Music (and sound) Theory 101

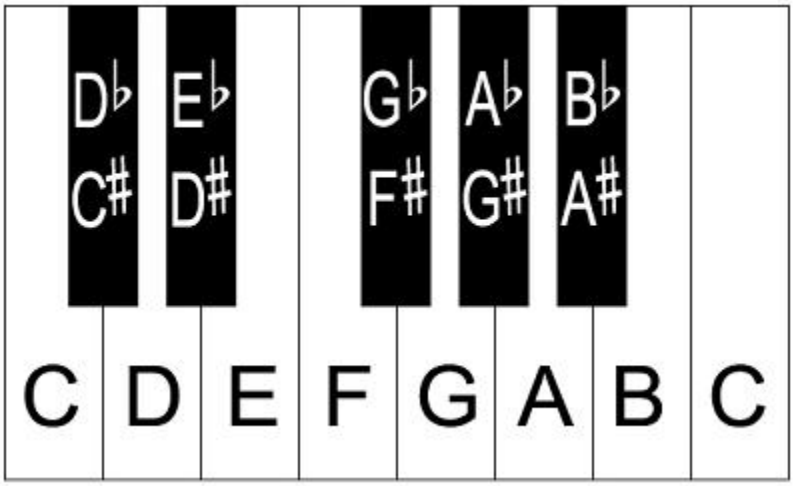
Don't let the word "theory" worry you in music theory, this will be a fun look at topics like *"why are there 12 notes?"* (in western music), *"what does ii–V–I mean, and where do we see that a lot?"* and *"what chord progression is used in 1000s of songs?"* Also *"why does a note played on a piano sound different than on a violin?"*

About 40 minutes, with videos (about 23 minutes of video) [10:00 + 0:15 + 3:25 + 1:15 + 0:30 + 7:30]

12 Tone Music

Western music uses 12 tones which are most easily shown on a keyboard. The 7 white keys and 5 black keys total 12 tones. The step between each key is known as a half step, between 2 keys is a whole step.

The interval between tone 1 and tone 13 is called an **octave**. In the example below that is C to C. The higher tone is exactly twice the wavelength of the lower one, so your ear hears that as the same tone, but higher up (A3 = 220 hz, A4 = 440 hz). [aside: Adam Neely on 440 hz vs 432 hz debate]
Because of that, the octave is a given, **but why are there 12 divisions between each octave and what are those divisions?** It did not have to be 12, it could have been some other number. Why was 12 chosen?



BTW the letter names really begin on A: **A B C D E F G** **A4 is 440hz** (see A440 (pitch standard).
Note that all strings in an orchestra have an A string (see Why do orchestras tune to an 'A'?)
A sharp (**♯**) raises the note by a half step, a flat (♭) lowers it by a half step. (F♯ = G ♭ but which to call it?)

David Bennett Piano: Why Does Music Only Use 12 Different Notes? play to 10:00
After 10:00 it goes into temperament where standard tuning used is not "just intonation" (the ratios discussed in the video), but rather 12 tone equal temperament is used, where the frequency jump between each note is the equal.

David Bennett Piano: Why is there no B# or E# on the piano?
Early music used only the major scale, black notes, ♯ and ♭ gradually got added in between as needed.

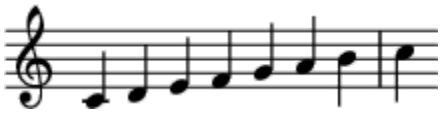
Two key components of music are **melody** and **harmony**. **Melody** means **scales**, or one note at a time. **Harmony** means **chords**, or multiple notes at a time. **Rhythm** is a third key component.

