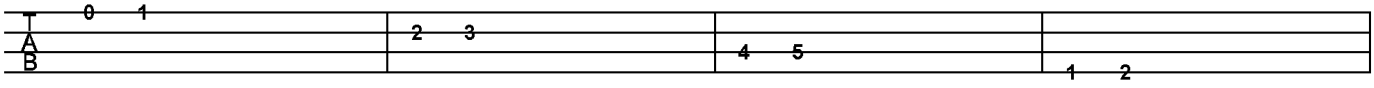
Some basic music theory for mandolin players

Intervals

In music, an interval is the difference in pitch between two notes. The ones we are interested in are semitones, tones and octaves.

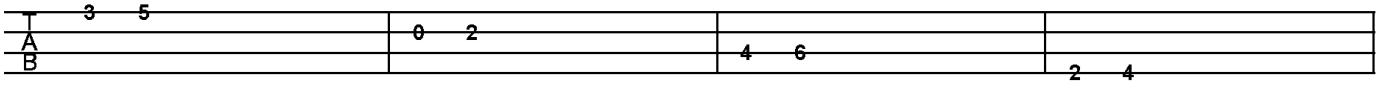
Semitones

The interval between two notes that are on the same string and a fret apart is called a semitone:



Tones

The interval between two notes that are on the same string and *two* frets apart is called a tone:



Open Strings

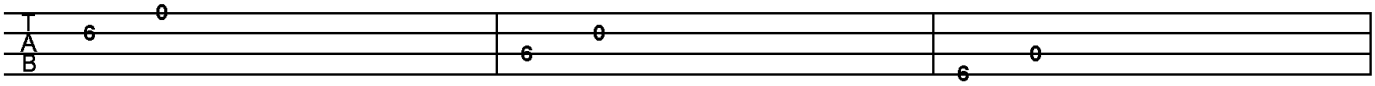
Notice that there is nothing intrinsically special about open strings. Think of them as being fretted at the 'zeroeth' fret (a fret lower that the first fret), but without involving any fingers.

Tones and Semitones Involving Two Strings

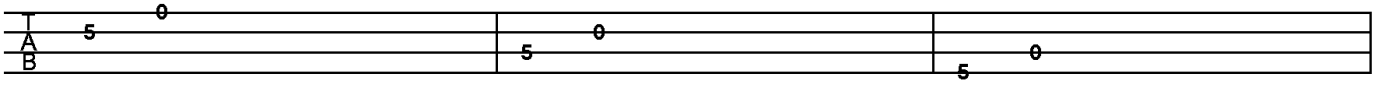
Two notes a semitone or a tone apart can be on separate strings. For our purposes, one of these strings will always be an open string.

Notice that **the notes on fret 7 of strings 2, 3 & 4 are the same as 'open' notes on strings 1, 2 & 3 respectively**. It follows that:

- There is a **semitone** between the notes on fret **6** of strings 2, 3 & 4 and the 'open' notes on strings 1, 2 & 3 respectively:



- There is a **tone** between the notes on fret **5** of strings 2, 3 & 4 and the 'open' notes on strings 1, 2 & 3 respectively:



For our purposes, **never play above the 6th fret of strings 2, 3 or 4**. Always play the note 7 frets lower on the next string.

The Major Scale

The major scale is the most common structure on which Western music is based. It is often taught using the pattern 'TONE-TONE-SEMITONE-TONE-TONE-TONE-SEMITONE' (**TTSTTTS**). This works as follows:

1. Start on any chosen note (called the **tonic** - use the open 2nd, 3rd or 4th string for now)
2. Play the note a **tone** higher than the starting note
3. Play the note a **tone** higher than the previous note
4. Play the note a **semitone** tone higher than the previous note
5. Play the note a **tone** higher than the previous note (if you started on the open 2nd, 3rd or 4th string, this will also be an open string)
6. Play the note a **tone** higher than the previous note
7. Play the note a **tone** higher than the previous note
8. Play the note a **semitone** tone higher than the previous note (this note is also called the **tonic**)

Octaves

There are exactly 12 semitones between the first note and the last one in the model of the major scale given above. This interval is called an octave. Notes an octave apart have a special affinity. Despite the difference in pitch, they are thought of as being essentially 'the same'. They are given the same names, and have the same relationships with the notes surrounding them. When played together, it can be difficult to distinguish between them.

