

*TL;DR Music Theory*  
*String Instrument Crash Course for Absolute Beginners*



*To peace that this might bring on your journey*

*Version 1 Curated by: Matthew Hess*

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# Foreword

I have tried my best to limit the amount of music theory displayed to get you playing with some knowledge as fast as possible, hence the TL;DR part of the title.

Please note that these concepts are transferable to a bass. This resource will get you familiar with illustrating a string instrument

Follow this and the additional resources attached in the moving forward section and I guarantee you'll be playing bass or any other instrument you want in no time, granted you put in the time and effort along with being consistent. Feel free to reach out anytime to talk about concepts or clarify some questions you might have.

“Learn the rules like a pro,  
so you can break them like an artist.”

-Pablo Picasso

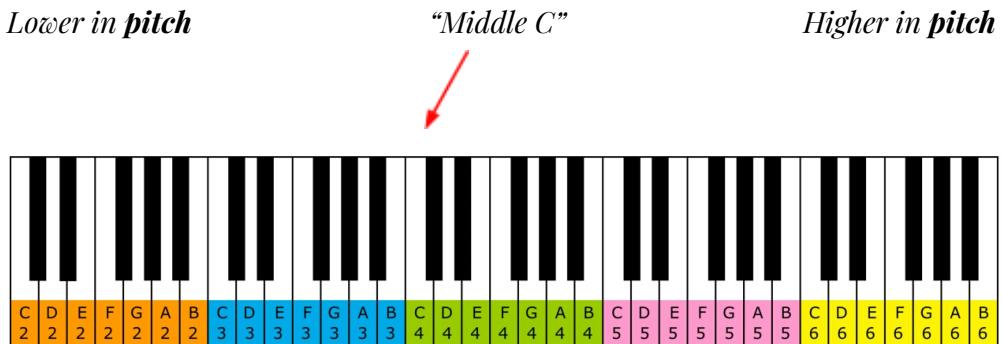
Made with love and other resources still needing to be cited,

Matt

# Notes and Pitch

## Guitar Notes In Relation To Piano Octaves

Simply put, each fret on a string instrument, or key on a piano has a name.



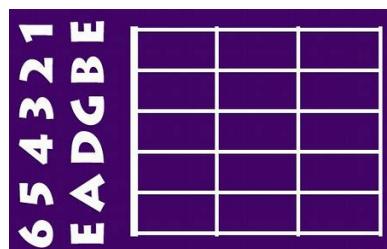
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
E	F	F# Gb	G	G# Ab	A	A# Bb	B	C	C# Db	D	D# Eb	E	F	F# Gb	G	G# Ab	A	A# Bb	B	C	C# Db	D	D# Eb	E
B	C	C# Db	D	D# Eb	E	F	F# Gb	G	G# Ab	A	A# Bb	B	C	C# Db	D	D# Eb	E	F	F# Gb	G	G# Ab	A	A# Bb	B
G	G# Ab	A	A# Bb	B	C	C# Db	D	D# Eb	E	F	F# Gb	G	G# Ab	A	A# Bb	B	C	C# Db	D	D# Eb	E	F	F# Gb	G
D	D# Eb	E	F	F# Gb	G	G# Ab	A	A# Bb	B	C	C# Db	D	D# Eb	E	F	F# Gb	G	G# Ab	A	A# Bb	B	C	C# Db	D
A	A# Bb	B	C	C# Db	D	D# Eb	E	F	F# Gb	G	G# Ab	A	A# Bb	B	C	C# Db	D	D# Eb	E	F	F# Gb	G	G# Ab	A
E	F	F# Gb	G	G# Ab	A	A# Bb	B	C	C# Db	D	D# Eb	E	F	F# Gb	G	G# Ab	A	A# Bb	B	C	C# Db	D	D# Eb	E



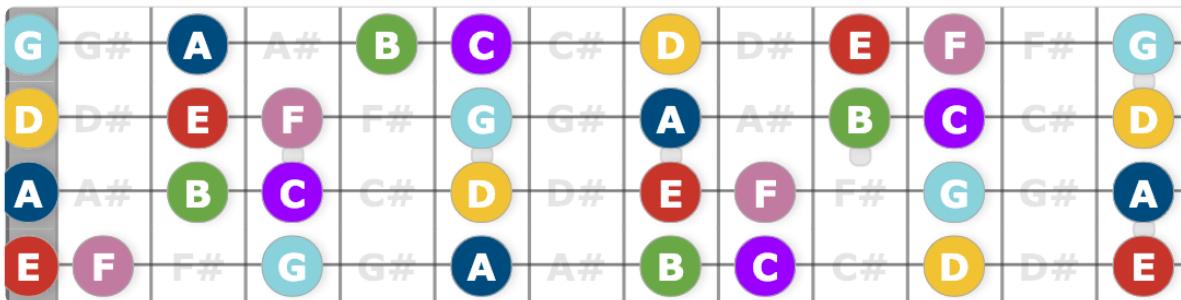
Play string without holding down a fret, also known as the string name or open strings.

Mnemonics to help remember the string note names:

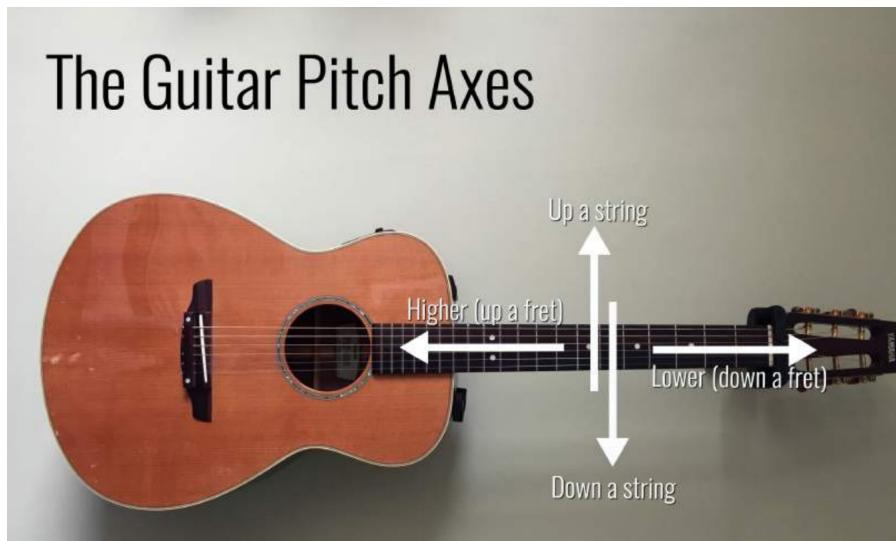
(6) Eddie (5) Ate (4) Dynamite (3) Good (2) Bye (1) Eddie



## 4 String Bass Natural Notes



## Getting Familiar with a String Instrument



The **pitch** of a sound is how high or low it is.

On the guitar fretboard we can move horizontally on one string (towards the guitar body or the headstock) or vertically across the strings (towards the floor or the ceiling). As we move horizontally (down a fret) on one string, the sound created when we fret the notes is progressively higher. The 'pitch' is being raised. When I refer to going up a fret, I mean a movement on one string towards the guitar body, creating a lower pitch. Conversely, if I refer to going down a fret, this will correspond to a movement towards the guitar headstock, making a higher pitch than a fret closer to the guitar body. Similarly if we play a string closer to the

ceiling (up a string) it will create a lower pitch, and if we play a string closer to the floor (down a string) we will play a higher pitch.

On the vertical axis, the pitch of the strings gets higher as we move downwards towards the floor as they become thinner and thinner. Fun fact, the reason we get a higher pitch on lower strings is due to the string being of less weight so it vibrates back and forth faster than a string closer to the ceiling which would weigh more, needing more time for a string to vibrate back and forth due to its weight.

