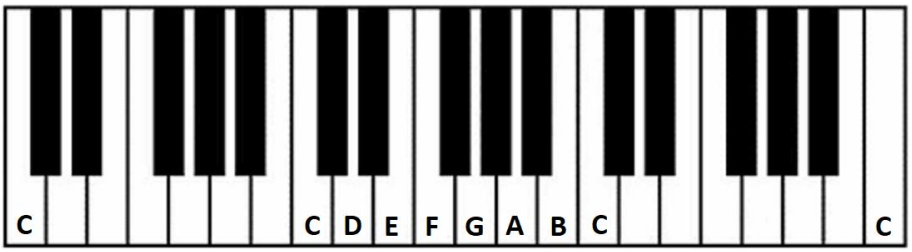
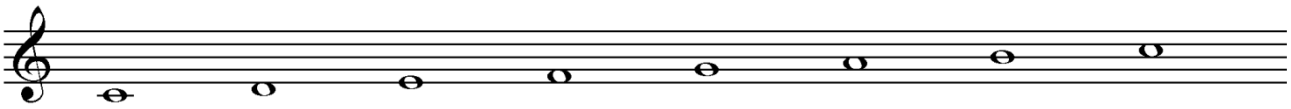
# How Key Signatures Work

You will need access to a piano or a keyboard for this activity. You do not need to be a pianist: you can play all the exercises with one finger if you wish. All you need to know is that the white notes are normally **naturals** and are named after the first seven letters of the alphabet, ascending alphabetically. The black notes are the **sharps** and **flats**. You also need to be able to find middle C. Here is the piano keyboard with some of the notes named. **Middle C** is the C nearest the centre of the piano keyboard.



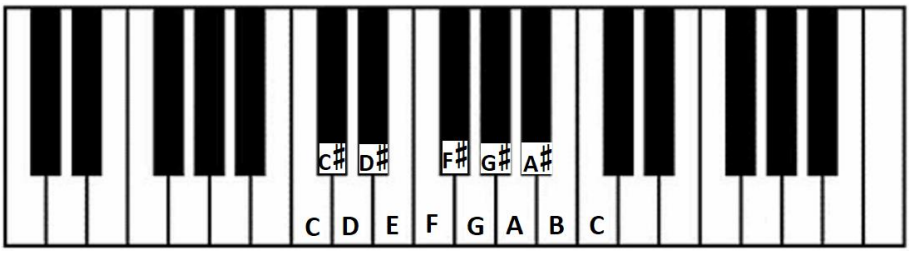

Play 8 white notes starting from middle C and moving up the keyboard (to your right). You have played a scale of **C major** ascending. This is how it is written:

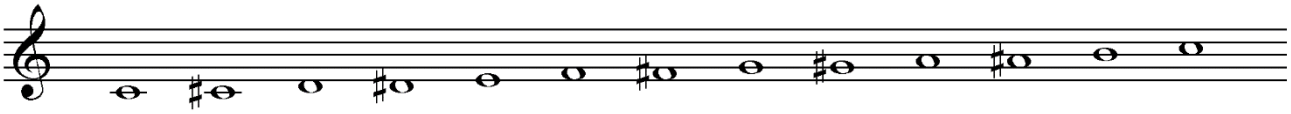


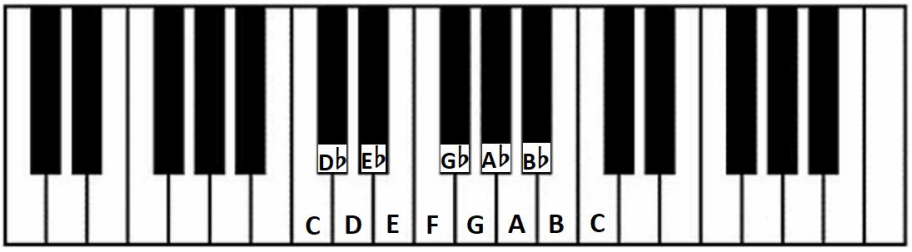
The fifth note of the scale is G. We say that G is a 5th above C. To get from the bottom of the scale to the top we play 8 notes. The distance from middle C to the C above is one **octave**.

