

Music Theory

The Interval Ruler

1	b2	2	b3	3	4	#4/b5	5	#5/b6	6	b7	7	1
	(b9)	(9)	(#9)		(11)	(#11)		(b13)	(13)			
										(bb7)		

The most important element in understanding how music works is **The Interval Ruler**. Every scale, chord, melody, harmony and key structure is found in the ruler. Keys, scales, chords, arpeggios and modes are all based on specific interval (ruler number) formulas. The additional numbers under the ruler are extension tones which are used for certain extended chord formulas. The number ones are the root notes. Then, we add other intervals to create and memorize our various structures. Throughout our curriculum, we show the intervals in our guitar chord and scale patterns so you can see and learn how they are used on the guitar fret-board.

Below are some examples of these formulas.

Scales and Modes

Major (Ionian Mode) - 1 2 3 4 5 6 7

Natural Minor (Aeolian Mode) - 1 2 b3 4 5 b6 b7

Dorian Mode - 1 2 b3 4 5 6 b7

Mixolydian Mode - 1 2 3 4 5 6 b7

Major Pentatonic - 1 2 3 5 6

Minor Pentatonic - 1 b3 4 5 b7

Major Blues - 1 2 b3 3 5 6

Minor Blues - 1 b3 4 b5 5 b7

Whole Tone - 1 2 3 b5 b6 b7

Chords and Arpeggios

Major - 1 3 5

Minor - 1 b3 5

Dominant - 1 3 5 b7

Diminished - 1 b3 b5

Augmented - 1 3 #5

Scale Formulas

Diatonic Modes

1. Ionian (Major) - 1 2 3 4 5 6 7
2. Dorian - 1 2 b3 4 5 6 b7
3. Phrygian - 1 b2 b3 4 5 b6 b7
4. Lydian - 1 2 3 #4 5 6 7
5. Mixolydian - 1 2 3 4 5 6 b7
6. Aeolian (Natural or Relative Minor) 1 2 b3 4 5 b6 b7
7. Locrian - 1 b2 b3 4 b5 b6 b7

Pentatonic Modes

Major Pentatonic - 1 2 3 5 6

Minor Pentatonic - 1 b3 4 5 b7

Egyptian - 1 2 4 5 b7

Ritusen - 1 2 4 5 6

Harmonic Minor

1. Harmonic Minor - 1 2 b3 4 5 b6 7
2. Diminished Flat 2 - 1 b2 b3 4 b5 6 b7
3. Augmented - 1 2 3 4 #5 6 7
4. Romanian (Dorian Sharp 4) - 1 2 b3 #4 5 6 b7
5. Spanish Gypsy - 1 b2 3 4 5 b6 b7
6. Lydian Sharp 2 - 1 #2 3 #4 5 6 7
7. Mode 7 - 1 b2 b3 3 #4 #5 6

Melodic Minor

1. Melodic Minor - 1 2 b3 4 5 6 7
2. Dorian Flat 2 - 1 b2 b3 4 5 6 b7
3. Lydian Augmented - 1 2 3 #4 #5 6 7
4. Mixolydian Sharp 4 - 1 2 3 #4 5 6 b7
5. Mixolydian Flat 6 - 1 2 3 4 5 b6 b7
6. Aeolian Flat 5 - 1 2 b3 4 b5 b6 b7
7. Super Locrian - 1 b2 b3 b4 b5 b6 b7

