Music theory & reading music

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Contents

The note names and how to find the notes on a piano keyboard

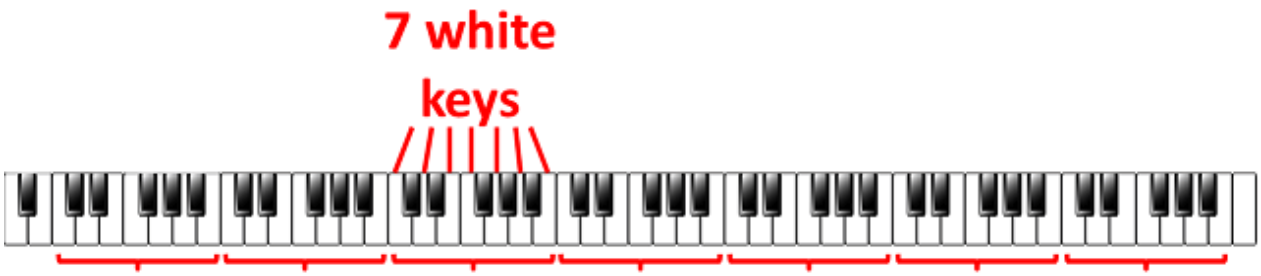
What are the music note names that are used in Western music?

In Western music, we can distinguish 12 different notes. Every song or piece of music is made of only those 12 different notes.

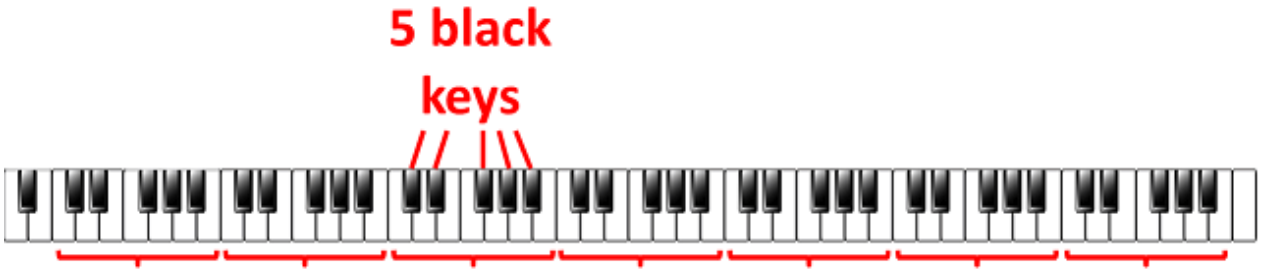
The easiest way to show the 12 notes is on a piano keyboard. On the keyboard, you can see a repetitive pattern of white and black keys.

One such a pattern consists of 12 keys,

7 white keys:



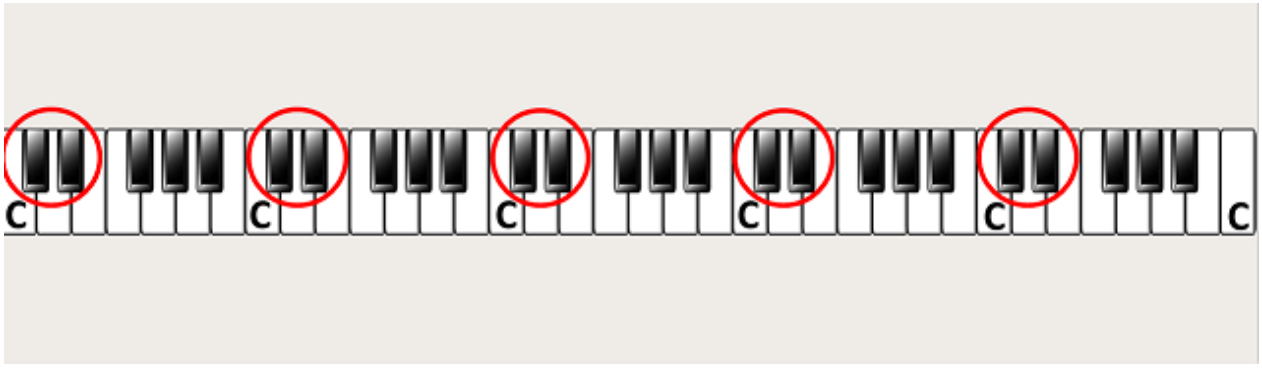
and 5 black keys:



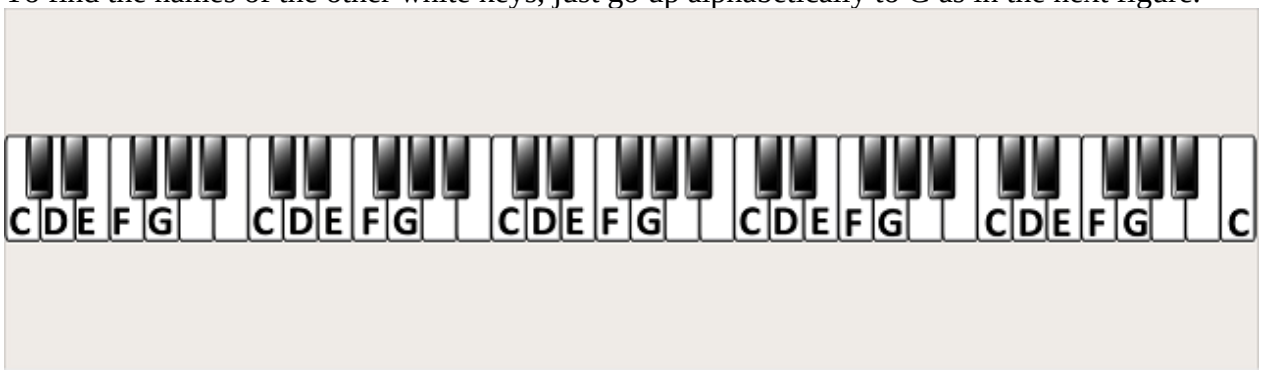
Those are exactly the 12 different notes in Western music we spoke of above.

The note names of the white keys

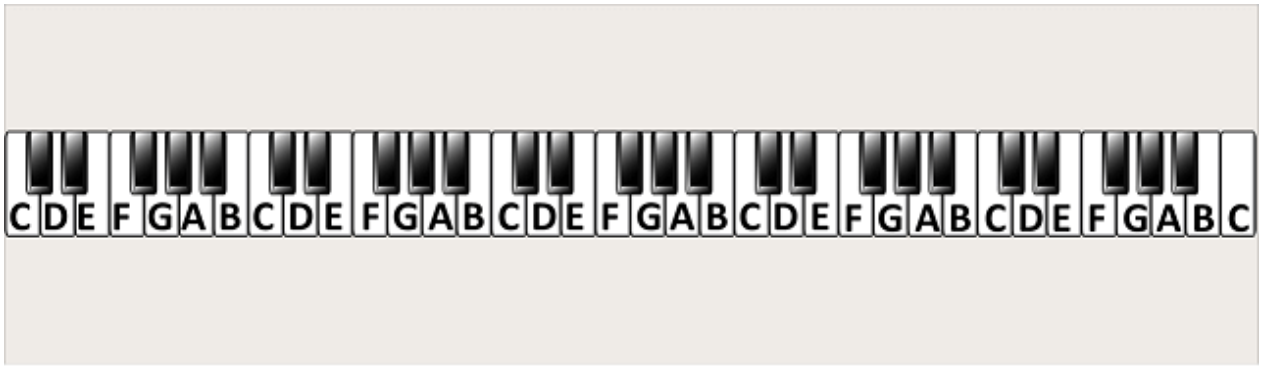
This might sound funny, but to find the names of the white keys, look first at the black keys: they come in groups of 2 black keys and 3 black keys. Just at the left of a group of 2 black keys you can find the note C.



To find the names of the other white keys, just go up alphabetically to G as in the next figure.



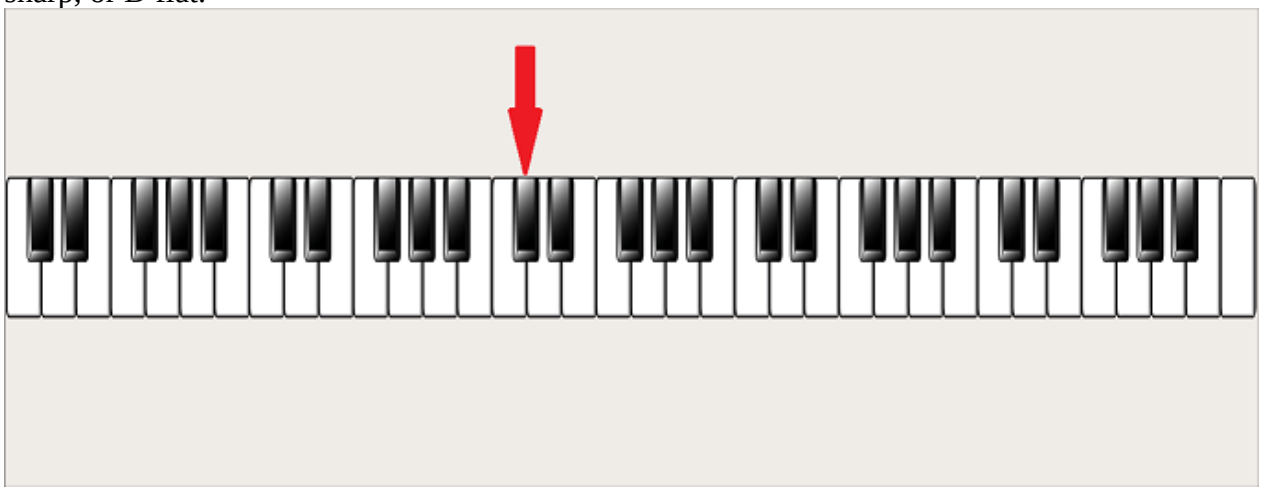
Now, we have to name 2 more white keys. Notice that we've used the letters C to G in alphabetical order, but we haven't used the 2 first letters of the alphabet yet. So, let's use them for the 2 missing keys, as follows:



The note names of the black keys

Do you remember that we had to look at the black keys first to find the names of the white keys? Well, let's reverse the roles now: to find the names of the black keys, we have to look at the white key names first, since the names of the black keys are derived from the white key names.

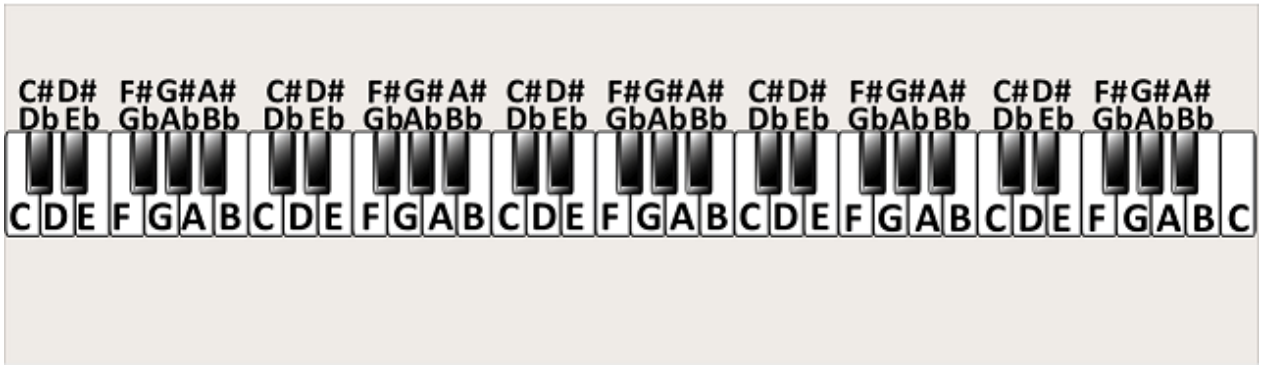
As you can see, a black key is always situated between 2 white keys. The black key indicated by the arrow in the figure below is for example between the C and the D. As this note is higher than the C, but lower than the D (the pitch of the notes gets higher when you go from left to right), we call this note C sharp, or D flat.



So, sharp means: the note just at the right, and flat means: the note just at the left. We write C sharp as C# and D flat as Db.

So, the black keys actually have 2 names, the name of the white key at the left with a sharp (#) sign, or the name of the white key at the right with a flat (b) sign.

In the next figure, you can see all the names of the notes on a piano keyboard.



As you can see, this is a pattern of 12 different notes (represented on the piano by 7 white keys and 5 black keys) that repeats itself.

Double sharps and double flats

Btw, notice that on the right side of the B and on the right side of the E, there is no black key. So you could call the C also B#, and the F an E#. Or, in the same way, you could call the B a Cb and the E an Fb. In music theory, this is sometimes needed (the 7th note in the F# major scale is an E#, not an F, even if it is exactly the same note). It is even possible to have double flats (bb) or double sharps (##). For example, a C## is raised 2 times, so this is equivalent to a D. A shorter writing for double sharp looks a bit like an x (see figure below), so Cx would be the same note as C## or just simply D.

Enharmonic equivalent

Two notes that are written differently, but that are actually one and the same note, are called enharmonic equivalent notes.

C# and Db are for example enharmonic equivalent notes: they are written differently, but are the same note.

Other examples:

- A# and Bb
- E# and F
- F## (or Fx) and G
- Bbb and A
- etcetera

After this lesson, you should be able to recognize the keys of the piano and know the names of the corresponding notes. In the beginning, you will probably not remember every note and every key on the piano, so just practice 5 minutes a day and you will see: in no time you will master it.

The exercises that are accessible via the links below will certainly help you to practice the notes.

Recommended exercises for music note names

Which note is played on the piano?

Place the note on the right key of the piano

Where is middle C on the piano or keyboard?

From all the C's on the piano, there's only one that is the middle C. The middle C is, as you guessed already, a C that doesn't sound (very) low nor (very) high. It sounds, well, in the middle… But where is middle C on a piano or keyboard? That depends on the piano or keyboard, as we will see later.

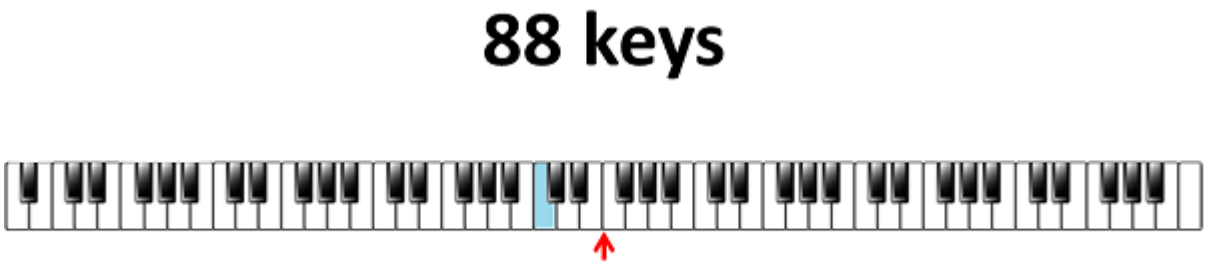
Where is the middle C?