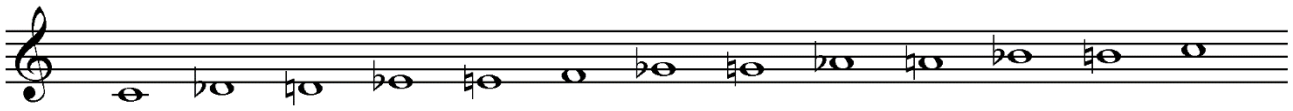
To play the scale you did not play all the notes between the two Cs. You only used the white notes. All the notes in the scale were naturals. Now play all the notes including the black ones between middle C and the C above. You have played a **chromatic scale**. A chromatic scale is a scale which moves in steps of a **semitone**. A semitone is the smallest interval (difference of pitch) you can have between two notes.

The chromatic scale can be written in more than one way. Compare these two examples of the same chromatic scale.





If you place a sharp sign (♯) in front of a note you raise it by a semitone.

If you place a flat sign (♭) in front of a note you lower it by a semitone.

The full name of C is C-natural (C♮).

C♯ is a semitone above C♮.

D♭ is a semitone below D♮.

C♯ and D♭ sound the same but are written differently. They are **enharmonic equivalents**.

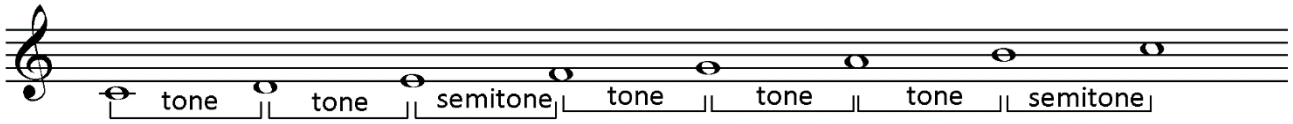
The same is true of D♯/E♭, F♯/G♭, G♯/A♭, A♯/B♭.

There is no black note between E and F: they are a semitone apart.

E♯ is the enharmonic equivalent of F♮ and F♭ is the enharmonic equivalent of E♮.

B and C are also a semitone apart: they have no black note between them.

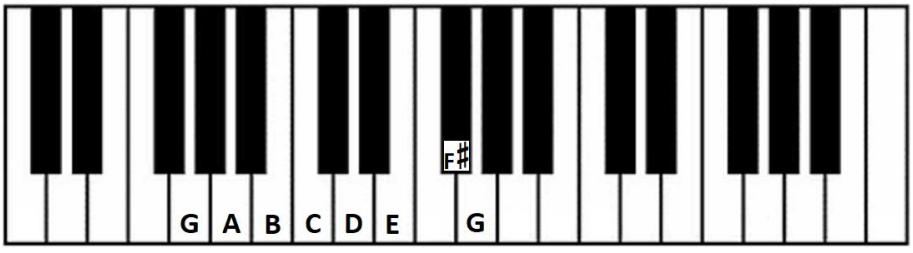
Here is the scale of C major written out again:




Some of the steps in the scale are a semitone and some are a tone (1 tone = 2 semitones). The semitones are between E and F and between B and C where there are no black notes. Starting on middle C, the steps are: tone, tone, semitone, tone, tone, tone, semitone. It is this pattern of tones and semitones that makes the progression known as the **major scale**.

In the earliest stages of learning, most of the tunes you have to play are made up of the notes of the C major scale. They are in the key of **C major**.

