Lecture 4: Intervals

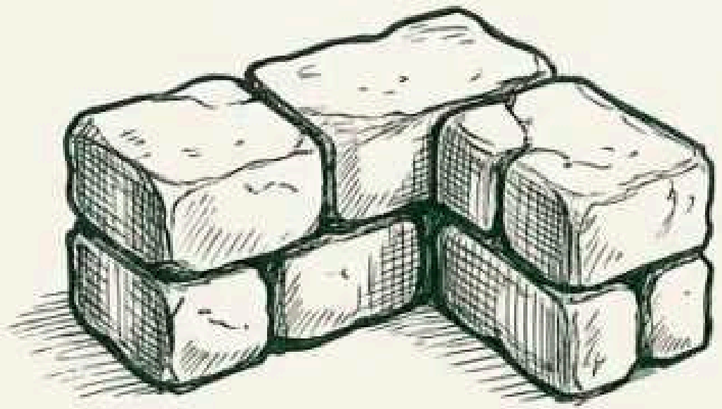
- Melodic & harmonic
- Counting size & quality
- Semitone counts & spelling
- The tritone
- Consonance & dissonance
- Frequency ratios & inversion
- Compound intervals

Welcome to Lecture 4.

Gemini Notebook

The distance between two notes forms the building blocks of music.



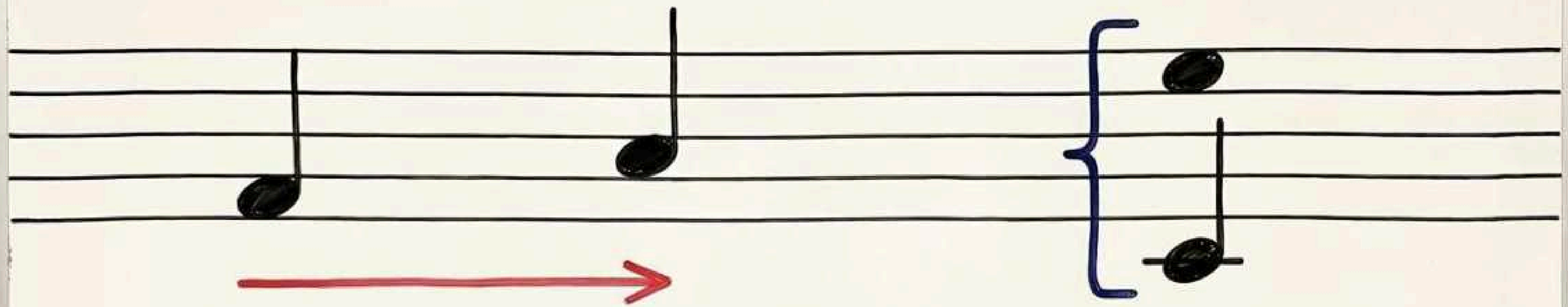


- ☑ Name them
- ☑ Measure them
- ☑ Understand their tension
- ☑ Recognize them by ear

"The key to hearing music as relationships, not as separate sounds."

Gemini Notebook

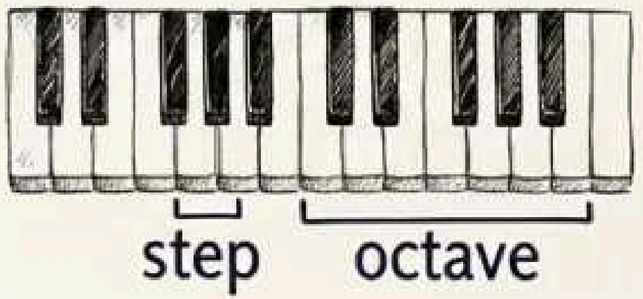
Intervals occur across time or in stacked unity.