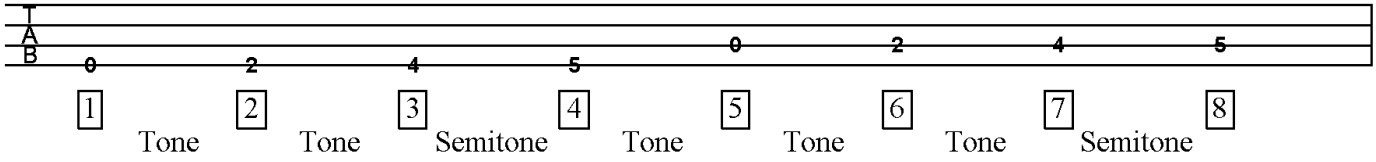
Major scale 'formula'

I find that the TTSTTTS pattern can be quite confusing in practice, so I prefer to number the notes 1, 2, 3, 4, 5, 6, 7, 8. 1 and 8 are actually interchangeable as they both refer to the tonic - usually we use '1', but there are times when it is more convenient to call it '8'.

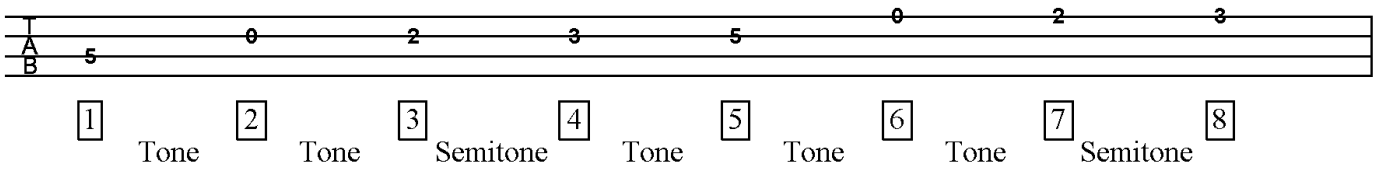
The most important thing to remember about this formula is that **there is a tone between each adjacent pair of notes except 3&4 and 7&8** (or 7&1). In the following scales, say these numbers out loud as you play the scales.

Scale of G Major

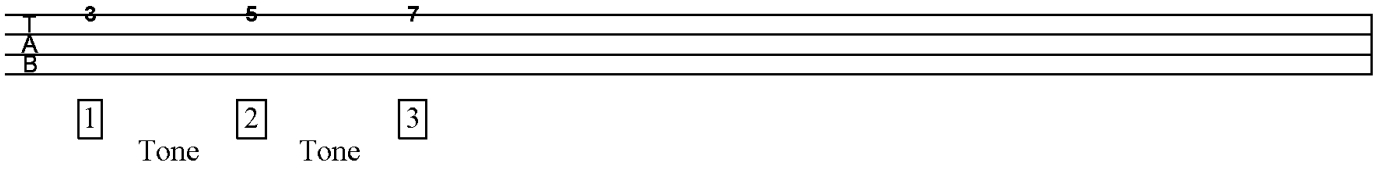
If we take the open 4th string ('G') as our tonic and play the sequence 1, 2, 3, 4, 5, 6, 7, 8 as described above, we should end up on the fret 5 of string 3:



By taking this note as a new tonic (remember: 8=1), we can start our sequence again, and end up on fret 3 of string 1:

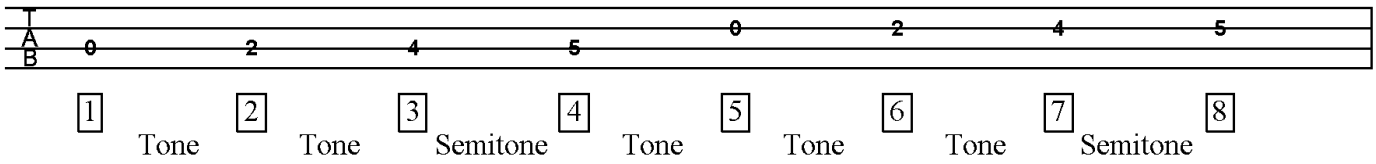


We could then play first three or four notes of our sequence starting from here (we could go even higher, but that would take us out of position):

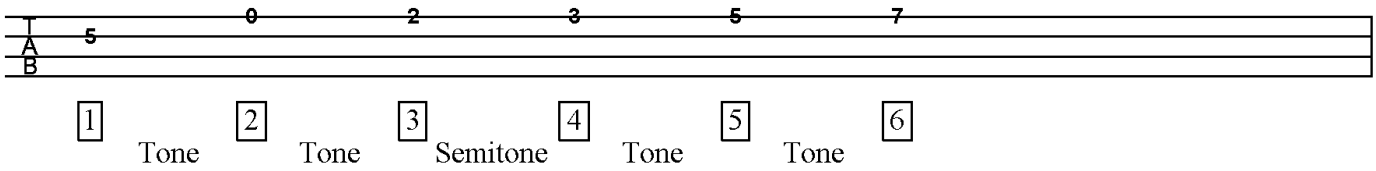


Scale of D Major

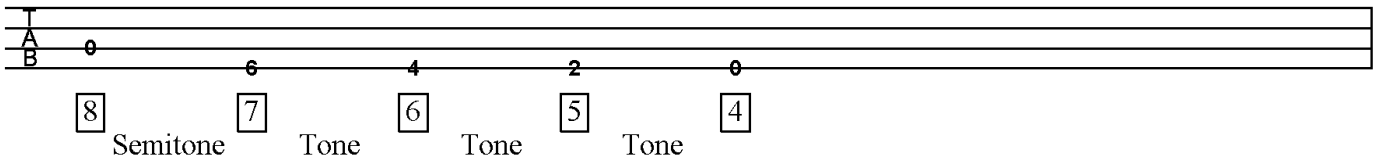
If we take the open 3rd string (‘D’) as our tonic and play the sequence 1, 2, 3, 4, 5, 6, 7, 8 we should end up on the fret 5 of string 2:



By taking this note as a new tonic, we can play the first five or six notes of our sequence an octave higher:

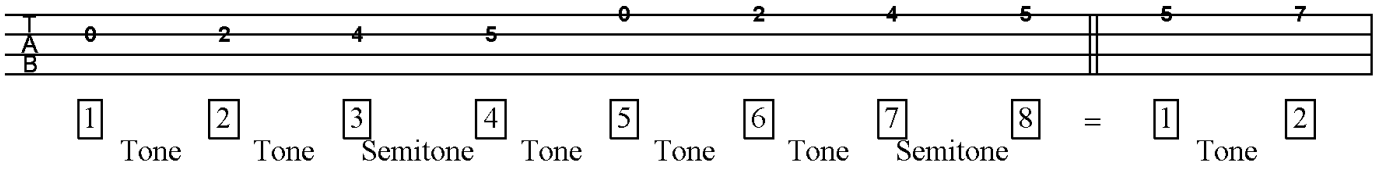


What about the fourth string? I hear you ask. If we start again on the open 3rd string, we can count *backwards* (8, 7, 6, 5, 4) and discover notes in our scale on the fourth string:

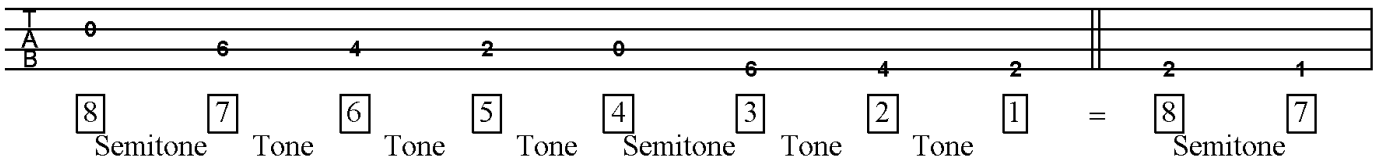


Scale of A Major

If we take the open 2nd string (‘A’) as our tonic and play the sequence 1, 2, 3, 4, 5, 6, 7, 8 , we should end up on the fret 5 of string 1. By taking this note as a new tonic, we can play the first two (or, if you’re feeling adventurous, three) notes of our sequence an octave higher:



By starting on the open 2nd string and working backwards (8, 7, 6, 5, 4, 3, 2, 1), we get all the notes in this scale down to fret 2 of string 4. We can squeeze in an extra ‘7’ on fret 1 of string 4:



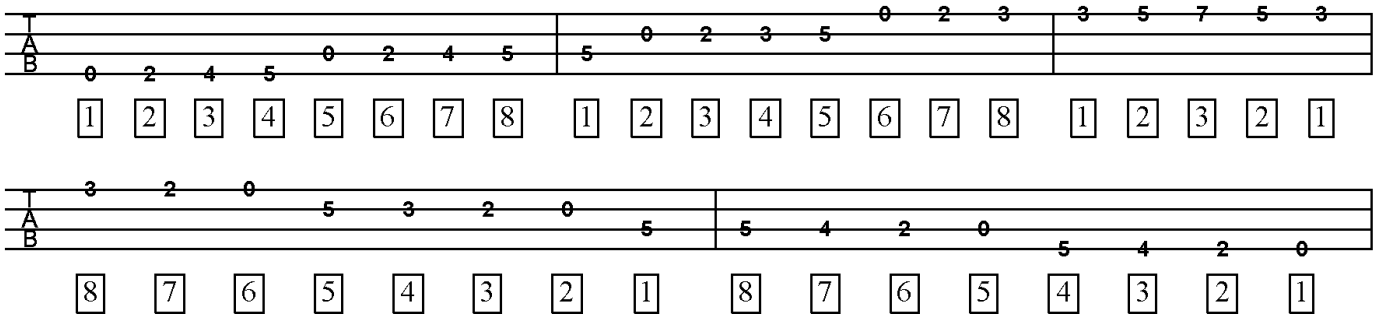
Practicing the scales

Try to get to know all these scales as thoroughly as possible. Practice running up and down the entire range of each scale as follows:

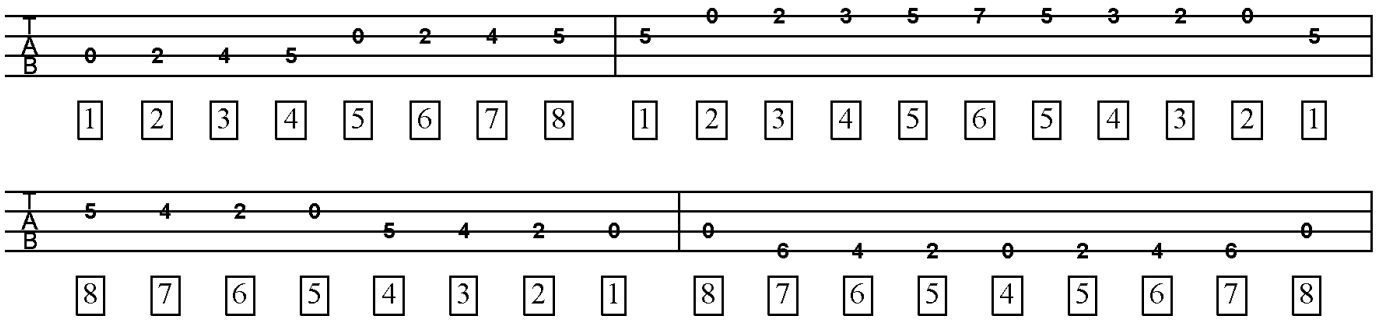
- Start on a tonic
- Go up, note-by-note, until you get to around fret 7 of string 1
- From there, down, note-by-note, until you get to the lowest note possible
- Go up, note-by-note, until you get to the tonic you started from