The location of the middle C on a piano or keyboard depends on the number of keys that your instrument has. An acoustic piano normally has 88 keys. An electronic keyboard however has not necessarily always 88 keys. There are keyboards with 76, 73, 61 or 54 keys, and even other numbers of keys exist. As a general rule: the middle C is the C that is nearest to the exact middle of the keyboard.

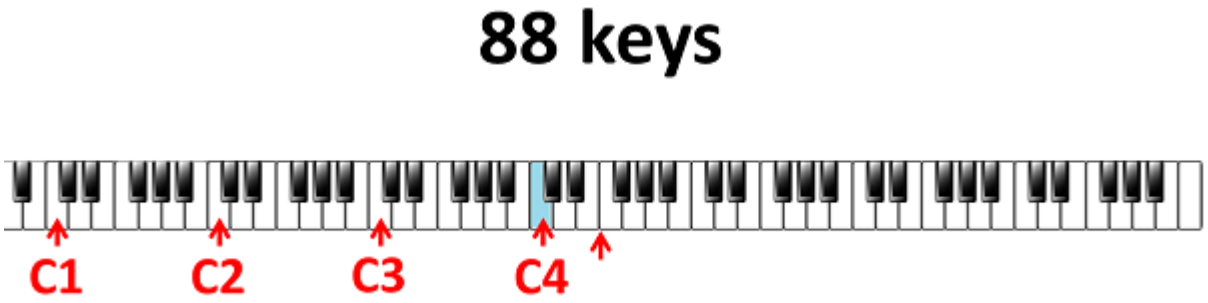
Let me illustrate this with some keyboard-examples.

The middle C on an 88-key piano (most acoustic pianos)

To find the middle C on an 88 key piano or keyboard, look for the exact middle of the keyboard. Since the keyboard has 88 keys, this is between key 44 and 45 (red arrow in figure). The middle C (highlighted in blue) is the C nearest to the exact middle of the piano.

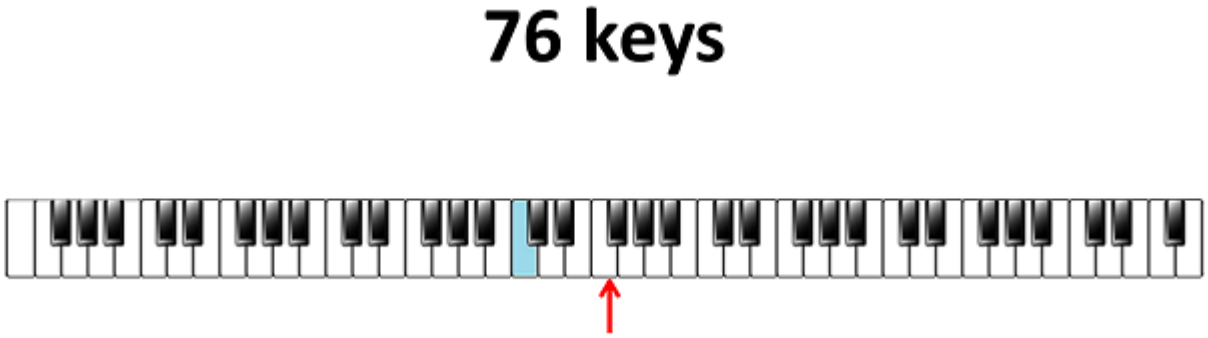


On an 88 key piano or keyboard, the middle C is the 4th C from the left of the keyboard.



The middle C on a 76-key piano

The exact middle of a 76 key piano is shown in the next figure. In the same figure, the middle C – which is the C nearest to the middle of the keyboard- is also indicated.



The middle C on other keyboards

As mentioned above, the general rule states: the middle C is the C that is nearest to the exact middle of the keyboard. And, to be honest, it's normally not even necessary to count the number of keys, divide by 2, look for the nearest C, etcetera: with a little bit of feeling, you can see at a glance which C is the middle C.

Intervals

When you play 2 different notes at the same time or one after the other, you will have a lower and a higher note. This means there is a distance (in pitch) between the 2 notes. This distance is called the interval between the 2 notes, the note interval, or simply interval.

You can measure these intervals between notes in number of semitones, and this takes us directly to our first interval: the semitone.

The semitone

The easiest way to explain semitones is to look at the piano keyboard. A semitone is the interval from a key on the keyboard to the first note at the left or the right. So, for example, the interval from C to C# (or Db) in the next figure is a semitone.

Or, for example from G# (or Ab) to A:

It's also possible to have a semitone between 2 white keys; this is the case between E and F and between B and C:

Notice that it's not possible to have an interval of a semitone between 2 black keys on the piano.

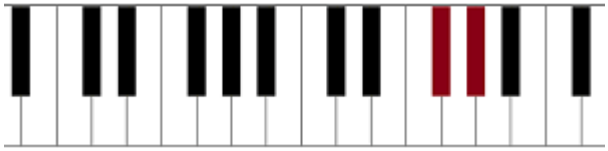
Other names for a semitone are: half tone or half step.

The whole tone

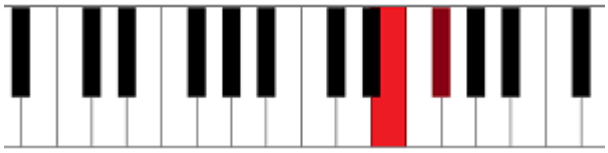
The whole tone, or also called whole step, is an interval that consists of 2 semitones. Here are some examples of a whole tone:

From C to D:

From F# (or Gb) to G# (or Ab):



From E to F# (or Gb):



From Bb (or A#) to C:

Intervals from C to other ‘white key-notes’

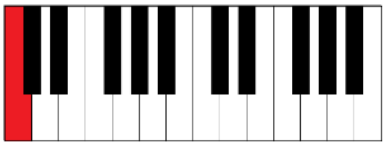
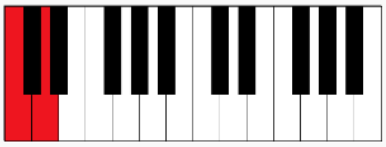
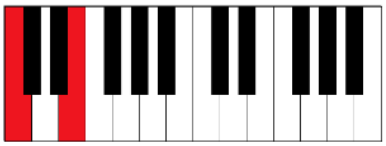
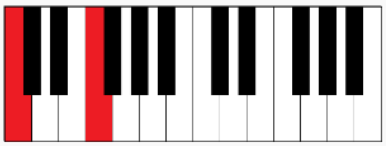
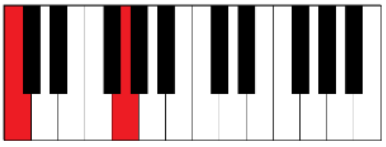
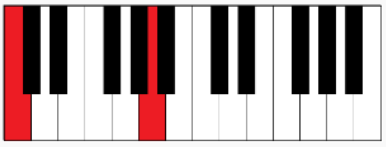
Let’s take a look at the intervals from C to the other white keys on the piano up till the next C. Those notes are the notes from the C major scale (as you will learn later).

- When we call C the first note, D the second note, E the third note and so on, then the interval from C to the second note (D) is simply called ‘second’. The interval from C to the third note (E) is called ‘third’. And so on…
- The interval from C to the eighth note (C) is not called ‘eighth’, but ‘octave’.
- The interval from C to itself is called ‘’unison’.

In the table below, you can see an overview of all those intervals:

Note 1: the interval from C to D is not called ‘whole tone’ in this table, because ‘whole tone’ is actually an alternative name, where ‘second’ is more an official name. However, ‘whole tone’ is used more often than ‘second’.

Note 2: it might seem strange to call the unison an interval, since there is no distance between a note and itself. You could however call this a distance of 0 (semitones).

Interval on piano keyboard:	Interval between the notes:	Distance in (whole) tones:	Name of the interval:
	C-C	0	unison
	C-D	1	second
	C-E	2	third
	C-F	2½	fourth
	C-G	3½	fifth
	C-A	4½	sixth
	C-B	5½	seventh
	C-C	6	octave

All the intervals from C

Let's also include in the table the intervals from C to the notes on black keys on the piano.

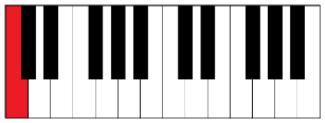
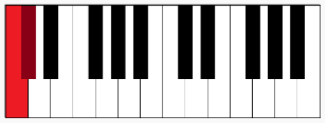
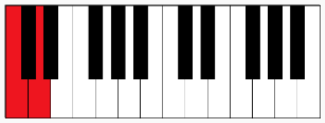
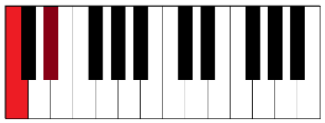
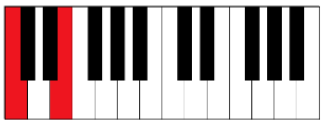
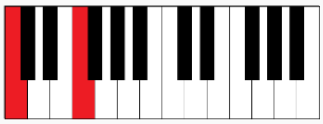
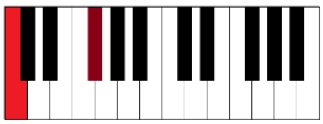
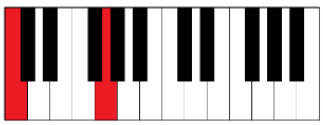
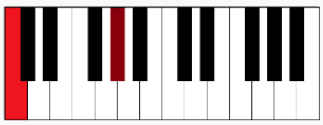
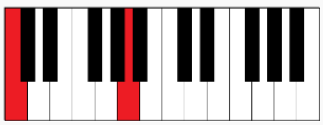
To do so, we have to introduce **perfect intervals**, **major intervals** and **minor intervals**.

Actually, in the table above, the unison, the fourth, the fifth and the octave are all **perfect intervals**. So, we speak of the perfect unison, the perfect fourth, and so on (even if we often omit the term 'perfect', and we just say unison, fourth, … etcetera).

All the other intervals in the table above are **major intervals**, so: major second, major third, major sixth and major seventh. The **minor intervals** will appear between C and the 'black notes' (table below).

In order to complete the table below, we have to follow the next rules:

- When a major interval is reduced by a half tone, it becomes a minor interval (this is not possible for a perfect interval). For example, when a major 3rd interval (C-E) is reduced by a half tone, it becomes a minor 3rd interval (C-Eb).
- Perfect intervals and minor intervals can be reduced by a half tone, they then become diminished intervals. For example, when a perfect 5th (C-G) is reduced by a half tone, it becomes a diminished 5th (C-Gb).
- Perfect intervals and major intervals can be increased by a half tone, they then become augmented intervals. For example, when a perfect 5th (C-G) is increased by a half tone, it becomes an augmented 5th (C-G#).

Interval on piano keyboard:	Interval between the notes:	Distance in number of (whole) tones	Interval name (perfect/major/minor):	Interval name (diminished/augmented):	Alternative name(s):
	C-C	0	perfect unison		
	C-C#	½		augmented unison	half tone, semitone, half step
	C-Db	½	minor second		half tone, semitone, half step
	C-D	1	major second		whole tone, whole step
	C-D#	1½		augmented second	
	C-Eb	1½	minor third		
	C-E	2	major third		
	C-F	2½	perfect fourth		
	C-F#	3		augmented fourth	tritone
	C-Gb	3		diminished fifth	tritone
	C-G	3½	perfect fifth		
	C-G#	4		augmented fifth	
	C-Ab	4	minor sixth		
	C-A	4½	major sixth		
	C-A#	5		augmented sixth	
	C-Bb	5	minor seventh		

Now, I can imagine that all this looks quite difficult, especially when you're a beginner and you see all those interval names for the first time.

In that case: don't worry: we will, especially in the beginning, not use all those interval names. So, don't start learning the table above by heart, but limit yourself to the next intervals:

- Half tone (also called: semitone or half step)
- Whole tone
- Minor 3rd
- Major 3rd
- Perfect 4th
- Perfect 5th
- Major 6th
- Minor 7th
- Major 7th
- Perfect octave

And, as I said before, I normally speak of the 4th, 5th and octave and not of perfect 4th, perfect 5th and perfect octave.

When you start learning about diminished chords, you should also know what a diminished 5th and a diminished 7th is, but that's for later…

Note: We normally call the notes after their interval they make with the root (the root is the starting note, in our example the root is the note C (you will learn more about this in the major scales)). So, when the root is C, then the note E is called the major 3rd. So, 'major 3rd' is then not only the name of the interval (from C to E), but also of the note E (but only when the root is C!).

Intervals from another root note than C

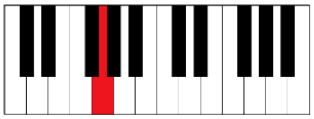
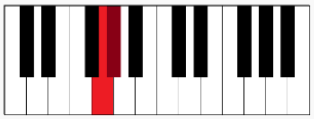
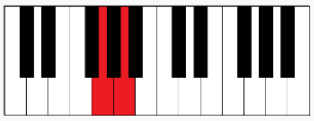
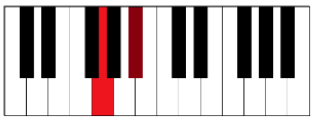
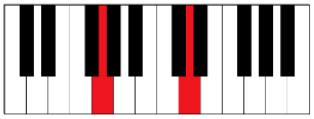
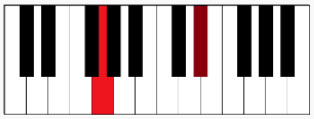
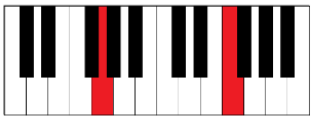
Till now, we've only seen the intervals in the C major scale, so intervals from the root note C. How does this work in other major scales, or said in another way: how does this work from another root note than C?

Let me take as an example the root note G. So, we're then looking for all the intervals from G to other (white and black) notes up till the next G an octave higher.

When you already know how major scales 'work', you can simply look at the G major scale: from G to the second note of the G major scale (A) is the major 2nd, from G to the third note of the G major scale the major 3rd, to the fourth note the perfect 4th, and so on… Watch out: the major 7th is now on a black key, the F#.

When you still don't know how major scales 'work', then just look at the number of tones in the second table and apply that from the note G.

The result is shown in the table below:

Interval on the piano keyboard:	Interval between the notes:	Distance in number of (whole) tones:	Interval name (perfect/major/minor):	Interval name (diminished/augmented):	Alternative name:
	G-G	0	perfect unison		
	G-G#	½		augmented unison	half tone, semitone, half step
	G-Ab	½	minor second		half tone, semitone, half step
	G-A	1	major second		whole tone, whole step
	G-A#	1½		augmented second	
	G-Bb	1½	minor third		
	G-B	2	major third		
	G-C	2½	perfect fourth		
	G-C#	3		augmented fourth	tritone
	G-Db	3		diminished fifth	tritone
	G-D	3½	perfect fifth		
	G-D#	4			
	G-Eb	4	minor sixth		
	G-E	4½	major sixth		
	G-E#	5		augmented sixth	
	G-F	5	minor seventh		
	G-F#	5½	major seventh		

One further step

When you're already more advanced in music (theory) and you want to know more about intervals, then keep reading. When you're a beginner, then just scroll down to the bottom of this page where you will find interactive exercises about intervals.

