

Music Theory For Guitar Players Lesson #1: Intervals, Scales and Chord Spellings

Introduction

For many learning theory is the most dreaded part of being a musician. For many of us music can be intuitive, so it can be frustrating to try to analyze and make sense of what is actually happening when we play. Theory is much like learning grammar. For most of our childhood we learn our native language and by the time we're a teenager we can express ourselves with specific words and phrases that convey the thoughts that are in our head. (It is one of the most incredible aspects of being a human when you think about it.) Then when we start to learn grammar we rebel and call it stupid and annoying, because it's like learning the rules of a game that we've already been playing our whole lives. Except in this case we realize we thought we knew all the rules, when in reality, we were breaking quite a few the whole time. Luckily in music breaking the rules can be what pushes the art forward. Still like many a great teacher has said, you must learn the rules before breaking them.

Learning theory dispels the myth and mystery of music, and gives us musicians a concrete way to formalize and analyze their work and the work of others. It makes us better communicators and illuminates the innate beauty and unity in music. You will have many "ah-ha" moments, and will realize music is universal and at its essence is part of what makes us human.

Some Important Terms

Before continuing let's define some basic terms that we will be using a lot in this unit.

Chord - When 3 or more unique notes are played simultaneously.

In this case the word unique refers to notes that have different letter names. For example if we play the note G twice in a chord that only counts as one unique note.

Triad - A chord that has exactly 3 unique notes. No more, no less.

7 Chord - A type of chord that has 4 notes in it. Not all 4 note chords are 7 chords, but all 7 chords have 4 notes.

Root - The note from which we derive a chord's name. For example the chords Em, Esus4 and Emaj7#11 all have the same root, which is the note E.

Interval - A unit of measurement that tells us how far away two notes are. Just like we can measure the distance between New York and Paris in miles or kilometers, we can measure the distance between two notes using intervals. For instance the notes A and B are closer together than the notes A and D. More frets between notes makes for a bigger interval.

Half Step - The smallest interval in music also known as a **semitone**. On guitar a half step is achieved by moving up or down one fret. For instance the 5th fret on the low E string is the note A. Moving up a half step would bring us to the note A# on the 6th fret. Moving down a half step would yield the note Ab on the fourth fret.

Whole Step - The equivalent of moving up or down two half steps. On a guitar this is done by moving up or down two frets. Moving up a whole step from the note A on the E string (5th fret) would give us the note B (7th fret), and moving down would give us the note G (3rd fret).

Scale - A repeating pattern of sequential notes.

Take a moment to look closer at the chord and scale definitions. A **chord** is when we play multiple notes all at once creating a **harmony**; whereas, a **scale** is when we play notes in a sequential order. **Harmony** is just another word for the sounding of multiple notes at once, although it can have different connotations than the word **chord**. For now it's ok to think of harmonies and chords as the same thing.

Both chords and scales are built using intervals. The focus of this unit is chords, but let's use a very simple C MAJOR scale to get a better understanding of how intervals work.

Musical Alphabet

The **musical alphabet** refers to the 12 unique pitches that make up all the possible notes in Western Music. You may look at a piano and say "but there's 88 keys on this keyboard. How do we only have 12 different notes?" This is because once we run through the 12 notes in order we just start over again at the beginning. If we start on a note and go up one note at a time, after going up 12 notes we will arrive on a note with the same letter name but an **octave** higher.

For now let's write out the musical alphabet with all twelve tones. This includes the sharps and flats. Sharps are indicated with the hashtag or number sign (#). Flats are indicated with a lowercase "b" (more on sharps and flats below). Here is the musical alphabet written with sharps:

A A# B C C# D D# E F F# G G#

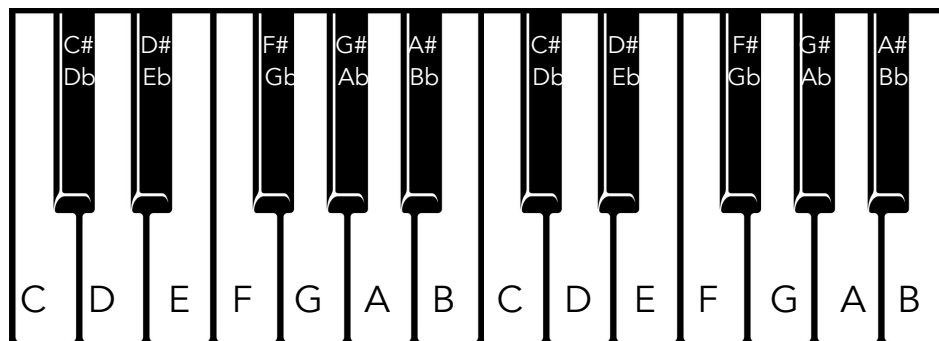
and written with flats

A Bb B C Db D Eb E F Gb G Ab

Even though we are guitar players looking at a picture of a keyboard can be super helpful as the keyboard is the perfect visualization of how the musical alphabet is organized. If you don't have access to a keyboard feel free to use the one below or this online one: <https://virtualpiano.net/>

Notice the white and black keys. All those notes we wrote with # and b symbols are the black keys. Also, notice the repeating pattern of the keys.