Time (Sequential)

Stacked (Simultaneous)

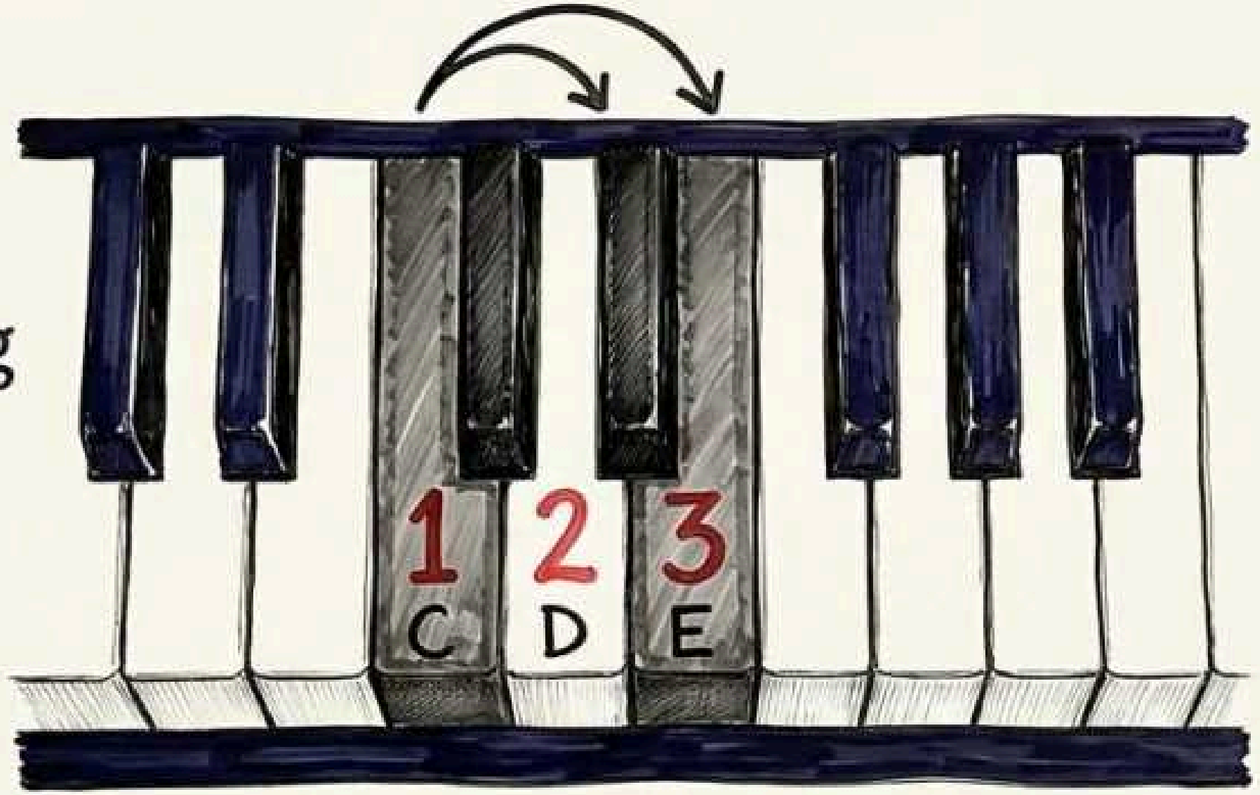
ALWAYS measure from the lower note to the upper note.



Gemini Notebook

Every interval has a Number, found by inclusive counting.

Count letter names, including both the first and the last.



C → C = Unison

C → G = Fifth

C → C (next) = Octave

C → E = A Third (3)

Gemini Notebook

Quality defines the exact size of the interval.

The Perfect Family

- Unison (1)
- Fourth (4)
- Fifth (5)
- Octave (8)

The Major/Minor Family

- Second (2)
- Third (3)
- Sixth (6)
- Seventh (7)

Minor is exactly one half-step smaller than Major.



