



## The chromatic scale

There are 12 notes in Western music. When you put these 12 notes in sequential order, you get the chromatic scale as illustrated by the C chromatic scale below.

1	2	3	4	5	6	7	8	9	10	11	12	(1)
C	C#	D	D#	E	F	F#	G	G#	A	A#	B	(C)
C	Db	D	Eb	E	F	Gb	G	Ab	A	Bb	B	(C)
	ST											

Table: The chromatic scale

The difference between the sequential notes in the chromatic scale is a semitone (ST) or half step. For example C to C# is one semitone. Ab to A is one semitone. B to C is one semitone. For the ease of the explanation I have used the C chromatic scale, however, you can start a chromatic scale on any note, it will always have 12 notes.

For the sake of convention, an ascending chromatic scale will have sharps (#) and a descending chromatic scale will have flats (b). Notice that F# and Gb are the same note. These are called enharmonic notes. They are still the same note even though they are written differently.

Interestingly, there are 12 notes in the chromatic scale and there are 12 keys in music as illustrated by the circle of fifths. This leads nicely to the major scale.

## The major scale

The major scale consists of seven notes with the root note or tonic being repeated at an octave interval. When you put these 7 notes in sequential order, you get the major scale as illustrated by the C major scale below.

1	2	3	4	5	6	7	8(1)
C	D	E	F	G	A	B	(C)
	T	T	ST	T	T	T	ST

Table: The major scale

The major scale has the formula, tone (T), tone, semitone, tone, tone, tone, semitone. Convention says that two semitones make a tone. Now, compare the C major scale to the C chromatic scale and look where the tones and semi-tones are.

Now by using the major scale formula with the C chromatic scale, you can write out any of the 12 major scales and know how many sharps and flats that they have. Try writing out the G, E, F and Eb scales on a piece of paper. It will be a worthwhile exercise.

Key	1	2	3	4	5	6	7	8	Number of # / b
<b>C</b>	C	D	E	F	G	A	B	C	0
<b>G</b>	G	A	B	C	D	E	F#	G	1#
<b>D</b>	D	E	F#	G	A	B	C#	D	2#
<b>A</b>	A	B	C#	D	E	F#	G#	A	3#
<b>E</b>	E	F#	G#	A	B	C#	D#	E	4#
<b>B</b>	B	C#	D#	E	F#	G#	A#	B	5#
<b>F#</b>	F#	G#	A#	B	C#	D#	E# (F)	F#	6#
<b>Gb</b>	Gb	Ab	Bb	Cb (B)	Db	Eb	F	Gb	6b
<b>Db</b>	Db	Eb	F	Gb	Ab	Bb	C	Db	5b
<b>Ab</b>	Ab	Bb	C	Db	Eb	F	G	Ab	4b
<b>Eb</b>	Eb	F	G	Ab	Bb	C	D	Eb	3b
<b>Bb</b>	Bb	C	D	Eb	F	G	A	Bb	2b
<b>F</b>	F	G	A	Bb	C	D	E	F	1b

**Table: 12 keys in music**

Looking at Table 3, the 12 keys of music, notice how a pattern emerges? In the key of C, counting up five notes (a perfect 5<sup>th</sup>) from scale position one (C) we get G, which is our dominant. The key of G has 1# which is F#, as defined by our major scale formula. By repeating this exercise for the key of G we get D which has 2#'s, F# and C#. From D we go to A and so on. Now, counting up four notes (a perfect 4<sup>th</sup>) from the key of C we get F our subdominant, which has 1b, Bb. From F we get Bb and so on.

Compare table 3 to figure 1, the circle of fifths. Clockwise from C is fifths, anti-clockwise from C is fourths. The same goes for our relative minors as well. Clockwise fifths, anti-clockwise fourths. The inner circle shows you the corresponding number of #'s or b's.

Ok, this theory is all well and good I hear you say, but when do we get to the songwriting part? Lets look

at the following scale table for chords using the C major scale.

Scale position	1	2	3	4	5	6	7	8(1)
Scale note	C	D	E	F	G	A	B	(C)
Triad	CEG	DFA	EGB	FAC	GBD	ACE	BDF	(CFG)
Chord name	C	Dm	Em	F	G	Am	B <sup>o</sup>	C
Chord type	Major	Minor	Minor	Major	Major	Minor (relative minor)	Diminished seventh	Octave
Chord type	M	m	m	M	M	m	dim 7	M
Chord position	I	ii	iii	IV	V	vi	vii <sup>o</sup>	VIII (I)
Position name	Tonic	Super-tonic	Mediant	Sub-dominant	Dominant	Sub-mediant	Leading note	Octave

**Table: The songwriting table – major scale**

Using table 4, we can see that each note in the scale can now be changed to a chord and used for songwriting (chord name/chord type rows). By referring to table 3, you can now write songs in any key you so desire. But which chords work well with each other and why are some major and some minor?