Blues Scales

Major Blues - 1 2 b3 3 5 6

Minor Blues - 1 b3 4 b5 5 b7

Whole Tone - 1 2 3 b5 b6 b7

Whole-Half Diminished - 1 2 b3 4 b5 6 b7

Half-Whole Diminished - 1 b2 b3 3 #4 5 6 b7

Chromatic - 1 b2 2 b3 3 4 b5 5 b6 6 b7 7

Chord Formulas

Majors

Major - 1 3 5

Major Flat 5 - 1 3 b5

Major 6 - 1 3 5 6

Major 7 - 1 3 5 7

Major 9 - 1 3 5 7 9

Add 9 - 1 3 5 9

6/9 - 1 3 5 6 9

Suspended 4 - 1 4 5

Suspended 2 - 1 2 5

Power - 1 5

Minors

Minor - 1 b3 5

Minor 6 - 1 b3 5 6

Minor 7 - 1 b3 5 b7

Minor/Major 7 - 1 b3 5 7

Minor 9/Major 7 - 1 b3 5 7 9

Minor 9 - 1 b3 5 b7 9

Minor 6/9 - 1 b3 5 6 9

Minor 11 - 1 b3 5 b7 9 11

Dominants

Seventh - 1 3 5 b7

Seven Sus 2 - 1 2 3 b7

Seven Sus 4 - 1 4 5 b7

Seven Aug 5 - 1 3 #5 b7

Seven Flat 5 - 1 3 b5 b7

Seven Flat 9 Aug 5 - 1 3 #5 b7 b9

Ninth - 1 3 5 b7 9

Ninth Aug 5 - 1 3 #5 b7 9

Ninth Flat 5 - 1 3 b5 b7 9

Ninth Flat Aug 5 - 1 3 #5 b7 b9

Flat Nine - 1 3 5 b7 b9

Sharp Nine - 1 3 5 b7 #9

Ninth Aug 11 - 1 3 5 b7 9 #11

Eleven - 1 3 5 b7 9 11

Sharp 11 - 1 3 5 b7 9 #11

Thirteen - 1 3 5 b7 9 11 13

Thirteen Flat 9 - 1 3 5 b7 b9 11 13

Thirteen Flat 9 flat 5 - 1 3 b5 b7 b9

Thirteen Sharp 11 - 1 3 5 b7 9 #11 13

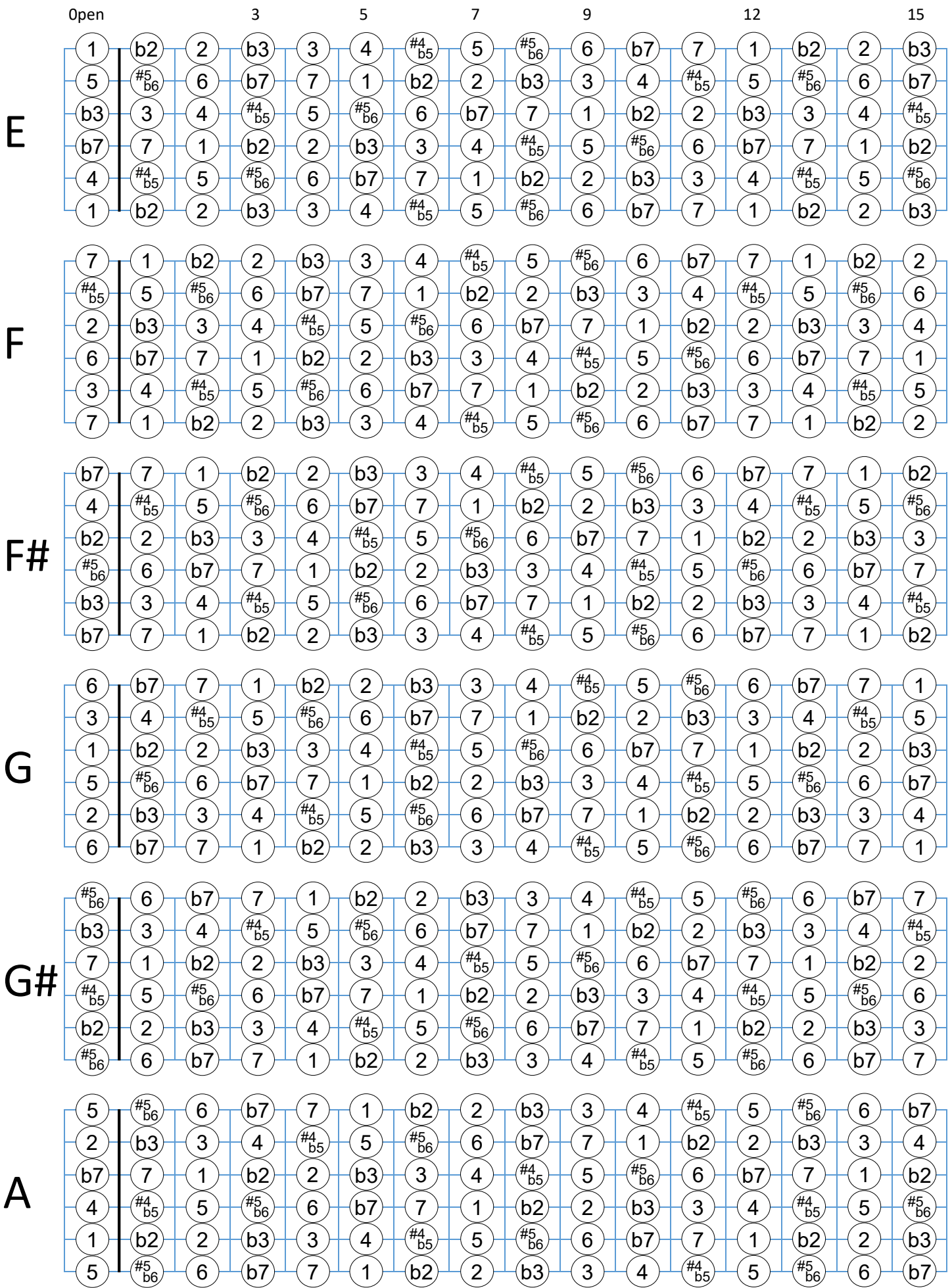
Diminished - 1 b3 b5

Diminished 7 - 1 b3 b5 bb7

Half Diminished (Minor 7 Flat 5) - 1 b3 b5 b7

Augmented - 1 3 #5