Let's just go over sharps and flats in some detail. Take the note A which is a white key. The black key below it is Ab and the black key above it is A#. Thus, the word **Flat** means



to lower a pitch by a **Half step** and **sharp** means raise the pitch a **half step**. The note Ab can also be called G# and A# can be called Bb. The correct names depend on the key you are in, but for now all we need to know is that every black key on the piano has two names: a sharp and a flat name.

What about the white keys that don't have black keys in between them? That occurs between the notes E and F and B and C. Let's go back to the musical alphabet:

A A# B C C# D D# E F F# G G#

Notice we didn't write B# or E#? There is a very complicated reason as to why, but for now all we need to know is that the notes B and C, and E and F are a half step apart.

(There are rare times we refer to C as B# or to B as Cb. Same goes for E and F, but this is only used in very specific keys and situations. For now let's keep it simple.)

Half and Whole Steps

We've now used the term **half step** a few times now, so let's define it.

half step - The smallest interval or the smallest unit of measurement when measuring the distance between two notes. Notes that are a half step apart are right next to each other on the piano. Likewise, each time you move one fret up or down on your guitar you have moved a half step.

If we have half steps we surely must have whole steps right?

A **Whole Step** is the 2nd smallest interval. It is when we move up or down 2 half steps, or two frets on the guitar. Going from G to G# is moving up a half step and G to A is moving up a whole step.

Ok back to the musical alphabet. This time lets start with the note C:

C - C# - D - D# - E - F - F# - G - G# - A - A# - B

Let's now pick out the notes in the C major scale. They are in **BOLD RED**

C - C# - **D** - D# - **E** - **F** - F# - **G** - G# - **A** - A# - **B**

Notice how there are no sharps or flats in the C Major scale. This makes it an easy scale for us to use as an example.

Now Let's put some numbers under those notes. These notes will serve as our **scale degrees**.

C	D	E	F	G	A	B
1	2	3	4	5	6	7

What is written above is the intervallic relationship between all the notes in the major scale in reference to the tonic of C.

That previous statement is most likely confusing to you. We will break that all down, but before we can do that we need to quickly go over the terms tonic and root in more detail.

Tonic and Root

The word tonic is similar to the word root. The **tonic** is the note from which we get a scale's letter name from. The C Major, C minor and C lydian augmented scales all have a tonic of C. The tonic is also known as the first scale degree.

When talking about chords we use the word root in a similar fashion. The **root** is the note a chord gets its name from. Like Am, A9 and Am7b5 all have a root of A.

It's ok to use the word root in place of tonic, but not vice versa. We can say C is the root of the C major scale, but saying the note C is the tonic of a C minor chord would be a little weird since chords themselves can be referred to as the tonic. But this is not particularly important right now. Just know that tonic is used when talking about scales, and root is used when dealing with chords.

Thus, if we know the tonic of our C major scale is the note C, then we can think of each note in the scale in terms of how many intervals away it is from the tonic. Therefore, the numbers we wrote under the scale indicate the size of the interval that note is away from C. D is a 2nd above C. E is a 3rd above C and so on.. When we get back to C instead of calling it an 8th away, we use the term **Octave**. An octave is just a fancy name for an interval of eight. Think octopus or octagon.

The Major Scale Formula

Let's get back to our C major scale:

C	D	E	F	G	A	B
1	2	3	4	5	6	7

What we can do with this is figure out the formula or recipe for a major scale. Every type of scale (whether it is major or minor or something else) has a specific sequence of intervals. The same goes for different chord types.

Let's figure out the distance between all the notes in the scale.

C to D is a whole step. D to E is also a whole step. We will use the letter W to abbreviate "whole step." So far we have:

C - D = W

D - E = W

Now E to F is a half step. Let's use the letter H to abbreviate "half step." Whole and half steps are all that's needed for a major scale so here is the full C Major scale formula:

$$C - D = W$$

$$D - E = W$$

$$E - F = H$$

$$F - G = W$$

$$G - A = W$$

$$A - B = W$$

$$B - C = H$$

Get rid of the notes so we're just left with the intervals and voila! We have our **major scale formula**:

$$W - W - H - W - W - W - H$$

So if we take any note and then start going up using this formula we will get a major scale in any key.