In the first lesson (about note names) I told you already something about double sharps and double flats.

As you know, C and Dbb are the same note on the piano. Does this mean that the interval between C and Dbb is the same interval as the interval between C and C, so a unison?

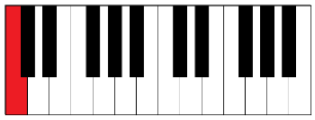
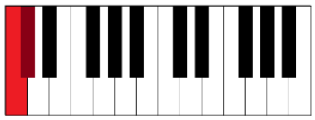
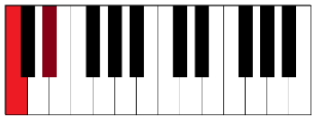
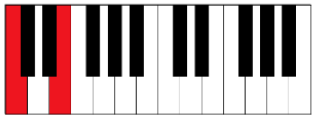
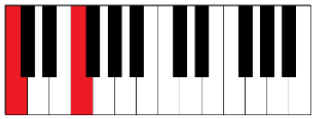
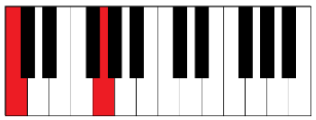
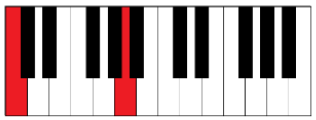
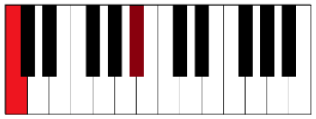
No. The interval from C to Dbb is not called a unison. We call this interval a diminished 2nd.

But why second? This is because Dbb is based on the note D: it is a D that has been lowered twice by a half tone: From C to D is a major 2nd, from C to Db a minor 2nd, so from C to Dbb a diminished 2nd.

Now, to be honest: you will almost never see the name 'diminished 2nd', but officially it exists.

But, for example a diminished 7th occurs often in music, for example in the C diminished chord. A diminished 7th is a half tone lower than a minor 7th, so a half tone lower than Bb (when C is the root note). This makes the diminished 7th in the key of C the note Bbb, which is on the piano the same note as the A.

We can now extend our table as follows (from the root C):

Interval on the piano keyboard:	Interval between the notes:	Distance in number of (whole) tones:	Interval name (perfect/major/minor):	Interval name (diminished/augmented):	Alternative name:
	C-C	0	perfect unison		
	C-Dbb	0		diminished second	
	C-C#	½		augmented unison	half tone, semitone, half step
	C-Db	½	minor second		half tone, semitone, half step
	C-D	1	major second		whole tone, whole step
	C-Ebb	1		diminished third	whole tone, whole step
	C-D#	1½		augmented second	
	C-Eb	1½	minor third		
	C-E	2	major third		
	C-Fb	2		diminished fourth	
	C-E#	2½		augmented third	
	C-F	2½	perfect fourth		
	C-F#	3		augmented fourth	tritone
	C-Gb	3		diminished fifth	tritone
	C-G	3½	perfect fifth		
	C-Abb	3½		diminished sixth	
	C-G#	4		augmented fifth	
	C-Ab	4	minor sixth		
	C-A	4½	major sixth		
	C-Bbb	4½		diminished seventh	
	C-A#	5		augmented sixth	
	C-Bb	5	minor seventh		

It's very practical to be able to quickly recognize intervals. For that reason, I advise to do the exercises below.

Recommended exercises for note interval

Which interval is played on the piano (from C)?

Which interval is played on the piano (from any note)?

Inversions

Let me start with the example of the perfect 5th interval from C to G, as indicated on the next keyboard:

You can make an inversion of this perfect 5th interval by either taking the highest note and move it an octave down, or by taking the lowest note and move it an octave up. In the keyboard below, you see the highest note that was moved an octave down. Whether you move the highest note an octave down, or the lowest note an octave up, the result is the same: the inversion of the perfect 5th interval from C to G is a perfect 4th interval from G to C.

So, a perfect 4th interval is the inversion of a perfect 5th interval. The reverse is also true: a perfect 5th interval is the inversion of a perfect 4th interval. Together they add up to an octave, because a perfect 5th (7 semitones) plus a perfect 4th (5 semitones) make together 12 semitones, an octave.

You can also see it the following way: when you want to go from C to G, you can either go up a 5th, or go down a 4th.

Inversions of other intervals

Now, this is not only true for the 'perfect 5th-perfect 4th pair'. Other pairs of intervals exist that act the same way. In fact, every interval has its inversion. For example, the inversion of the major 3rd interval from –let's say- E to G# is the minor 6th interval from G# to E. Also here, the intervals add up to an octave, because 4 semitones (major 3rd) plus 8 semitones (minor 6th) equals 12 semitones (an octave).

A special case is the tritone interval. The tritone doesn't need a partner, it just needs itself! A tritone splits an octave exactly in two equal parts, so a tritone just needs another tritone to make an octave.

A tritone consists of 6 semitones, so: 6+6=12, an octave!

Here's a list of intervals with their inversions:

Intervals with their inversion:

Perfect unison + perfect octave

Semitone (or minor second) + major seventh

Whole tone (or major second) + minor seventh

Minor third + major sixth

Major third + minor sixth

Perfect fourth + perfect fifth

Tritone + tritone

Notice that a perfect interval always goes together with another perfect interval and a minor interval always goes together with a major interval (and, of course, vice versa).

How to form a major scale

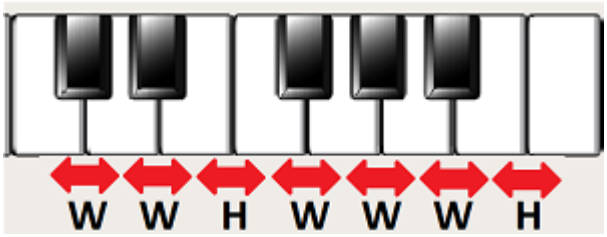
For piano players, the C major scale is the easiest major scale because it starts on C and consists of all the white notes up to the next C. So, the notes of the C major scale are: C D E F G A B C (this looks as if the scale has 8 notes, but since the C is played twice, the scale consists of 7 different notes).

Let's now look at the intervals between its consisting notes:

- From C to D: whole tone (**W**)
- From D to E: whole tone (**W**)
- From E to F: half tone (**H**)
- From F to G: whole tone (**W**)
- From G to A: whole tone (**W**)
- From A to B: whole tone (**W**)
- From B to C: half tone (**H**)

So, the intervals between the consecutive notes of the C major scale are:

W W H W W W H (see figure)



Since all major scales sound the same way, this structure is valid for all major scales. That means that the only difference between all major scales is their root (starting note). So we can use this structure to find out all the other major scales. Let me illustrate this with some examples:

The D major scale

Let's apply our 'formula' (W W H W W W H) to find the scale of D major.

- From **D**, a whole tone (W) up to **E**
- From E, a whole tone (W) up to **F#**
- From F#, a half tone (H) up to **G**
- From G, a whole tone (W) up to **A**
- From A, a whole tone(W) up to **B**
- From B, a whole tone (W) up to **C#**
- From C#, a half tone (H) up to **D**

So, the notes of the D major scale are: **D E F# G A B C# D**

Now, why did I call the 3rd and 7th notes F# and C# and not Gb and Db? Well, this is because we have to apply one of the following 2 rules (you can choose which rule to apply, since one rule implies automatically the other):

- Don’t use the same letter for 2 consecutive notes
- Don’t leave a ‘gap’ between 2 consecutive notes

Let me explain those rules:

Don’t use the same letter for 2 consecutive notes: Imagine that in the D major scale, I would have used Gb instead of F#. The first 4 notes of the scale would then have been: D E Gb G …

In this case, the letter G is used twice (even if the first has a flat sign), so this is against our first rule.

In the same way, you can show that you have to use C# instead of Db.

Don’t leave a gap between 2 consecutive notes: Again, imagine I would have used Gb instead of F# in the D major scale, so: D E Gb G …

Now, between E and Gb, there’s a ‘gap’ because we miss the letter F. We have therefore to use the letters in the order as they appear on the white keys of the piano keyboard.

The F major scale

When we apply our formula to find the F major scale, we get:

- From **F**, a whole tone up to **G**
- From G, a whole tone up to **A**
- From A, a half tone up to **Bb**
- From Bb, a whole tone up to **C**
- From C, a whole tone up to **D**
- From D, a whole tone up to **E**
- From E, a half tone up to **F**

Did you notice that the scale of F major has a flat note (the Bb), not a sharp? It cannot be an A# (just apply one of the rules mentioned above and you will see that the 3rd note in the scale of F major is a Bb, not an A#).

So, the scale of F major is: **F G A Bb C D E F**

The other major scales

With our formula (WWHWWWH), you can now find out yourself the other major scales. Since there are 12 different notes, that means that there are also 12 major scales.

When you do the scales in the order as listed below, you will see that each time you will get one extra sharp in the scale. Starting from the C major scale (0 sharps), move on to the G major scale (1 sharp), then the D major scale (2 sharps, as you have already seen before), etcetera, till you reach the scale of F# (6 sharps). And don't forget to apply one of the 2 rules (don't repeat letters & don't leave gaps). At the end of this lesson you will find the right solutions.

Order for the major scales with sharps:

C major (0 sharps)

G major (1 sharp)

D major (2 sharps)

A major (3 sharps)

E major (4 sharps)

B major (5 sharps)

F# major (6 sharps)

Notice that in the list above, we go up a 5^{th} in every step. So, starting with C major, every time you go up a 5^{th}, the major scale gets one extra sharp.

When done, then go to the list of major scales with flats.

Starting with C, every time you go a 5th down, you will get one extra flat in the scale. So, the list for the major scales with flats is:

C major (0 flats)

F major (1 flat)

Bb major (2 flats)

Eb major (3 flats)

Ab major (4 flats)

Db major (5 flats)

Gb major (6 flats)

Btw, instead of saying a 5th down, I could also have said a 4th up, this is explained in the lesson characteristics of intervals.

You might have noticed that the two lists have together 14 items. That's strange, because there are only 12 different notes, so also 12 different major scales. Well, as you can see, the C is repeated, so this eliminates already 1 item. When you look well at both lists, you can also see that the last item in list 1 is exactly the same as the last item in list 2: F# and Gb are enharmonic equivalent notes. So, they are exactly the same note, only written differently. When you found the right notes for both major scales, you will see that they consist of exactly the same notes, but written as their enharmonic equivalents.

All the major scales (solutions)

It’s time to check if you found the right major scales, so first the table with the major scales with sharps:

Root (first note)	Notes of the major scale
C	C D E F G A B C
G	G A B C D E F# G
D	D E F# G A B C# D
A	A B C# D E F# G# A
E	E F# G# A B C# D# E
B	B C# D# E F# G# A# B
F#	F# G# A# B C# D# E# F#

And now the table with the major scales with flats:

Root (first note)	Notes of the major scale
C	C D E F G A B C
F	F G A Bb C D E F
Bb	Bb C D Eb F G A Bb
Eb	Eb F G Ab Bb C D Eb
Ab	Ab Bb C Db Eb F G Ab
Db	Db Eb F Gb Ab Bb C Db
Gb	Gb Ab Bb Cb Db Eb F Gb

Compare the F# major scale from the first table with the Gb major scale from the second table: both scales are exactly the same, the notes are only written differently.

Note also the E#, which is enharmonic equivalent with F, and the Cb, the enharmonic equivalent of B.

Other enharmonic equivalent scales

You might have asked yourself: "Why are the Gb and F# scales listed as enharmonic equivalent scales and not for example Db and C#, or Ab and G#? Why are only the 'flat scales' listed?"

You will understand this better with the circle of fifths, but the short answer is: "Of course, you can make the C# major scale, the G# major scale and so on, but they have so many sharps (even double sharp notes), that they become difficult to handle." What would you prefer? The Ab major scale with 4 flats, or the G# major scale with 8 sharps? I think the choice is not so difficult...

It's of very big importance to know well your major scales. It will help you with all the other music theory if you can quickly come up with the right scale in all the 12 different keys. For that purpose, it's important to practice a lot. The exercise below is an excellent way to practice your major scales.

Recommended exercises for all major scales

Place the notes of a major scale on the piano

How to form a natural minor scale

First of all, why do I say '**natural** minor scale', and not simply 'minor scale' (I also called a major scale just 'major scale' without any other specification)?

This is, because there exists only one type of major scales, but there are 3 types of minor scales:

- the natural minor scale
- the harmonic minor scale
- the melodic minor scale

In this lesson, we talk only about the natural minor scale, in another lesson, I will talk about the other 2 minor scales.

The natural minor scale

When you know how to form a major scale, it's very simple to form a natural minor scale. Before telling you the general rule, let me first show you this with an example:

In this example I will show you how to form the A natural minor scale. Well, as I promised, it's very simple: the notes of the A natural minor scale are exactly the same as the notes of the C major scale, so only the white keys on the piano.

So the A natural minor scale is:

A B C D E F G A

The only difference is the starting note, the root: A natural minor starts on an A, where C major starts on a C. And that's all! Simple, isn't it?

Since A natural minor and C major share the same scale (only another starting note), we say that 'A minor is the **relative minor** of C major' and 'C major is the **relative major** of A minor'.

Now, every minor scale has its relative major scale, so the question now is: "How to find out which relative major scale belongs to a natural minor scale?"

Well, when you look at A minor/C major, you see that from A, when you go up a minor 3rd, you arrive at C.

So, when you want to find out –for example- what the C natural minor scale is, you have to go up a minor 3rd from C. A minor 3rd up from C brings us to Eb.

Eb major is the relative major of C minor and so they share the same scale. This means that the C natural minor scale is:

C D Eb F G Ab Bb C

The other natural minor scales

As an exercise, you could now try to find out all the other natural minor scales. The best way to start is perhaps with our list of major scales. Then start with a certain major scale, find its relative minor, and start on the root of that relative minor scale and you're done.

For example: start with the Db major scale. What's the relative minor of Db major? Well, now you have to go **down** a minor 3rd!

A minor 3rd (3 semitones) down takes us to Bb (not A#, because in the scale of Db, it's a Bb).

Another way to find the relative minor of a major scale is to look at the 6th note in the major scale: remember that the relative minor of C major was A minor. Well, A is the 6th note in the scale of C major.