Pitch in music is highness or lowness in the sounds we hear as we play. Pitch changes with the speed at which the strings vibrate. The more vibrations, the higher the sound. Pitch is measured in vibrations per second, and its unit of measurement is Hertz (Hz). You may have seen 440 Hz on your guitar tuner which refers to a string vibrating 440 times per second. Notes are the written representations of these different pitches. Each different pitch, whether it is high or low, will have a specific note name .

## The Language of Music

Learning its Alphabet Music is often considered a language like any other and, as such it has its own alphabet; the musical alphabet. This begins in the same way as the standard English alphabet:

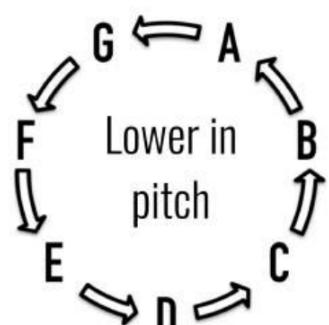
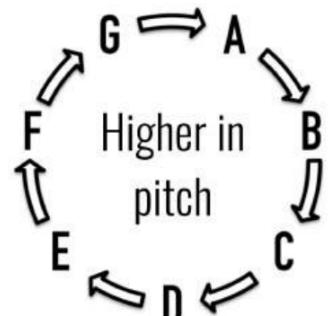
A, B, C, D, E, F, G

But the musical alphabet only contains seven letters. After **G** we return back to an **A**, but this **A** will be higher in pitch than the **A** upon which we started.

A, B, C, D, E, F, G, A, B, C, D, E, F, G, A, B, C, D, E, F, G, A...

I like to think of the musical alphabet as a continuous circle. Moving clockwise makes the notes higher in pitch, and moving anticlockwise makes the notes lower.

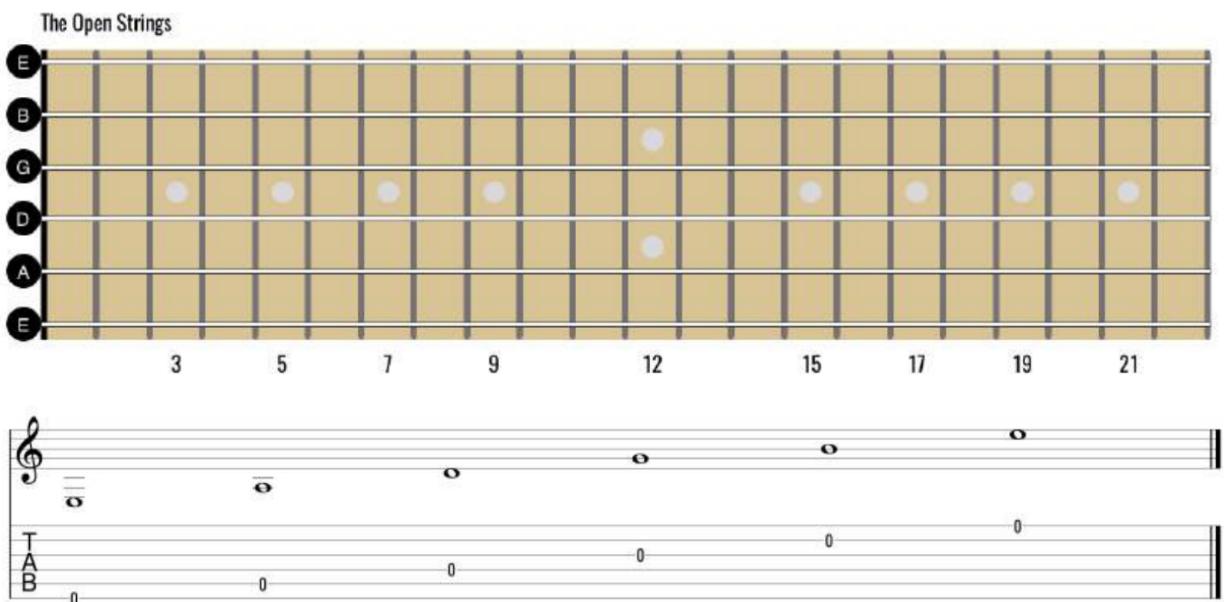
We can very easily recite the alphabet in order, but you also need to have it memorised backwards as music can be played in either direction, higher and lower. Try saying a few rounds of each circle to get used to this.



The distance (or **interval**) between A to A (or B to B, C to C...) is said to be an **octave**. The prefix oct- referring to the 8 notes that make up one octave (A B C D E F G A). A standard piano has 7 octaves. A guitar with 24 frets will span 4 octaves from the open string 6(E) to the 24th fret of string 1(E).

An **interval** is the distance between two notes, measured from the lower in pitch of the two notes.

## The Tuning of the Guitar Strings



There is a **two octave** distance between strings 6(E) and 1(E) (i.e. two full rotations around our alphabet circle).

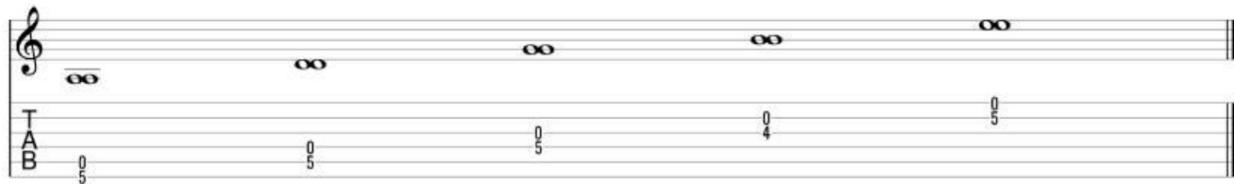
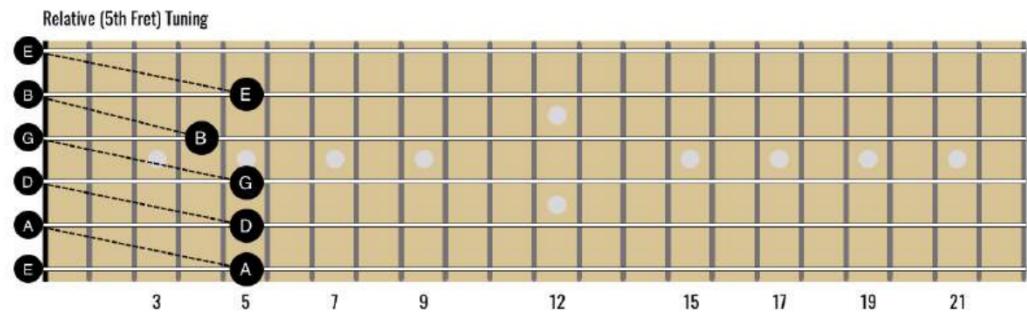
There are lots of different mnemonics to help remember the string note names, in which the first letter of each word is the note to which we tune the strings (from string 6 to 1).

A great way to memorize this is:

(6) Eddie (5) Ate (4) Dynamite (3) Good (2) Bye (1) Eddie

## Finding the same note on a string below

If you are familiar with tuning your guitar by ear with ‘relative’ or ‘fifth-fret’ tuning, you will know that the interval between the notes to which we tune the strings are not all the same. The distance between each adjacent string spans 4 letters (**E** to **A**, **A** to **D**, **D** to **G**...) until we get to string 3 and 2 in which the distance spans only 3 letters (**G** to **B**) and you tune the string 2(**B**) string from the 4th fret of string 3(**G**). This is an important exception to remember as we progress. See image below to connect the dots.