Use the keyboard to work out a scale of **G major**. Remember to use the correct sequence of tones and semitones. These are the notes you should play:

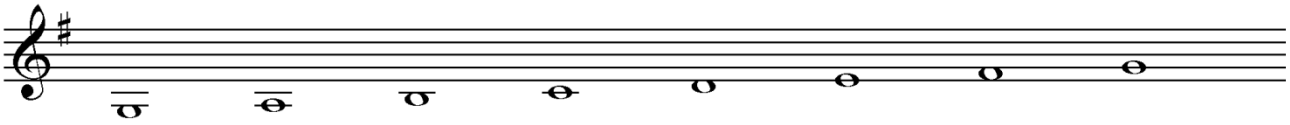


For most of the scale the white notes (naturals) provide the required pattern of tones and semitones. However, at the top of the scale, to take a step of a tone after E you will need to play F♯. Then a step of a semitone brings you back on to a white note which is, of course, G. It must be called F♯ rather than G♭. The scale must have some kind of F and cannot have two different sorts of G. Every scale has one and only one of each letter name.

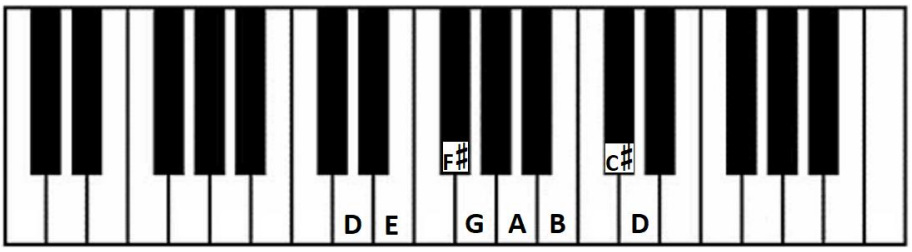
Write a scale of G major starting on the note provided. Make each note a semibreve and don't worry about bar lines. Don't forget to put a sharp sign before the F.

Instead of putting a sharp sign in front of each F, you can put the sign at the beginning of each staff, on the F line (top line). This tells the player that every F should be sharpened and, therefore, that the music is in the key of G major. Because the sharp at the beginning of the line identifies the key, it is called the **key signature**.

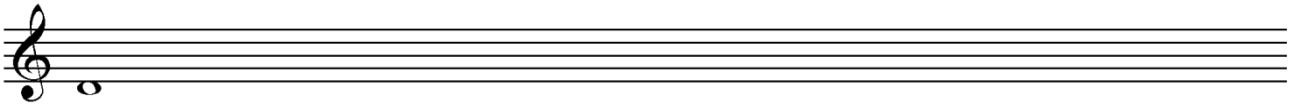
Here is the scale of G major with its key signature:



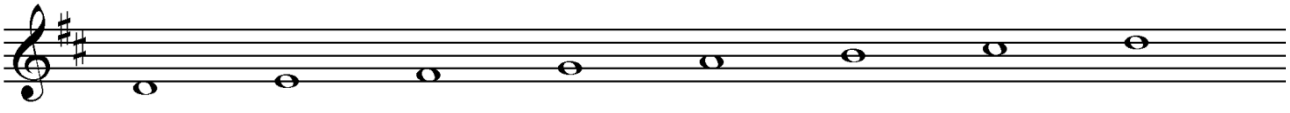
Use the keyboard to work out a scale of **D major**, remembering to use the correct sequence of tones and semitones. You should play the following notes:



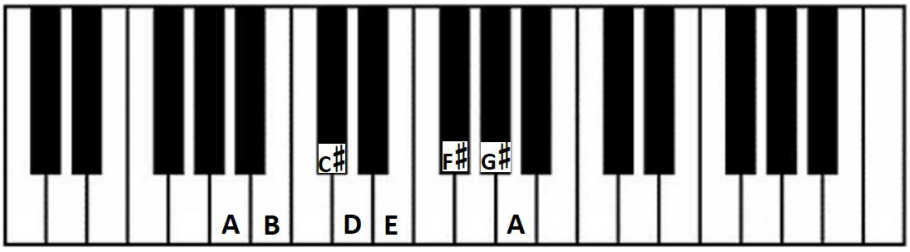

This time you need to include two sharps: F♯ and C♯. Write a scale of D major, starting on the note provided. Don't forget to write sharp signs before the F and the C.



