

What the Hell's a semitone?

An in depth level 1 theory tutorial By Lou Stonehill, aimed at the total beginner wishing to start off on the right track by building a complete and thorough understanding of the basics of Music Theory and Harmony.

WARNING: This tutorial contains some mild humour!

Ok, so what the hell is a semitone? Well, it's the smallest interval available in western music.

Now, whilst being concise and factually correct, the explanation above leaves the novice and sometimes even the more experienced player none the wiser. Before we really get going on this I feel it only fair to point out that I'm a self-confessed "geeky nerd" when it comes to harmonic accuracy and musical grammar! This is not for any reason other than in a creative yet subjective area such as music; it's always beneficial to really understand as many of the rules as possible before you start trying to musically bend them.

In my 20 or so years as a professional player I have encountered many occasions when a student is totally confused by the basic principles of Music Theory. In such cases it's proved invaluable to relate topics of music that a student does not understand to topics which they do.

So with this in mind please let me start by asking you to forget the title of this tutorial for a moment, and to allow me to apparently change the subject.

Have you ever really considered the dictionary definition of the word 'Unit'?

Quite possibly not, after all we all know what a unit is don't we? This is where it gets awkward; yes we know what units are since we use them all the time in everyday life, but that does not make it any easier to provide an accurate definition. When I have put this to students, I have never had a plausible answer. I have then asked for examples - so away you go, try to think of examples of units of one form or another and I bet you're coming up with centimetre, meter, kilometre, inch, mile (depending on age) etc possibly gram, ounce, (again depending on age!) but what about fathom? hectare? euro? Kilojoule? watt? or of course decibel! Then there's newton, micron, amp, not to mention the all important *pint*, etc etc.

Ok so you're getting the idea, and yes, all units are used to measure stuff for one reason or another but we still don't have a definition that encompasses all units accurately. So here goes:

"A unit is an internationally recognised pre-determined reference between two given points"

If you're not convinced, when you hold your thumb and forefinger roughly a centimetre apart, you can immediately see the two points, namely your thumb and forefinger which are now roughly a centimetre apart because you are totally aware of the recognised measurement of one centimetre. When considering a bag of sugar, you have the downward force applied by the weight of the bag, namely a kilogram (first point), and no downward force if you let go of the bag (second point with a thick ear from the Mrs!) and these two rather basic examples would be the same anywhere in the world.

"Yeah right, thought this was supposed to be a music lesson not a physics lesson!"

Why on earth would I rant on like this? Quite simply, because units also exist in music, and are used to measure the audible pitch difference between any two different notes.

Take a close look at the photo of the keyboard below.



"This is a guitar site and there's no Ctrl Alt Del" (p.c. users only!)

True, but believe me the piano is by far the easiest way to get into harmony since its all there for you in black and white literally. The letters have been added to help you identify the note names and to show the real newcomer that the connection between the alphabet and western music stops at the letter G, once we get to a G it's then straight back to A and so on! No chaps there's no H in music! There is here however a real pattern which repeats with relentless simplicity, meaning that if the above photo were

to be six times as wide, you'd effectively see exactly the same thing again and again in either direction left or right.

The next time you look at a keyboard not provided by PC World, notice that the black notes appear in two groups, a group of two followed by a group of three, then two followed by three and so on till the bats start queuing for your autograph! Just so that you're fully aware, the notes will sound progressively higher in pitch as you play from left to right, and, the white note immediately to the left of any group of two black notes will always be a C as shown above.

Enough already - you still don't know what the hell a semitone is! Actually you do!

Take the C as labelled bottom left of the picture, now consider the black note immediately to its right, and yes folks the pitch difference between these two keys is what is internationally recognised as one semitone. If you now consider this same black note and the white note to its right (the D) that is also a pitch variation of one semitone.

Ok so far so good but were not even scratching the surface here. Basically any two immediately adjacent notes on a keyboard constitute one semitone. The word semi means half (semicircle, semi sphere etc) so if we were to put two notes together which had two semitones between them, then it would be fair to assume that these two notes would be a whole tone apart as in C to D (two white notes next to each other-left in picture) usually abbreviated to a tone.

You now also know something else which is critical to good understanding of harmony, and that is that any two different notes considered, played, written down, or talked about after the gig constitute an 'Interval' and all intervals are, yup you guessed it, measured according to the number of semitones contained between the two notes involved. For example if you were to consider the same C again (far left), and the F (right in the middle) and then counted the number of semitones between the two, you should be able to see that this 'interval' (C to F) is actually five semitones. If on the other hand you were to count the number of semitones between the two C's, you'd be spot on if you arrived at the answer twelve!

What this now means is that the closest in pitch that you can play any two notes without them being the same is, of course, one semitone and hopefully the definition I gave at the top of this article now makes sense.

"What about the western music bit?"