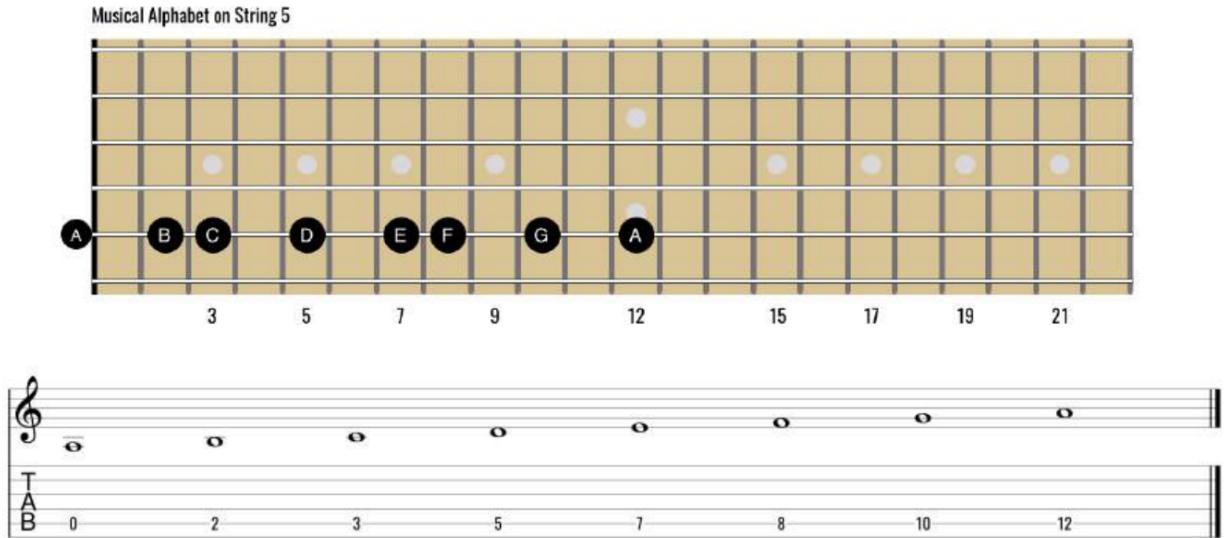
In short, on the 6(**E**), 5(**A**), 4(**D**), 2(**B**) strings, you can find the same note on the string below by moving one string down to the floor and going up 5 frets towards the nuts.

On the 3rd (**G**) string we can find the same note on the string below by moving one string down to the floor and going up 4 frets towards the nuts.

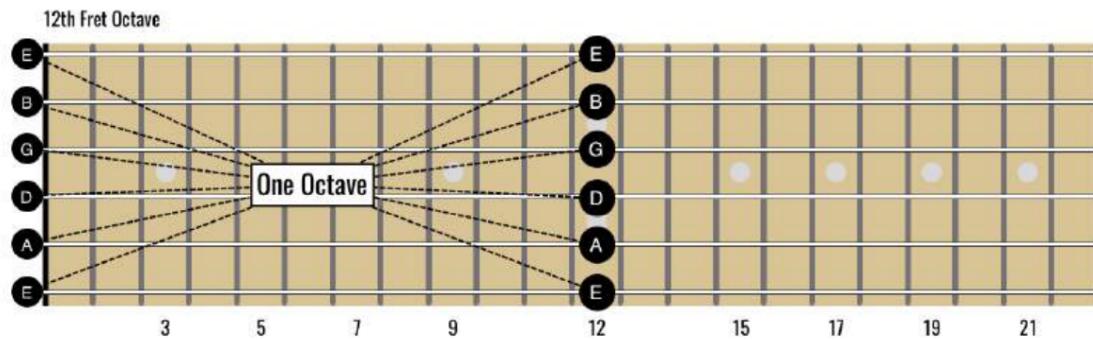
Note you can also reverse engineer this and look at it the other way around. We will look at other ways to find unison notes later on.

# Mapping out the Musical Alphabet Across the Fretboard

We are now going to lay out the musical alphabet horizontally up one of the guitar strings. As the alphabet starts with the letter A, we shall do this on string 5(A). You can hear how we are going higher in pitch as we move the fretting hand towards the guitar body.



We are back to the note upon which we started at the 12th fret. This is why there are two inlay dots on the fretboard at the 12th fret to indicate the octave of the open string.



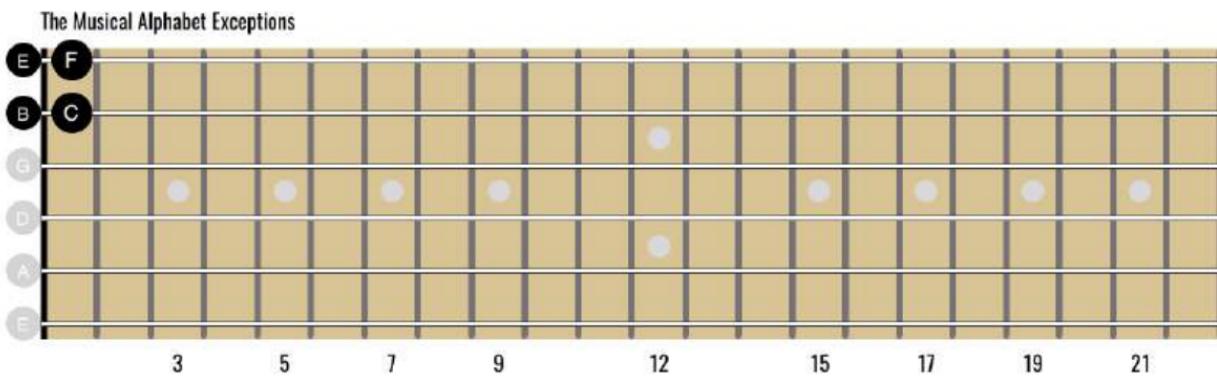
You will see from the musical alphabet that the notes are not evenly spaced. There is a fret-sized gap between the letters except between B to C and E to F which are immediately next to one another.

If we consider a piano keyboard, the white keys are the notes of the musical alphabet. Between the alphabet notes there is a black key (which we will be naming shortly) except between the notes B to C and E to F, just like on the fretboard.



The fretboard has all the white keys and black keys of the piano in one, indistinct row up and down each of the strings. That is why it is important to know exactly where we can expect a gap in the musical alphabet, and where there will not be one.

Wherever you are on the fretboard, in whatever octave, there will always be a fret's gap between the notes of the musical alphabet except B going higher to C and E going higher to F.

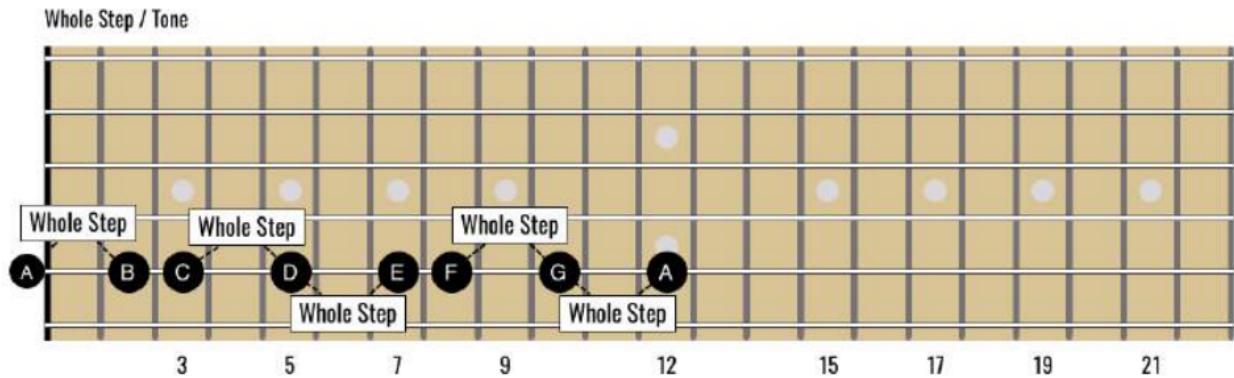


If you are ever unsure as to where the exception is you can refer to strings 2 and 1. They are the two notes upon which the next alphabet note will be one fret higher.