OK, try to see if you can find the other natural minor scales. You will find the solutions just here below:

Tables with all the natural minor scales

First, the table with sharps:

Major scale	Relative minor	Natural minor scale	Number of sharps
C	Am	A B C D E F G A	0
G	Em	E F# G A B C D E	1
D	Bm	B C# D E F# G A B	2
A	F#m	F# G# A B C# D E F#	3
E	C#m	C# D# E F# G# A B C#	4
B	G#m	G# A# B C# D# E F# G#	5
F#	D#m	D# E# F# G# A# B C# D#	6

Followed by the table with flats:

Major scale	Relative minor	Natural minor scale	Number of flats
C	Am	A B C D E F G A	0
F	Dm	D E F G A Bb C D	1
Bb	Gm	G A Bb C D Eb F G	2
Eb	Cm	C D Eb F G Ab Bb C	3
Ab	Fm	F G Ab Bb C Db Eb F	4
Db	Bbm	Bb C Db Eb F Gb Ab Bb	5
Gb	Ebm	Eb F Gb Ab Bb Cb Db Eb	6

Notice that the D# natural minor scale (6 sharps) and the Eb natural minor scale (6 flats) are the same scales, only written differently (they are enharmonic equivalent).

Now, it's important to practice the natural minor scales. I advise you to do the exercise below.

Recommended exercises for natural minor scales

Place the notes of a natural minor scale on the piano

The circle of fifths

The circle of fifths (also called **cycle** of fifths) gives us a handy overview of the different scales and how they are related to each other.

How to form the circle of fifths

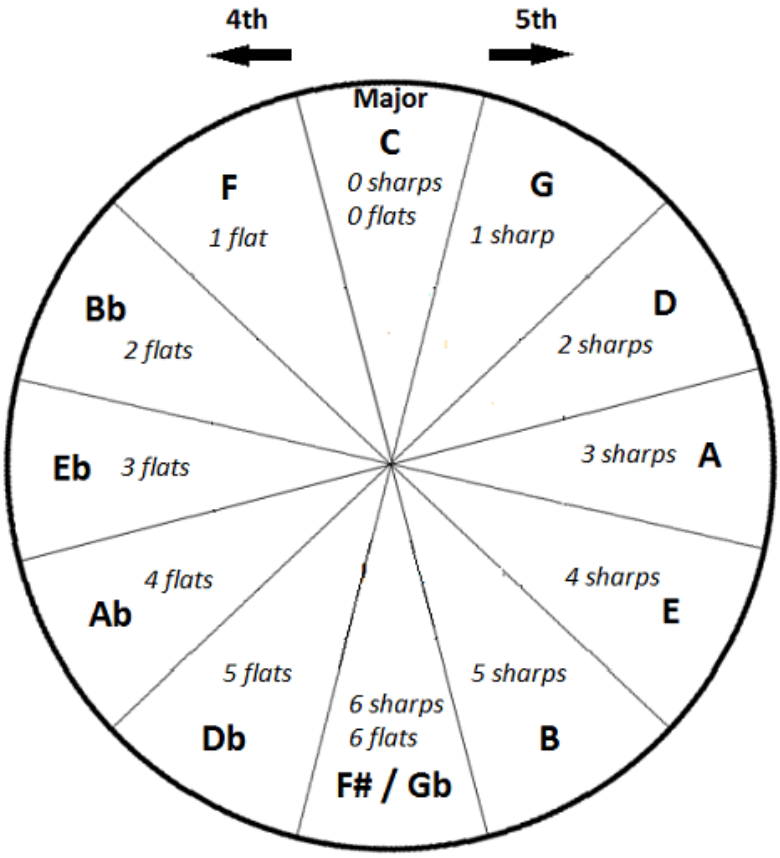
In the lesson 'How to form a major scale', I explained that starting from the C major scale, every time we take a major scale a fifth higher, the scale gets one extra sharp note. And, starting from C major, every time we go a fifth down (or a fourth up, which is basically the same), we get one more flat note in the major scale.

We could now display all the roots (starting notes) of the major scales in a row with C major (no sharps, no flats) in the middle. At the left of C, all the major scales with flats. Every step to the left would mean a fifth down (or a fourth up) and thus an extra flat note in the scale. At the right of C, all the major scales with sharps. Every step to the right would mean a fifth up (or a fourth down) and thus an extra sharp note in the scale.

Gb Db Ab Eb Bb F **C** G D A E B F#

It is important to realize that the most left scale (Gb) and the most right scale (F#) are actually the same scale, since Gb and F# are the same note, only written differently: they are enharmonic equivalent.

So that means that we could display this row with scales in a circle, as follows:

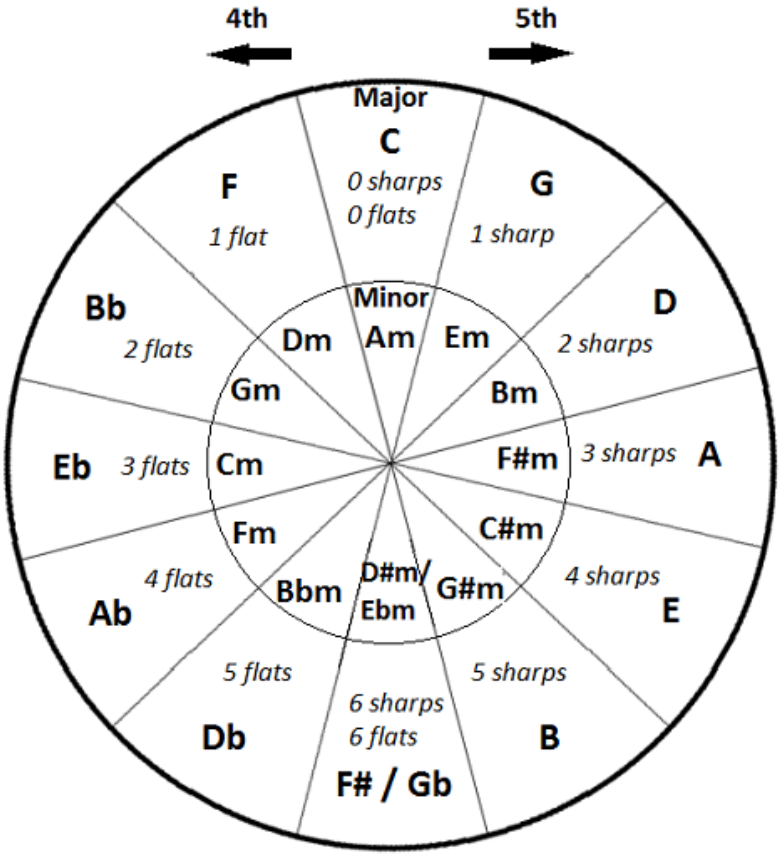


At the right side we have the major scales with sharps, on the left side the major scales with flats.

Every step clockwise in this circle (this would correspond with a step to the right in our row above) means a fifth up (or a fourth down). And every step counterclockwise a fifth down (or a fourth up). That's why we call this circle the 'circle (or cycle) of fifths'. Since a fifth up corresponds with a fourth down and vice versa, this circle is sometimes also called the 'circle (or cycle) of fourths.

The minor scales in the circle of fifths

Since a natural minor scale has exactly the same notes as its relative major scale, we can also put the natural minor scales in our circle of fifths. So, for example: since the A minor scale and the C major scale share the same notes, we can put them in the same place in the circle of fifths:



And see here our circle of fifths, which gives us a quick overview of the number of sharps and flats in every major and minor scale, plus an overview of relative minor/major relationships.

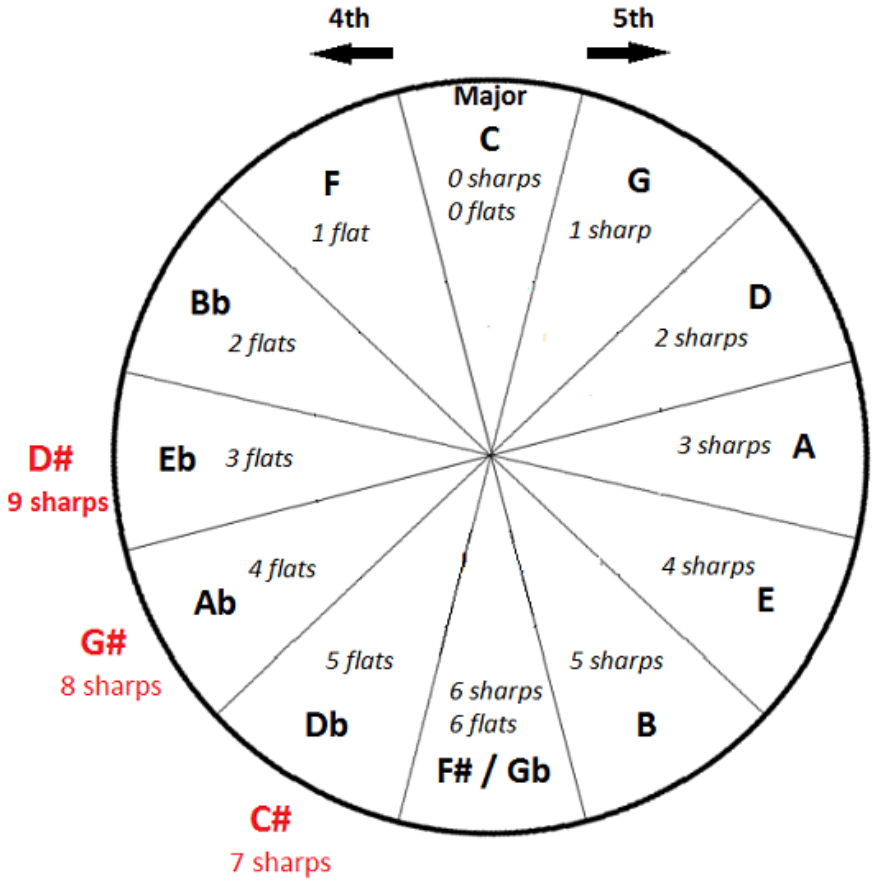
Why would I need a circle of fifths?

As mentioned above, the circle of fifths gives a good overview of sharps/flats and relative minor/major.

The circle of fifths is among other things very handy for example in transposing a song (I'll come back on this in a later lesson).

The circle of fifths also quickly shows us why the major scales that start on a black key on the piano are mostly written with flats instead of with sharps. Let me illustrate this with the Eb major scale, which has 3 flats.

Eb is enharmonic equivalent with D#, so let's look how the D# major scale looks like. First of all, in the circle of fifths, from F# I will go on clockwise to C#, G# and then to D# (so every step a fifth up). You can see that D# major has 9 sharps (wow!).



Let's, for fun, see how the D# major scale looks like (see also the lesson 'How to form a major scale'):

From **D#**, a whole tone (W) up to **E#**

From E#, a whole tone (W) up to **F##** (or Fx)

From F##, a half tone (H) up to **G#**

From G#, a whole tone (W) up to **A#**

From A#, a whole tone (W) up to **B#**

From B#, a whole tone (W) up to **C##** (or Cx)

From C##, a half tone (H) up to **D#**

So the D# major scale is:

D# E# F## G# A# B# C## D#

As you can see: a total of 9 sharps (don't count the D# twice)!

Compare this with the Eb major scale:

Eb F G Ab Bb C D Eb

Now, my question to you is: "Which scale do you prefer, the Eb major scale, or the D# major scale?" I think I know the answer… :-)

Major chords

How are major chords formed? The most important characteristic of a major chord is the major 3rd interval from the root (starting note) to the second chord note. We can have major triads and major chords with a 7th.

If you want to hear sound samples of the different chords, please refer to the lesson 'What is a chord? How do different chords sound?'.

Major triads

A major triad is made of the root (1st), 3rd and 5th note of the major scale. For example, the C (major) triad is formed by the root, the 3rd and the 5th note of the C major scale. So, the notes of a C major triad are: C, E and G. Notice the major 3rd interval between the root (C) and the E. The E is therefore called the major 3rd in the key of C.

Let's try another example: the A major triad. The root, 3rd and 5th in the A major scale are A, C# and E.

OK, one more example: the Eb major triad. The root, 3rd and 5th are Eb, G and Bb.

We write the major triad just with its root note, so the C major triad is simply written as C. The context will tell you if the symbol C refers to the single note C or to the C triad.

Major 7th chords

Major 7th chords are formed by a major triad with an extra note: the 7th note of the corresponding major scale. In the scale of C major, the 7th note is a B, so the C major 7th chord consists of the notes: C, E, G and B. Note that the interval of the root (C) to the 7th note in the scale (B) is a major 7th interval. That's why we call this chord the C major 7th chord. So, the word 'major' in the chord name refers to the major 7th (the B) of the scale, not to the major 3rd (the E). We write the C major 7th chord as: CΔ7, CMaj7 or CM7.

Let me take the 2 other triad examples to show you 2 more major 7th chords:

The A major triad was: A, C# and E. Add the major 7th of the A major scale, and AΔ7 consists of the notes A, C#, E and G#.

When you apply the same thing to Eb, you can see that EbΔ7 consists of the following notes: Eb, G, Bb and D.

Dominant or 7th chords

Instead of adding the major 7th to the major triad, we can also add the minor 7th to the major triad. The minor 7th in the scale of C is Bb (the minor 7th is the note that makes a minor 7th interval with the root). So the C dominant (or C seventh) chord consists of the notes C, E, G and Bb.

We write this chord as: C7.

Note: a major 7th chord is a major triad with a major 7th, but a 7th chord is a major triad with a minor 7th. So, we don't call this a minor 7th chord. A minor 7th chord is a chord based on a minor 3rd interval between the root to the second chord note. So here, the word 'minor' doesn't refer to the 7th, but to the 3rd. A bit confusing, I admit, but things are like that…

So, A7 consists of the notes A, C#, E and G (since G is the minor 7th in the key of A). And Eb7 consists of the notes Eb, G, Bb and Db.

All the other major chords

With the information in this lesson, you can now find out all the other major chords. Start with all the 12 triads, and then put the minor 7th or major 7th on top to find the dominant (7th) and major 7th chords. If you don't remember well all the major scales, then have a look at the lesson about major scales. For the major chords that have a 'black key root': take the roots that have a major scale with not more than 6 sharps or 6 flats (see 'How to form a major scale'). For the sake of completeness, I will also add the enharmonic equivalents with more than 6 sharps or flats in parentheses.

When you're finished, check your answers with the solutions below.