Scales

Major scale

https://en.wikipedia.org/wiki/Major_scale

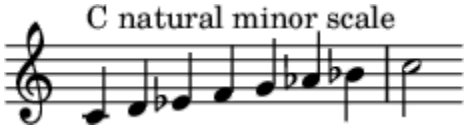
A major scale is a diatonic scale. (5 whole + 2 half steps). The sequence of intervals between the notes of a major scale is: **whole, whole, half, whole, whole, whole, half**



Minor scale

https://en.wikipedia.org/wiki/Minor_scale

There are actually 3 versions of the minor scale: **natural**, **harmonic** and **melodic**. Usually minor means **natural minor**. The intervals between the notes of a natural minor scale follow the sequence below:
whole, half, whole, whole, half, whole, whole



The flat 3rd is what really makes it minor. The flat 6th and 7th are what makes it the natural minor, which is the minor scale most often used.

Other scales:

Pentatonic *

Blues

* The Pentatonic scale works for soloing over anything. All guitarists learn this scale and sometimes it's the only scale they learn as it's all they need. Cmaj pentatonic: C D E G A Cmin pentatonic: C Eb F G Bb

The **Modes**:

Mode	Tonic relative to major scale	Interval sequence	Example
Ionian (Major *)	I	W–W–H–W–W–W–H	C–D–E–F–G–A–B–C
Dorian	ii	W–H–W–W–W–H–W	D–E–F–G–A–B–C–D
Phrygian	iii	H–W–W–W–H–W–W	E–F–G–A–B–C–D–E
Lydian **	IV	W–W–W–H–W–W–H	F–G–A–B–C–D–E–F
Mixolydian	V	W–W–H–W–W–H–W	G–A–B–C–D–E–F–G
Aeolian (Minor *)	vi	W–H–W–W–H–W–W	A–B–C–D–E–F–G–A
Locrian	vii^{ø}	H–W–W–H–W–W–W	B–C–D–E–F–G–A–B

* **Ionian** is the same as Major scale, **Aeolian** is same as Natural Minor scale
** **Lydian** (sharp 4th) is a beautiful uplifting sound found in a lot of movie scores.

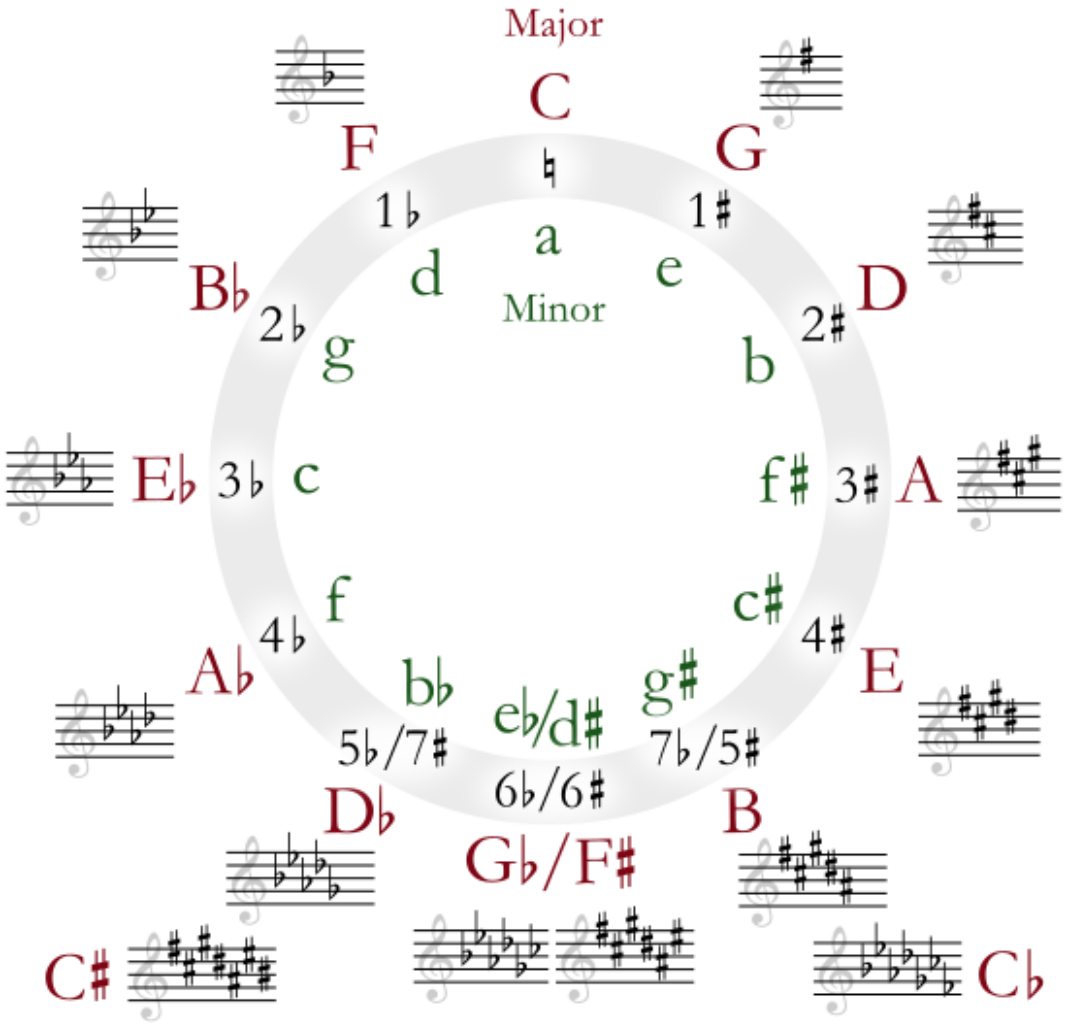
Rick Beato has great videos on the Modes. (Rick is my fav overall music channel)

