe. On your paper, put your name and “Net Grocer” for the title.

4. On your paper, include the following information and answer these questions in complete sentences:

1.) List the items you purchased.

2.) What is the total purchase price of your recipe ingredients?
3.) What is the average cost of an item?

4.) If you receive $1.50 allowance per week, how many weeks need to pass for you to actually purchase your ingredients?

5.) How much change would you have left over?

5. Turn in your answers to the language basket.

Step 6

1. You will be completing step 6 on your own. (Ask your partner or teacher for assistance if needed.)

2. You will need one copy of your recipe, a sheet of paper, and pencil. Put the name of your recipe for your title.

3. Your job is to write a narrative paragraph which explains how to make your food item. Please include these sentences in your paragraph:

   topic sentence = State what your item is and make a statement about it.

   detail sentences = List the materials and ingredients needed. Write the directions of how to make your recipe. (Use complete sentences.)

   concluding sentences = Finish with a sentence about clean-up, and then make a final statement about making your food item.

4. Place your paragraph and recipe in your language folder.

Step 7

1. You will need your recipe paragraph and a green pen.

2. Please trade your paragraph with another student. Use a green pen when you initial the bottom of the page and edit for capitalization, punctuation, spelling, and incomplete sentences.

3. Return the edited paragraph to the owner.

4. Take your paragraph home and have an adult edit with a blue pen. Return the edited paragraph to school.

Step 8

1. Rewrite your paragraph with the name of your food item for the title. Don’t forget your name.
2. Turn in your second draft paragraph to the language basket.

Step 9

1. You will need a few index cards and your paragraph for this assignment.

2. Your job will be to give a short speech to the class about making your recipe.

3. On the index cards, write down any notes you would like to have with you during your speech. Keep the notes simple and easy to read.

4. Put your cards in your homework folder.

Step 10

1. Make your recipe at home with your parent’s permission and help.

2. Practice your speech at home with an audience.

Step 11

1. Give your speech and share your recipe with your class. Remember to speak in a loud, clear voice.

Step 12

1. Take your second copy of your recipe out from your language arts folder.


3. Decide which student will go first as you will both need to complete a questionnaire.

4. When it is your turn, click on the blue “questionnaire” button.

5. Answer the questions about yourself and your recipe.

6. Click on “submit”.

7. Click on the purple arrow at the bottom left of your screen.

8. Now your partner should also complete and submit the questionnaire, also.

9. Place your recipe copy back in your language arts folder.

Step 13
1. Give your recipe to your teacher who will be sending it by e-mail to “The Children’s Museum” in Germany to be included in the “International Children’s Cookbook”.
(e-mail @ ki.jumus.pb@museum.b.shuttle.de)
(Send to: Kinder + Jugend Museum im Prenzlauer Berg, Schivelbeiner Str. 45, D-10439 Berlin, Germany)

EVALUATION:

“Internet Adjectives” Schoolhouse Rock List - Each adjective will be worth 10 points. (10 adjectives = 100 percent)

“Adjective Exercises” - All 3 of the exercises were graded on the score sheets. Those scores will be entered in the grade book.

“Adjective Sentences” - Each of the 5 sentences is worth 20 points. You will receive all 20 of the points if it is a complete sentence and if 2 adjectives are used and circled in purple colored pencil.

“Our School Lunch Menu” - You will receive 50 points for writing your menu in a paragraph with complete sentences, 25 points for planning a nutritious menu, and 25 points for circling at least 10 adjectives in your paragraph with a purple colored pencil. (Total of 100 points possible)

“Recipe Questions” - You will receive 100 points if you have answered all 3 questions in complete sentences.

“Net Grocer” - There are 5 questions, and each one is worth 20 points. (Total of 100 points possible)

Narrative Paragraph - This paragraph will be graded using a rubric.

Recipe Speech - Your speech will be graded using a rubric.

CONCLUSION:

Did you accomplish your mission? Did you make yourself hungry as you described food in an irresistible way? In our next study of adjectives, you will be making a menu for your very own restaurant. You could create an Italian restaurant or perhaps an ice cream parlor! Be thinking about what type of restaurant you would like to have.

RETRIEVED FROM: http://teachers.net/lessons/posts//461.html
English Language Arts Standards » Reading: Informational Text » Grade 4

Craft and Structure

- **CCSS.ELA-Literacy.RI.4.4** Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area.

- **CCSS.ELA-Literacy.RI.4.5** Describe the overall structure (e.g., chronology, comparison, cause/effect, problem/solution) of events, ideas, concepts, or information in a text or part of a text.