Triads

Major triad	Chord notes	Number of sharps/flats in the major scale
C	C E G	0
D	D F# A	2 sharps
E	E G# B	4 sharps
F	F A C	1 flat
G	G B D	1 sharp
A	A C# E	3 sharps
B	B D# F#	5 sharps
Db (C#)	Db F Ab (C# E# G#)	5 flats (7 sharps)
Eb (D#)	Eb G Bb (D# F## A#)	3 flats (9 sharps)
F# / Gb	F# A# C# / Gb Bb Db	6 sharps / 6 flats
Ab (G#)	Ab C Eb (G# B# D#)	4 flats (8 sharps)
Bb (A#)	Bb D F (A# C## E#)	2 flats (10 sharps)

Major 7th chords

Major 7th chord	Chord notes	Number of sharps/flats in the major scale
CΔ7	C E G B	0
DΔ7	D F# A C#	2 sharps
EΔ7	E G# B D#	4 sharps
FΔ7	F A C E	1 flat
GΔ7	G B D F#	1 sharp
AΔ7	A C# E G#	3 sharps
BΔ7	B D# F# A#	5 sharps
DbΔ7 (C#Δ7)	Db F Ab C (C# E# G# B#)	5 flats (7 sharps)
EbΔ7 (D#Δ7)	Eb G Bb D (D# F## A# C##)	3 flats (9 sharps)
F#Δ7 / GbΔ7	F# A# C# E# / Gb Bb Db F	6 sharps / 6 flats
AbΔ7 (G#Δ7)	Ab C Eb G (G# B# D# F##)	4 flats (8 sharps)
BbΔ7 (A#Δ7)	Bb D F A (A# C## E# G##)	2 flats (10 sharps)

Dominant (7th) chords

Dominant chord	Chord notes	Number of sharps/flats in the major scale
C7	C E G	0
D7	D F# A	2 sharps
E7	E G# B D	4 sharps
F7	F A C Eb	1 flat
G7	G B D F	1 sharp
A7	A C# E G	3 sharps
B7	B D# F# A	5 sharps
Db7 (C#7)	Db F Ab Cb (C# E# G# B)	5 flats (7 sharps)
Eb7 (D#7)	Eb G Bb Db (D# F## A# C#)	3 flats (9 sharps)
F#7 / Gb7	F# A# C# E / Gb Bb Db Fb	6 sharps / 6 flats
Ab7 (G#7)	Ab C Eb Gb (G# B# D# F#)	4 flats (8 sharps)
Bb7 (A#7)	Bb D F Ab (A# C## E# G#)	2 flats (10 sharps)

And now it's time to practice all that you've learned in this lesson. The exercises below are an excellent way to practice your skills.

Recommended exercises for major chords

If you don't know what chord inversions are, then do only the exercises in root positions. Otherwise, you can follow the lesson about inversions.

Major triads:

Place the notes of the major triad on the piano (only root positions)

Place the notes of the major triad on the piano (all the inversions)

Dominant chords:

Place the notes of the dominant chord on the piano (only root positions)

Place the notes of the dominant chord on the piano (all the inversions)

Major 7th chords:

Place the notes of the major 7th chord on the piano (only root positions)

Place the notes of the major 7th chord on the piano (all the inversions)

Mix of all chords (also minor!):

If you know how minor chords work, you can do also the following exercises. If not, look first at the minor chords lesson.

Place the notes of the chord (dominant/minor 7th/major 7th) on the piano (only root positions)

Place the notes of the chord (dominant/minor 7th/major 7th) on the piano (all the inversions)

Minor chords

How are minor chords formed? The most important characteristic of a minor chord is the minor 3rd interval from the root (starting note) to the second chord note. We can have minor triads and minor chords with a 7th.

If you want to hear sound samples of the different chords, please refer to the lesson 'What is a chord? How do different chords sound?'.

Minor triads

A minor triad is made of the root (1st), 3rd and 5th note of the minor scale. For example, the C minor triad is formed by the root, the 3rd and the 5th note of the C minor scale. So, the notes of a C minor triad are: C, Eb and G. Notice the minor 3rd interval between the root (C) and the Eb. The Eb is therefore called the minor 3rd in the key of C.

Two more examples:

- The A minor triad: the root, minor 3rd and 5th in the key of A are A, C and E, so the A minor triad is: A C E
- The Db minor triad: the root, minor 3rd and 5th in the key of Db are Db, Fb (enharmonic equivalent of E) and Ab, so the Db minor triad is: Db Fb Ab

Minor 7th chords

Minor 7th chords are formed by a minor triad with an extra note: the minor 7th. The minor 7th is the note that makes a minor 7th interval with the root note. The minor 7th in the key of C is Bb. So, the C minor 7th chord consists of the notes C, Eb, G and Bb.

We write the C minor 7th chord as Cm7, Cmin7 or C-7

I will take the 2 other examples from above to give you 2 more minor 7th chords:

- The A minor 7th chord: the A minor triad (A C E) with the added minor 7th (G) gives us the A minor 7th chord: A C E G
- The Db minor 7th chord: add the minor 7th in the key of Db to the Db minor triad to get: Db Fb Ab Cb (Cb being the enharmonic equivalent of B)

Minor major 7th chords

Minor major 7th chords are almost never used in rock/pop/blues music, but a lot in jazz.

A minor major 7th chord is made of a minor triad with an added major 7th note. At first sight, the name is a bit confusing: is it a minor chord or a major chord? Well, it is a minor chord because of the minor 3rd (it's built on a minor triad!). The 'major' in the chord name refers to the 7th because it is a major 7th note.

We write a C minor major 7th chord as C-Δ7 or $Cm^{\Delta 7}$.

A minor major 7th chord is easy to find when you know the minor 7th chord: just raise the minor 7th by a semitone.

Taking the same examples as before, we get:

- The C minor major 7th chord: C Eb G B
- The A minor major 7th chord: A C E G#
- The Db minor major 7th chord: Db Fb Ab C

All the other minor chords

With the information in this lesson, you can now find out all the other minor chords. Start with all the 12 triads, and then put the minor 7th or major 7th on top to find the minor 7th and minor major 7th chords. If you don't remember well all the minor scales, then have a look at the lesson about minor scales. For the minor chords that have a 'black key root': take the roots that have a minor scale with not more than 6 sharps or 6 flats (see 'How to form a minor scale'). For the sake of completeness, I will also add the enharmonic equivalents with more than 6 sharps or flats in parentheses.

When you're finished, check your answers with the solutions below.

Triads

Minor triad	Chord notes
Cm	C Eb G
Dm	D F A
Em	E G B
Fm	F Ab C
Gm	G Bb D
Am	A C E
Bm	B D F#
C#m (Dbm)	C# E G# (Db Fb Ab)
D#m / Ebm	D# F# A# / Eb Gb Bb
F#m (Gbm)	F# A C# (Gb Bbb Db)
G#m (Abm)	G# B D# (Ab Cb Eb)
Bbm (A#m)	Bb Db F (A# C# E#)

Minor 7th chords

Minor 7th chord	Chord notes
Cm7	C Eb G Bb
Dm7	D F A C
Em7	E G B D
Fm7	F Ab C Eb
Gm7	G Bb D F
Am7	A C E G
Bm7	B D F# A
C#m7 (Dbm7)	C# E G# B (Db Fb Ab Cb)
D#m7 / Ebm7	D# F# A# C# / Eb Gb Bb Db
F#m7 (Gbm7)	F# A C# E (Gb Bbb Db Fb)
G#m7 (Abm7)	G# B D# F# (Ab Cb Eb Gb)
Bbm7 (A#m7)	Bb Db F Ab (A# C# E# G#)

Minor major 7th chords

Minor major 7th chord	Chord notes
C-Δ7	C Eb G B
D-Δ7	D F A C#
E-Δ	E G B D#
F-Δ7	F Ab C E
G-Δ7	G Bb D F#
A-Δ7	A C E G#
B-Δ7	B D F# A#
C#-Δ7 (Db-Δ7)	C# E G# B# (Db Fb Ab C)
D#-Δ7 / Eb-Δ7	D# F# A# C## / Eb Gb Bb D
F#-Δ7 (Gb-Δ7)	F# A C# E# (Gb Bbb Db F)
G#-Δ7 (Ab-Δ7)	G# B D# F## (Ab Cb Eb G)
Bb-Δ7 (A#-Δ7)	Bb Db F A (A# C# E# G##)

It's really important to practice a lot in order to be able to quickly come up with the right minor chord when you're play a song for example. The exercises below are an excellent way to practice your minor chord knowledge.

Recommended exercises for minor chords:

If you don’t know what chord inversions are, then do only the exercises in root positions. Otherwise, you can follow the lesson about inversions.

Minor triads:

Place the notes of the minor triad on the piano (only root positions)

Place the notes of the minor triad on the piano (all the inversions)

Minor 7th chords:

Place the notes of the minor 7th chord on the piano (only root positions)

Place the notes of the minor 7th chord on the piano (all the inversions)

Mix of all chords (also major!):

If you know how major chords work, you can do also the following exercises. If not, look first at the major chords lesson.

Place the notes of the chord (dominant/minor 7th/major 7th) on the piano (only root positions)

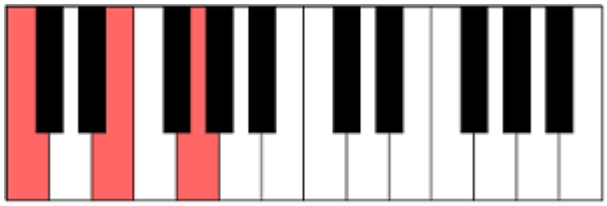
Place the notes of the chord (dominant/minor 7th/major 7th) on the piano (all the inversions)

Chord inversions: different ways to play the same chord

Let me start with a simple C major triad. You can play the C major triad in 3 different ways on the piano. All you need is a chord inversion. Let me explain…

Chord inversion in a triad

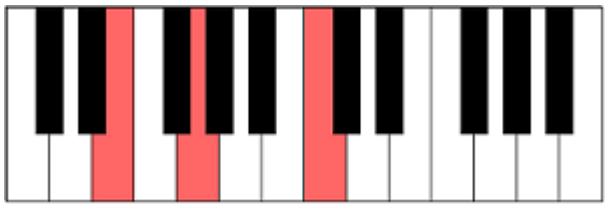
I will continue with the C major triad: C E G. On the piano keyboard, it looks like:



You can see that the C, the root of the triad, is at the bottom. We call the C major triad in this position the root position.

When we move the lowest note, the C, to the top, we get: E G C.

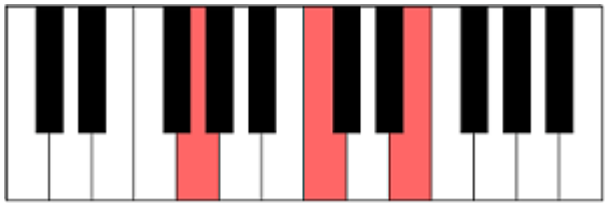
Or, on the piano keyboard:



We call this the C major triad in 1st inversion.

When we move now the lowest note (which is the E) to the top, we get: G C E.

We call this the C major triad in 2nd inversion (see next figure).



When we move now the lowest note (which is the G) to the top, we're back in root position, with the root (the C) at the bottom.

You can see that it's possible to make three different ways to play a major triad:

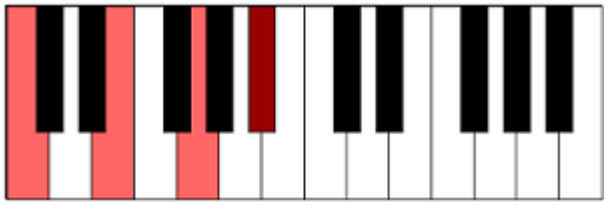
- Root position
- 1st inversion
- 2nd inversion

Now, you can imagine that all triads, whether they are major, minor, diminished or whatever, can be played in those 3 positions.

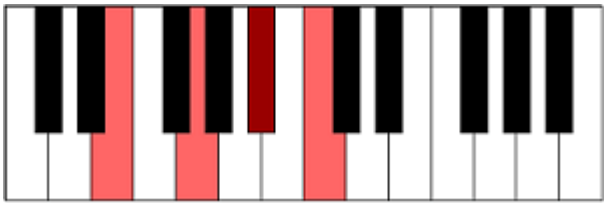
Chord inversion in 7th chords

We can apply the same 'trick' in 7th chords: always move the bottom note to the top to get to the next position.

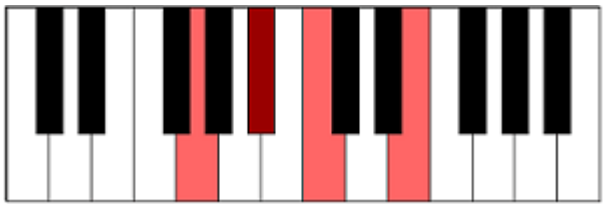
Let me illustrate this with the C7 chord. In root position, this is: C E G Bb (see figure)



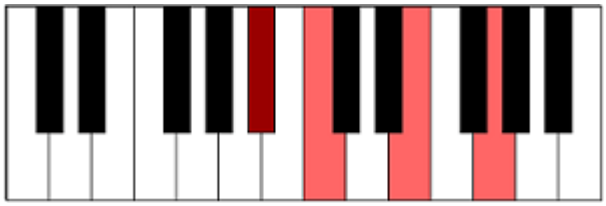
Let's move the root to the top to go to the C7 chord in 1st inversion: E G Bb C (see figure)



Move the bottom note (the E) to the top, and we're in 2nd inversion:



Again, move the bottom note (now the G) to the top, and we're in 3rd inversion:



And, as you guessed already, when we move now the bottom note (the Bb) to the top, we're back in root position.

This means that the 7th chords have 4 possible positions:

- Root position
- 1st inversion
- 2nd inversion
- 3rd inversion

And, of course, you can apply the same trick to all other kind of 7th chords (minor 7th, major 7th, ...).

It takes some time to really master the inversions of all kind of chords, that's why it is important to practice a lot with it. You can do this by doing the exercises that are accessible via the links below. Do them in the order as they appear in this list, because they go from easy to more difficult. Do an exercise for about 5 minutes and then come back at the same or a next exercise later (or the next day).

Recommended exercises for chord inversions:

Place the notes of the major triad on the piano (all the inversions)

Place the notes of the minor triad on the piano (all the inversions)

Place the notes of the dominant chord on the piano (all the inversions)

Place the notes of the minor 7th chord on the piano (all the inversions)

Place the notes of the major 7th chord on the piano (all the inversions)

Place the notes of the chord (dominant/minor 7th/major 7th) on the piano (all the inversions)

How to form a diminished chord

A diminished chord has -like a minor chord- a minor 3rd interval from the first note (the root) to the second note of the chord. The difference with minor chords lies within the 3rd chord note as we will see below. Like with minor chords and major chords, we can have diminished triads and diminished 7th chords.

If you want to hear sound samples of the different chords, please refer to the lesson 'What is a chord? How do different chords sound?'.

Diminished triads

A diminished triad is made of the root, the minor 3rd and the flattened 5th. So, in the case of the C diminished triad, this would be: C Eb Gb

Another example is the G diminished triad: G Bb Db

The notation for a diminished chord is (in this case C diminished): C^{O} or Cdim. And in the case of G diminished: G^{O} or Gdim.

Half diminished chords

As with major and minor chords, we can add the 7th. When we add the minor 7th to a diminished triad, we get a half diminished chord. Let's see how that works in the key of C. The C diminished triad is C Eb Gb. The minor 7th in the key of C is the Bb, so C half diminished is: C Eb Gb Bb

The notation for the C half diminished chord is: $C^{Ø}$ or Cm7b5.

$C^{Ø}$ is a nice and short notation, but Cm7b5 actually shows better what's going on in the chord:

- The 'm' stands for minor, since we have a minor 3rd
- The '7' stands for the 7th in the chord, in this case a minor 7th
- The 'b5' stands for the flattened 5th in the chord

The G half diminished chord is: G Bb Db F

So we can write G half diminished as: $G^{Ø}$ or as Gm7b5

A half diminished chord can also be considered as a minor chord (but a minor chord with a flattened 5th).