Gemini Notebook

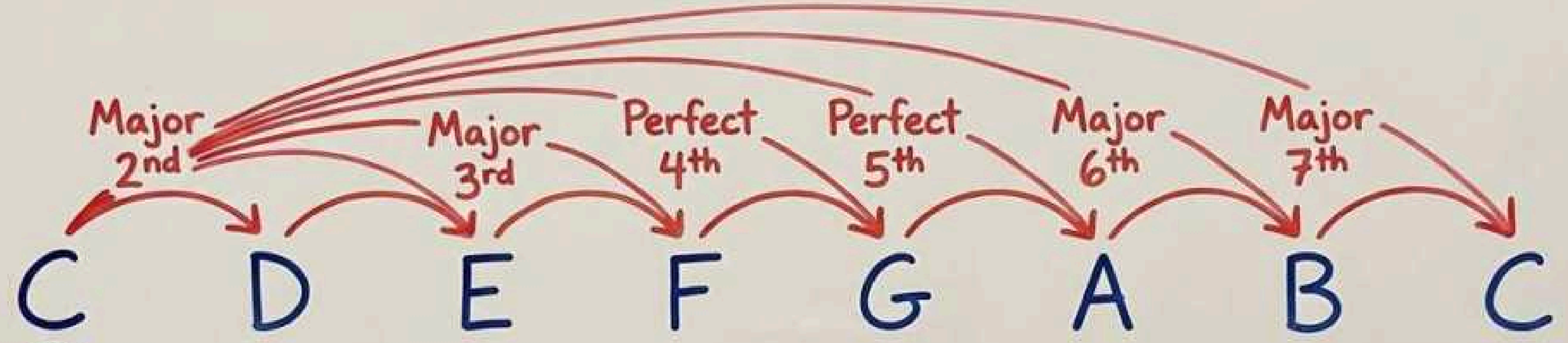
Measuring by semitone counts provides absolute precision.

A semitone is the smallest step. Knowing the exact acts as a universal reference.

1:	1: Minor 2nd	2: Major 2nd
2:	3: Minor 3rd	4: Major 3rd
5:	5: Perfect 4th	
6:	6: THE TRITONE	
7:	7: Perfect 5th	
8:	8: Minor 6th	9: Major 6th
10:	10: Minor 7th	11: Major 7th
12:	12: Perfect Octave	

Gemini Notebook

The Major Scale method offers a simple shortcut for naming.





Tonic (Anchor)

Take the lower note as the tonic. If the upper note is in that major scale, the interval is automatically Major (or Perfect for 4, 5, 1, 8).

Gemini Notebook

Adjusting intervals and why spelling dictates the number.

Major Interval

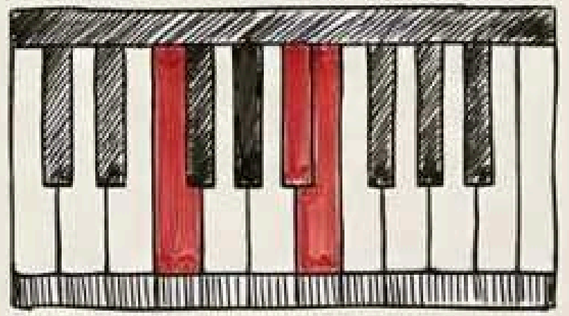
– half step

Minor Interval

C → E
(Major 3rd)
becomes
C → E flat
(Minor 3rd).



C → D# =
Augmented 2nd
(Count C, D = 2)



C → E flat =
Minor 3rd
(Count C, D, E = 3)

Spelling matters: the letter names fix the number, even when they sound exactly the same on the keyboard.

Gemini Notebook

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The Tritone divides the octave exactly in half.