On the following 2 pages are guitar fretboards with every interval in every root position. If you're not used to guitar fretboard theory, it may look like a physics project. Once you get the concept down, it will become much more simple to understand and use. It is recommended that you print out several copies of each page so you can use them to learn the fretboard interval process and begin using the guitar in a much more creative way. Remember, hidden inside them is every scale, chord, melody, harmony, key structure, solo, riff, lick and phrase you will ever play on the guitar. You can use the PDFs for Scales and Chords to learn the individual patterns and shapes or by circling intervals from your printed pages, creating what works for you.



Open 3 5 7 9 12 15

A#

#4 b5	5	#5 b6	6	b7	7	1	b2	2	b3	3	4	#4 b5	5	#5 b6	6
b2	2	b3	3	4	#4 b5	5	#5 b6	6	b7	7	1	b2	2	b3	3
6	b7	7	1	b2	2	b3	3	4	#4 b5	5	#5 b6	6	b7	7	1
3	4	#4 b5	5	#5 b6	6	b7	7	1	b2	2	b3	3	4	#4 b5	5
7	1	b2	2	b3	3	4	#4 b5	5	#5 b6	6	b7	7	1	b2	2
#4 b5	5	#5 b6	6	b7	7	1	b2	2	b3	3	4	#4 b5	5	#5 b6	6

B

4	#4 b5	5	#5 b6	6	b7	7	1	b2	2	b3	3	4	#4 b5	5	#5 b6
1	b2	2	b3	3	4	#4 b5	5	#5 b6	6	b7	7	1	b2	2	b3
#5 b6	6	b7	7	1	b2	2	b3	3	4	#4 b5	5	#5 b6	6	b7	7
b3	3	4	#4 b5	5	#5 b6	6	b7	7	1	b2	2	b3	3	4	#4 b5
b7	7	1	b2	2	b3	3	4	#4 b5	5	#5 b6	6	b7	7	1	b2
4	#4 b5	5	#5 b6	6	b7	7	1	b2	2	b3	3	4	#4 b5	5	#5 b6

C

3	4	#4 b5	5	#5 b6	6	b7	7	1	b2	2	b3	3	4	#4 b5	5
7	1	b2	2	b3	3	4	#4 b5	5	#5 b6	6	b7	7	1	b2	2
5	#5 b6	6	b7	7	1	b2	2	b3	3	4	#4 b5	5	#5 b6	6	b7
2	b3	3	4	#4 b5	5	#5 b6	6	b7	7	1	b2	2	b3	3	4
6	b7	7	1	b2	2	b3	3	4	#4 b5	5	#5 b6	6	b7	7	1
3	4	#4 b5	5	#5 b6	6	b7	7	1	b2	2	b3	3	4	#4 b5	5