This is illustrated in the next three exercises. When playing through these, don't treat them as an arbitrary set of notes. Rather, try to understand how the few simple concepts we've discussed come together to dictate which notes are present in each scale. You don't need to repeat the tonics (1 & 8) as shown, but this can help you 'get your bearings' at first.

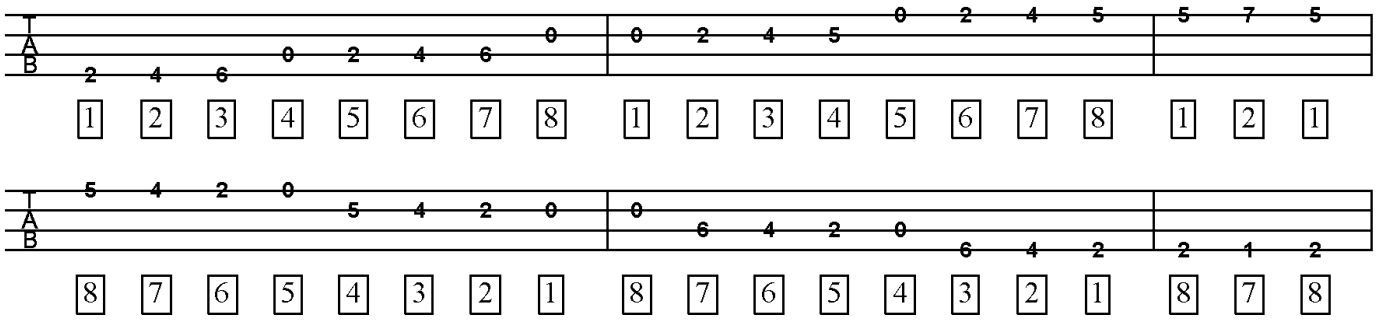
G major:



D major:



A major:



When you're comfortable with these scales, experiment with starting and stopping them on different notes and 'changing direction' (up or down the scale) at random. Who knows, your experiments could result in a fabulous new tune!

The Chromatic Scale

In the chromatic scale, there is a semitone between each adjacent note. On the mandolin, we can play a chromatic scale as follows:

- Play the notes on frets 0,1, 2, 3, 4, 5 & 6 of string 4
- Play the notes on frets 0,1, 2, 3, 4, 5 & 6 of string 3
- Play the notes on frets 0,1, 2, 3, 4, 5 & 6 of string 2
- Play the notes on frets 0,1, 2, 3, 4, 5, 6 & 7 of string 1

(Use the right-hand index-finger for frets 1-2; the middle finger for frets 3-4; the ring finger for frets 5-6 and the pinkie for fret 7)

Naming the notes

The chromatic scale contains every note in an octave. We use the first seven letters of the alphabet (A, B, C, D, E, F, G) to name these notes. Seven names for twelve notes? How can this possibly be?

Well, A & B are a tone apart (You can find an A and a B on the frets 0 and 2 of string 2 respectively). There is an extra, as yet un-named, note between them The same is true of C&D, D&E, F&G and G&A.

In fact, **only B&C and E&F have no extra note in between them.**

What should we call these extra notes then? They all, in fact, have two possible names. We can:

- take the name of the lower neighbour and add the word '**sharp'** (symbol - ♯) OR
- take the name of the higher neighbour and add the word '**flat'** (symbol - ♭)

So the note between A and B could be called A-sharp (A♯) or B-flat (B♭). You can find this note on fret 1 of string 2. Which name we use depends on the context. In Scottish traditional music, we tend to use 'sharps' more often. Keep reading to find out why!