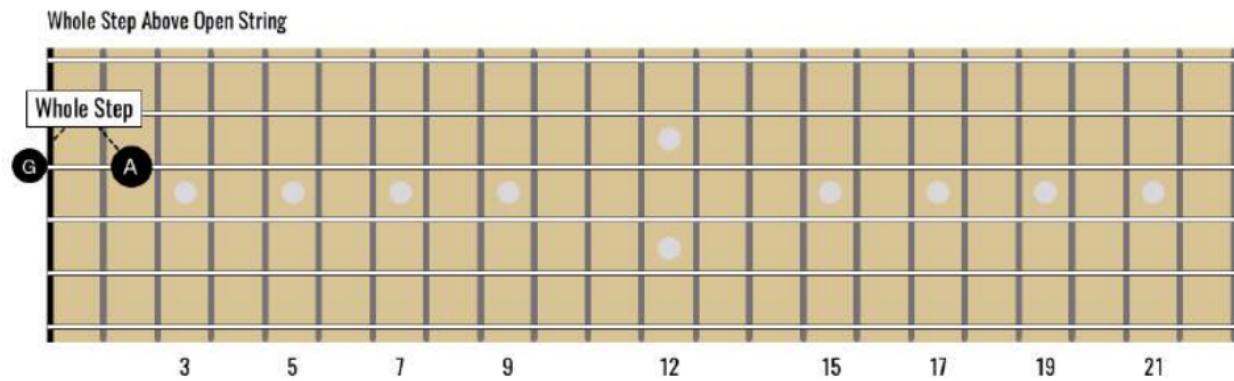
# Defining the Distances

## The Whole Step (or Tone)

The distance of two frets (e.g. A to B or C to D) is called a **whole step** or **tone** (depending on where in the world you live). I will be using the term ‘whole step’ moving forward.

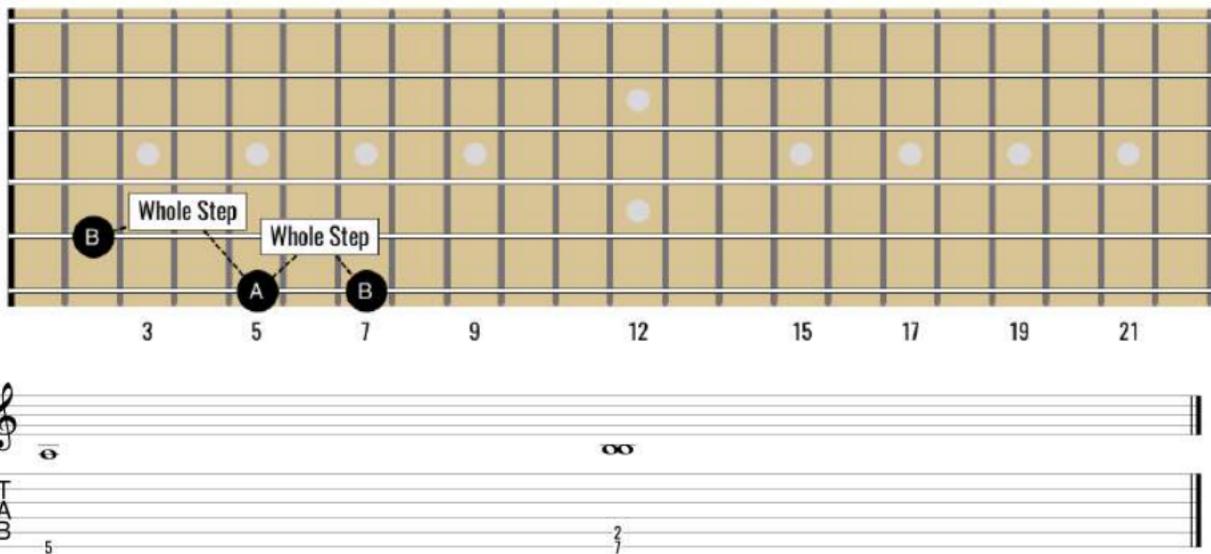


A whole step above an open string will find you in the 2nd fret. For example, from the open string 3(G), the note A is found at the 2nd fret.



You can move a whole step up towards the guitar body or down towards the headstock from any fret. You can also move a whole step moving up or down a string vertically.

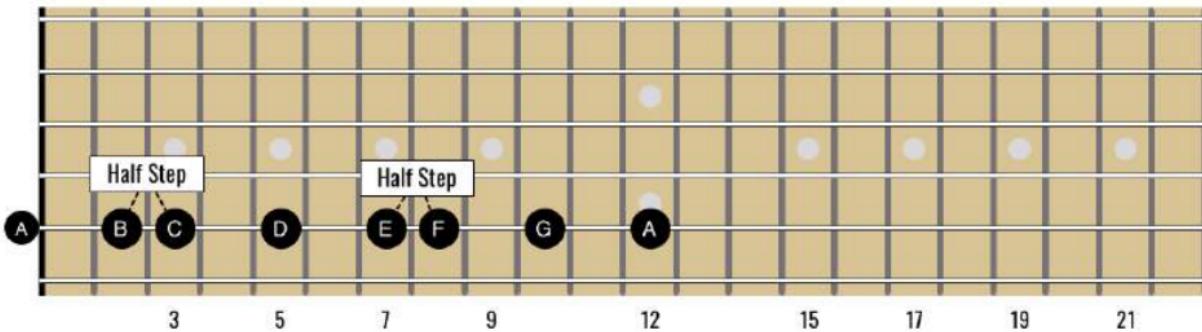
**Whole Step Movements**



## The Half Step (or Semitone)

The distance of one fret (our exceptions: B to C and E to F) is called a **half step** or **semitone**. I will use 'half step' throughout the course.

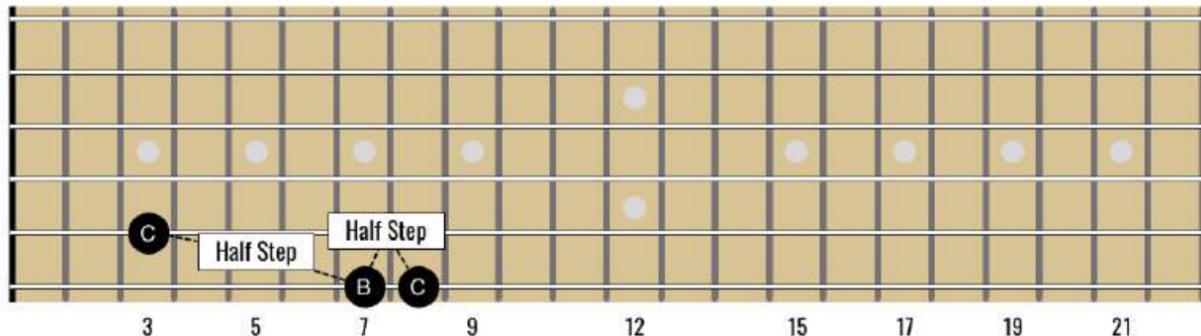
**Half Step / Semitone**



A half step above an open string will therefore be in the 1st fret. We saw previously that a half step above the open string 2(B) would be the note C in the 1st fret. You can move a half step up towards the guitar body or down towards the headstock from any fret.

You can also move a half step moving up or down a string vertically.