Ok, if you've ever eaten in an authentic Japanese restaurant and wondered why the background music sounded out of tune, this is because in the Far East they use quarter tones as well, which are exactly half the pitch variation of a semitone. The same effect can also be heard with certain ethnic instruments such as the Sitar, Koto, or Samisen.

Now, before we start applying this new found knowledge to the Guitar, I'd like to draw your attention to a few more things.

If we look at the same photo again and analyse the combination of 'intervals' between each pair of adjacent white notes, we would get the following:



C to D = Tone, D to E = Tone, E to F = Semitone (no black note in between), F to G = Tone, G to A = Tone, A to B = Tone, and finally B to C = Semitone (again no black note in between). Now that looks a little complex, but if we use T to represent Tone and ST to represent Semitone, the whole combination looks more straightforward i.e.

T T ST T T T ST

We're still not done yet since this reveals two of the most important fundamentals that you must absolutely know. Firstly, the notes E to F and B to C are the only natural semitones available to you, that is, the only semitones that occur naturally. In other words, every other semitone in western music will have to contain a black note.

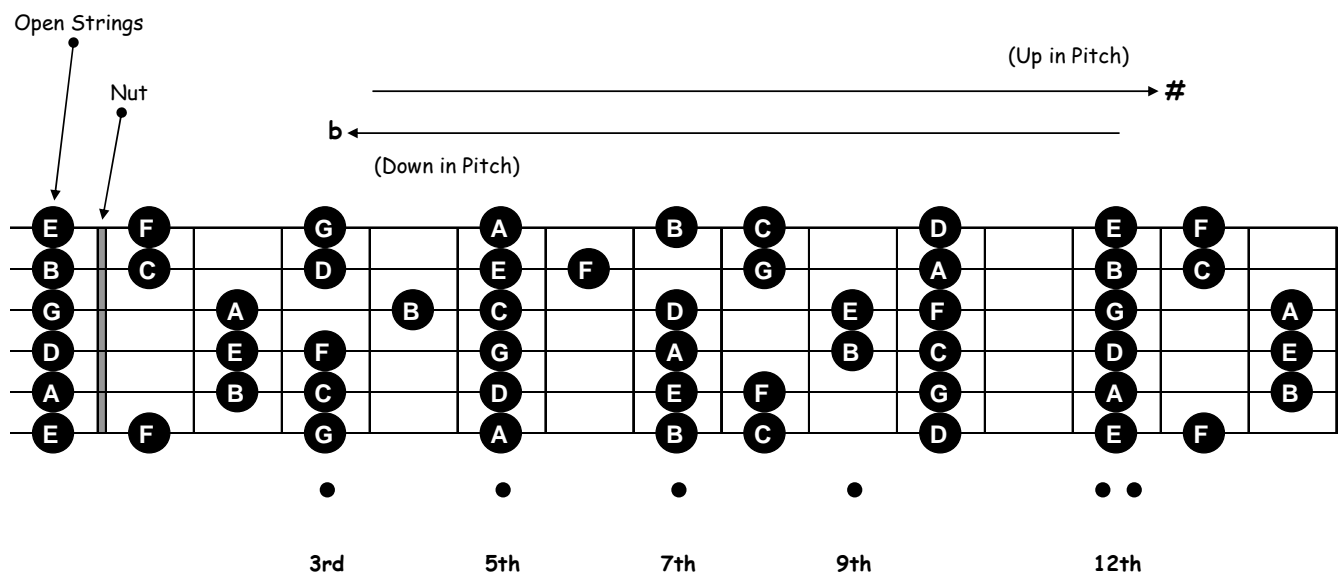
Furthermore, the interval combination shown above (T T ST T T T ST) represents the combination required to obtain what western ears interpret as being a major scale. Now lets really hammer this point home - this combination is that of a major scale, you must have this combination in order to have a major scale (regardless of which note you start from, black or white), if you do not have this combination, then you wont hear a major scale and, finally, all other scale types have a different tone/semitone

combination. In order to help you memorise this quickly, simply think of the interval structure of a major scale as being $2\frac{1}{2}$ $3\frac{1}{2}$ where the numbers refer to the amount of tones and the fractions show the semitones.

Now if what I'm telling you is true, and believe me it is, there has to be a degree of similarity between the keyboard photo and a guitar fretboard. Good news, people, there is.

Any two notes on the guitar played one fret apart on the same string will generate an interval of one semitone. Any two notes played two frets apart on the same string will create a tone.

To conclude for this issue, examine the fretboard diagram below and notice that immediately to the right of every E there is an F, and to the right of every B there is a C, all natural semitones. All other alphabetical pairs are two frets apart i.e. tones. Now count the frets between the open string E (bottom left) and the next E on the same string and hey presto twelve, exactly like the twelve semitones between the two C's in the keyboard photo earlier. Cool or what!



Thanks for reading; I hope you found this article informative. In the next issue I'll be taking you through the sharps and flats (black notes), what they do and why. This will, hopefully, give you a total understanding of the key system and all its scary contents!

Warm Regards,

Lou.

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