Diminished 7th chords

Perhaps you noticed that a diminished triad is made of 2 stacked minor 3rd intervals. Look at the C diminished triad: from the root (C) to the minor 3rd (Eb) is a minor 3rd interval and from Eb to Gb is also a minor 3rd interval. Well, why not adding another minor triad? So, let's do that!

What is a minor 3rd up from Gb? A minor 3rd consists of 3 semitones and 3 semitones up takes us to A. The only problem is that the 3rd note in the Gb minor scale cannot be an A. Ab is the 2nd note, so the 3rd note must be written with the letter 'B' (see the rules in the major scale lesson). The only way we can do that, is with a double flat: Bbb (which is of course the enharmonic equivalent of A).

So, the C diminished chord is: C Eb Gb Bbb

G diminished is a bit easier because it doesn't contain any double flat: G Bb Db Fb

The notation for diminished chords is as follows:

C diminished: **C °7, Cdim7 or C °**

G diminished: G °7, Gdim7 or G °

Even though diminished chords have a minor 3rd, they are, in contrast to half diminished chords, not considered as minor chords.

All the other diminished chords

Diminished 7th chords

And here comes the good news: there are only 3 different diminished 7th chords! Not 12, as was the case with minor and major chords (but this is only for diminished chords, not for half diminished chords since there are 12 different half diminished chords!). Only 3? Let me explain:

Look at the Eb diminished chord:

- From Eb, up a minor 3rd to Gb
- Then, from Gb, a minor 3rd up to Bbb
- Finally, from Bbb, a minor 3rd up to Dbb (which is a C)

So, Eb diminished is: Eb Gb Bbb Dbb (or C)

Compare this with the C diminished chord: C Eb Gb Bbb

Even when not written totally the same (Dbb instead of C), the chords are exactly the same! And, indeed: a diminished chord of a note of the C diminished chord has the same notes as the C diminished chord itself. So, this means that Cdim7, Ebdim7, Gbdim7 and Adim7 all are the same chord!

(Btw, notice that I wrote Adim instead of Bbbdim, because it would be a bit ridiculous to talk about the Bbbdim chord when we can simply say Adim.)

This enables us to finally make the table with the 3 different diminished chords:

Diminished chord:	Chord notes:
C $^{o}7$, Eb $^{o}7$, Gb $^{o}7$, A $^{o}7$	C Eb Gb A
Db $^{o}7$, E $^{o}7$, G $^{o}7$, Bb $^{o}7$	Db E G Bb
D $^{o}7$, F $^{o}7$, Ab $^{o}7$, B $^{o}7$	D F Ab B

Some remarks concerning this table:

- Notice that the roots of the chords listed in the left column are the same as the notes of the diminished chords in the right column.
- Instead of writing the correct notes for each individual diminished scale (like Bbb for Cdim), I wrote the easiest enharmonic equivalent (A instead of Bbb).
- For the diminished chords with a black note root: I didn't list the enharmonic equivalents, but you can find the notes of for example **D# $^{o}7$ at Eb ^{o}**

Half diminished chords

Here’s the table with half diminished chords:

C$^{\varnothing}$	C Eb Gb Bb
D$^{\varnothing}$	D F Ab C
E$^{\varnothing}$	E G Bb D
F$^{\varnothing}$	F Ab Cb Eb
G$^{\varnothing}$	G Bb Db F
A$^{\varnothing}$	A C Eb G
B$^{\varnothing}$	B D F A
Db$^{\varnothing}$ / C#$^{\varnothing}$	Db Fb Abb Cb / C# E G B
Eb$^{\varnothing}$ / D#$^{\varnothing}$	Eb Gb Bbb Db / D# F# A C#
Gb$^{\varnothing}$ / F#$^{\varnothing}$	Gb Bbb Dbb Fb / F# A C E
Ab$^{\varnothing}$ / G#$^{\varnothing}$	Ab Cb Ebb Gb / G# B D F#
Bb$^{\varnothing}$ / A#$^{\varnothing}$	Bb Db Fb Ab / A# C# E G#

The notes on the treble clef

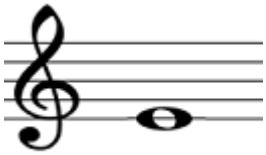
Musical notes are written on a staff. A staff consists of 5 horizontal lines where the notes can be placed. The notes on the treble clef can be **on** or **in between** the 5 horizontal lines.

The treble clef

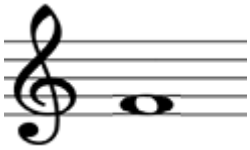
The treble clef is mainly for notes from middle C and higher. So, this is for the right hand on the piano. This is, however, not a rule. You can display notes on a treble clef that are lower than middle C. And sometimes, but not often, notes on the treble clef are played with the left hand.

To indicate that the staff we're reading is in treble clef, we use the next treble clef symbol at the beginning of the staff:

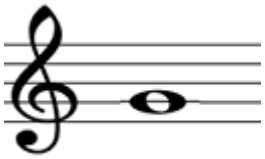
As I said, the notes can be displayed **on** or **in between** the lines of the staff. The note on the lowest line is an E. This is the E which is a major 3rd higher than the middle C.



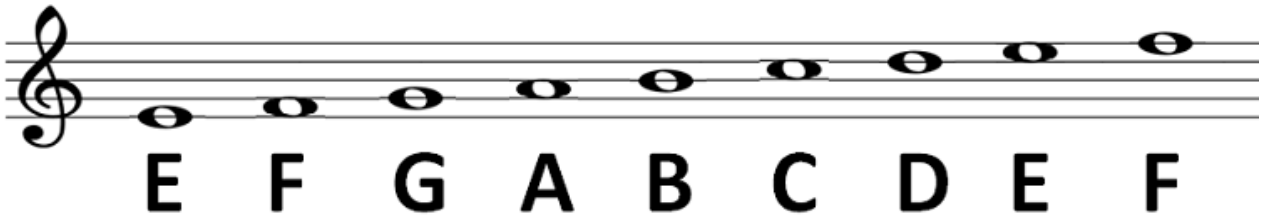
The next note, F, is displayed between the lowest 2 lines of the staff.



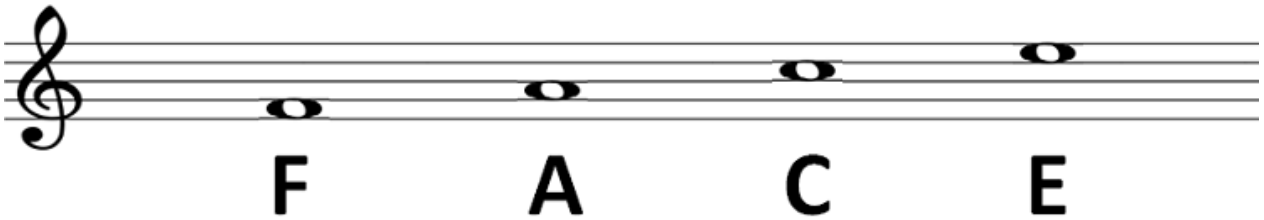
The G is on the 2nd line.



In this way we can go on, which gives us all the notes that can be placed on or in between the lines of the staff.



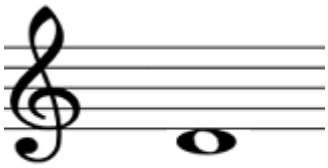
An easy way to remember the notes on the treble clef is by looking at the notes that go **in between** the lines: they make the word ‘FACE’.



From the ‘FACE’-notes, it’s very easy to deduce all the other notes.

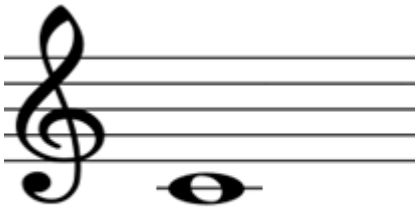
Ledger lines

As I mentioned before: the treble clef is for notes from middle C and higher. And it was even possible to display notes lower than middle C. How is this possible when the note on the lowest line is an E? Let’s first put a D on the staff. That’s still easy: just put it under the lowest line.



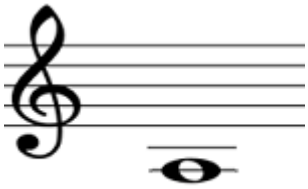
But how can we put the middle C? The middle C should be again **on** a line. But we don’t have any lines anymore. Well, you can do that with ledger lines.

A ledger line is a little horizontal line just under or above the staff that you place there where you want your note. The middle C is then displayed as follows:



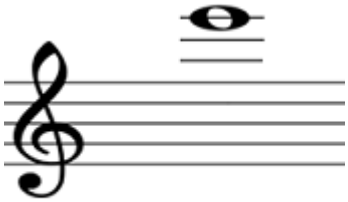
You can even make the B:

For the A, we need a 2nd ledger line:



You can go on putting extra ledger lines for even lower notes. Now, the next question may arise: till how many ledger lines can you go? Well, officially, you can have as many ledger lines as you want. But, ask yourself: is it still readable? I would say that it's still possible to read 3 or 4 ledger lines without a too big effort. But sometimes, you see even more ledger lines…

It’s also possible to put ledger lines above the staff to display higher notes. Can you see which note is displayed in the next figure?



Well, I hope you found it on your own…

If not: it’s an E!

This is not all

As you might have noticed, this is not all:

- For the lower notes (so for the left hand on the piano), we have the bass clef, which we will see in another lesson.
- The notes on the treble clef we’ve seen till now are only ‘white key’ notes. We will see how to display the sharp and flat notes in another lesson.

And now it's time to do some exercises. Click on the link below to test your knowledge of the notes on the treble clef.

Recommended exercises for treble clef notes:

Place the note on the treble clef on the piano keyboard (only white keys)

Note lengths

Note lengths are important in music: a note can be played (very) short, (very) long and everything in between.

You can measure note lengths in number of beats; but this can also be in fractions of a beat.

But what is exactly a beat?

What is a beat?

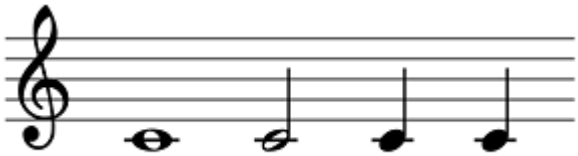
A beat could be defined as the basic rhythmic unit in music.

When you clap your hands or tap your toes when you listen to a piece of music, you do that normally on every beat.

Notation of note lengths in the staff

Whole note, half note and quarter note

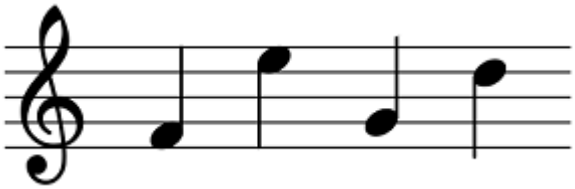
Some basic note lengths (or note values) are the whole note, the half note and the quarter note. You can see them displayed in the staff below.



The whole note has a duration of 4 beats. In 4/4 time, this corresponds to a whole measure, from where 'whole note' has its name. The duration of a half tone is half of that of a whole tone, so 2 beats. And, logically, a quarter note has a duration of 1 beat.

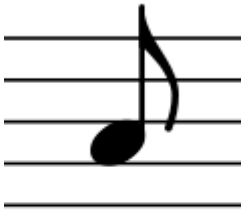
Remark: **whole note** and **half note** have nothing to do with **whole tone** and **half tone**. The first 2 are durations, the last 2 are intervals.

The stem of a note (the little vertical bar) can be pointed upwards (as in our previous examples), but also downwards. Generally spoken, the stem is upwards for notes in the lower half of the staff, and downwards in the upper half. See the next figure for an example.



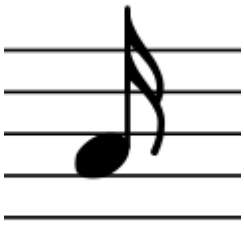
Eighths notes and sixteenths notes

An eighth note has a duration half of that of the quarter note, which means a half beat. You can thus have two eighth notes in one beat. The note symbol for an eighth note is:

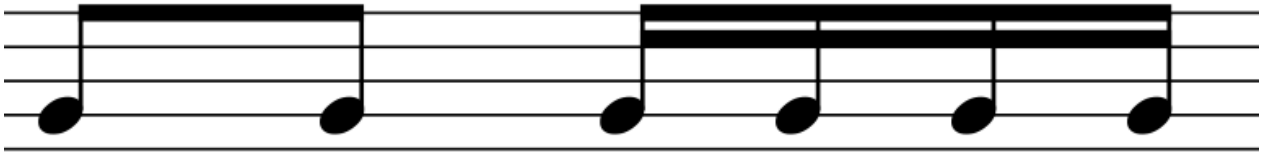


A sixteenths note is again half as long as an eighth note. You can have 4 sixteenths notes in one beat.

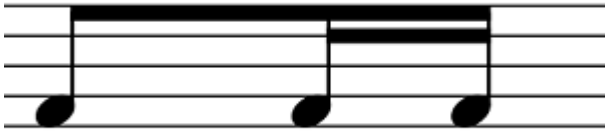
The note symbol for a sixteenth note is:



When 2 or more eighths or sixteenths notes are played after each other, you can make beamed notes as follows:

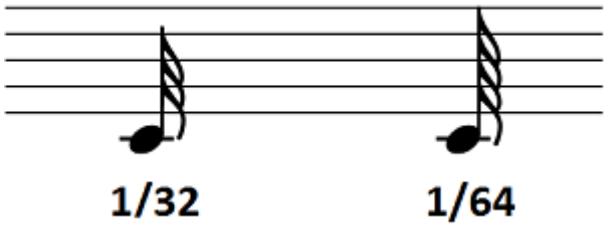


Combinations are also possible:



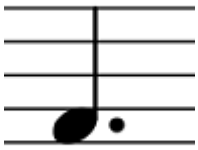
Other note lengths

By adding extra flags to the stem (little vertical bar on the note), we can make thirty-second notes (8 in a beat), sixty-fourth notes (16 in a beat), etcetera.

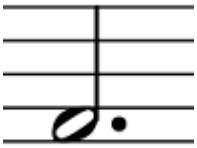


We can augment the note length by 50% by adding a dot after the note, for example:

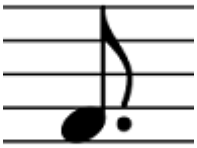
- 1 + ½ = **1½ beats**:



- 2 + 1 = **3 beats**:

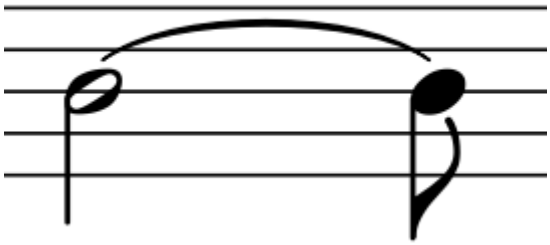


- ½ + ¼ = **¾ beats**:



Remark: a ¾ beat note followed by a sixteenth note (¼ beat) can be notated as beamed notes, as follows:

What to do if we want a note with a duration of –let's say- 2½ beats? We can do this by linking a half note (2 beats) and an eighth note (½ beat) together:



Make sure to master your knowledge of note lengths by doing the exercises that are available via the 2 links below:

Recommended exercises for note lengths:

Whole note, half note, quarter note. Choose the right staff with the audio

Half note, quarter note, eighth note. Choose the right staff with the audio

Rests: whole rest, half rest, quarter rest and more

Music generally doesn't only consist of a long stream of only notes. Music also needs some rests. How do we write rests?