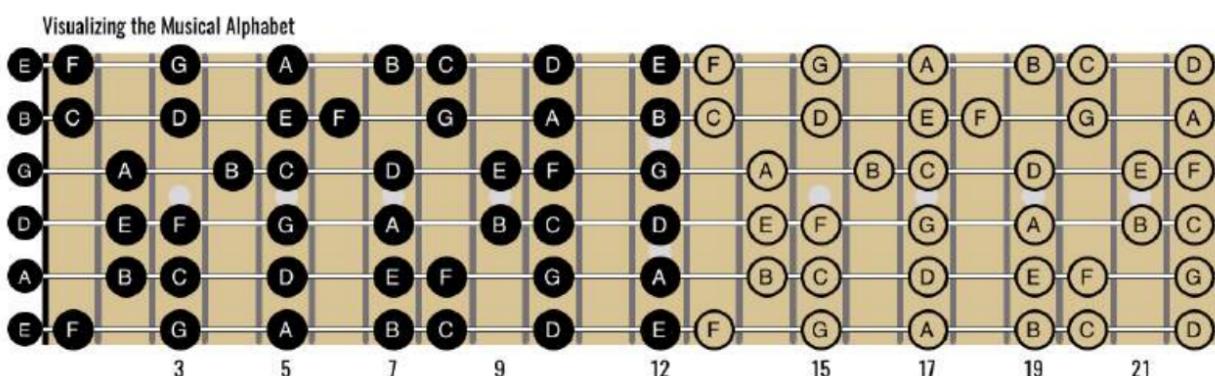
Half Step Movements



## Visualizing the Musical Alphabet

Your first task is to practise playing the musical alphabet up and down each of the strings. Start from the open string and be naming the notes as you play them. Ensure that you are back to the open string note at the octave when you get to the 12th fret.

You can continue beyond the 12th fret as the notes continue in the same sequence, but an octave higher.



# Expanding Upon the Essentials Filling the Gaps

We're starting to see the musical alphabet now, but how do we name the frets that fall between the musical alphabet?

## Filling the Gaps - Sharp Notes

Raising a note one fret towards the guitar body makes the note **sharp** (#) meaning higher in pitch by one half step. For example, we have a C at the 3rd fret on string 5(A). The note C# ("C sharp") will therefore one fret higher in the 4th fret.

Naming all the notes with Sharp Notes

A    A#    B    C    C#    D    D#    E    F    F#    G    G#    A  
3    5    7    9    12    15    17    19    21

T  
A  
B    0    1    2    3    4    5    6    7    8    9    10    11    12

The term 'sharp' can also be applied when tuning an instrument. Any note that is a little higher than it should be can be described as sharp ("that note sounds sharp") and should be lowered to bring it to the correct pitch.

## Filling the Gaps - Flat Notes

Lowering a note one fret towards the headstock makes the note flat (  $\flat$  ) meaning lower in pitch by one half step. For example, we have an D at the 5th fret on string 5(A). The note D  $\flat$  (“D flat”) will therefore one fret lower in the 4th fret.

Naming all the notes with Flat Notes

A B $\flat$  B C D $\flat$  D E $\flat$  E F G $\flat$  G A $\flat$  A

3 5 7 9 12 15 17 19 21

T  
A  
B 12 11 10 9 8 7 6 5 4 3 2 1 0

Again, the term ‘flat’ can also apply when tuning an instrument. Any note that is a little lower than it should be can be described as flat (“that note sounds flat”) and should be raised to bring it to the correct pitch.

## Enharmonics

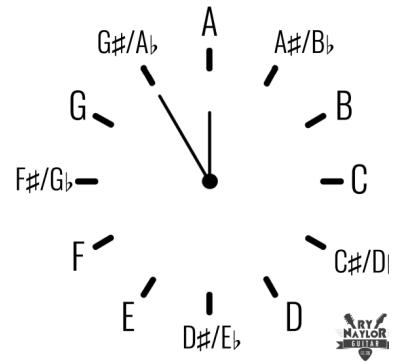
Two notes which have the same pitch (for example **C#** and **D  $\flat$**  ) are called **enharmonic**. Exactly how they are named depends on the key and scale you are using. You will find that you see one name for a note more often than the other (for example we see B  $\flat$  more often than A $\sharp$ , or F $\sharp$  is seen more often than G  $\flat$  ). That being said, you should be familiar with both possible names for these notes.

# The Note Clock

You can think of the 12 notes in an octave as being like the 12 numbers on a clock face:

The note clock shows all the 12 notes that exist in music. Moving clockwise makes the notes higher in pitch. Conversely, moving counterclockwise makes the notes lower in pitch.

Each step around the clock is a movement up or down one half step (a movement from one fret to the next horizontally).



You can use the note clock to identify any note on any string.

Pinpoint the fret number

and identify the note name of the string being played. Then, from the open string note

on the clock face, move clockwise a number of steps equal to the fret number and you will know the note being played.

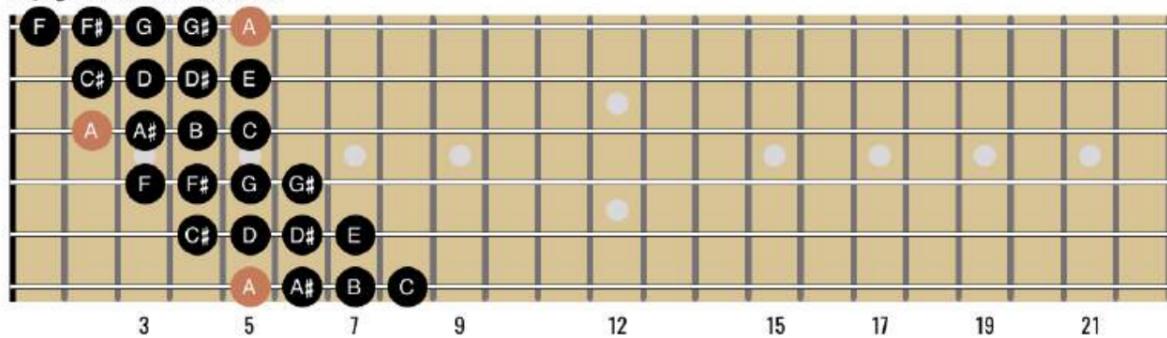
For example, if I wanted to identify the note at the 5th fret of string 1(E) I would find the E note (at the 7 o'clock position) and count clockwise 5 steps. The note at the 5th fret of string 1(E) will therefore be an A (seen at the 10 o'clock position).

## Playing the Chromatic Scale

If we play every note in one rotation of the note clock (starting from any position) we are said to be playing a '**chromatic scale**'. A chromatic scale is a 12-note scale with a half step interval between each note. A chromatic scale can be played horizontally up and down a single string. The numbers beside the notes in the standard notation refer to recommended fretting hand finger numbers:

A chromatic scale can also be played vertically across the string set. Care must be taken as you move vertically because the hand must change position as it crosses the strings:

Playing a Vertical Chromatic Scale



**Vertical Chromatic Scale (Fret 3)**

4/4 time signature, treble clef, key of A major (no sharps or flats).

Fret positions: 5, 6, 7, 8 | 4, 5, 6, 7 | 3, 4, 5, 6 | 2, 3, 4, 5

**Vertical Chromatic Scale (Fret 5)**

4/4 time signature, treble clef, key of C major (one sharp, F#).

Fret positions: 2, 3, 4, 5 | 1, 2, 3, 4 | 4, 5, 6, 7 | 3, 4, 5, 6

**Vertical Chromatic Scale (Fret 7)**

4/4 time signature, treble clef, key of D major (two sharps, F# and C#).

Fret positions: 5, 4, 3, 2 | 6, 5, 4, 3 | 7, 6, 5, 4 | 8, 7, 6, 5

**Vertical Chromatic Scale (Fret 9)**

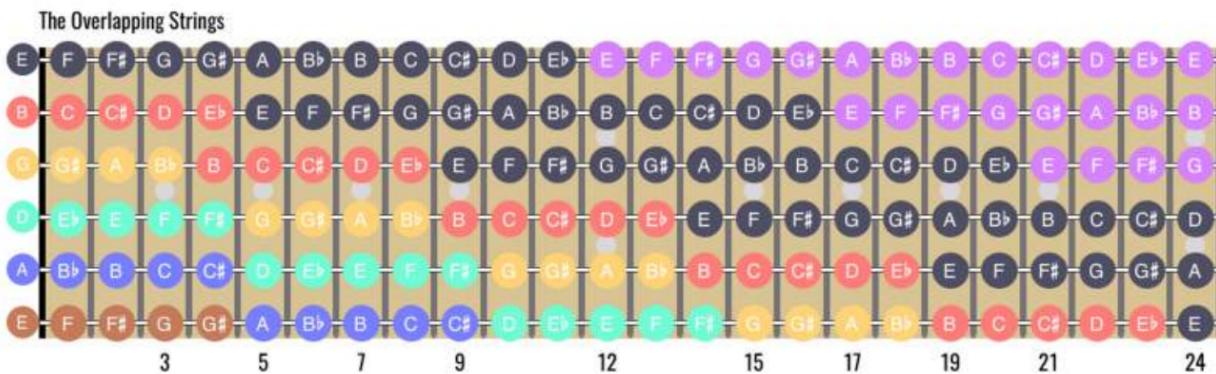
4/4 time signature, treble clef, key of E major (three sharps, F#, C#, G#).