Our chromatic scale then, looks something like this:

G	G♯ A♭	**A**	A♯ B♭	**B**	**C**	C♯ D♭	**D**	D♯ E♭	**E**	**F**	F♯ G♭	**G**	G♯ A♭	**A**	A♯ B♭	**B**	**C**	C♯ D♭	**D**	D♯ E♭	**E**	**F**	F♯ G♭	**G**	G♯ A♭	**A**	A♯ B♭	**B**

Another way of looking at the major scale

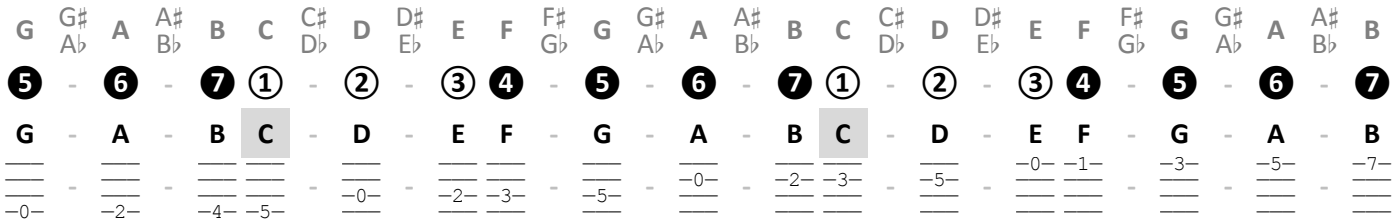
We can think of the major scale as being made up of alternating groups of three and four notes: **the adjacent notes within each group are separated by a tone**. The groups themselves are separates by a semitone. The 3-note group has the notes 1, 2 &3; and the 4-note group has the notes 4, 5, 6 & 7. Below is a representation of this idea.

❶ ❷ ❸ ④ ⑤ ⑥ ⑦ ❶ ❷ ❸ ④ ⑤ ⑥ ⑦ ❶ ❷ ❸

In this diagram, the black dots represent the 3-note group and the white ones represent the 4-note group. It can also be the other way about. Note that this has nothing to do with what people usually mean by 'white-notes' and 'black-notes' (this refers to the piano keyboard where A, B, C, D, E, F & G are white, and all the ♯/♭ notes are black).

Scale of C Major

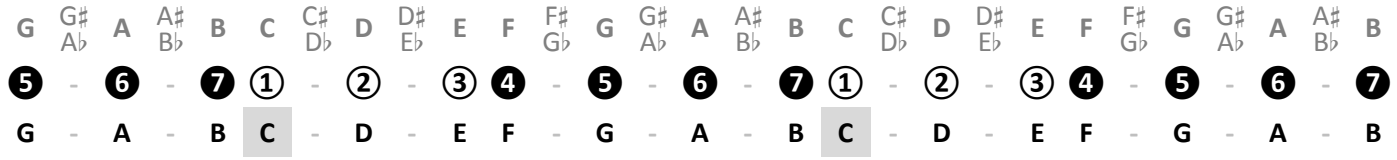
Although we don't use this scale very often in Scottish traditional music, it is a useful one to consider when learning about music theory. The note C can be found on fret 5 of string 4. By taking this note as our tonic, we can derive the scale as follows:



