What is a Major Scale?

A major scale is a sequence of musical pitches which follows a very specific pattern and gives rise to a particular "tune" consisting of seven notes.* This tune is very recognisable and forms the basis of almost all Western music.

The major scale is in fact one of the musical "modes" which arise from the system of tones and semitones which make up Western music; this system is called the "diatonic" system and the major scale is correctly known as "the Ionian mode".

In a musical method called "solfége" (or "sol-fa"), the notes of the major scale are sung to the syllables "do", "re", "mi", "fa", "sol", "la" and "ti". These syllables are derived from an ancient Italian hymn called "Ut Queant Laxis" which follows the tune of the major scale.

*It's normal to complete a major scale by playing the first note again - one octave higher than the starting note - at the end of the sequence of seven notes, so that the starting note occurs twice and makes the major scale eight notes long in total.

Pythagoras of Samos



Pythagoras of Samos (and yes, that is the same Pythagoras that you learned about in your maths lessons at school!) was a Greek mathematician, philosopher and cult-leader. We know relatively little about Pythagoras's life, partly because the cult he led was secret. He was born on the Greek island of Samos in about 550 BC, and he relocated to Italy in about 510 BC, but other than that, we don't know very much about him. Some of the claims* made about Pythagoras are dubious, others are outlandish and some are downright ridiculous!

However, one thing we do know about him is that he gave us the major scale, which gives us the basis, which we still use today, for almost all Western music. Pythagoras developed a tuning system for the four-string harp (or "lyre" - a very popular instrument at the time) which was based on mathematical ratios. This tuning system gave a beautiful symmetry to the notes that the instrument produced, and also made it easier to play.

He used the ratios of the speed of vibration in the strings to come up with the system for tuning the four-string harp. A ratio in the vibration speed of 2:1 will produce a note an octave higher, a ratio of 3:2 will produce a note a fifth higher and a ratio of 4:3 will produce a note a fourth higher. A ratio of 1:2 will produce a note an octave *lower*. His idea was to tune the intervals of the four strings in the order of tone, tone, semitone (or as he would have called it, "tonus, tonus, semitonium"). There are three intervals because there are four strings; think of your fork - it has *four* tines but there are *three* spaces between them.

This tuning system was called the "tuning of the tetrachord". "Tetrachord" simply means "four strings", so it's not the most imaginative of names. However, it does produce an ingenious symmetry within the notes available. When you tune the four strings of your harp in the order of tone, tone, semitone, you will have notes that span a fourth (4:3). If you then stop the strings (either with your hand or a tone bar) at the ratio of 3:2 (ie one third of the way along) you will get another tetrachord tuning a bit higher up. But here is the clever part... the highest note you played is the same as your starting note. So if you play two tetrachords, one on top of the other, you've come full circle and are back where you started. And that is the major scale! So thank you, Pythagoras!

*Pythagoras was, by most accounts, a somewhat strange person. He was the leader of a secret society, and commanded his followers to worship him as a god. It has been claimed that he was the son of a Greek god, he had legs made of gold and he emitted bright white light wherever he went. But so little is known about him it is difficult to separate the myths from the facts. Some people even question whether he did indeed discover the now famous "square on the hypotenuse".

The Order of Intervals in a Major Scale

The major scale is derived from two of Pythagoras's "tetrachords". As you know, the tuning of the tetrachord is a tone, then another tone, and then a semitone. To create the complete major scale, this tuning is then repeated a fifth higher (at the ratio of 3:2). At first glance, this would appear to give us the order of jumps between notes as being "tone: tone: semitone: tone: tone: semitone". However, this is not correct because it misses one vital fact... there is also a gap *between* the lower tetrachord and the upper tetrachord, and this gap is a tone. So the major scale is two tetrachords of the intervals "tone: tone: semitone" which are themselves separated by a tone.

Accordingly, a major scale is constructed by using the intervals of tones and semitones in this order:



This is a very important sequence to memorise. Once again...