Fret positions: 8, 7, 6, 5 | 9, 8, 7, 6 | 10, 9, 8, 7 | 11, 10, 9, 8

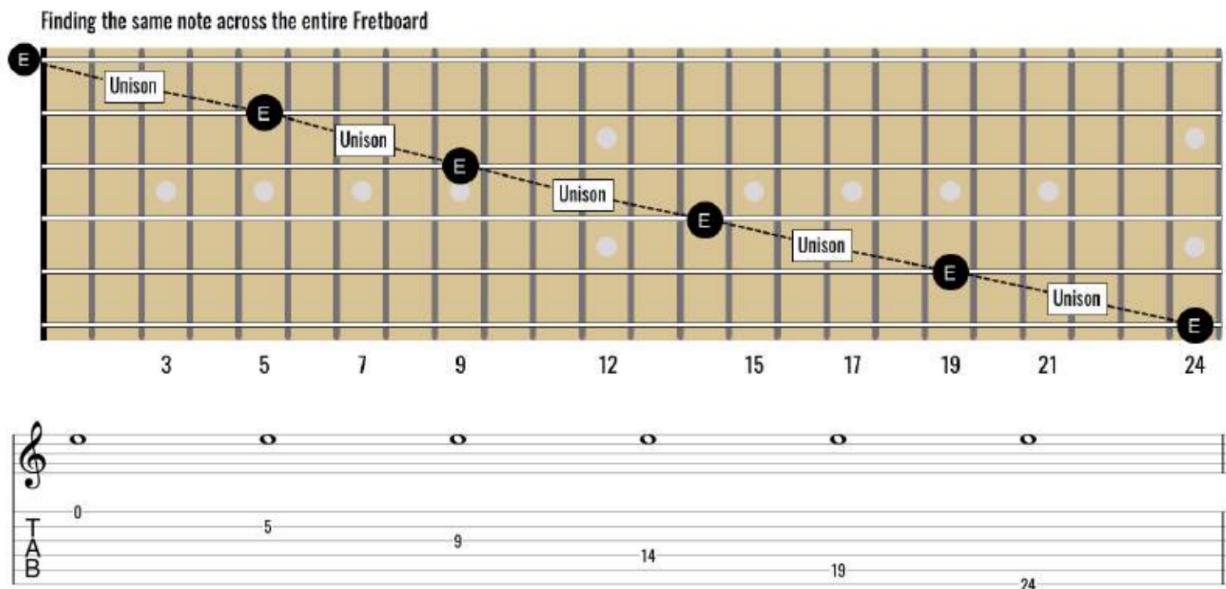
# Fretboard Mastery

## Overlapping Strings and Moving Notes

The guitar strings are laid out as a chromatic scale. There is a half step movement between each fret horizontally. There is also an overlapping of the different notes on the strings. As the fretboard diagram below demonstrates, the same note can be found at the same pitch in multiple positions on the fretboard. Each colour represents notes of the same pitch across the strings:



The same note at the same pitch (called unison) can be found by going back 5 frets towards the headstock on the string immediately below as we look down across the strings towards the floor. This shift can be applied from any note at any fret.



Remember though that string 2(B) was tuned from the 4th fret of string 3(G). So as we move a note from string 3(G) to 2(B), the same note will be found back 4 frets towards the headstock.

**Informational Tip:** Always adjust for string 2 When moving ANY chord, scale or interval shapes across the string sets, any note that is moved from string 3(G) to string 2(B) must be raised up one fret towards the guitar body for the relationship of the notes to remain the same.

## Octaves

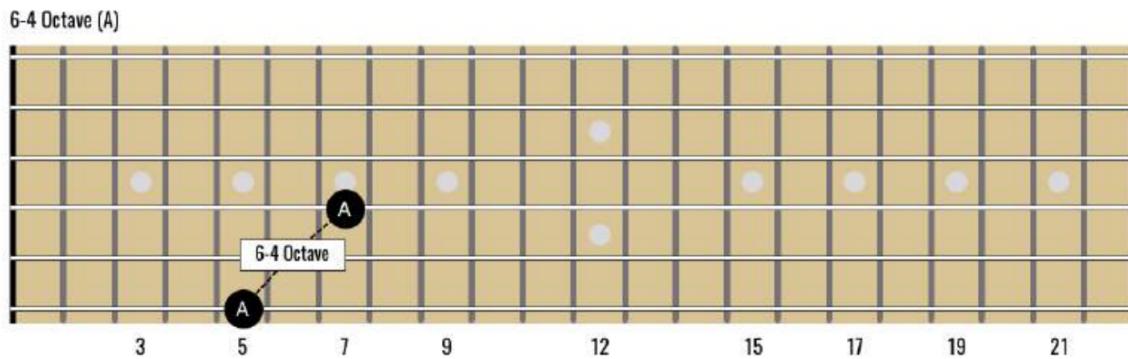
### Octave Shapes 1 - Towards the Guitar Body (One-String Skip)

Octave shapes are really useful to help us easily locate the same note an octave higher on the vertical axis. We can firstly identify octave patterns that move diagonally across the strings towards the guitar body (i.e. moving to a higher fret number). Each of these octave shapes finds us skipping over one string.

Note these names, reference the string names/numbers, i.e. 6-4

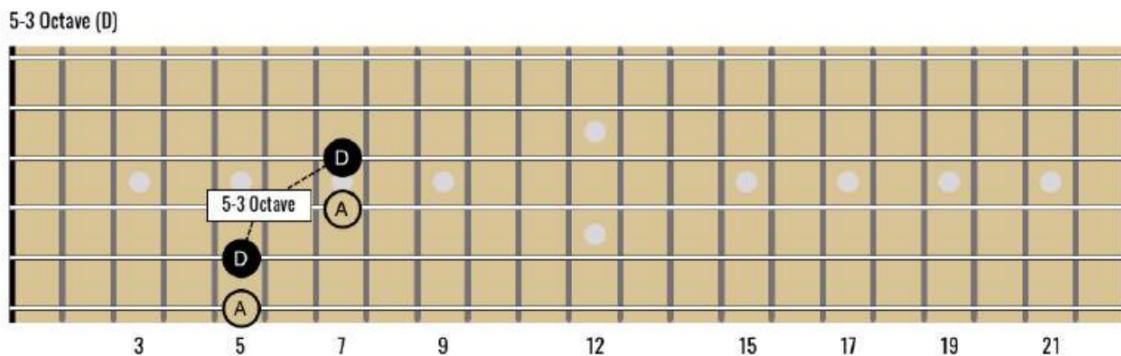
#### 6-4 Octave Shape

The octave of any note played on string 6(E) will always be **two frets higher** (towards the guitar body) on string 4(D). This is what I call the **6-4 octave** shape:



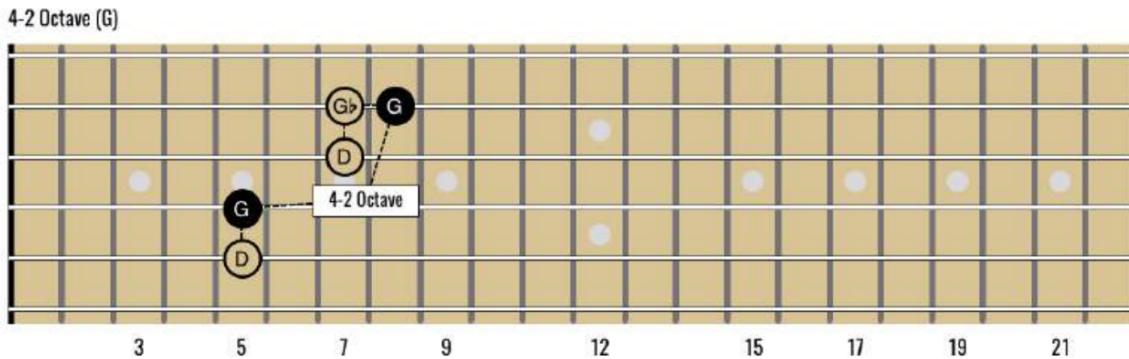
## 5-3 Octave Shape

This octave shape can then be moved across the string sets for a **5-3 octave** shape. Again, the octave of any note played on string 5(A) will always be **two frets higher** (towards the guitar body) on string 3(G).