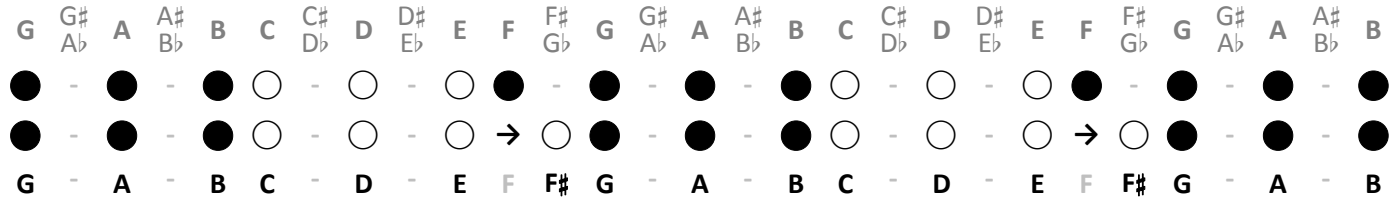
This is very often the first scale musicians learn as these are no 'sharps' or 'flats' involved. Take your time and study the diagram of the C major scale until you fully understand how it works.

From C major to G major

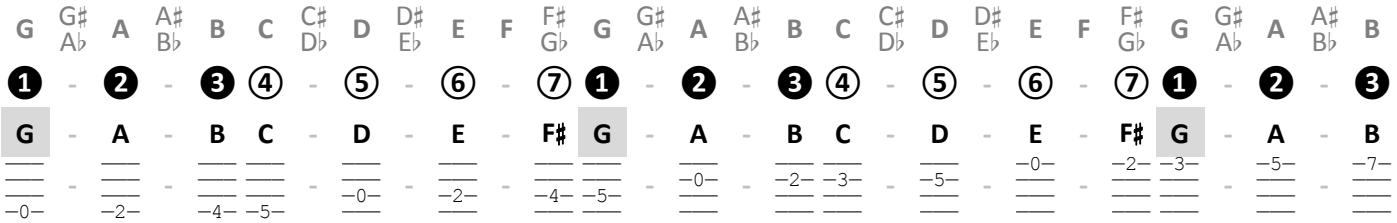
Let's look again at C major:



If we shift note 4 (F) up a semitone, the 3-note group gets extended to a 4-note group; and the 4-note group gets truncated to a 3-note group. So that each letter (A, B, C, D, E, F & G) is used, we choose the name F♯ rather than G♭ (E, F♯, G makes more sense than E, G♭, G).

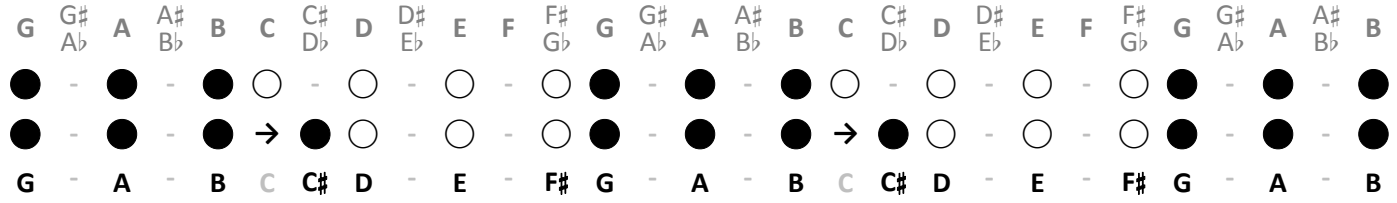


This is a new major scale. We know that the first note in the 3-note group is the tonic. In this case the tonic is G, so this is the scale of G major:

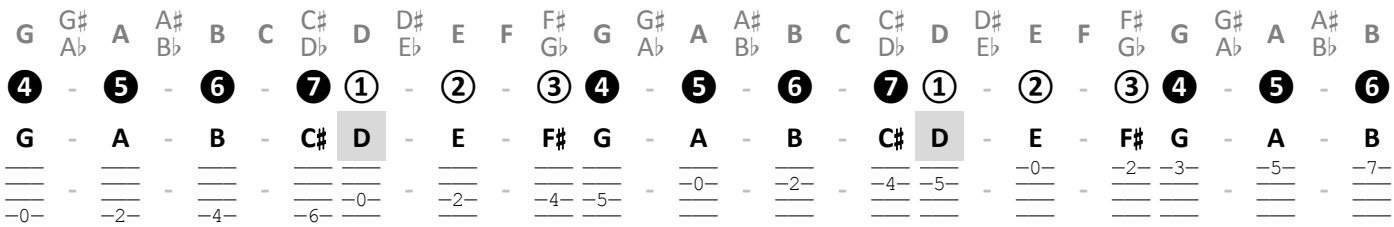


From G major to D major

We can transform G major to a new scale in a similar manner (by raising note 4 - i.e. swapping C for C♯):

