



Experiments with Standard Piano

Paul VanRaden
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Introduction

- Research in this report used the standard piano keyboard with standard tuning
- Goals were to play the 7 white and 5 black keys per double as if they were simply numbered 1 to 12
 - Except for some scales played only on black keys
- Most of my other piano research focused on:
 - Better math for setting tones (tuning systems)
 - Evenly-spaced piano keyboards to easily use the math

Experiments

- Music using all 12 keys whether black or white
- Scales using every other or every third key (black or white)
- Scales using different numbers (8, 4, 2, and 1) of evenly spaced tones per double
- Scales using only black keys
- Do-Re-Mi as a marching song
- Scales to accompany Happy Birthday and Beethoven's 9th



Warning !

Sound quality is poor due to powerpoint audio compression of music

This is a well-known issue that .pptx will not solve

See: [Powerpoint's audio recording quality is terrible : r/powerpoint](https://www.reddit.com/r/powerpoint/comments/10j8k8k/powerpoint-audio-recording-quality-is-terrible/)

The scales sound great on my piano speakers

Music using all 12 keys whether black or white

- Some percussion to start
- Lead part using piano keys 0 to 12 (0 = C1, 12 = C2):
 - 0 12 10 11 12 9 8 9 7 8 9 6 5 6 4 5 6 3 2 0 4 8 12
- Then **ascending** using all 12 keys in a row while **descending** using every 2nd key every 3rd beat
 - [0 12] 1 [2 10] 3 [4 8] 5 6 7 4 8 9 2 10 11 [12 0]
- Base part using every 4th key, then every other key
 - 0 12 0 8 0 4 4 0 0 12 10 8 6 4 2 0



Scales using every other or every third key

- Some percussion to set the mood
- Piano descending 8-tone scales skipping every 4th key (counting white and black keys), 12 10 9 8 6 5 4 2 1 0
- Harpsicord descending 6-tone scales skipping every other key (counting white and black keys) and following one measure behind, 12 10 8 6 4 2 0
- Both parts sound like running down the steps
- Cello part using just a few notes



Scales using 8, 4, 2, and then 1 tone per double

- Some percussion to get started
- Lead part doubling the width of its scale 4 times
 - First using 8 tones per double, then returning to its base tone
 - Beginning scale with relative frequencies 8, 9, 10, 11, 12
 - Next scale with relative frequencies 8, 10, 12, 14, 16
 - Next scale with relative frequencies 8, 12, 16, 24, 32
 - Last scale with relative frequencies 8, 16, 32, 64, 128
- Bass part also doubling the width of its scale 4 times



Scales using only black keys

- Some percussion to set the mood
- Two lead scales going up and then down 5 black notes in a row
- One reacting part going down 4 black notes in a row
- One base part going up and down 8 black notes in a row
- Very simple to play, but pleasing



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Do-Re-Mi as a marching song

- A song teaching the standard 7 tones per double you are supposed to use
- Do-Re-Mi-Fa-So-La-Ti and then the next “Do” with twice the frequency
- From the 1965 movie The Sound of Music
- Reimagined as a marching song
- Played here with just percussion and piano



Happy Birthday hearing the 9 beats/measure

- The Happy Birthday song has 3 main beats per measure and triplets within those for 9-beat measures.
- Scales with 3 keys per double and repeated 3 times accompany the song to better hear the 9-beat music timing.

Beethoven's 9th symphony

- First song I learned to play during piano lessons when 9 years old.
- Added a repeating scale using 4 notes per double.
- Starting 2 doubles above the melody, descending to 1 double above, then ascending back to 2 doubles above.
- Harmony scale played at twice the speed (half the note duration) of the main melody.
- Many different songs harmonize well with similar repeating scales.

Conclusions

- These early experiments gave me confidence that evenly spaced keys and scales would be better
- Thinking about the white notes, black notes, sharps, flats, and naturals on the standard keyboard and in music notation is unnatural and hard on your brain
- Thinking of repeating patterns of keys 1-12 is easier
- This research was mostly done around year 2000 after first purchasing an electronic keyboard
- Return to [Music and Math in Harmony](#)