C#

b3	3	4	#4 b5	5	#5 b6	6	b7	7	1	b2	2	b3	3	4	#4 b5
b7	7	1	b2	2	b3	3	4	#4 b5	5	#5 b6	6	b7	7	1	b2
#4 b5	5	#5 b6	6	b7	7	1	b2	2	b3	3	4	#4 b5	5	#5 b6	6
b2	2	b3	3	4	#4 b5	5	#5 b6	6	b7	7	1	b2	2	b3	3
#5 b6	6	b7	7	1	b2	2	b3	3	4	#4 b5	5	#5 b6	6	b7	7
b3	3	4	#4 b5	5	#5 b6	6	b7	7	1	b2	2	b3	3	4	#4 b5

D

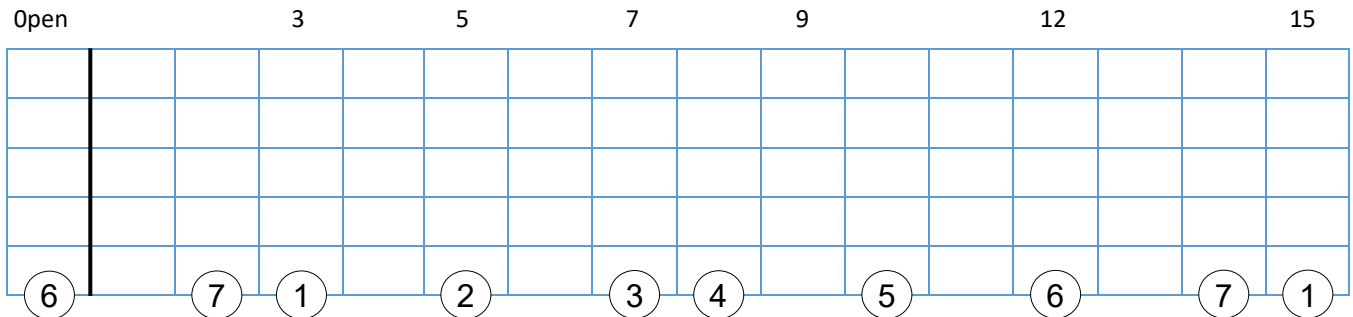
2	b3	3	4	#4 b5	5	#5 b6	6	b7	7	1	b2	2	b3	3	4
6	b7	7	1	b2	2	b3	3	4	#4 b5	5	#5 b6	6	b7	7	1
4	#4 b5	5	#5 b6	6	b7	7	1	b2	2	b3	3	4	#4 b5	5	#5 b6
1	b2	2	b3	3	4	#4 b5	5	#5 b6	6	b7	7	1	b2	2	b3
5	#5 b6	6	b7	7	1	b2	2	b3	3	4	#4 b5	5	#5 b6	6	b7
2	b3	3	4	#4 b5	5	#5 b6	6	b7	7	1	b2	2	b3	3	4

D#

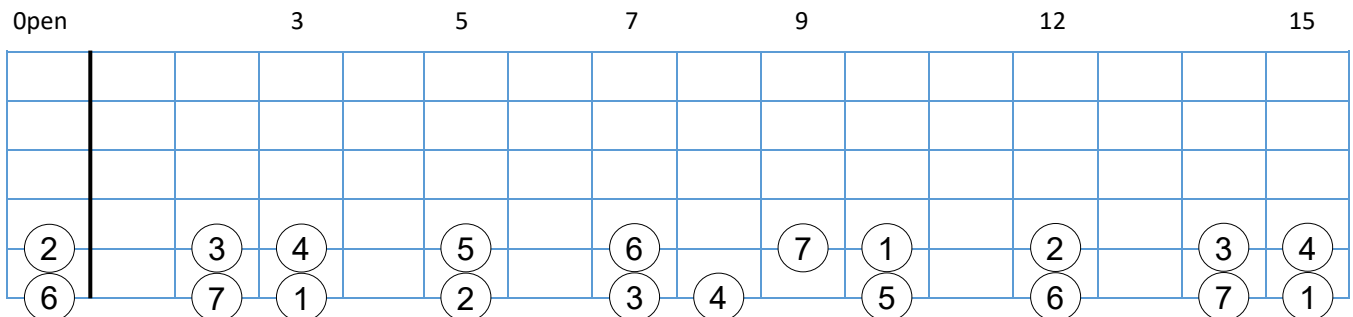
b2	2	b3	3	4	#4 b5	5	#5 b6	6	b7	7	1	b2	2	b3	3
#5 b6	6	b7	7	1	b2	2	b3	3	4	#4 b5	5	#5 b6	6	b7	7
3	4	#4 b5	5	#5 b6	6	b7	7	1	b2	2	b3	3	4	#4 b5	5
7	1	b2	2	b3	3	4	#4 b5	5	#5 b6	6	b7	7	1	b2	2
#4 b5	5	#5 b6	6	b7	7	1	b2	2	b3	3	4	#4 b5	5	#5 b6	6
b2	2	b3	3	4	#4 b5	5	#5 b6	6	b7	7	1	b2	2	b3	3