Whole rest, half rest, quarter rest

As with notes, rests have durations, you can have short rests and longer rests.

The equivalents of the whole note, half note and quarter note are the whole rest, the half rest and the quarter rest.

Whole rest

The whole rest has, like the whole tone, a duration of 4 beats.

In the staff, you can write a whole rest as follows:

Half rest

The half rest has, like the half tone, a duration of 2 beats.

You can write the half rest as follows:

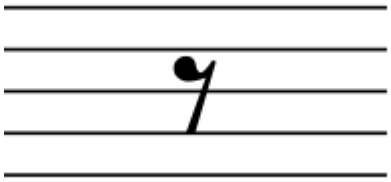
Quarter rest

And, as you might have guessed already, the quarter rest has a duration of 1 beat.

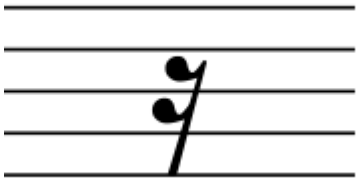
Here, you can see the quarter rest in a staff:

Eighth rest, sixteenth rest and more

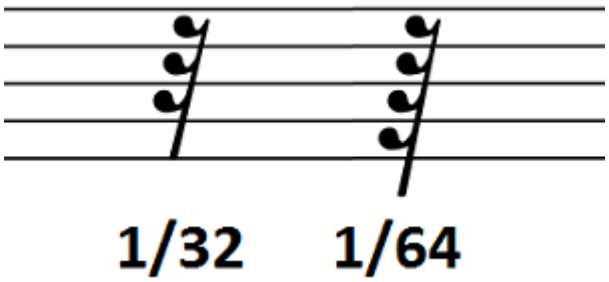
The eighth rest, with a duration of a half beat, can be written as follows:



And, you might not be surprised when I tell you that the sixteenth rest, with duration of a quarter beat, can be written as the eighth rest with an extra flag (see below). Like was the case with the sixteenth note.



By adding more flags, we can make thirty-second rests and sixty-fourth rests (see below). Those very short rests are not often used.



Recommended exercises for rests and notes:

Rests and notes

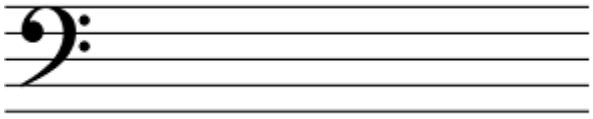
The notes on the bass clef

When you've seen my lesson about treble clef notes, you know how to find all the notes on the staff with a treble clef, especially if you remember the trick how to memorize them (the FACE-notes). To easily find all bass clef notes, we also have a little trick. Keep reading to find out how to find all bass clef notes.

How to find all bass clef notes?

The bass clef is mainly for notes from middle C and lower. So, this is for the left hand on the piano. This is, however, not a rule. You can display notes on a bass clef that are higher than middle C. And sometimes, but not often, notes on the bass clef are played with the right hand.

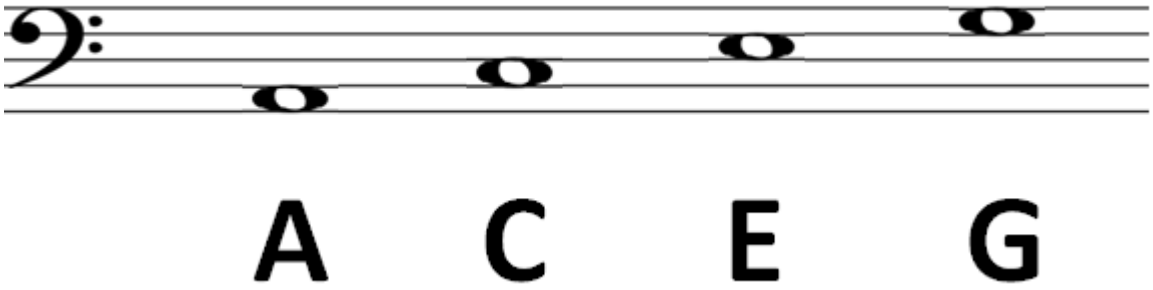
To indicate that the staff we're reading is in bass clef, we use the next bass clef symbol at the beginning of the staff:



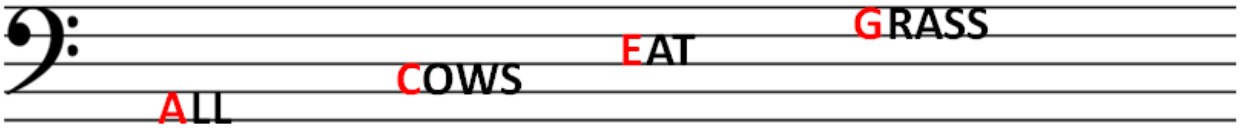
On the next staff, you can see all bass clef notes **on** and **in between** the 5 lines of the staff:

The highest note, the A on the upper line of the staff, is the A just under the middle C, so a minor 3rd under the middle C.

As I promised you, there's also a trick to easily remember all bass clef notes. When I display only the notes in between the lines of the staff, we get:



At first sight, those notes A, C, E and G don't make up a nice word as was the case with the FACE-notes in the treble key. But, the letters of those bass notes form the first letters of the sentence "**A**LL **C**OWS **E**AT **G**RASS".

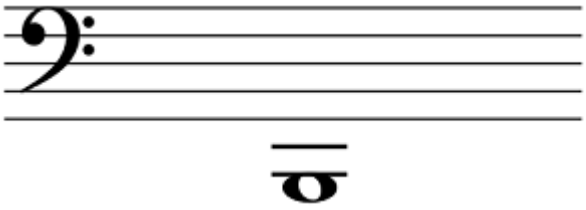


With this trick, it's easy to remember the bass notes in between the lines of the staff. The other notes are then easy to find from those 4 notes.

Ledger lines

As with the treble clef, we can add ledger lines to the staff. When you don't remember how they work, have a look at the treble clef lesson.

Can you see which note is displayed here?



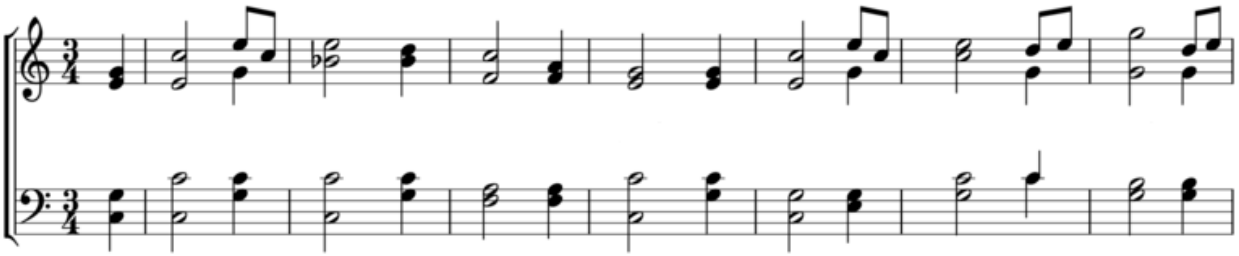
It's a (very low) B!

And this one?

Well, this is an important one to remember: it's the middle C!

The middle C is on the first ledger line **above** the bass clef staff. Remember that the middle C is also on the first ledger line **under** the treble clef staff.

Treble and bass clef together



In sheet music for piano, you find the treble clef (generally for the right hand) and the bass clef (generally for the left hand) displayed together as in the figure above.

Now that you learned how to read notes on the bass clef, be sure to practice this regularly. The exercise that is accessible via the link below is ideal for this purpose.

Recommended exercises for bass clef notes:

Place the note on the bass clef on the piano keyboard (only white keys)

Measures (bars) – Time signature

Musical notes on a staff are grouped in measures, or also called bars (I will use both terms in this lesson). How many beats in a bar there are? Well, that depends on the time signature, as we will see soon.

How many beats in a bar (or measure)?

You can often hear musicians that play together count 1 - 2 - 3 - 4 before the song starts. What they are counting, are actually the beats in a measure. Most songs have 4 beats in a bar. You can count 1 - 2 - 3 - 4 - 1 - 2 - 3 - 4 - ... during the whole song (when the time signature doesn't change during the song).

Another common type of songs has 3 beats in a measure. A waltz is an example of a piece with 3 beats per measure.

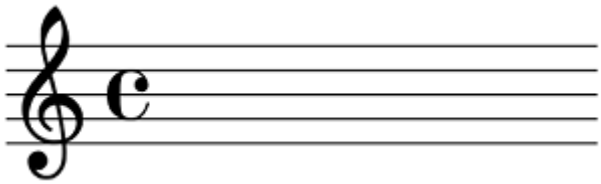
Those two types (4 beats in a bar and 3 beats in a bar) are most common, but other numbers of beats in a bar are also possible.

Time signature – 4/4 time

Let's again have a look at songs that have 4 beats in a measure. You remember probably that a quarter note has a duration of exactly one beat. So that means that instead of saying 4 beats per measure, you could also say: **4 quarter notes per measure**. A piece of music that has 4 quarter notes per measure is called a piece in 4/4 time. Or, you can also say: the **time signature** is 4/4.

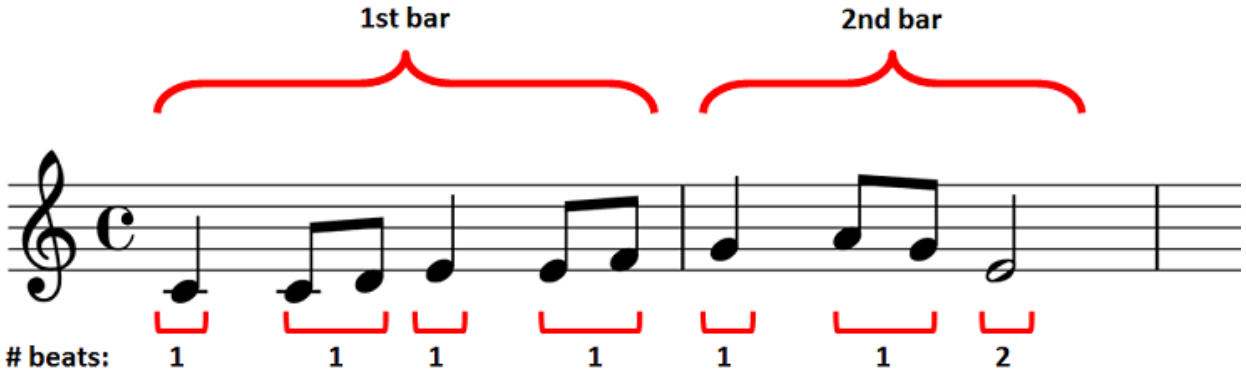
In sheet music, in the beginning of a piece, we write this as follows (after the treble or bass clef):

Since 4 quarter is the most common time signature, it's also very often written as follows:



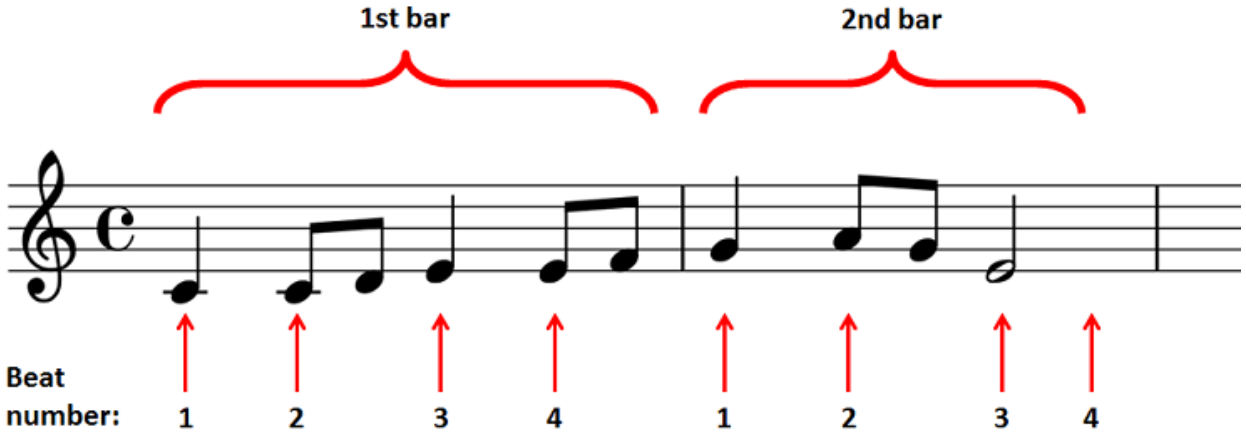
Now, 4 quarter notes per bar doesn't mean that you can only have quarter notes. It means that all the note durations of the notes in one bar added together make 4 beats. For example, 1 bar can consist of one whole note, or 2 half notes, or a half note with 2 quarter notes. One bar can have 8 eighth notes, or 4 eighth notes and 2 quarter notes, etcetera, as long as the total duration is that of 4 beats.

Let me give an example of 4 quarter time music. In the next staff, 2 bars of a little musical line are written out. Note that the bars are separated by vertical lines.



For a good understanding of the music, it's important to know on which beat the notes in a song are. To know this, you can count 1 - 2 - 3 - 4 - 1 - 2 - 3 - 4 etcetera during the whole song.

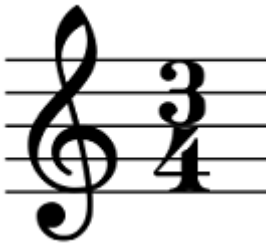
When you do it well, you should come up with the following:



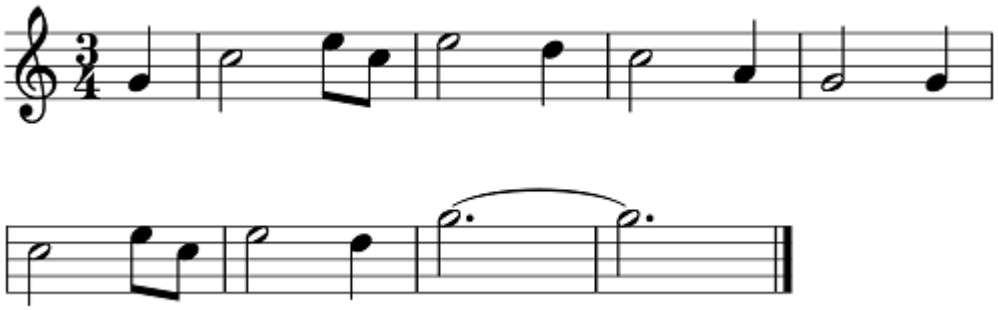
Time signature – 3/4-time

We already know how many beats in a bar the 3/4-time signature has: that's 3 beats, or 3 quarter notes. But any other combination of note lengths can be made that add up to 3 quarter notes, of course. So, 1 quarter note plus 4 eighth notes, or 2 quarter notes and 2 eighth notes, etcetera.

