The Key to Teaching Statistics through Music

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Voices Conference
Using Music

🎵 Good focus (hook) for lessons.
🎵 Music has mathematics
🎵 Connects to students’ world.
🎵 Addresses student interests.
🎵 Universal language.
🎵 Collect and represent data
🎵 Connections
🎵 Wide participation.
🎵 Address standards – NCTM, important in teacher preparation classes
<table>
<thead>
<tr>
<th>SOUND/PHRASE</th>
<th>FREQUENCY</th>
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<tbody>
<tr>
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<td></td>
</tr>
<tr>
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<td></td>
</tr>
<tr>
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<td></td>
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<td>Ba boom ba…</td>
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“Lollipop” by Beverly Ross and Julius Dixon is used by permission of the copyright owner, Edward B. Marks Company.
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© “Lollipop” by Beverly Ross and Julius Dixon is used by permission of the copyright owner, Edward B. Marks Company. Foran & Goldsby, 2019
| Lollipop lollipop | Oh lolli lolli lolli | Crazy way he thrills-a me,  
| Oh lolli lolli lolli | Lollipop lollipop | Tell you why,  
| Lollipop lollipop | Oh lolli lolli lolli | Just like-a lightning from the sky,  
| Oh lolli lolli lolli | Lollipop POP | He loves to kiss me till I can’t see straight.  
| Lollipop lollipop | Sweeter than candy on a stick,  
| Oh lolli lolli lolli | Huckleberry, cherry or lime;  
| Lollipop POP | If you had a chance, he’d be your pick,  
| Call my baby lollipop, tell you why, | But lollipop is mine.  
| His kiss is sweeter than an apple pie. |  
| And when he does his shaky rockin’ dance, |  
| Man, I haven’t got a chance. |  
| I call him lollipop lollipop | Oh lolli lolli lolli | Gee, my lollipop is great.  
| Oh lolli lolli lolli | Lollipop lollipop | I call him Lollipop lollipop  
| Lollipop lollipop | Oh lolli lolli lolli | Oh lolli lolli lolli  
| Oh lolli lolli lolli | Lollipop lollipop | Lollipop lollipop  
| Oh lolli lolli lolli | Oh lolli lolli lolli | Lollipop lollipop  
| Lollipop lollipop | Oh lolli lolli lolli | POP  

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## Thunder Statistics

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<tr>
<td>Feel the thunder</td>
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Thunder lyrics © Universal Music Publishing Group
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Thunder Lyrics

Just a young gun with a quick fuse
I was uptight, wanna let loose
I was dreaming of bigger things
And wanna leave my own life behind
Not a yes sir, not a follower
Fit the box, fit the mold
Have a seat in the foyer, take a number
I was lightning before the thunder

Thunder, thunder
Thunder, thun', thunder
Thunder, thun', thunder
Thunder, thun', thunder
Thunder, thun', thunder
Thunder, thun', thunder
Thunder, thun', thunder
Thunder, thun', thunder
Thunder, thun', thunder
Thunder, thun', thunder
Thunder, thun', thunder
Thunder, thun', thunder

Kids were laughing in my classes
While I was scheming for the masses
Who do you think you are?
Dreaming 'bout being a big star
They say you're basic, they say you're easy
You're always riding in the back seat
Now I'm smiling from the stage while
You were from the stage while
You were clapping in the nose bleeds

Thunder, feel the thunder
Lightning and the thunder
Thunder, feel the thunder
Lightning and the thunder, thunder
Thunder, feel the thunder
Lightning and the thunder, thunder
Thunder, feel the thunder
Lightning and the thunder, thunder
Thunder, feel the thunder
Lightning and the thunder, thunder
Thunder, feel the thunder
Lightning and the thunder, thunder

Happy by Pharrell Williams

It might seem crazy what I'm 'bout to say
Sunshine she's here, you can take a break
I'm a hot air balloon that could go to space
With the air, like I don't care baby by the way

Huh, because I'm happy
Clap along if you feel like a room without a roof
Because I'm happy
Clap along if you feel like happiness is the truth
Because I'm happy
Clap along if you know what happiness is to you
Because I'm happy
Clap along if you feel like that's what you wanna do
Hey, come on, uh

Bring me down, can't nuthin' (happy)
Bring me down
My level is too high to bring me down (happy)
Can't nuthin', bring me down (happy)
I said, let me tell you now, unh (happy)
Bring me down, can't nuthin', bring me down (happy, happy, happy)
My level is too high to bring me down (happy, happy, happy)
Can't nuthin' bring me down (happy, happy, happy)
I said

Because I'm happy
Clap along if you feel like a room without a roof
Because I'm happy
Clap along if you feel like happiness is the truth
Because I'm happy
Clap along if you know what happiness is to you
Because I'm happy
Clap along if you feel like that's what you wanna do
Hey, come on, unh bring me down can't nuthin' (happy, happy, happy)
Bring me down my level is too high (happy, happy, happy)

