

# Performing Pleasant Music With Mathematics

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This study aimed to devise a spreadsheet, mathematically, to identify the sounds people feel comfortable, and create an environment where people worldwide can enjoy music with others towards testing the hypothesis that there is a close relationship between "mathematics" and "music." First, to research which chords people feel comfortable to hear, 10 subjects were made to listen to the chords composed of various three tones, and report if they feel them comfortable. Meanwhile, I arranged all the musical scales in a circle and expressed the tones used in the research in a way that shows the distances between each of the three tones in mathematical proportion. All the subjects reported that the chords composed of the three tones which are shown in the proportion of 3:4:5 sounded comfortable. Approximately, 82 to 93% of the existing songs with pleasant melodies are composed in this chord. This led me to the idea that if people could find pleasant-sounding chords with ease, it will be useful for those who want to compose melodies, but do not have much knowledge of music theories. Therefore, I created a spreadsheet, which, by just choosing the three tones one comes up with, immediately judges if people feel the chords composed of the three tones are comfortable or not. I want to make this spreadsheet available to people worldwide as a software program to compose and enjoy music with people with different backgrounds, and further develop this research toward public acceptance.