The Lydian Mode | Why Film Composers and Rock Guitarists Love This Sound play short intro to 0:15

Also this is good: [The FASTEST Way To Learn MODES]

Oliver Prehn (New Jazz) on modes for piano:
[THE MODES: a Basic Introduction with a Crazy Continuation...]
New Jazz is my fav Piano site.

Circle of Fifths
"In music theory, the circle of fifths is a way of organizing the 12 chromatic pitches as a sequence of perfect fifths."
C D E F **G** A B C **D** E F ...etc C > G is a fifth, G > D is the next fifth, etc
1 2 3 4 **5** 6 7 8 **9** 10 11 ...etc note if you go around to the left, you go down a 4th for each position

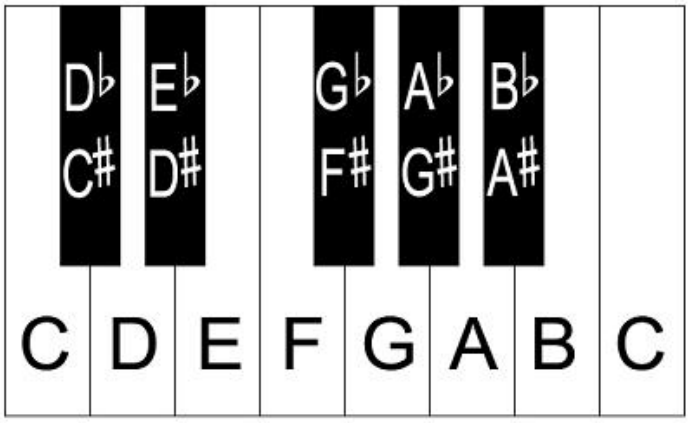


Order of sharps: **F C G D A E B** (**Father Charles Goes Down And Ends Battle**)
Order of Flats: **B E A D G C F** (**Battle Ends And Down Goes Charles' Father**)

Intervals and Chords

Scales are about single notes one at a time, which is melody. Intervals and chords are about multiple notes at once, which is harmony. An interval is the distance between two notes. A chord is 3 notes or more.

