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| <p>Lesson Title:</p> <p>Rapping Through Formulas</p> | <p style="text-align: center;"><u>Big Idea & Learning Objectives</u></p> <ol style="list-style-type: none"> 1. Students will review geometric formulas learned in class. 2. Students will draw connections between music and memory. 3. Students will create songs and/or music videos about a mathematical formula or procedure used to find area, surface area, or volume. |
| <p>Content Area & Arts Discipline:</p> <p>Math and Music</p> | <p style="text-align: center;"><u>Overview of the Lesson</u></p> <p>The students will use geometric formulas and procedures to create songs and/or music videos. These videos will work through how to find the area, surface area, or volume of a shape or figure. <i>This is an excellent way to review. It allows students to show what they know and to teach it to others.</i></p> |
| <p>Grade Level:</p> <p>6th, 7th, and 8th grades</p> | <p style="text-align: center;"><u>Procedures</u></p> <p>Engaging Students (“The Hook”):</p> <p>The teacher will start class by playing songs and/or music videos created by students. The students can have a chance to give feedback on what they noticed about the songs that were created -- the lessons inside the lyrics, the rhythms and beats within the music, etc.</p> |
| <p>Proposed Time Frame:</p> <p>< 3 hours (3 class periods) - additional time outside of class will be needed to complete</p> | <p>Building Knowledge:</p> <p>The teacher will bring up basic children’s songs that the students can relate to: ABCs, Days of the Week, various color songs, and will begin a short discussion about why teachers use these songs. The teacher will lead the conversation into the fact that music helps with memory and is useful in helping students learn information.</p> |
| <p>Date Lesson Created:</p> <p>February 4, 2014</p> | <p>Modeling the Experience:</p> <p>The teacher will have examples of music videos created by students and teachers demonstrating the use of music in math.</p> |

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| <p>Lesson Author:</p> <p>Shasta Long -classroom teacher</p> | <p>Guided Practice:</p> <p>The teacher will have the students pick one concept that is being studied in class.</p> <p>The teacher will have the students choose a song that they would like to use as the basis of their remix (unless they choose to create their own rhythms and melodies or can use a provided website that contains free music and beats).</p> <p>The students will write what they know about their chosen concept before they being to create their remix.</p> |
| | <p>Applying Understanding:</p> <p>Students will create songs and/or music videos about how to use a formula to find area, surface area, or volume.</p> |
| <p>Room Requirements & Arrangement:</p> <p>classroom -students seated alone, with a partner, or with a small group</p> | <p>Opportunities for Reflection (Closing):</p> <ul style="list-style-type: none"> •Students will discuss why music is used in helping with memorization. •Students will present their songs or music videos to the class. •Students will be a proper audience for classmates. |
| <p>Material Equipment:</p> <ul style="list-style-type: none"> •computer/laptop •paper •pencil | <p>Assessing the Learning:</p> <ul style="list-style-type: none"> •Students will turn in a copy of their song with the mathematical procedure parts underlined. •The teacher will observe students as they work within their groups to create music. •The students will also be graded on their participation in the audience. |

Resources:

•“Just a Boring Square” <http://www.schooltube.com/video/2020fa2f642304cf32e4/Polygon-Song>

•“Ice Ice Baby Math Remix” <http://www.youtube.com/watch?v=zrWM7HAqLs>

•“Math Math Baby” <http://www.youtube.com/watch?v=EilfFljygtc>

•“Rap Beats” <http://www.flocabulary.com/instrumentals>

•“Rhyming Word Website” <http://www.rhymezone.com/r/rhyme.cgi?Word=price&typeofrhyme=perfect&org1=syl&org2=l&org3=y>

Standards & Principles**Common Core State Standards:****6.G.1 Geometry**

Standard: Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.

6.G.2 Geometry

Standard: Find the volume of a right rectangular prism with fractional lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying $V = lwh$ and $V = bh$ to find the volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.

7.G.4 Geometry

Standard: Know the formulas for the area and circumference of a circle and use them to solve problems; given an informal derivation of the relationship between the circumference and area of a circle.

7.G.6 Geometry

Standard: Solve real-world and mathematical problems involving area, volume, and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

8.G.9 Geometry

Standard: Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

Arts Standards:**Music: Middle Level III**

2 - Compose and/or improvise vocal and/or instrumental music examples using major and minor scales, standard and syncopated rhythms, and written music notation. (CP)

c. Compose short original music selections employing melodies and rhythms using manuscript, instruments, or technology (e.g., MIDI, notation software, or sequencing software).

Vocabulary (math):

- area
- formula
- surface area
- three-dimensional figure
- two-dimensional shape
- variable
- volume

Vocabulary (music):

- beat
- compose
- composition
- melody
- rhythm

Principles of Universal Design for Learning:

- I. Provide Multiple Means of Representation
 - 1: Provide options for perception
 - 1.2 Offer alternatives for auditory information
 - 2: Provide options for language, mathematical expressions, and symbols
 - 2.1 Clarify vocabulary and symbols
 - 3: Provide options for comprehension
 - 3.1 Activate or supply background knowledge
 - 3.4 Maximize transfer and generalization
- II. Provide Multiple Means of Action and Expression
 - 4: Provide options for physical action
 - 4.2 Optimize access to tools and assistive technologies
 - 5: Provide options for expression and communication
 - 5.1 Use multiple media for communication
 - 6: Provide options for executive functions
 - 6.2 Support planning and strategy development
- III. Provide Multiple means of engagement
 - 7: Provide options for recruiting interest
 - 7.3 Minimize threats and distractions
 - 8: Provide options for sustaining effort and persistence
 - 8.3 Foster collaboration and community
 - 9: Provide options for self-regulation
 - 9.1 Provide expectations and beliefs that optimize motivation

Appendix

Extended Learning Activities:

- Have students use different forms of technology to develop music videos of their songs/raps.
- Allow students that are excelling in a certain area of math to create songs/ raps and music videos to help struggling students.

TIPS/FAQs:

- Have guidelines set prior to the writing process -- allow the students to have a say in creating the guidelines and the grading rubric. This will help students to be more aware of what is being expected (behaviorally and academically).

References:

- SchoolTube
- YouTube
- <http://psychcentral.com/blog/archives/2013/09/19/using-music-as-a-teaching-tool-for-kids/>