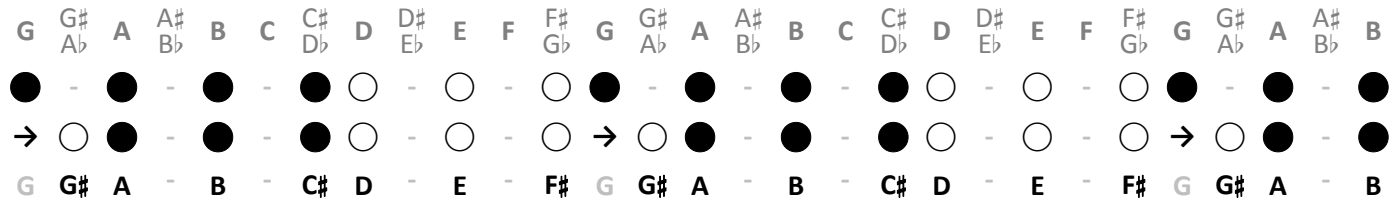


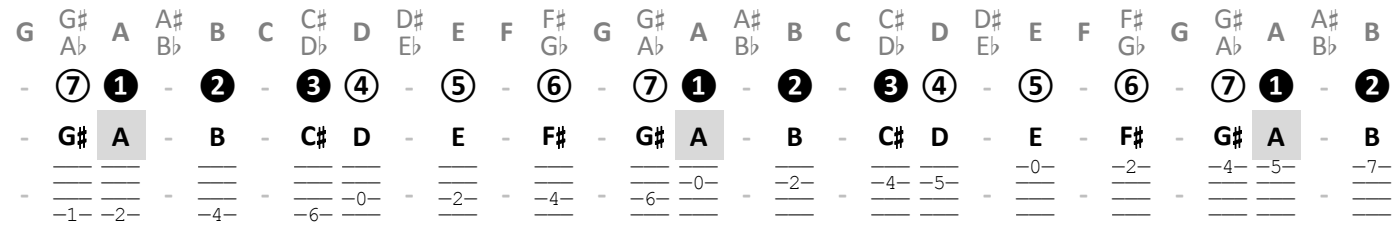
Now D is our tonic, so we have a scale of D major:



From D major to A major

Finally, we can shift note 4 of this scale up a semitone (G to G♯) to give us the scale of A major:





Conclusion

We could continue in this manner until all the notes from C major were replaced with the 'sharpened' versions (yes, B♯ and E♯ do exist - they're the same as C and F respectively). We could also start at C major and create new scales by *flattening* note 7 until all the notes have been flattened (effectively the opposite of what we've been doing).

There are, in fact 12 possible major scales, one for each note of the chromatic scale - some of them even have two possible names! However they all have the same TTSTTTS structure, and anything that can be played using one major scale, can pretty much be played using any other.

For Scottish (and, for that matter Irish, Bluegrass etc.) music, we don't have to worry too much about scales other than G, D and A major (although other ones do occasionally crop up). Most of our tunes are played in these keys because the suit the instruments on which the music tends to be played.

You will come across tunes that aren't based on the major scale, but very often the scales that these tunes are based on have exactly the same notes as the scales we've looked at - it's just that they treat a different note as the tonic.

In short, being familiar with just the three scales we've concentrated on here will give you a huge advantage when it comes to learning and understanding Scottish tunes.

Happy practising!