Tone: Tone: Semitone: Tone: Tone: Tone: Semitone,

or **T-T-S-T-T-T-S**.

The number of semitones' jump as the sequence progresses is:

2-2-1-2-2-2-1.

The major scale can start on any note, white or black, and if you play a series of notes in this order, you will end up back on your starting note.*

*Actually this is not quite true. You will end up on your starting note one octave higher than where you started. If you wanted to get back to your actual starting note, you would have to halve the speed of vibration of your finishing note (ie a ratio of 1:2), or drop the note down one octave.

The Names of the Notes in a Major Scale

Each note (or "degree") of a major scale has a particular name. This name remains the same irrespective of which note the major scale has started on - for example, the note of 'E' is the second note of the scale of D major, but the seventh note of the scale of F major. So the note of 'E' will have a different name in these two scales, despite its pitch being identical.

The first note of a major scale is called the **tonic** ("Do").

The second note of a major scale is called the **supertonic** ("Re").

The third note of a major scale is called the mediant ("Mi").

The fourth note of a major scale is called the **sub-dominant** ("Fa").

The fifth note of a major scale is called the **dominant** ("Sol").

The sixth note of a major scale is called the **sub-mediant** ("La").

The seventh note of a major scale is called the **leading note** ("Ti").

How To Construct a Major Scale

The major scale can start on any note, but will always follow the same pattern relative to that starting note. For our example here we shall begin on a note of E-flat. The procedure is:

- 1. Play your starting note (in our example, that will be an E-flat). This is called the "tonic".
- 2. Play a note **one tone higher** (in our example, that will be an F). This is called the "supertonic".
- 3. Play a note **one tone higher** (in our example, that will be a G). This is called the "mediant".
- 4. Play a note **one semitone higher** (in our example, that will be an A-flat). This is called the "subdominant".
- 5. Play a note **one tone higher** (in our example, that will be a B-flat). This is called the "dominant".
- 6. Play a note **one tone higher** (in our example, that will be a C). This is called the "sub-mediant".
- 7. Play a note **one tone higher** (in our example, that will be a D). This is called the "leading note".
- 8. Play a note **one semitone higher** (in our example, that will be an E-flat). This is called the "tonic", and brings us back to our starting note but one octave higher than where we started.

This procedure can then be reversed and the scale will be played in descending order.

So the scale of E-flat major looks like this on the keyboard:



The Keyboard Is Basically a Major Scale

The way a piano (or synthesiser, harpsichord, organ etc.) keyboard is laid out reflects a major scale, and in many ways pays homage to the "diatonic" nature of Western music.

If we were to write out the order of tones and semitones in a major scale, it would look like this:

T-T-S-T-T-T-S

As you can see, due to the two tetrachord tunings (tone, tone, semitone) which are separated by a tone, the tones in the major scale end up grouped in a bunch of two, then a bunch of three. Now let's write it out again, but this time not over just one octave, but over three:

T-T-S-T-T-S-T-T-S-T-T-S-T-T-S-T-T-S

And now to emphasise the position of the tones in that sequence, let's change the font of the letters 'T':



As you can see, this very closely resembles the layout of the piano keyboard:



The Fingering Pattern of a Major Scale

All major scales have essentially the same fingering, although at first glance this can be difficult to tell. Sometimes the starting or ending finger will be different in different major scales, but during the main "body" of the scale, the fingering will be the same no matter which major scale you are playing.

As we have seen, the tones in a major scale are grouped in twos and threes, and this can be observed by simply looking at the keyboard:



The fingering for the major scale can also be thought of as groups of two and groups of three. A group of two notes should be played by the index and middle finger, and a group of three notes should be played by the index, middle and ring finger. This is the same for both left and right hands:



After playing a grouping of notes (be it a group of two *or* a group of three), the thumb should then be used to play the intervening note (usually, but not always, a semitone) by tucking itself under the group of fingers which are about to play the next group of tones. On occasion, and usually just for convenience, the little finger can be used either to begin or finish the scale (or reverse its direction), but this varies according to which scale is being played and in any case is at the discretion of the player.