Key Ideas and Details

- **CCSS.ELA-Literacy.RI.4.1** Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.

Integration of Knowledge and Ideas

- **CCSS.ELA-Literacy.RI.4.8** Explain how an author uses reasons and evidence to support particular points in a text.

English Language Arts Standards » Reading: Informational Text » Grade 4

Craft and Structure

- **CCSS.ELA-Literacy.RI.4.4** Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area.

- **CCSS.ELA-Literacy.RI.4.5** Describe the overall structure (e.g., chronology, comparison, cause/effect, problem/solution) of events, ideas, concepts, or information in a text or part of a text.
English Language Arts Standards » Writing » Grade 4

Standards in this strand:

- CCSS.ELA-Literacy.W.4.1
- CCSS.ELA-Literacy.W.4.2
- CCSS.ELA-Literacy.W.4.3
- CCSS.ELA-Literacy.W.4.4
- CCSS.ELA-Literacy.W.4.5
- CCSS.ELA-Literacy.W.4.6
- CCSS.ELA-Literacy.W.4.7
- CCSS.ELA-Literacy.W.4.8
- CCSS.ELA-Literacy.W.4.9
- CCSS.ELA-Literacy.W.4.10

Text Types and Purposes

CCSS.ELA-Literacy.W.4.1 Write opinion pieces on topics or texts, supporting a point of view with reasons and information.

- CCSS.ELA-Literacy.W.4.1a Introduce a topic or text clearly, state an opinion, and create an organizational structure in which related ideas are grouped to support the writer's purpose.

CCSS.ELA-Literacy.W.4.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

- CCSS.ELA-Literacy.W.4.2a Introduce a topic clearly and group related information in paragraphs and sections; include formatting (e.g., headings), illustrations, and multimedia when useful to aiding comprehension.

- CCSS.ELA-Literacy.W.4.2b Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related to the topic.

- CCSS.ELA-Literacy.W.4.2d Use precise language and domain-specific vocabulary to inform about or explain the topic.

- CCSS.ELA-Literacy.W.4.2e Provide a concluding statement or section related to the information or explanation presented.

CCSS.ELA-Literacy.W.4.3 Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.

- CCSS.ELA-Literacy.W.4.3a Orient the reader by establishing a situation and introducing a narrator and/or characters; organize an event sequence that unfolds naturally.

- CCSS.ELA-Literacy.W.4.3e Provide a conclusion that follows from the narrated experiences or events.
Science
Why Pluto is No Longer a Planet

by Fraser Cain on January 5, 2012

This article was originally written in 2008; in 2012 Universe Today created a cool video to go along with it: http://www.youtube.com/watch?v=BYoRt-6pjAE

Let’s find out why Pluto is no longer considered a planet.

Pluto was first discovered in 1930 by Clyde W. Tombaugh at the Lowell Observatory in Flagstaff Arizona. Astronomers had long predicted that there would be a ninth planet in the Solar System, which they called Planet X. Only 22 at the time, Tombaugh was given the laborious task of comparing photographic plates. These were two images of a region of the sky, taken two weeks apart. Any moving object, like an asteroid, comet or planet, would appear to jump from one photograph to the next.

After a year of observations, Tombaugh finally discovered an object in the right orbit, and declared that he had discovered Planet X. Because they had discovered it, the Lowell team were allowed to name it. They settled on Pluto, a name suggested by an 11-year old school girl in Oxford, England (no, it wasn’t named after the Disney character, but the Roman god of the underworld).

The Solar System now had 9 planets.

Astronomers weren’t sure about Pluto’s mass until the discovery of its largest Moon, Charon, in 1978. And by knowing its mass (0.0021 Earths), they could more accurately gauge its size. The most accurate measurement currently gives the size of Pluto at 2,400 km (1,500 miles) across. Although this is small, Mercury is only 4,880 km (3,032 miles) across. Pluto is tiny, but it was considered larger than anything else past the orbit of Neptune.

Over the last few decades, powerful new ground and space-based observatories have completely changed previous understanding of the outer Solar System. Instead of being the only planet in its region, like the rest of the Solar System, Pluto and its moons are now known to be just a large example of a collection of objects called the Kuiper Belt. This region extends from the orbit of Neptune out to 55 astronomical units (55 times the distance of the Earth to the Sun).

Astronomers estimate that there are at least 70,000 icy objects, with the same composition as Pluto, that measure 100 km across or more in the Kuiper Belt. And according to the new rules, Pluto is not a planet. It’s just another Kuiper Belt object.
Here’s the problem. Astronomers had been turning up larger and larger objects in the Kuiper Belt. 2005 FY9, discovered by Caltech astronomer Mike Brown and his team is only a little smaller than Pluto. And there are several other Kuiper Belt objects in that same classification.

