

# MUSIC AND MATH\*

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## Abstract

An overview of some of the math concepts that are relevant to music. Includes suggestions for classroom activities for grades 3-7 that use music to illustrate a math concept, as well as reviews of the math necessary for older students to understand some music theory and acoustics.

Most people enjoy music and find it a naturally interesting subject, while many consider math to be a "difficult" subject. Often they do not realize how closely related music and math are. Rhythm and pitch, two of the most basic elements of music, are best described using basic math concepts. The following lesson suggestions either use music to illustrate an important math concept, or they explain the math underlying an important idea in music theory.

## The math / music concepts explored include:

- Fractions / rhythm
- Sets and intersecting sets / keys and related keys
- The relationship between ratios, fractions, and decimals / frequency and interval
- Roots and powers / equal temperament tuning

## Uses for these lessons:

- For math students **3rd-5th grade** who may be struggling with the connections between the concepts of **multiplication, division, and fractions**, Fractions, Multiples, Beats, and Measures can engage aural and hands-on learners. It is probably best to use this activity in addition to any visual aids (for your visual learners) and other hands-on demonstrations you have available.
- For math students **3rd-8th grade who are studying sets**, Keys and Scales are Sets is not only a hands-on demonstration of a basic math concept, but also a simple explanation of a very basic music concept. Again, this activity will be strongest if you use it alongside any other visual and hands-on demonstrations that you have available.
- The scale set activity may also help **music students who are just beginning to study keys and scales**. It is a hands-on demonstration of keys and what makes one key more or less related to another key.
- Fractions, Multiples, Beats, and Measures may also be helpful to **beginning music students** who are being introduced to rhythm and meter.
- **Music students, 7th grade and up**, who want to understand the relationship between interval and frequency but need to review ratios, fractions, and decimals should look at Musical Interval, Frequency, and Ratio. If they need a review of roots and powers in order to study frequency relationships in equal temperament, they should look at Powers, Roots, and Equal Temperament.

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- Any homeschool or classroom that emphasizes **cross-discipline lessons** may be interested in all of these activities. Other lessons that may be of interest are Sound and Music, Sound, Physics, and Music, Duration: Notes and Rests, Rhythm, Scales that aren't Major or Minor, and Conducting

This is by no means a complete list of all the ways that music and math are related. As of this writing, the animations at Musemath<sup>1</sup> were one place to start exploring some more advanced music/math concepts.

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<sup>1</sup><http://www.musemath.com>