Interval examples (using C Major):
Major 3rd - C to E
Minor 3rd - C to E ♭
5th - C to G
7th - C to B



The simplest chords are **triads** which use the 1-3-5 of any scale.
C Major - C E G
A Minor - A C E
D Major - D F# G

Seventh chords are used a lot in Jazz. They simply add the 7th to the triad, so 1 3 5 7
C Major 7th - C E G B
The **dominant 7th** is also used a lot, which adds a flat 7 instead of &
C7 - C E G B ♭

Chord progressions

Notation is done in Roman numerals, upper case is major, lower case is minor. (BTW this is something you see in pop and jazz all the time, but not classical).

I V vi IV (1-5-6-4) progression
Example: **C G Amin F** (key of C major) C=1 G=5 Amin=6 F=4
Many, many pop songs use this progression. **Let It Be** is perhaps most famous.

David Bennett Piano: 7 super common chord progressions and why they work play 0:20 - 3:45
^ great explanation of this

Pianote: The 1-5-6-4 Chord Progression (Piano Lesson)
https://www.youtube.com/watch?v=8n7LsgFfFC4

ii–V–I (2-5-1) progression
Example: **Dmin G C** (key of C major)
Very common in Jazz songs, **Autumn Leaves** is a great example play to 0:59 - 2:11

Pianote: The 2-5-1 Chord Progression (Jazz Piano 101)
https://www.youtube.com/watch?v=EZsHfvzPxuI

David Bennett Piano: Songs that use 2 5 1 chord progressions
https://www.youtube.com/watch?v=6y-LoytFckI&t=248s

Other:

David Bennett Piano: Songs to help you recognise chords in a progression
https://www.youtube.com/watch?v=fxNRcKnMF-c

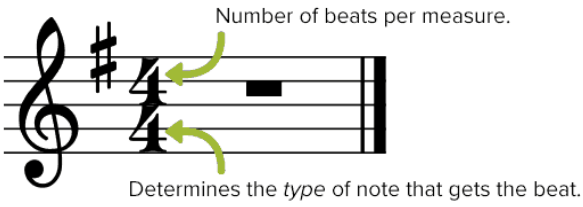
Pianote: The Three Most Popular Chord Progressions (Full Piano Lesson)
https://www.youtube.com/watch?v=v9koZrHEDvI&t=887s

Chordify: Upload songs and get the chords
https://chordify.net/

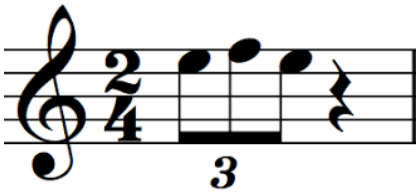
Tonal Harmony Vs Modal Harmony
Everything above was about tonal or "functional" harmony. See below about modal harmony.
Classic examples of modal songs are: So What (Miles Davis), Maiden Voyage (Herbie Hancock).
Modern Jazz - Tonal vs Modal Harmony
Modal Jazz Explained - Improvisation and Harmony
Briefly, this is the deal with this:
With tonal or "functional" harmony, chords are set up for tension and release, thus they have a function. For example, in a 2 5 1 progression (D G C for example), the 2 is "pre dominant" and wants to resolve to the 5, and the 5 is "dominant" and wants to resolve to the 1. In modal harmony, chords don't feel like they need to resolve to anything, they just hang there while a solo is played or whatever. To understand why this is, watch those videos.

Rhythm

Not getting into this much, but briefly, time signature is what indicates the rhythm of music.
The top number indicates how many beats there are per measure and the bottom number indicates that note gets a value of one beat. By far the most common is 4/4 where there are 4 beats per measure and the quarter note (4) gets one beat.



Within any time signatures, notes can also be grouped, which is called a tuplet . A common example is a triplet. In the example below, there are 4 beats per measure, a half note (2) gets one beat, but here we see that for the first beat the half note is replaced by a triplet of notes, which means each of those notes gets 1/3 of a beat.