Major Scale Fingering Reference Charts

All major scales feature alternating groups of two fingers and groups of three fingers (as detailed on the previous page), with the thumb used as a "lever" to prepare and position the hand for the next group of fingers (be it a group of two *or* a group of three) to play. However, the starting and finishing fingers can vary from scale to scale. The following charts show the suggested fingerings for all major scales:

Name of Major Scale	Starting Finger	Which Finger Group Plays First	Finishing Finger
С	thumb	group of two	thumb
D	thumb	group of two	thumb
E	thumb	group of two	thumb
F	thumb	group of three	thumb
G	thumb	group of two	thumb
A	thumb	group of two	thumb
В	thumb	group of two	thumb
D-flat / C-sharp	index	group of two	index
E-flat / D-sharp	middle (then thumb)	group of three	middle
G-flat / F-sharp	index (then middle)	group of three	index
A-flat / G-sharp	middle (then ring)	group of three*	middle
B-flat / A-sharp	ring (then thumb)	group of two	ring

FOR THE RIGHT HAND GOING UP:

*In the scale of A-flat major/G-sharp major, the starting fingering (middle finger then ring finger) commences part-way through the group of three.

Name of Major Scale	Starting Finger	Which Finger Group Plays First	Finishing Finger
С	thumb	group of three	thumb
D	thumb	group of three	thumb
E	thumb	group of three	thumb
F	thumb	group of two	thumb
G	thumb	group of three	thumb
A	thumb	group of three	thumb
В	thumb	group of three	thumb
D-flat / C-sharp	index (then thumb)	group of three	index
E-flat / D-sharp	middle	group of two	middle
G-flat / F-sharp	index (then thumb)	group of two	index
A-flat / G-sharp	middle (then index)	group of two	middle
B-flat / A-sharp	ring (then thumb)	group of two	ring

FOR THE RIGHT HAND GOING DOWN:

*In the scale of A-flat major/G-sharp major, the starting fingering (middle finger then index finger) commences part-way through the group of three.

FOR THE LEFT HAND GOING UP:

Name of Major Scale	Starting Finger	Which Finger Group Plays First	Finishing Finger
С	thumb	group of two	thumb
D	thumb	group of two	thumb
E	thumb	group of two	thumb
F	thumb	group of three	thumb
G	thumb	group of two	thumb
А	thumb	group of two	thumb
В	thumb	group of two	thumb
D-flat / C-sharp	middle (then index)	group of two	middle
E-flat / D-sharp	index (then thumb)	group of three	index
G-flat / F-sharp	ring (then middle)	group of three	ring
A-flat / G-sharp	middle (then index)	group of two	middle
B-flat / A-sharp	index (then thumb)	group of two	index

*In the scale of A-flat major/G-sharp major, the starting fingering (middle finger then index finger) commences part-way through the group of three.

FOR THE LEFT HAND GOING DOWN:

Name of Major Scale	Starting Finger	Which Finger Group Plays First	Finishing Finger
С	thumb	group of three	thumb
D	thumb	group of three	thumb
E	thumb	group of three	thumb
F	thumb	group of two	thumb
G	thumb	group of three	thumb
А	thumb	group of three	thumb
В	thumb	group of three	thumb
D-flat / C-sharp	middle (then thumb)	group of three	middle
E-flat / D-sharp	index	group of two	index
G-flat / F-sharp	ring (then thumb)	group of three	ring
A-flat / G-sharp	middle (then ring)	group of two*	middle
B-flat / A-sharp	index (then thumb)	group of two	index

*In the scale of A-flat major/G-sharp major, the starting fingering (middle finger then ring finger) commences part-way through the group of three.