Written as Augmented 4th or Diminished 5th

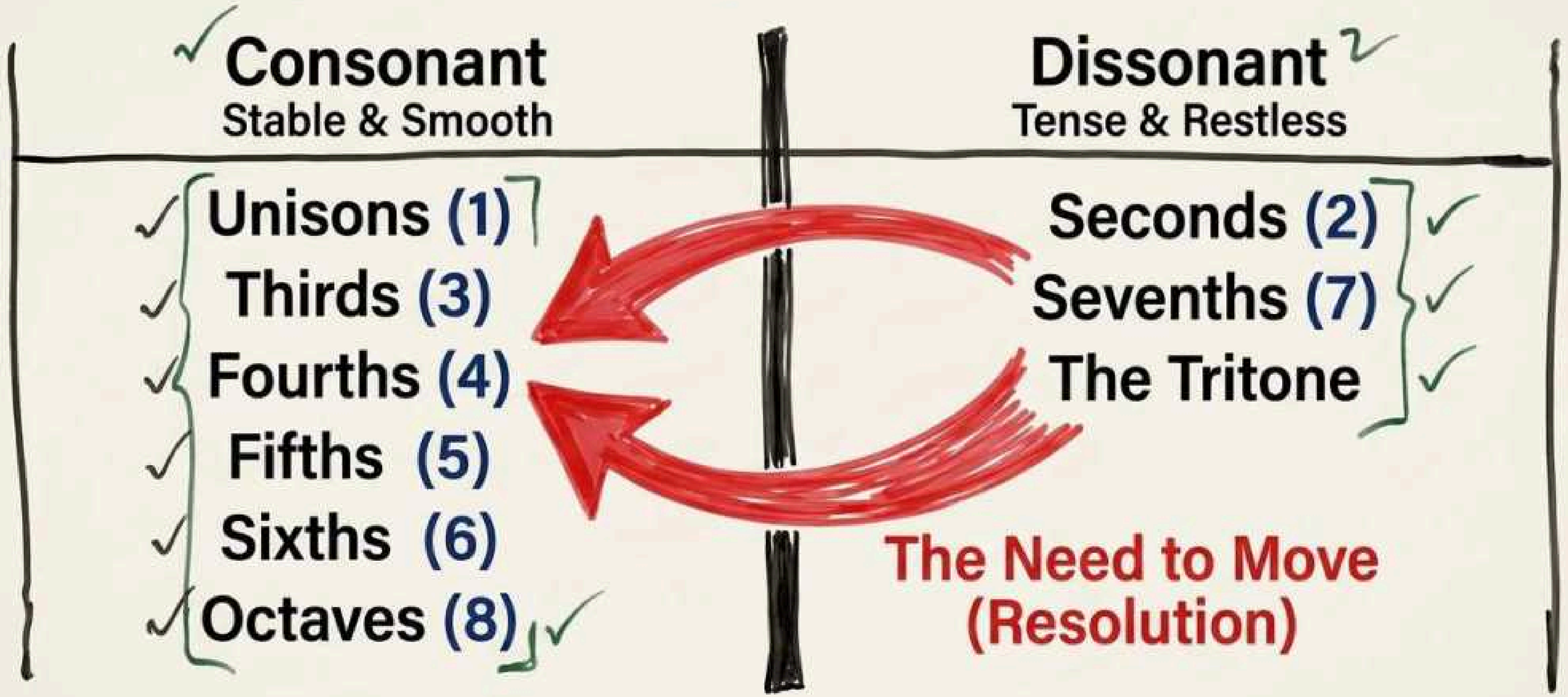
Nicknamed "The Devil in Music" (medieval ban partly legend)

Unstable and restless.

Used constantly by composers to create tension that demands resolution.

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Consonance provides stability; dissonance demands movement.

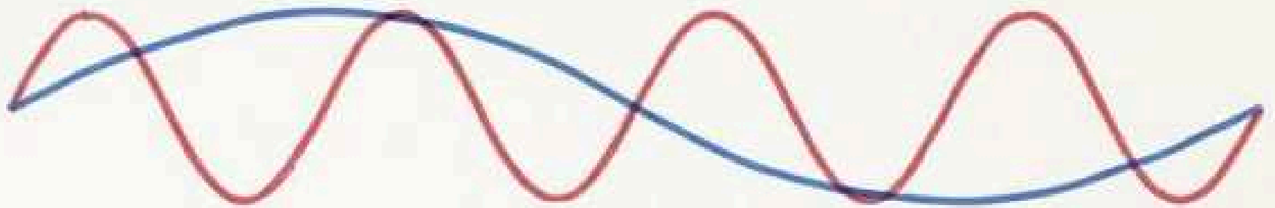


Dissonance is not bad. The resolution to a consonance is one of the most satisfying events in music.

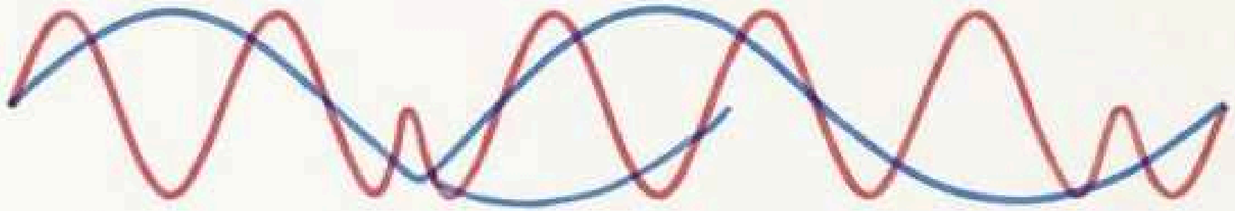
Gemini Notebook

Pleasant intervals correspond to simple physical frequency ratios.