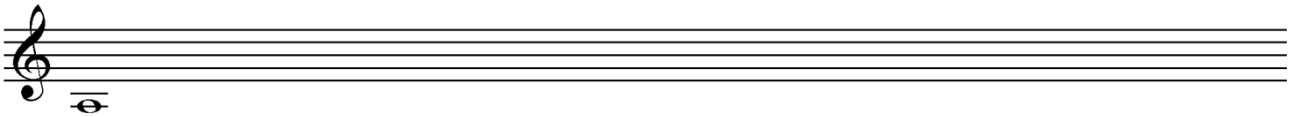
Here is the scale of D major with its key signature. The sharp signs on the top line and in the third space apply to F and C in every octave.



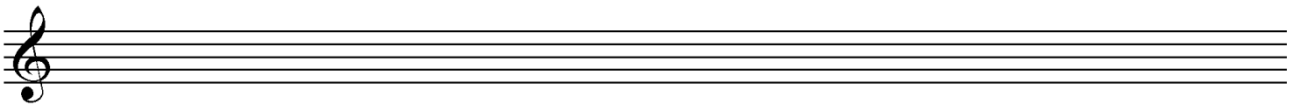
Use the keyboard to work out a scale of **A major**, remembering to use the correct sequence of tones and semitones. These are the notes you should play:




This time you need to include three sharps: F♯, C♯ and G♯. Write a scale of A major, starting on the note provided. Don't forget to write sharp signs before the F, the C and the G.

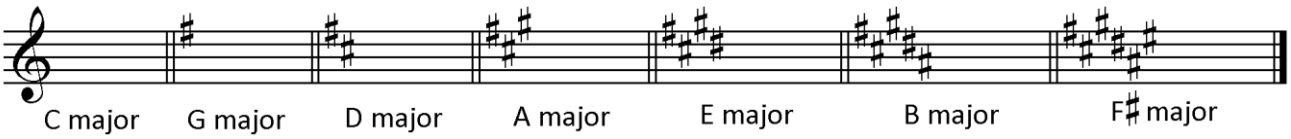


Now write the same scale with its key signature. The G♯ sign sits above the top line. You will not need to write sharps in front of any of the notes.



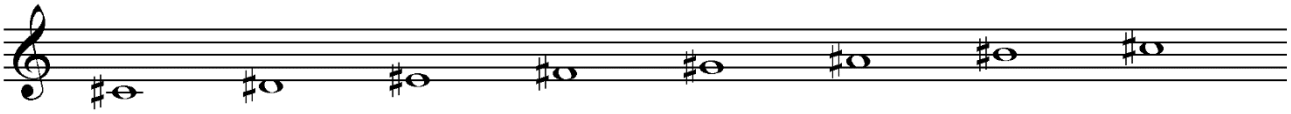
You may have noticed by now that the there is a pattern to the sequence of keys. Each time you have added a new sharp to the key signature it was a fifth higher than the previous one: the sharps were F, C and G. The keys have also gone up in fifths: C, G, D, A. If this pattern continues, the next key should be **E major** and the next sharp should be D♯. Work out E major on the keyboard to see if this pattern still works. Don't forget the sequence of tones and semitones.

Here is the sequence of sharp key signatures:



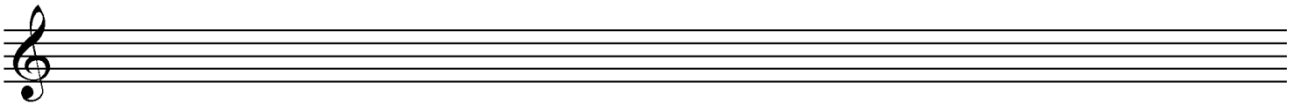

All you need, to be able to work out the sequence of sharp keys and the order of sharps in their key signatures, is to know the first seven letters of the alphabet and to be able to count the fingers of one hand.