Here's why
Because I'm happy
Clap along if you feel like a room without a roof
Because I'm happy
Clap along if you feel like happiness is the truth
Because I'm happy
Clap along if you know what happiness is to you
Because I'm happy
Clap along if you feel like that's what you wanna do
Hey, come on, uh

Bring me down, can't nuthin' (happy)
Bring me down
My level is too high to bring me down (happy)
Can't nuthin', bring me down (happy)
I said, let me tell you now, unh (happy)
Bring me down, can't nuthin', bring me down (happy, happy, happy)
My level is too high to bring me down (happy, happy, happy)
Can't nuthin' bring me down (happy, happy, happy)
I said

Because I'm happy
Clap along if you feel like a room without a roof
Because I'm happy
Clap along if you feel like happiness is the truth
Because I'm happy
Clap along if you know what happiness is to you
Because I'm happy
Clap along if you feel like that's what you wanna do
Hey, come on, unh bring me down can't nuthin' (happy, happy, happy)
Bring me down my level is too high (happy, happy, happy)

Here come bad news, talking this and that
(Yes) Well, give me all you got, and don't hold it back
(Yes) I should probably warn you
I'll be just fine
(Yes) No offense to you, don't waste your time

Because I'm happy
Clap along if you feel like a room without a roof
Because I'm happy
Clap along if you feel like happiness is the truth
Because I'm happy
Clap along if you know what happiness is to you
Because I'm happy
Clap along if you feel like that's what you wanna do
Hey, come on, unh bring me down can't nuthin' (happy, happy, happy)
Bring me down my level is too high (happy, happy, happy)

Bring me down can't nuthin' (happy, happy, happy)
Bring me down, I said
Because I'm happy
Clap along if you feel like a room without a roof
Because I'm happy
Clap along if you feel like happiness is the truth
Because I'm happy
Clap along if you know what happiness is to you, eh eh eh
Because I'm happy
Clap along if you feel like that's what you wanna do
Because I'm happy
Clap along if you feel like a room without a roof
Because I'm happy
Clap along if you feel like happiness is the truth
Because I'm happy
Clap along if you know what happiness is to you, eh hey
Because I'm happy
Clap along if you feel like that's what you wanna do, heh come on

Songwriters: Pharrell Williams
<table>
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<tr>
<th>ELEMENT</th>
<th>TARGET</th>
<th>ACCEPTABLE</th>
<th>UNSATISFACTORY</th>
<th>POINTS</th>
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<tbody>
<tr>
<td>Counts</td>
<td>Counts accurately, efficiently. Recorded using groupings of tallies.</td>
<td>Counts accurately or with some self-correction. May use groupings of tallies.</td>
<td>Difficulty in counting and recording the counts.</td>
<td></td>
</tr>
<tr>
<td>Graphs</td>
<td>Neat, accurate graph with accurate intervals. Title given. Bars are accurately drawn.</td>
<td>Neat graph with good intervals. Title given. Bars are fairly accurate.</td>
<td>Difficulty with graphing. Incorrect or missing title. Incorrect counts given.</td>
<td></td>
</tr>
<tr>
<td>Group Work</td>
<td>Active participation. Cooperative. Leads or facilitates the discussion.</td>
<td>Active participation. Works with the others.</td>
<td>Does not participate or participates in unacceptable manner.</td>
<td></td>
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Goldsby 2018 NCTM: Lollipop© Statistics
Extensions/Variations

- Count other musical elements.
- Count the “lollipop lollipop o lolli lolli” as one phrase.
- Use another song as a follow-up.
- Assign for homework to find a song and do the activity
More advanced statistics

- For higher-level statistics, have students compare the number of albums sold by their favorite artists.
  - Find top 5 albums.
  - Mean and SD of albums
  - To increase sample size, group by genre.
CAUTIONS

- Select music with appropriate lyrics.
- Select music with countable elements.
- Use music with a beat that will get them involved.
- For the homework assignment, give guidelines on music that can be used.
- Assign members as best for your class to the elements to be counted.
- Have all tools ready to go.
Suggested Songs

- Lollipop by the Chordettes
- Yakkety Yak by the Coasters
- Mr. Lee by the Bobbettes
- Rockin’ Robin by Bobby Day
- Stand by Me by Ben E. King
- Hit the Road Jack by Ray Charles
- Sea Cruise by Frankie Ford
- Thunder by Imagine Dragons
- Happy by Pharrell Williams
- Perfect by Ed Sheeran
- Believer by Imagine Dragons
- Can’t Stop the Feeling by Justin Timberlake
- Firework by Katy Perry
Questions or Comments?
Contact Information

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- dgoldsby@tamu.edu