### Major and minor chords

Chords are built around triads, which is the root note, a third above the root note and a fifth above root note. Major chords have a major third and a perfect fifth. Minor chords have a flattened third and a perfect fifth.

In table 4, the tonic chord (I, C major) for the key of C is major, because it has the notes C, E, & G (triad row). These notes occur naturally in the C scale. The supertonic chord (ii, D minor) in the C scale is minor as it has the notes D, F & A. Why? Because in the D major scale F would be F# as illustrated in table 3. However, we are working in the C major scale, which has F and not F#. Therefore the third is naturally flattened making it minor chord. Follow this logic for the remaining chords in the C major scale until you get to vii, the diminished chord or leading note.

### The diminished chord

The diminished chord is an interesting chord. It is called the leading note because the seventh note of any scale naturally leads back to the root note or tonic. The diminished chord has a flattened third and a flattened fifth as illustrated by the B diminished chord in the C major scale (table 4). B diminished (B<sup>o</sup>) has the notes B D F. In the B major scale (table 3) we would find that notes D and F are D# and F#. However in the C scale these notes are D and F, making the chord a diminished chord.

Diminished 7<sup>th</sup> chords are interesting chords because each note in the diminished 7<sup>th</sup> chord is 3 semitones apart. Therefore B<sup>07</sup> would be B D F Ab. What does this mean? Well, without going too deeply into the theory (why stop now I hear you say), technically every note in a diminished 7<sup>th</sup> can be the tonic because they are equal distances apart. This means that B<sup>07</sup>=D<sup>07</sup>=F<sup>07</sup>=Ab<sup>07</sup>. The same goes for Bb<sup>07</sup> and A<sup>07</sup>, which have the notes Bb C# E G and A C Eb F# respectively. So in reality, you only need to know three diminished 7<sup>th</sup> chords to play all 12!

Ok, using table 4 lets look how these chords interact so we can start writing songs.

### **I, IV & V chords.**

As previously discussed, these are great chords and you can build a lot of songs around them. Grab your guitar and play around with chords C, F and G or any I,IV,V chords from table 3. You will soon hear some classic rock & roll progressions i.e. Wild thing or Louie Louie (Cx2, Fx2, Gx2, Fx2) and 12 bar blues progressions (Cx4, Fx2, Cx2, Gx1, Fx1, Cx1, Gx1). Let's understand why these chords work the way they do.

### **The Tonic chord I**

Meet the tonic chord, which comes from the root note of the key you are playing in. The tonic chord is a major chord and you will find that your songs will rarely end on anything but this chord. (There are always exceptions!)

Now, go back and play those I, IV, V progressions, then when you want to finish them, play the tonic chord. It sounds resolved. Now try playing anything other than the tonic to finish the song. The song doesn't sound resolved does it? Even if you physically finish on chords IV or V, your musical mind will be finishing on I. Try it and see.

### **The Dominant chord V**

The dominant chord is a major chord. It is the strongest and most important chord because it leads us back to the tonic. Chords that lead back to the tonic are often described as having a dominant function and hence the name dominant.

A great way of ending a phrase or a song is using the V-I progression. This is also known as a cadence. Try it on your guitar.

Now try V<sup>7</sup> – I. The dominant 7<sup>th</sup> chord is always a great chord to use when returning to the tonic as the 7<sup>th</sup> creates dissonance (tension) and your ear subconsciously wants to hear harmony.

### **The Subdominant chord IV**

The subdominant chord is also a major chord. The IV chord is one of many chords that can lead to the dominant chord and hence it is pre-dominant or subdominant.

The chord progression IV-V-I is one of the strongest progressions in music. Try this on your guitar. This is a really strong way to end a phrase or a song.

The chord progression IV-I is called the **plagal cadence**. Listen out for this one in church music as it often ends hymns. It is informally known as the “amen” cadence. Can I get an amen?

## **ii, iii, vi chords**

Using these minor chords in your songwriting will add some depth and colour to your compositions.

### **The supertonic chord ii**

ii chord is the strongest pre-dominant chord because it resolves to V very easily. One of the most common progressions using ii is the ii-V-I progression. Jazz uses this example fairly regularly. ii can move to IV or vi, although this isn't as strong as ii-V.