If you count up another fifth from F♯ you get to C♯. Here is **C♯ major**:

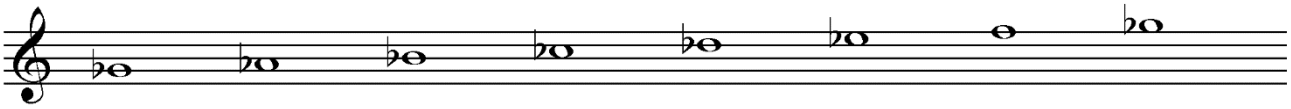


Every note is a sharp. The key signature of C♯ major has seven sharps. Such a key does exist, but you do not need to worry about it at this stage. You will see why shortly.

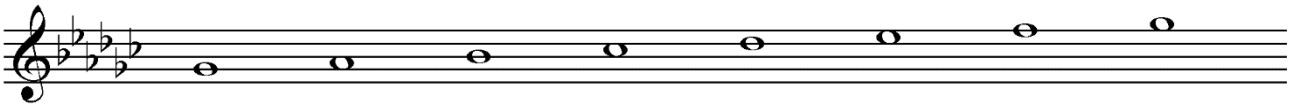
Work out a scale of **F♯ major** on the keyboard. Remember to follow the major scale pattern of tones and semitones. Write the scale out. First you should simply write a line of eight notes ascending from F to F. There should be one note on each line and in each space. Then place sharp signs in front of all the notes that should be sharpened. Check against the key signature of F♯ major shown on page 9.



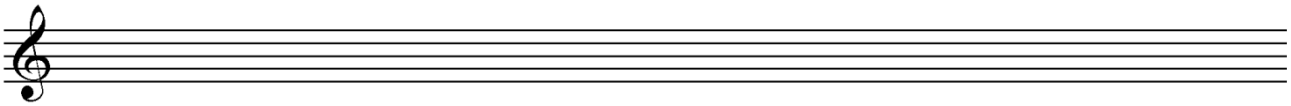
Instead of calling this scale F♯ major, we could think of it as **G♭ major**, converting all the notes to their enharmonic equivalent. The scale would be written like this:



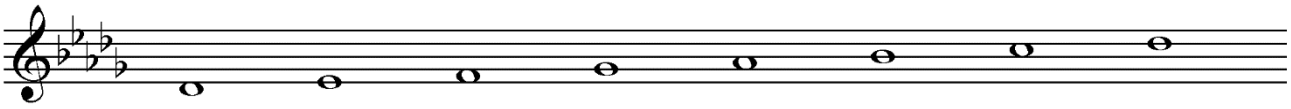
Instead of having six sharps in the key signature, the scale now has six flats. Here is G♭ major with its key signature:



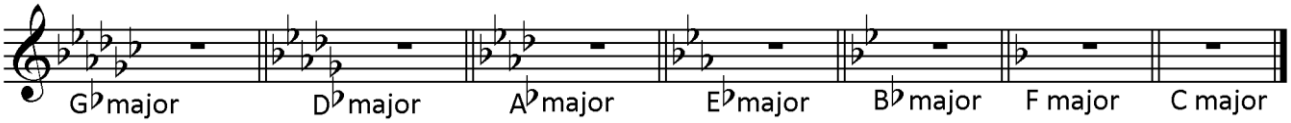
If you count up a fifth from G♭, you get not C♯ but D♭. Use the keyboard to work out a scale of **D♭ major**. Remember to follow the major scale pattern of tones and semitones. Write the scale out. You should find you have to write five flats.



Here is D♭ major with its key signature:



As you continue up in fifths you work your way down through the flat key signatures, losing the last flat each time until you return to C major.




If you want to start with C major and work through the flat keys in the other direction you will need to count backwards in fifths (C,B,A,G,F). **Alternatively, you can go up in fourths:**
**F is a fifth below C.**
**F is also a fourth above C.**

In other words, if you count the fingers of one hand, going round the first seven letters of the alphabet to work out the sharps, you can do the same thing for flats, but with your thumb tucked out of the way.