For a really crazy example of tuplets, see the drumming in Frank Zappa's The Black Page #1 play 0:30 which has a 4/4 time signature, but is crazy hard to play because of all the odd note groupings.

About Sound

Why does a note played on a piano sound different from the same note played on a violin?

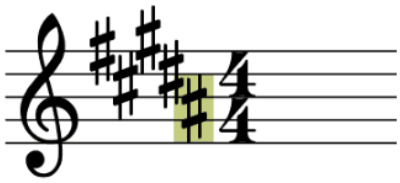
Andrew Huang: The most mind-blowing concept in music (Harmonic Series) play to 7:30
(yes, he says "mind blown" a lot, but when he says it, it means something)

Andrew Huang is a great channel for music: Learn music theory in half an hour.

For those learning music:

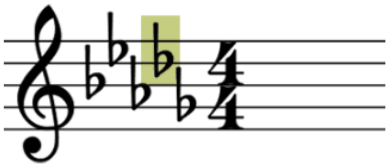
How to quickly find the key of a key signature:

Major Keys - Sharps



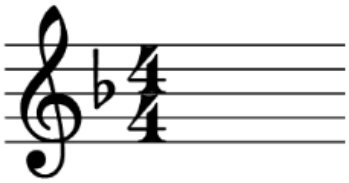
To determine the major key, **go one half-step up from the last sharp listed**.
In this example, an A-Sharp is highlighted. One half-step up from A-Sharp is B.
The key is B Major.

Major Keys - Flats



With flat key signatures, all you have to do is **look to the second flat from the right** to determine the major key. In the example above, notice that a D-Flat is highlighted in green. And just like that, D Flat Major is the key! No additional steps required!

There is one catch with this trick. Since the key of F Major only has one flat, it's impossible to locate the second flat from the right in that key signature. So just like you'll have to wire C Major and A Minor into your brain with no extra help (both all white keys), you'll have to do the same for F Major.

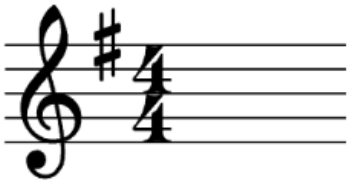


— F Major only has **one** flat: B-flat.

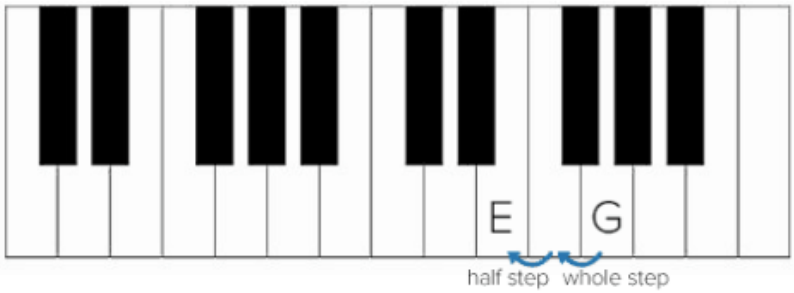
Minor Keys

To determine the minor key, simply **go down a minor third from the major key**.

Say you are given the key signature below:



We can determine by using the trick we learned earlier that one half-step up from F Sharp is G, therefore we are in G Major. Now, **to find the relative minor key, find the note a minor third below G**.