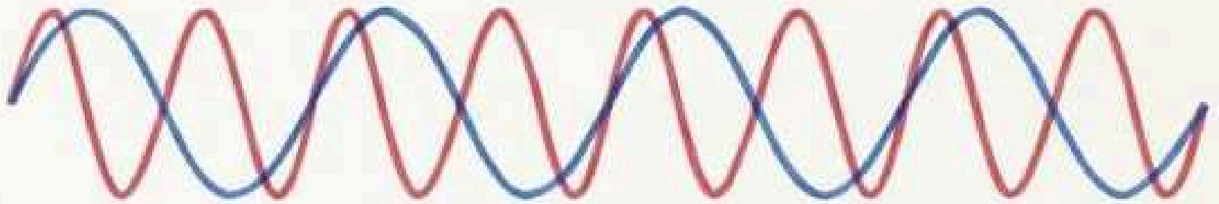
2:1 = Octave



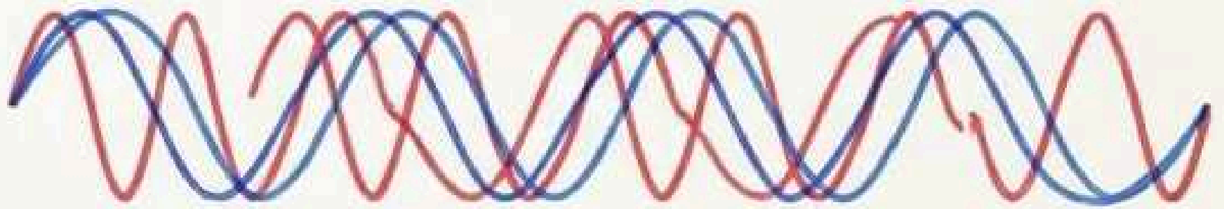
3:2 = Perfect Fifth



4:3 = Perfect Fourth



5:4 = Major Third

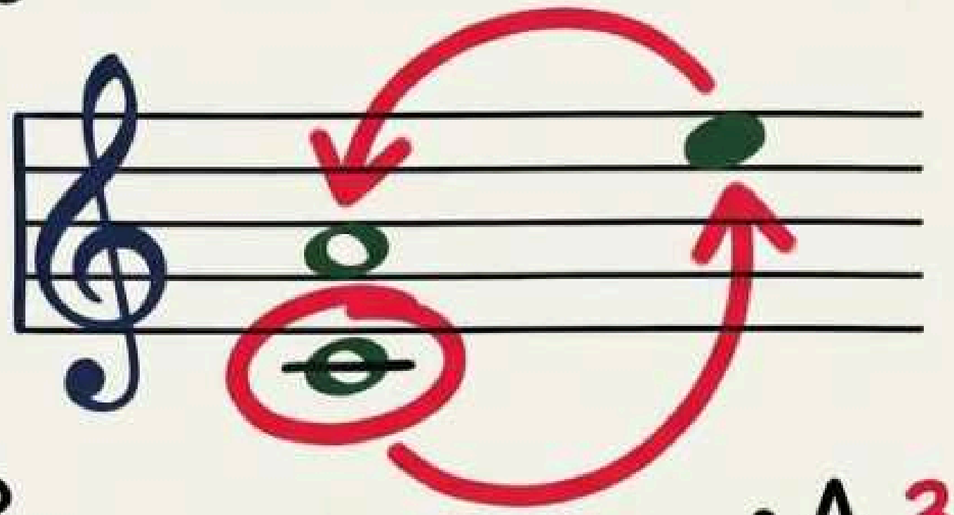


In equal temperament, these ratios are approximations. The tempered fifth is very close to 3:2, but the tempered major third is slightly wide.