## 4-2 Octave Shape

For the **4-2 octave** shape, the note moving from string 3(G) to 2(B) must be raised one fret (towards the guitar body) for the octave to be intact. The octave of any note played on string 4(D) will always be **three frets higher** (towards the guitar body) on string 2(B).



## 3-1 Octave Shape

Moving the octave down for a **3-1 octave** shape, the pattern remains the same as no note has crossed from strings 3(G) to 2(B). The octave of any note played on string 3(G) will always be **three frets higher** on string 1(E).

The diagram illustrates a 3-1 Octave shape (C) on a guitar neck. The neck shows strings 3 (G), 2 (B), and 1 (E) across 21 frets. A note on string 3 at fret 5 is highlighted with a black circle, and its octave on string 1 at fret 8 is highlighted with a white circle. A dashed arrow labeled "3-1 Octave" points from the note on string 3 to its octave on string 1. Below the neck, a musical staff shows a treble clef, a note on the 5th string, a rest, another note on the 5th string, and a measure ending with a double bar line. The staff is labeled with "T", "A", and "B" under the 1st, 2nd, and 3rd strings respectively, with a "5" indicating the 5th fret.

## Octave Shapes 2 - Towards the Headstock (Two-String Skip)

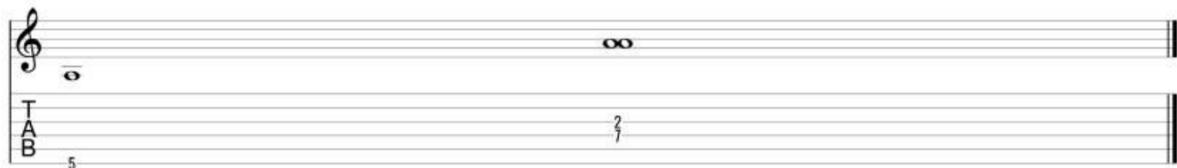
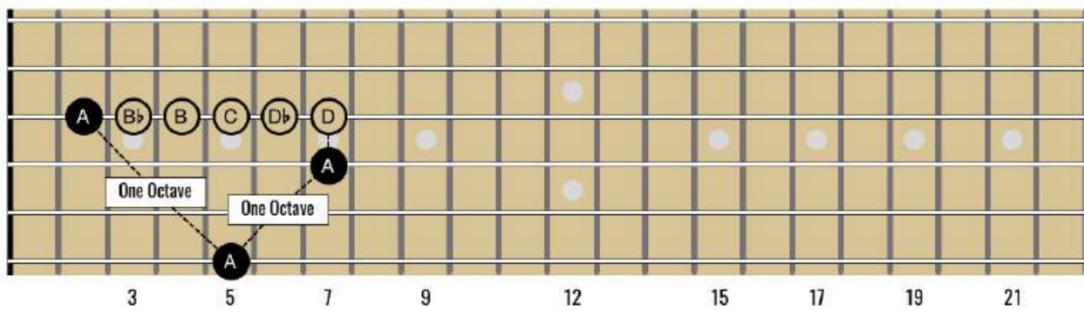
The previous octave shapes can be used as a starting point to create a second set of octave shapes.

We can identify octave patterns that move diagonally across the strings towards the guitar headstock (i.e. moving to a lower fret number). Each of these octave shapes finds us skipping over two strings.

## 6-3 Octave Shape

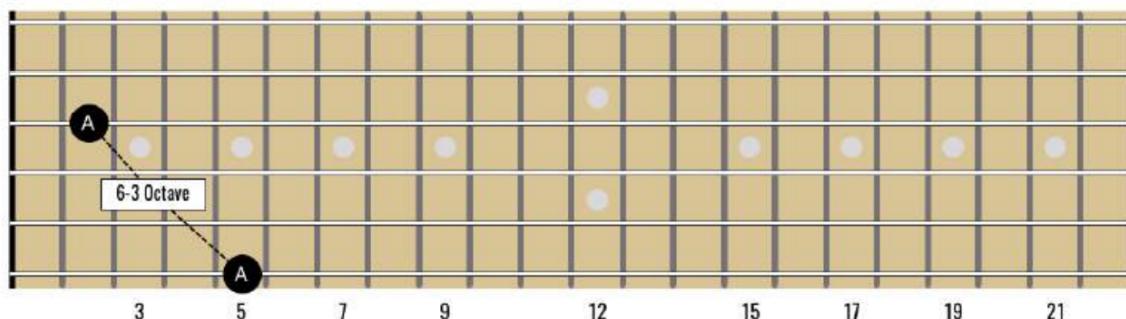
We can start with a 6-4 octave shape and apply the rule of moving back 5 frets to move the note on string 4(D) down onto string 3(G):

6-4 Octave into the 6-3 Octave (A)



The octave of any note played on string 6(E) will always be **three frets lower** (towards the headstock) on string 3(G); the **6-3 octave** shape.

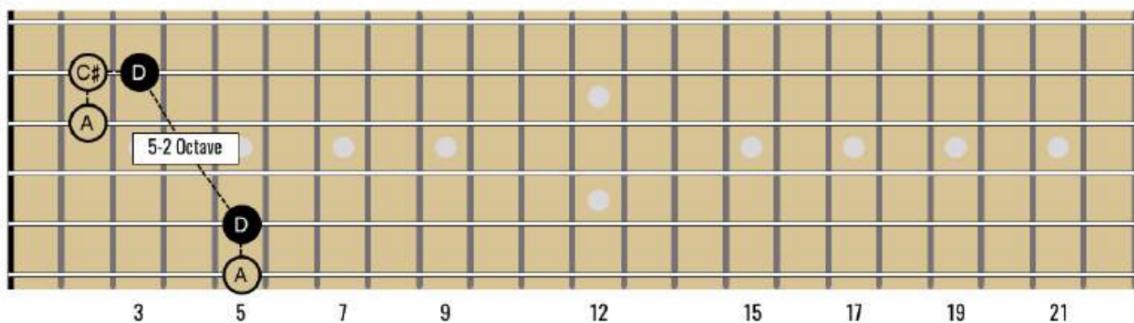
6-3 Octave (A)



## 5-2 Octave Shape

For the **5-2 octave** shape, the note moving from string 3(G) to 2(B) must be raised one fret (towards the guitar body) for the octave to be intact. The octave of any note played on string 5(A) will always be **two frets lower** on string 2(B).