Astronomers realized that it was only a matter of time before an object larger than Pluto was discovered in the Kuiper Belt.

And in 2005, Mike Brown and his team dropped the bombshell. They had discovered an object, further out than the orbit of Pluto that was probably the same size, or even larger. Officially named 2003 UB313, the object was later designated as Eris. Since its discovery, astronomers have determined that Eris’ size is approximately 2,600 km (1,600 miles) across. It also has approximately 25% more mass than Pluto.
With Eris being larger, made of the same ice/rock mixture, and more massive than Pluto, the concept that we have nine planets in the Solar System began to fall apart. What is Eris, planet or Kuiper Belt Object; what is Pluto, for that matter? Astronomers decided they would make a final decision about the definition of a planet at the XXVIth General Assembly of the International Astronomical Union, which was held from August 14 to August 25, 2006 in Prague, Czech Republic.

Astronomers from the association were given the opportunity to vote on the definition of planets. One version of the definition would have actually boosted the number of planets to 12; Pluto was still a planet, and so were Eris and even Ceres, which had been thought of as the largest asteroid. A different proposal kept the total at 9, defining the planets as just the familiar ones we know without any scientific rationale, and a third would drop the number of planets down to 8, and Pluto would be out of the planet club. But, then… what is Pluto?

In the end, astronomers voted for the controversial decision of demoting Pluto (and Eris) down to the newly created classification of “dwarf planet”.

Is Pluto a planet? Does it qualify? For an object to be a planet, it needs to meet these three requirements defined by the IAU:

- It needs to be in orbit around the Sun – Yes, so maybe Pluto is a planet.
- It needs to have enough gravity to pull itself into a spherical shape – Pluto…check
- It needs to have “cleared the neighborhood” of its orbit – Uh oh. Here’s the rule breaker. According to this, Pluto is not a planet.

What does “cleared its neighborhood” mean? As planets form, they become the dominant gravitational body in their orbit in the Solar System. As they interact with other, smaller objects, they either consume them, or sling them away with their gravity. Pluto is only 0.07 times the mass of the other objects in its orbit. The Earth, in comparison, has 1.7 million times the mass of the other objects in its orbit.

Any object that doesn’t meet this 3rd criteria is considered a dwarf planet. And so, Pluto is a dwarf planet. There are still many objects with similar size and mass to Pluto jostling around in its orbit. And until Pluto crashes into many of them and gains mass, it will remain a dwarf planet. Eris suffers from the same problem.

It’s not impossible to imagine a future, though, where astronomers discover a large enough object in the distant Solar System that could qualify for planethood status. Then our Solar System would have 9 planets again.

Even though Pluto is a dwarf planet, and no longer officially a planet, it’ll still be a fascinating target for study. And that’s why NASA has sent their New Horizons spacecraft off to visit it. New Horizons will reach Pluto in July 2015, and capture the first close-up images of the (dwarf) planet’s surface.
Space enthusiasts will marvel at the beauty and remoteness of Pluto, and the painful deplaneting memories will fade. We’ll just be able to appreciate it as Pluto, and not worry how to categorize it. At least now you know why Pluto was demoted.

Here is much more info about Pluto, including pictures of Pluto: http://www.universetoday.com/13872/interesting-facts-about-pluto/

References:
Caltech: http://www.gps.caltech.edu/~mbrown/dwarfplanets/

RETRIEVED FROM: http://www.universetoday.com/13573/
Pluto Not a Planet, Astronomers Rule

Mason Inman
for National Geographic News

August 24, 2006 (Updated 3:30 p.m. ET)

Pluto has been voted off the island.

The distant, ice-covered world is no longer a true planet, according to a new definition of the term voted on by scientists today.

"Whoa! Pluto's dead," said astronomer Mike Brown, of the California Institute of Technology in Pasadena, as he watched a Webcast of the vote. "There are finally, officially, eight planets in the solar system."

In a move that's already generating controversy and will force textbooks to be rewritten, Pluto will now be dubbed a dwarf planet.

But it's no longer part of an exclusive club, since there are more than 40 of these dwarfs, including the large asteroid Ceres and 2003 UB313, nicknamed Xena—a distant object slightly larger than Pluto discovered by Brown last year.

"We know of 44" dwarf planets so far, Brown said. "We will find hundreds. It's a very huge category."

A clear majority of researchers voted for the new definition at a meeting of the International Astronomical Union (IAU) in Prague, in the Czech Republic. The IAU decides the official names of all celestial bodies.