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Inversion: Turning an interval upside down.

$$N_{original} + N_{inverted} = 9$$



How Qualities Flip

Major ⟷ Minor
Perfect ⟷ Perfect

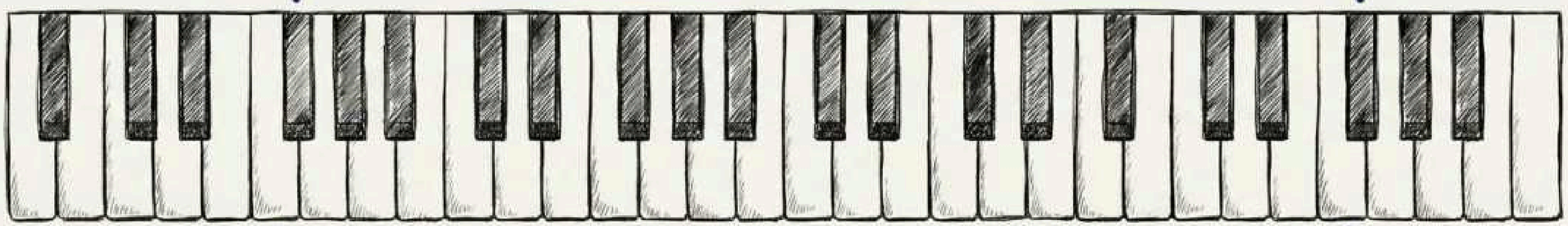
- A 3rd becomes a 6th.
- A 2nd becomes a 7th.
- A 5th becomes a 4th.

Gemini Notebook

Compound intervals extend beyond the octave limit.

Compound Interval − 7 = Simple Interval

8 + 2 = A Ninth (9th)



A Tenth (10th)

Jazz and popular music use ninths and elevenths constantly as colour notes added to chords.

Gemini Notebook

The best way to learn intervals is to attach them to familiar tunes.

Minor 2nd: Theme from Jaws



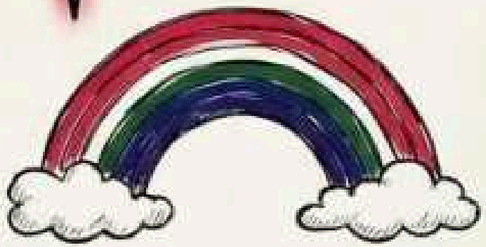
Major 3rd: When the Saints Go Marching In