To prove that this formulas works for all major scales lets look at the E Major Scale:

$$E - F\# - G\# - A - B - C\# - D\# - E$$

$$E - F\# = W$$

$$F\# - G\# = W$$

$$G\# - A = H$$

$$A - B = W$$

$$B - C\# = W$$

$$C\# - D\# = W$$

$$D\# - E = H$$

Exercise #1:

See if you can use the major scale formula to figure out the following major scales:

G _____

F _____

E^b _____

**Answers are on the last page*

Major And Minor Intervals

Let's get back to our C major scale with the numbers written under it:

C	D	E	F	G	A	B
1	2	3	4	5	6	7

Those numbers represent the scale degrees of C Major. The scale degrees match the interval that each note is above the tonic. Let's explore that further.

We have discussed the two smallest intervals in music already: the half and the whole step. Both of those intervals are also classified as a 2nd. More specifically a half step is a **minor 2nd** and a whole step is a **major 2nd**. So what about when we have larger intervals? Again, go back to the C Major scale with the scale degrees written under it.

The scale degree number matches the type of interval that each note is above the tonic. That means that E is a 3rd above C, F a 4th and so on... So we use numbers to indicate the size of an interval: the bigger the number, the bigger interval.

That may seem easy enough but we also have to attach **qualities** to the intervals. Intervals of a 2nd, 3rd, 6th and 7th can be either major or minor. Intervals of a 4th, 5th and an 8th (**octave**) are called perfect intervals. 5ths can also be diminished or augmented. Things might be getting confusing, but the chart below should provide some clarity

When looking at the C major scale the note D is a whole step above C so that is a MAJOR 2nd. If it was Db that would be a half step above C or a MINOR 2nd. In this case it is helpful to realize that the word minor simply means small and major means big. Major intervals are bigger than minor intervals.

So if a half step is a minor 2nd and a whole step is a major 2nd what happens when we go 3 half steps or 4 half steps? 3 half steps up is a minor 3rd and 4 half steps is a major 3rd.

Let's visualize this.

Here's a list of all intervals all the way up to an **octave**. Octopuses have 8 legs, octagons have 8 sides, and an **octave** is what we call an interval of 8. If we take any note and go up or down an **octave** we will arrive at a note with the exact same name but in a different register.

Name of Interval	Number of Steps	Other Names for Intervals
Minor 2nd	1 half step	b2, b9
Major 2nd	2	
Minor 3rd	3	b3, #9
Major 3rd	4	
Perfect 4th	5	
Tritone	6	#4, b5, #11 Augmented 4th, Diminished 5th,
Perfect 5th	7	
Minor 6th	8	b6, b13
Major 6th	9	bb7, Fully Diminished 7th
Minor 7th	10	b7
Major 7th	11	#7
Octave	12	

As we noted earlier most intervals are either minor (small) or major (big). Notice that 4ths, 5ths and octaves are not called major or minor. These are what we call **perfect intervals**. These intervals have less tension in them and are more stable. Again, we can get into the weeds with this last point, so for now all we need to understand is that intervals can be major or minor except 4ths, 5ths and octaves.

Chord Formulas

Ok, now let's go back to our piece of paper with the musical alphabet written on it. Might be getting a little messy, so let's just rewrite it starting with C again. This time let's put the specific names of all intervals under each note. I'll use a small m for minor and a capital M for major. Remember minor just means small and major means big. The tritone interval is abbreviated with TT.

C	C#	D	D#	E	F	F#	G	G#	A	A#	B
1	m2	M2	m3	M3	4	TT	5	m6	M6	m7	M7

Let's recall how scales and chords both follow formulas or recipes. We learned the recipe for a scale is to start with the tonic and then play the following intervals consecutively. W W H W W W H. Remember a whole step is a major 2nd and a half step is a minor 2nd.

Now here is our formula for Major and Minor Triads. Remember what a triad is? A chord with exactly 3 notes.

Major triad: Root - Maj3 - 5th

Minor triad: Root - Min3 - 5th

3 half steps is a minor 3rd and 4 half steps is a major 3rd.

Both major and minor chords use perfect 5ths which are 7 half steps above the root. And the root is whatever note the chord is named after.

So if we want to play a C major chord we would need the root C, a Major third above C which is E, and the 5th which is G. Thus a C major chord is spelled C E G.

A chord spelling refers to the individual notes in a given chord.

A C minor chord would require a minor 3rd as opposed to a major third. E is 4 half steps or 2 whole steps above C, but Eb is 3 half steps above C. This would give us a minor 3rd. So C minor is spelled C - Eb - G.

Exercise #2

Spell the following chords:

G Major _____

D Minor _____

Bb Major _____

C# Minor _____

**Answers are on the last page*

Summary and Quick Look at 7s, Adds and Suspensions

There are other chords besides major and minor; such as, diminished, augmented, 7 chords and extended chords.

