

# Guitar Volume



## Math & Music

Grade 8

### Math Common Core Standard(s) Grade 8

3.0 The student will apply concepts of measurement using tools and technology when appropriate.  
3. 2. The student will use techniques of measurement and will estimate, calculate, and/or compare perimeter, circumference, area, volume, and/or surface area of two- and three-dimensional figures and their parts.  
3.2.a Three dimensional shapes include cube, prisms, pyramids, cylinders, cones, spheres, and composite figures.

### Music (MD) Standard(s) Grade 8

1. Perceiving and Responding: Aesthetic Education: Students will demonstrate the ability to perceive, perform, and respond to music.:  
1.1. Evaluate application of the elements of music and characteristics of musical sounds as they are used in a variety of genres and styles representative of world cultures  
1.1.f. Listen to and demonstrate characteristic sounds on instruments of various world cultures, such as the steel drum, pan pipes, conga drum, gong, tabla, sitar, and guitar.



## CONNECTED OBJECTIVES

Students divide the guitar into segments in order to determine the volume; they discuss how the physical volume of the instrument affects the sound of the instrument.

## MATERIALS & RESOURCES

- Two different size acoustic guitars
- Ruler
- Measuring tape
- Large graph paper
- Pencils
- Calculator

## KEY CONTENT VOCABULARY

- Volume
- Surface Area
- Cubic Units
- Cube Root/Square Root
- Area

## KEY ARTS VOCABULARY

- Pitch
- Tone
- Notes
- Reverberation
- Acoustic
- Timbre

# A S S E S S M E N T

- Students will calculate the volume of their given guitar and compare it to the volume of the other guitar.
- Students will make connections between a guitar's volume and the pitch or tone that it creates when it is played.
- Students will respond correctly to guided worksheet questions.



# L E S S O N S T E P S

## Introduce the Instruments:

- Students see at least two different sized acoustic guitars and speculate what differences might exist in sound.
- Introduce key vocabulary that will be used throughout the lesson.
- Play some notes and chords, or have a student volunteer play in order for students to hear similarities in tone. Hearing both guitars in succession will be helpful.
- Show students the basic anatomy of an acoustic guitar because the lesson will reference the body and the neck of the guitar.

## Finding the Volume:

- Students will work in groups of 2-4 to trace the body and neck of their guitar on graph paper.
- The students will need to develop a strategy to find the volume of their guitar. They could break the large shape down into smaller shapes to find the volume of and then add the volume of the parts.
- Have the students calculate the volume of their guitars and answer the questions on their worksheet as they are working.

## Reflection:

- Reflect on the connection between the volume of the guitar and the overall sound of the guitar when it is played.
- What role does the volume have on the guitar's sound?
- Use volume as a point of departure for discussion on sound, resonance, and size. Volume is key factor.

# E X T E N S I O N S A N D O P T I O N S

Have students design their own guitar based on their needs, determining what kind of sound they want the guitar to produce.

# G E T S M A R T T H R O U G H T H E A R T S

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