Perfect 5th: Twinkle, Twinkle, Little Star



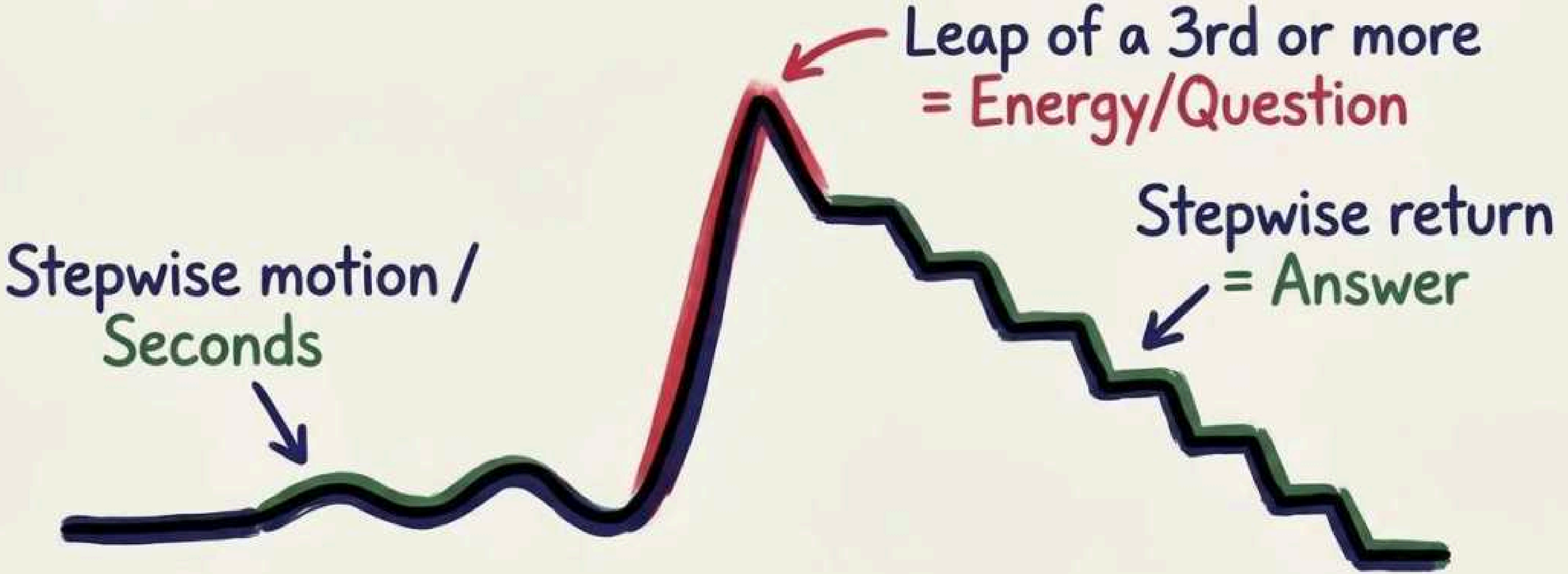
Octave: Somewhere Over the Rainbow



Collect a personal tune for every interval.

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Intervals dictate the shape and conversational flow of a melody.

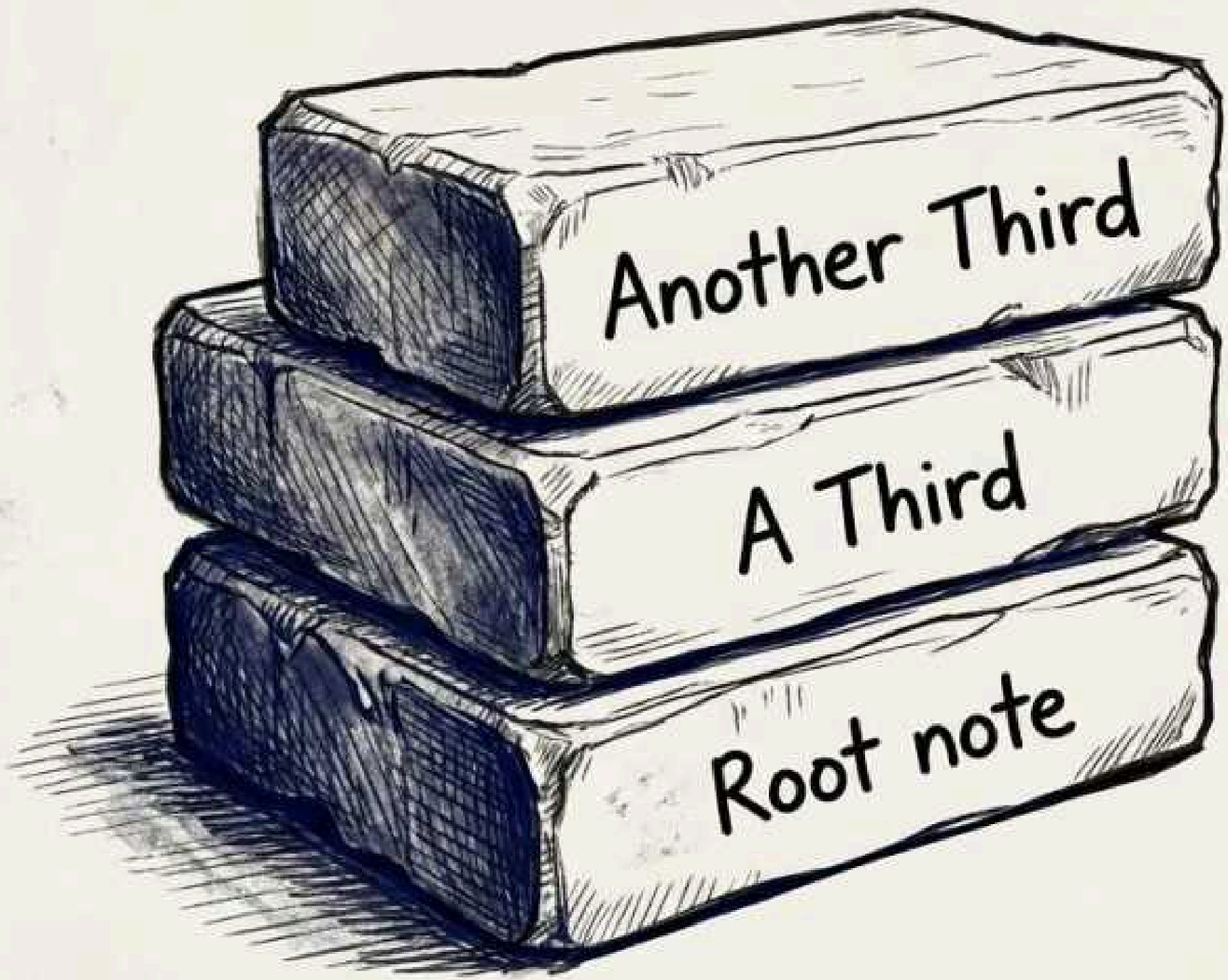


Most melodies move mainly by step. A leap followed by a stepwise return feels like a small question and answer.