The symbol for the 3/4-time signature that has to be placed in the beginning of the staff is:



Here's the first line of "Amazing grace", which is in 3/4-time:



You might notice a strange thing: the first measure only has 1 quarter note, when it should be 3! This happens quite often in the beginning of a song: the song actually starts on beat 3 instead of on beat 1. We call this first measure with only one quarter note a **pickup**, or more officially, an **anacrusis**.

Other time signatures

There are many other time signatures, sometimes very exotic ones, like for example 11 eighth. I will not talk about those very complicated time signatures, but let me introduce you 2 more or less common ones.

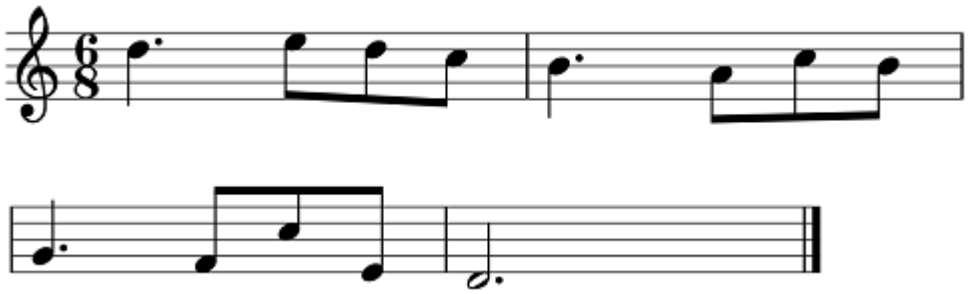
6/8-time

In a 6/8-time signature, you can have 6 eighth notes per bar.

How many beats in a bar is that? Well, that's 6 beats, because every beat in a 6 eighth time signature goes with an eighth note. Now, this might be confusing for you, because in my lesson about note durations I told that a quarter note was exactly one beat... Well, this is true for all the 'quarter time signatures', like 3/4 and 4/4. In 'eighth time signatures' (like 3/8 or 6/8), every **eighth** note is exactly one beat.

In fact, the '8' in 6/8 means that every beat corresponds to an eighth note. The '6' in a 6/8- time means that you have 6 of those eighth notes in a measure.

An example of a 6 eighth time is "Norwegian wood" from the Beatles. Here's the first line:



You might ask: "What's the difference between 3/4 and 6/8? You could very well have 6 eighth notes in a 3/4- time piece!

The difference is: which beats are accentuated?

When you have 6 eighth notes in a 3/4-time piece, you actually have 3 times 2 eighth notes. You could count like: '**1** and **2** and **3** and' for the 6 notes. The accents are on beat 1, 2 and 3.

When you have 6 eighth notes in a 6/8- time piece, beats 1 and 4 are accentuated, so there are 2 groups of 3 eighth notes in a bar. You can then count as follows: '**1** - 2 - 3 - **4** - 5 - 6'.

5/4- time

One of the most famous pieces in 5/4- time is "Take five" by Dave Brubeck. How many beats in a bar has a piece in 5/4- time? Well, 5 of course: 5 quarter notes.

Below, you can listen to "Take five" (see if you can count with the song: 1-2-3-4-5 1-2-3-4-5 etc):

Take five (Dave Brubeck) on YouTube

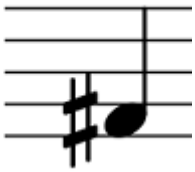
Sharps and flats - Key signature

In the treble clef and bass clef lessons, you learned how to read and write the 'white key notes', the ones without sharps or flats; how to write sharps and flats in sheet music?

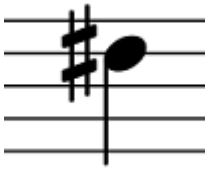
Sharps and flats

How to write a sharp note in a staff? It's really simple: just put the sharp sign (#) before the note.

For example, this is an F#:

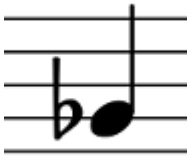


And this is a D#:

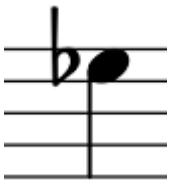


For a flat note, just write the flat sign (*b*) before the note:

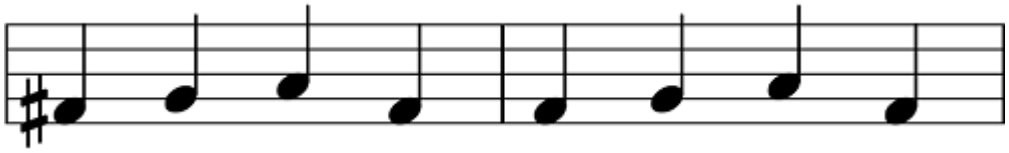
This is a Gb:



And this is an Eb:

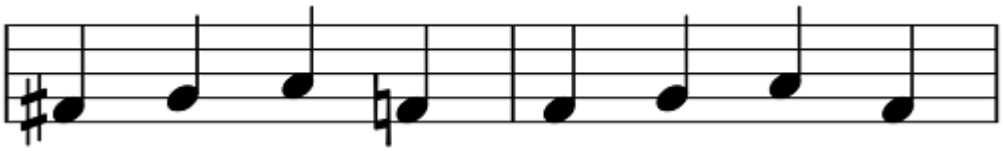


Important is that this sharp or flat sign is only valid from the moment the sign is displayed till the end of the measure you're in. In the next example, I'll explain this in more detail (btw, the staff is in treble clef):



The notes in the first measure are: F# G A F#. So, the last note in the first measure is an F#, not an F. The notes in the second measure are: F G A F. The sharp sign from the first measure is not anymore valid in the second measure.

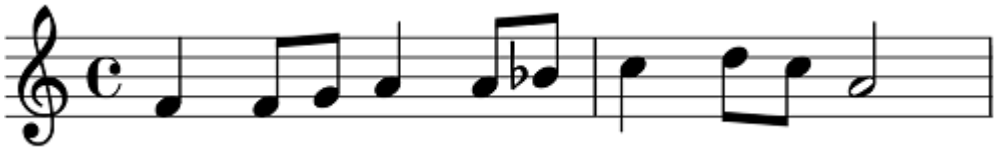
But what if I wanted to have F# G A F in the first measure? In that case, we have the natural sign, that cancels the sharp sign before the first note:



The same rule applies to flat notes. The flat sign is only valid within the measure where it is used. If we want to cancel the flat sign for a certain note in the same measure, you can apply the same natural sign as with the sharp notes.

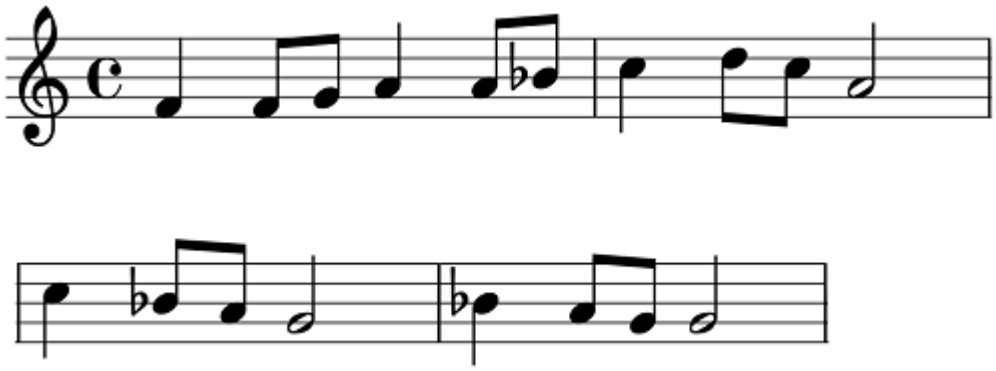
Key signature

Have a look at the next melody, which is in the key of F major:



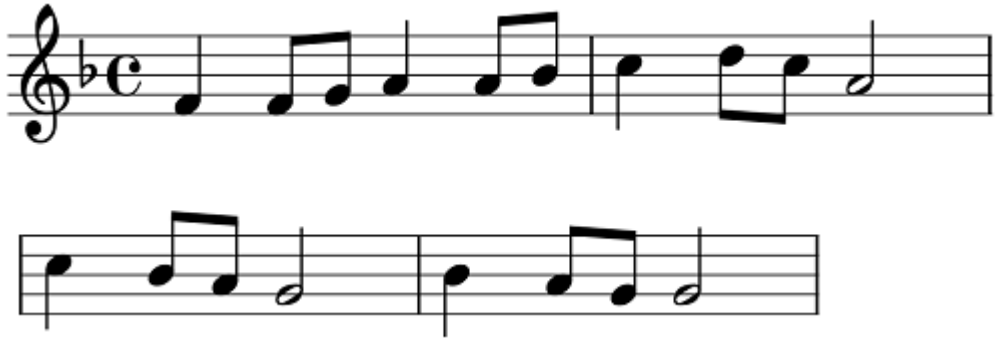
You see that the melody has one flat note, the Bb. That's normal, since F major has a flat note in its scale, the Bb!

You would expect this Bb to occur even more often in the melody. And that's exactly what happens, have a look at the next line in this song:



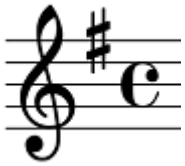
When I would display also the rest of the song, you would see even more B flats appear.

Wouldn't it be much easier to say at the beginning of the song that every B should be seen as a Bb? Well, that's exactly what is normally done. We put the flat sign in the beginning, between the clef and the time signature. Now, the same song can be displayed as follows:



Note that not only B's that are on the 3rd line of the staff become Bb's. All the B's become Bb's, so also this one.

Sharps and flats that are displayed between the clef and the time signature, are called the **key signature**.

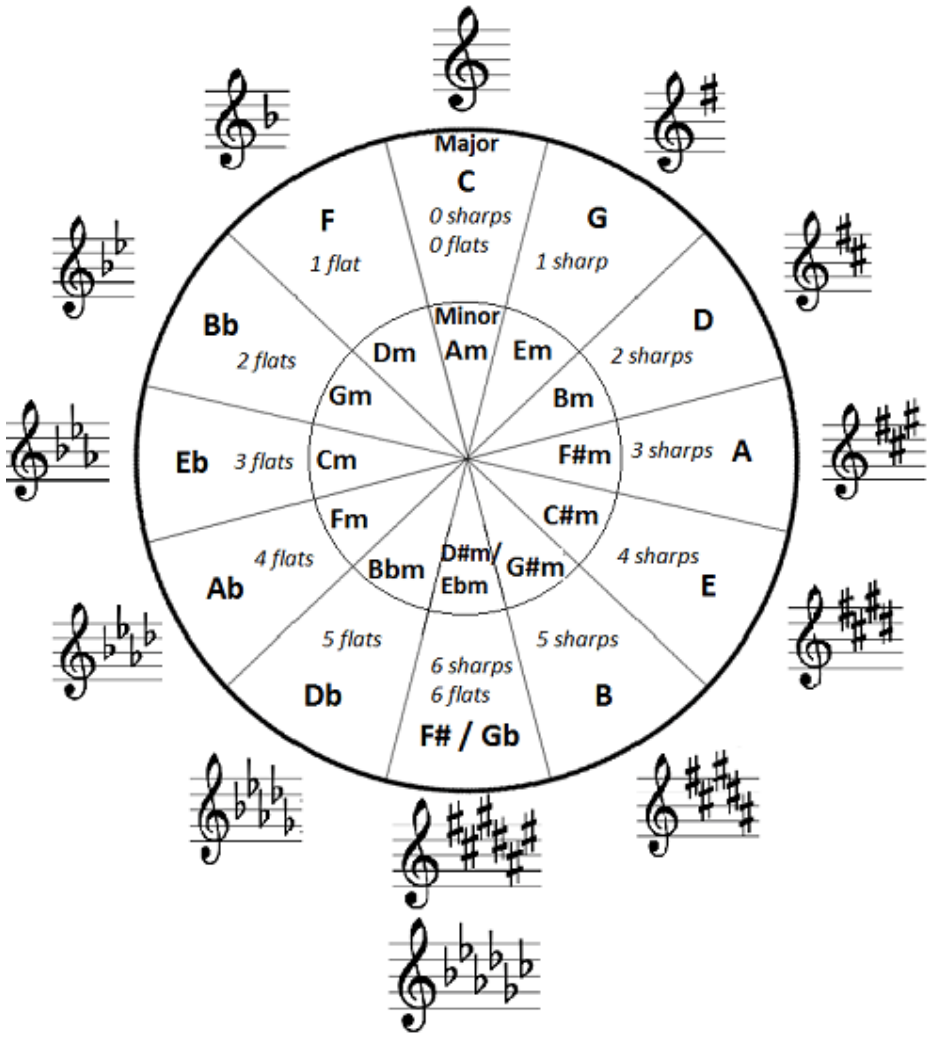


The key signature corresponds with the major or minor key the song is in. When a song is in G major, which, as you know, has only one sharp (the F#), the key signature looks as:

Now, the same key signature also applies to E minor, since E minor is the relative minor of G major. So, every key signature can be used for a major key and its relative minor key.

Other key signatures

We can display the key signatures for all major and minor keys in the [circle of fifths](). This gives us a nice and quick overview of all the sharps and flats in the major and minor keys:



Now that you know about sharps, flats and key signatures, check your knowledge with the quiz that is accessible via the link below:

Recommended exercises for sharps and flats:

[Final music reading exercise – Level I]()

[Final music reading exercise – Level II]()

Course Offer Overview

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All the courses

Learn piano or keyboard from scratch - Complete piano course

This 20-hour piano course takes you from absolute beginner to intermediate/advanced level. Lots of resources (play-along mp3's, PDF's with summaries and much more). Including eBook with all the scales and chords with finger positions (111 pages!).

The ultimate blues piano course – Blues piano for everyone

Like the piano course above, this course takes you from absolute beginner to intermediate/advanced level. Only difference is that it's based on blues. Also for more advanced piano players that just want to start to play the blues. 20 hours of video lessons. Including eBook with all the scales and chords with finger positions (111 pages!).

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This complete jazz theory course is for musicians that already know the basics of music theory (if you've followed the theory in this eBook, you're ready for this course). This course is for all instrumentalists (not only piano players). Duration: 5 hours.

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You always wondered how experienced jazz piano players create those rich sounding jazz chords? This course will teach YOU how to play them on the piano. Duration: 3 hours.

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Martin Cohen is the author of the 5 courses mentioned above and creator of the website PianoTheoryExercises.com.
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Martin has a master's degree in physics from the Free University in Amsterdam.
Martin now lives in Prague, Czech Republic with his wife and 2 childern.