### 5-2 Octave (D)

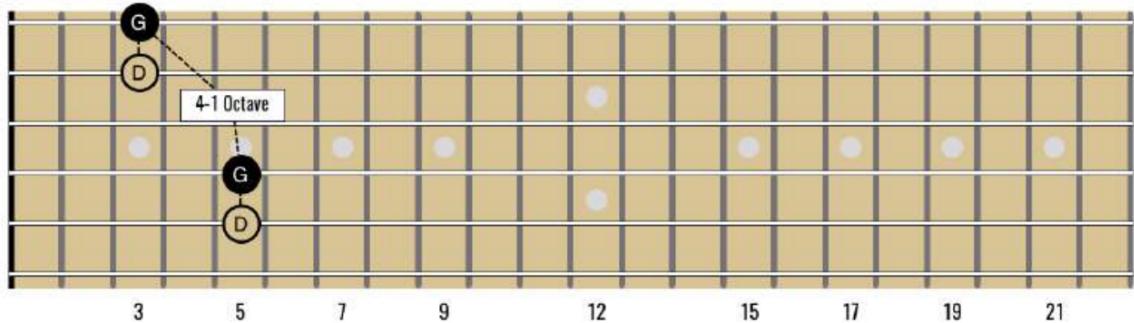


Musical notation corresponding to the 5-2 Octave shape. The top staff begins with a treble clef, followed by a note, a rest, another note, and a repeat sign. The bottom staff begins with a bass clef, followed by "T", "A", "B", and "5".

### 4-1 Octave Shape

Moving the octave down for a **4-1 octave** shape, the pattern remains the same as no note has crossed from strings 3(G) to 2(B). . The octave of any note played on string 4(D) will always be **two frets lower** on string 1(E):

### 4-1 Octave (G)



Musical notation corresponding to the 4-1 Octave shape. The top staff begins with a treble clef, followed by a note, a rest, another note, and a repeat sign. The bottom staff begins with a bass clef, followed by "T", "A", "B", and "5".

## Linking Octave Shapes

The ability to link the octave shapes forms the basis of the CAGED system and it is *incredibly* useful. These shapes can be used as stepping stones for instantly finding any given note all across the fretboard.

There is a sequence to the octave patterns that can be memorised and then applied to any particular note. The sequence is as follows:

1. When on 6(E), move to 4(D) (6-4 octave)
2. When on 4(D), move to 2(B) (4-2 octave)
3. When on 2(B) move to 5(A) (5-2 octave)
4. When on 5(A) move to 3(G) (5-3 octave)
5. When on 3(G) move to 1(E) (3-1 octave)
6. When on 1(E) move to 6(E) (6-1 two octave pattern)

This sequence will not change, although the starting shape will vary according to the particular note that you have chosen to start the sequence. You identify the string upon which the chosen note is closest to the headstock (i.e. the lowest fret) and start the sequence from that given string.

Our first example is finding all the F notes. If we begin from string 6(E), we would then follow the octave sequence from the 6-4 octave. In following through the octave shapes we are finding all the F notes across the fretboard.

Linking the Octaves (F)

The diagram illustrates the fretboard and a musical staff for finding all F notes. The fretboard shows the 6th string (E) at the top, with frets numbered 1 through 22. Dashed lines connect the 6th string's 1st fret to the 4th string's 3rd fret, the 4th string's 5th fret to the 2nd string's 7th fret, the 2nd string's 9th fret to the 5th string's 12th fret, the 5th string's 15th fret to the 3rd string's 17th fret, and the 3rd string's 19th fret back to the 6th string's 1st fret, forming a continuous loop. The musical staff below shows the notes corresponding to these frets: an open circle at the 1st fret, a solid circle at the 3rd fret, another open circle at the 5th fret, a solid circle at the 7th fret, an open circle at the 9th fret, a solid circle at the 12th fret (labeled 8va), an open circle at the 15th fret, a solid circle at the 17th fret (labeled 8va), an open circle at the 19th fret, and a solid circle at the 21st fret (labeled 8va). The staff also includes a treble clef, a key signature of one sharp, and a time signature of common time.

If we consider the note C, the lowest fret in which we find a C is in the 1st fret of string 2(B). Our octave sequence will therefore start from number 3. (when on 2(B) move to 5(A)) and the sequence will continue from that point.

**Linking the Octaves (C)**

8va

T A B

1	3	5	8	10	13	15	17	20	22
T	A	B							

As a final example, let's find all the B  $\flat$  notes. Again, start with finding the lowest fret in which we find a B  $\flat$ . This will be the 1st fret of string 5(A). Our octave sequence this time will start from number 4. (*When on 5(A) move to 3(G)*) and the sequence continues from that point.

**Linking the Octaves (B $\flat$ )**

8va

T A B

1	3	6	8	11	13	15	18	20
T	A	B						

Practise the sequence starting from any note at random. You'll find that with a little practice, it is possible to memorise the sequence and see the notes all over the fretboard.

## Exercises

### Horizontal Note Finding

This exercise will be finding each of the 12 chromatic notes horizontally on one string. The order of notes that you will play through (below) are 5 half steps apart (i.e 5 frets/ 5 steps clockwise around the note clock) to ensure that you are jumping around the string.

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

Limit yourself to the first 12 frets and if the note is an open string, play the octave at the 12th fret. With the sharp and flat notes, approach them by both their names (i.e. try finding C♯ in one practice session and then next time view it as D♭). Be saying the note names as you play them.

To add a little pressure and allow you to focus more, try the exercise along with a metronome, playing each note with the click. You can set the metronome at whatever tempo you need to be able to do that and then try and increase it in every practice session or every couple of sessions.

If you are just starting out and the click needs to be very slow (maybe 20-30 BPM) you can double the tempo and try to play every two clicks, or even multiply the tempo by 4 and pick every four clicks. For example if you are working at 20 BPM, set the metronome to 80 BPM and pick a note every four clicks.

Start each practice session with 5 minutes of note finding. With that time you should be able to try this exercise on each of the 6 strings. Write down the metronome speed that you are able to work with and try to beat it every day.

### The ULTIMATE Exercise - Vertical Note Finding

The ultimate note finding exercise has you doing a similar thing but extending the note finding vertically across the string set. Again working within the first 12 frets, try and find each note

across the strings from string 6(E) to 1(E) and back. You want to do this again with a metronome to help you focus, picking with the click or every 2 or 4 clicks.

Below is an example of finding all the A notes:

Vertical Note Finding Exercise (A)

Fretboard diagram showing vertical note finding exercise for the letter A. The fretboard has 24 frets. Notes are marked with black circles on the 5th, 7th, 9th, 12th, and 15th frets across all six strings. Fret numbers 3, 5, 7, 9, 12, 15, 17, 19, and 21 are labeled below the strings.

Below the fretboard is a tablature staff with six horizontal lines. It shows the following note positions: 5th fret (A), 12th fret (B), 7th fret (A), 2nd fret (B), 10th fret (A), 5th fret (A), 10th fret (B), 2nd fret (A), 7th fret (B), 12th fret (A), and 5th fret (A). The staff ends with a double bar line.

# Moving Forward

I think you are now ready to learn about **scales** (notes that sound good played in sequences), **intervals** (set distances between notes along with their names), **triads** and **chords** (multiple notes played at the same time) (somewhat irrelevant to playing the bass but still great to know with any instrument), and **chord** progressions (a guide to learning what chords sound good with each other).

As much as I would like to explain this to you, I don't want to reinvent the wheel, rather I'm going to reference three incredible resources moving forward that I swear by. Please don't take this lightly, I've studied music theory for 3 years now and these resources do an amazing job at connecting the dots for fundamentals I've learned over and over again with other resources. I would advise you to learn them in their respective order to help with making the most with time and solid foundation building.

1. A great resource for interactive learning  
[lightnote.co](http://lightnote.co)
2. An impeccable narrative for creating melody and harmony  
MUSIC THEORY: THE TL;DR VERSION  
By: Reginald Young / Neon The Rex
3. Ry Naylor Material (<https://shop.rynaylorguitar.com/>)  
Books in respective order (Note some have videos that go along with the books):
  1. Fretboard Mastery
  2. Inside Intervals
  3. Scales
  4. Essential Theory
  5. CAGED clarity
  6. Triads Reference