Gemini Notebook

Synthesis: Intervals are the raw, stackable material of chords.

¶ 4.16



A chord is built by stacking thirds on top of one another. The quality of the chord depends entirely on which kinds of thirds (Major or Minor) are used.

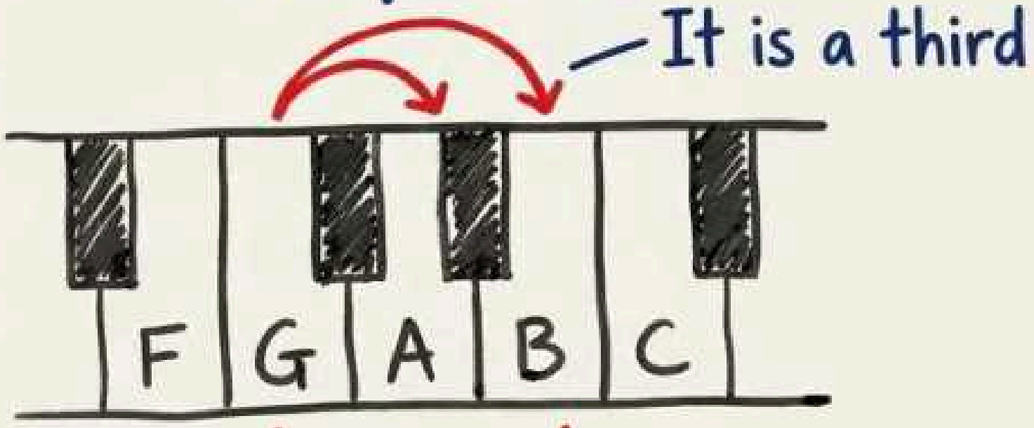
If you can name a third quickly, you have most of what you need.

Gemini Notebook

¶ 4.17

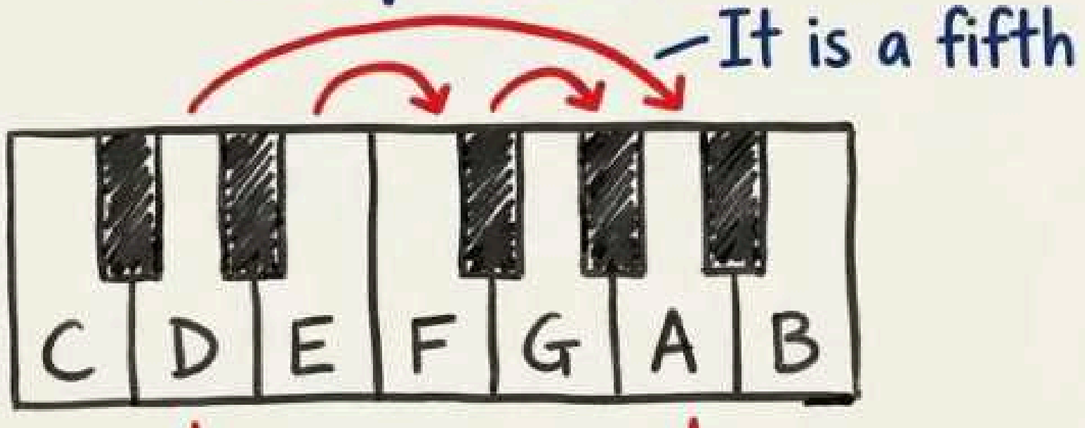
Let us practice measuring and naming together.

G up to B



Major Third

D up to A



Perfect Fifth

Try these on a keyboard, and then listen to them.

Gemini Notebook

Final Analysis: Find the leaps in your own library.



1. Choose two tunes you know that begin with a leap.

2. Find the exact interval of that leap on a keyboard.

3. What did the composer gain emotionally or energetically by starting with a leap instead of a step?

In Lecture 5, we stack intervals into chords.

Gemini Notebook