### **The submediant chord vi**

This chord is the relative minor for the key that you are composing in. Also called the submediant, it acts as a weak predominant. vi progresses well to IV or ii but generally doesn't follow these chords. Try the progressions I-vi-IV-V and vi-IV-V-I. Can you hear the heavens rumbling? Another good progression is I-vi-IV-ii. Are the skies getting dark?

Next try the progression vi-ii. Now remember that in the supertonic chord section, ii progressed well to V then I. So try vi-ii-V-I. Has that bolt of lightning struck yet?

Before we discussed the cadence V-I to end a passage or song. Compare the progression V-vi. Deceptive isn't it. Funnily enough it is called the deceptive cadence and adds some nice suspense, especially if you end a song with it.

### **The mediant chord iii**

The mediant chord not used that often in the major keys for songwriting and is found more often in the minor keys. This doesn't mean that we should avoid it completely and I find that the iii chord can add some interesting colour, especially in a bridge. iii rarely moves to V and generally leads to the chords vi, ii and IV.

Some nice progressions using iii are iii-vi-ii-V, iii-ii-V and iii-IV-V. Experiment and see what you can come up with.

### **The diminished (leading note) chord vii<sup>O</sup>**

As discussed previously, this chord is often a diminished 7<sup>th</sup> chord. It is mainly used as a passing chord as it leads nicely back to I, however ending a song with vii<sup>O</sup>-I doesn't sound as strong as V-I. Try the progression vii<sup>O7</sup>-I-V-I. vii<sup>O7</sup> also works well moving into the vi chord. Try vii<sup>O7</sup>-vi-V-I.

### **The minor scale**

The minor scale consists of seven notes with the root note or tonic being repeated at an octave interval and when you put these 7 notes in sequential order, you obtain the minor scale as illustrated by the A minor scale below.

1	2	3	4	5	6	7	8(1)
A	B	C	D	E	F	G	(A)
	T	ST	T	T	ST	T	T

**Table 5. The minor scale**

Writing in the minor key gives a sad or melancholy feel to a song. The minor key uses the same basic rules as the major key, however feel free to experiment by substituting chords from the relative major key.

Scale position	1	2	3	4	5	6	7	8(1)
Scale note	A	B	C	D	E	F	G	(A)
Triad	ACE	BDF	CEG	DFA	EGB	FAC	GBD	ACE
Chord name	Am	B <sup>o</sup>	C	Dm	Em	F	G	Am
Chord type	Minor	Diminished	Major (Relative Major)	Minor	Minor	Major	Major	Minor
Chord type	m	dim	M	m	m	M	M	m
Chord position	i	ii <sup>o</sup>	IIIb	iv	v	VIb	VIIb	viii(i)
Position name	Tonic	Super-tonic	Mediant	Sub-dominant	Dominant	Sub-mediant	Leading note	Octave

**Table: The songwriting table – minor scale**

Looking at table 6, the songwriting table for a minor scale, our tonic (i), subdominant (iv) and dominant (v) are minor. Our submediant (VIb) and leading note (VIIb) chords are major and our mediant (IIIb) is the relative major of the key we are writing in.

Convention helps us to distinguish chords built on the minor key from their relative major counterparts. The “b” (i.e. IIIb) means that the chord is from the minor key. Essentially IIIb in the minor key and I in the relative major key are the same chords, however seeing “b” you will automatically know that you are playing in the minor key.

Some chord progressions to get you started in the minor key.

i-iv-v, i-VIb-IIIb-VIb, i-iv-IIIb-VIIb-I, i-iv-V, i-IV-V

Two progressions that you might know using the minor key.

i-VIIb-VIb-VIIb – All along the watchtower (Bob Dylan / Jimi Hendrix)

i-VIb-iv-VIIb-i-VIb-VIIb – Mr Jones (Counting Crows)

One last trick to know using the minor key is the Picadilli third. This is when you end your song that is written in the minor key on the relative major chord. Compare i-iv-v-i to i-iv-v-IIIb and see what you think.

### Putting it all together.

Looking at the key of C major on the circle of fifths. C is your tonic or root (I). G (clockwise) is the dominant (V). F (anti-clockwise) is your subdominant (IV). A (minor) is the relative minor (vi), D (minor) is the supertonic (ii), E (minor) is the mediant (iii) and B is the leading note (diminished). Choose a different key, the same rules apply. An infinite number of chord progression are all here in one neat diagram.