The tough decision comes after a multiyear search for a scientific definition of the word "planet." The term never had an official meaning before.

What Is a Planet Today?

According to the new definition, a full-fledged planet is an object that orbits the sun and is large enough to have become round due to the force of its own gravity. In addition, a planet has to dominate the neighborhood around its orbit.
Pluto has been demoted because it does not dominate its neighborhood. Charon, its large "moon," is only about half the size of Pluto, while all the true planets are far larger than their moons.

In addition, bodies that dominate their neighborhoods, "sweep up" asteroids, comets, and other debris, clearing a path along their orbits. By contrast, Pluto's orbit is somewhat untidy.

The new definition also establishes a third class of objects that orbit the sun—"solar system bodies," which would apply to many asteroids, comets, and moons.

The new definition of "planet" retains the sense that a true planet is something special.

"It's going to be hard to find a new planet," Brown said. "You'd have to find something the size of Mars. Finding a new planet will really mean something."

Raising the Bar

A previous proposal, unveiled last week, would have set the bar for planethood considerably lower.

The earlier proposal also required planets to be round as a result of their own gravitational force. But it did not specify that a planet has to dominate its region, and that omission would have granted planet status to a lot of bodies.

Last week's proposal would have kept Pluto as a planet. But it also would have upgraded Charon to a planet in its own right. The proposal would have made full-fledged planets of 50 or more additional objects, including Ceres and 2003 UB313.

"Astronomers, who are normally mild-mannered types, are revolting against the IAU proposal," Brown wrote on his Web site last week, soon after the initial unveiling.

In response, the IAU committee charged with composing the definition "reversed course completely, and offered up a definition that's much more scientifically palatable," said astrophysicist Alan Boss of the Carnegie Institution in Washington, D.C., today.

"They reworked it and it has become a much superior definition. I think this will stand the test of time," Boss said.
Disgruntled

But for now the vote is drawing some opposition. Planetary scientist Andy Cheng said the definition is ambiguous, because it hasn't answered the question "how round is round?"

"This will be an issue in the future," Cheng said. "Dozens of objects are going to be straddling this line. The new definition is not going to help us with this."

"I'll still continue to maintain that Pluto is a planet," he said.

Owen Gingerich is an astronomer and historian at Harvard University in Cambridge, Massachusetts, and head of the IAU committee proposing the definition. He favored a special distinction for Pluto.

Gingerich supported a proposal to call the big eight planets classical planets—as opposed to just plain "planets"—and Pluto and the others dwarf planets, so there would be two classes of planets.

"This would have been much more sensible," Gingerich said.

The IAU members overwhelmingly rejected this idea.

"I think they voted primarily on scientific grounds and were not sensitive to the historical and cultural role that Pluto has played," Gingerich said.

The definition that won the vote is "a bit of a semantic atrocity," he added.

The definition was bound to be messy. It had to be palatable to many researchers and to address the plethora of celestial objects.

But most IAU members agreed that a line should be drawn somewhere to separate the largest bodies from what might be called the riffraff of our solar system.

Not Universal

Last week's proposed definition was meant to apply to all planets in the universe. But, faced with the difficulty of arriving at a consensus on universe-spanning criteria, the IAU committee narrowed the definition to apply only to our solar system.

Richard Conn Henry is an astrophysicist at Johns Hopkins University in Baltimore, Maryland. He says he never considered whether Pluto should be a planet until a few years ago.

But when the planetarium at New York City's American Museum of Natural History removed Pluto from the ranks of the planets, it got him thinking.

"This tiny thing in this oddball orbit—a planet? Give me a break!" Henry said.
"I think that, when the dust settles, people will recognize that there really are just eight planets."

ADDITIONAL RESOURCES

http://www.teachingheart.net/schoolhouserocks.dvd.html

http://www.lessonplanet.com/search?keywords=schoolhouse+rock


http://www.myaudioschool.com/?p=11633

https://www.schoolhouserock.tv/Grammar.html


http://faculty.kutztown.edu/schaeffe/Mnemonics/MultRock/multrock.html

https://www.teacherspayteachers.com/Browse/Search:schoolhouse%20rock

https://www.schoolhouserock.tv/Multiplication.html


http://www.slideshare.net/mwinfield1/using-music-to-teach-math-concepts

https://www.scholastic.com/teachers/articles/teaching-content/math-music-movement/

https://www.deseret.com/2012/5/24/20414646/math-music-can-be-taught-together

https://www.pinterest.ch/pin/436919601327748277/

**Songs for Teaching® Using Music to Promote Learning:**
http://www.songsforteaching.com/mathsongs.htm