Let's take 7 chords first. There are many types of 7 chords. We have major 7s, minor 7s, dominant 7s, half and fully diminished 7s, altered 7s and more. We will devote a whole chapter to the theory behind all 7 chords. Today we will simply look at dominant 7 chords.

With major and minor triads we used the Root - 3rd and 5th to form the chord. If it is a major chord we need to use a major third above the root and if it's minor then we need a minor 3rd above the root. The 5th is the same for both major and minor triads. A 7 chord is when we add the 7th note above the root to the chord. 7ths, like 3rds can be major or minor. A Major 7th is eleven half steps above the root or one half step below the root. A minor 7th is ten half steps above the root and one whole step below the root. So for any 7 chord we need to play the root and add the intervals of 3, 5 and 7 above the root. Different types of seven chords use different combinations of major and minor 3rds and 7ths.

A Dominant 7 uses the following formula:

$$R - M3 - 5 - m7$$

That's right: a major third but minor 7th. For example a G7 chord is spelled: G B D and then F. F is a minor 7th or ten half steps above G. An easier way to think about it can be that F is a whole step below G.

Refer back to the musical alphabet we previously drew out or look at piano to visualize this.

Now try to figure out the spelling on your own for the chord A7:

Think you got it? Let's walk through the answer.

So if we start with my root which is A and then go up a major 3rd we get C#.

So A - C# are our root and 3rd.

Now we need the 5th which is E, and then a minor 7th which is a whole step below A.

That would give us the note G. So our spelling is A, C#, E and G.

We now have the formula for dominant 7 chords which are written with just the root and the number 7. For example the chord Eb7 is just short for Eb dominant 7.

There are also Major and Minor 7 chords. Can you guess what the formulas for those would be?

$$\text{Major 7} = R - M3 - 5\text{th} - M7$$

$$\text{Minor 7} = R - m3 - 5 - m7$$

So both the 3rd and 7th are minor in minor 7 chords, and the 3rd and 7 are major in major 7 chords. The dominant is the weird one with a major 3rd and minor 7.

Suspensions and Extensions

A suspended chord is simply when we replace the 3rd of the chord with a 2nd or 4th above the root. When we play a major 2nd above the root instead of the 3rd we call that

a Sus2 chord, and when we play a perfect 4th above the root instead of the 3rd we call that a sus4 chord.

Let's look at the spellings of Dsus2 and Dsus4.

$$D_{\text{sus}2} = D - E - A$$

$$D_{\text{sus}4} = D - G - A$$

Now add chords are very similar except with add chords we keep the third in the chord. The most common type of add chord is an Add 9 chord. Recall the concept of an octave. If I go up an interval of an 8th I will land on the same note I started on, just an octave higher. If I go one more whole step up I will land on the 2nd again, but this time an octave higher. We call this interval a 9th. So an add 9 is when we play a triad and then add the 9th or 2nd note above the root. So Cadd9 is spelled:

$$C - E - G - D$$

or

$$C - D - E - G.$$

An add 11 chord would add the 4th, and an add 13 would add the 6, but add 13s we usually just call 6 chords.

Conclusion

Most music theory classes are taught using a keyboard. This is useful as the piano is the best visual tool we have for learning music, but as a guitarist we still can learn theory without any keyboard knowledge. Understanding the relationships between the frets and strings will go a long way in helping you identify intervallic makeup of the notes and chords you play.

Lots of times theory makes more sense after we get hands on. Many of us will internalize things differently and reach the same conclusions through different processes. So if you're getting frustrated or not understanding something in this lesson then try it on your own for a bit and then come back. If you're really beating your head against the wall then just play something that will make you happy and don't worry about the theory. Learning theory is just like learning a new song or technique. It takes practice, so as long as you stick with it and make it a priority you will get it. Always remember that music should be

fun, but sometimes in order to make it more fun we need to do some leg work to reach a higher level of understanding. Happy practicing!!!

Answer Key

**Exercise 1*

G Major = G A B C D E F# G

- G to A = Whole Step
- A to B = W
- B - C = Half Step
- C - D = W
- D - E = W
- E - F# = W
- F# - G = H

F Major = F G A Bb C D E F

- F - G = W
- G - A = W
- A - Bb = H
- Bb - C = W
- C - D = W
- D - E = W
- E - F = H

Eb Major = Eb F G Ab Bb C D Eb

- Eb - F = W
- F - G = W
- G - Ab = H
- Ab - Bb = W
- Bb - C = W
- C - D = W
- D - Eb = H

**Exercise 2*

- G Major = G B D
- D Minor = D F A
- Bb Major = Bb D F
- C# Minor = C# E G#