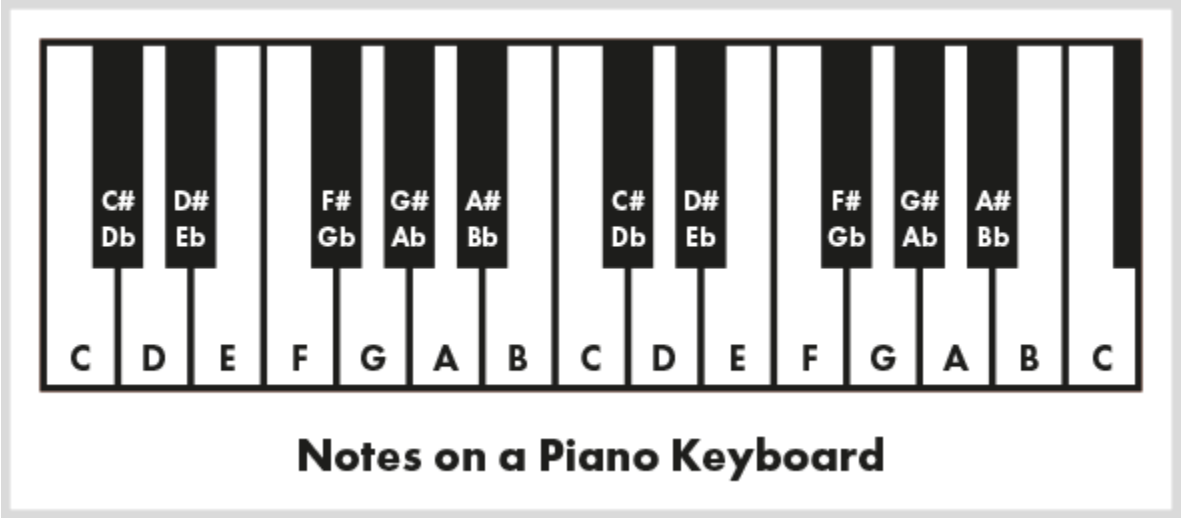


Looking at the image above, you can determine that the relative minor key for G Major is E Minor.
If this method is a little too confusing, you can also **find the relative minor by determining the sixth scale degree in the major key**. E is the sixth note (or scale degree) in the G Major scale.

So to find the minor scale is either:

- go up to the sixth (examples: G to E or C to A)
- go down a minor third: (examples: D to B or F to D)

Reference the keyboard below.



More

How to Play Jazz: An Overview of Jazz Theory

^ best overall overview of how to play Jazz

Tonal Harmony Vs Modal Harmony

Modal Jazz Improvisation & Harmony

Mediants
3 and 6 are the diatonic mediants, for example Emin and Amin for Cmaj
Emin (3) = mediant Amin (6) = submediant
But there are also 6 chromatic mediants: Emaj, Ebmaj, Ebmin, Amaj, Abmaj, Abmin
Why Top Composers Use Chromatic Mediant Modulations
Moving from Cmaj to the chromatic mediants are beautiful, used in film scores a lot.

Chord Scale Relationships: What's the Best Scale to Play With Each Chord?

Cmaj7 & Cmaj9 - C major Scale/C Lydian

Cmaj#11 - C Lydian (C major w/ #4)

C Augmented(#5) & Cmaj9#5 - Lydian Augmented (Lydian w/ #5)

Cmin7 - Dorian (Major scale w/ b3, b7)

Cmin maj7 - Melodic Minor Scale (b3)

Cmin 6 & Cmin 6/9 - Melodic Minor (Also Dorian for a b7 and 6 tension)

C7 (dominant) - Mixolydian (Major Scale w/ b7)

C9 (#11) - Lydian Dominant Scale (Major Scale w/ #4 & b7)

C7 Altered (#9, #5) - C Altered Scale (Melodic minor 1/2 step above the key ex. C Major -> C# Melodic Minor starting at C) & Half-Whole Diminished Scale (Root-Half-Whole-Half-Whole-Half-Whole-Half-Whole)

Cdim - Whole-Half Diminished Scale (Root-Whole-Half-Whole-Half-Whole-Half-Whole-Half)

C Half Diminished (Cmin7b5) - Locrian Scale (Major scale Half-step above ex. C Locrian -> C# Major Scale starting at C)

C Half Diminished 9 (Cmin9b5) - Locrian #2 Scale (Major w/ b3, #4, #5, b7, but natural 2, also known as a Locrian with a #2)

Other examples:

F 13sus (F13, replacing Ab or minor 3rd with the 4) - F Mixolydian