Finding the Intervals

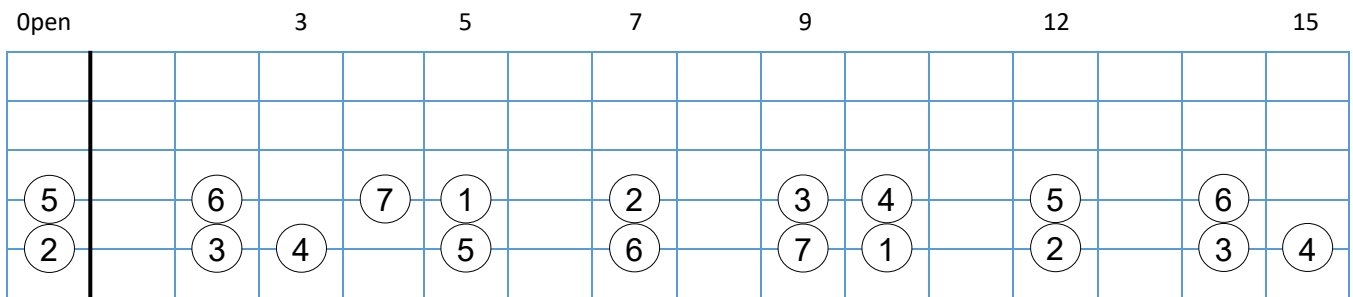
A great way to learn the intervals on the fretboard is by learning the major scale up and down one string then using a double digit sequence to cross over strings. The major scale can be defined by where the 3rd and 4th and 7th and 1st intervals sit next to each other (known as half steps) and the other intervals are two notes apart (known as whole steps). The example below shows a **G** major scale on string 6...



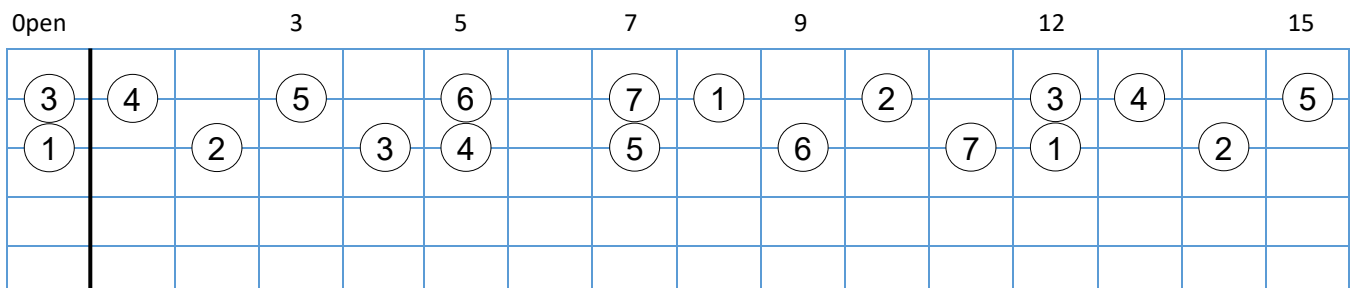
Now, we can use the double digit system to recognize the major scale intervals across the fretboard. The system works like this: 14 - 25 - 36 - 47 - 51 - 62 - 73. All the double digit numbers line up except 47 which is diagonal. The only other exception is when crossing from the 3rd string (**G**) to the 2nd string (**B**) where the second or higher pitched digit moves up a fret to compensate for the lowered tuning of the **B** string.



Here we are again moving across in the **G** major scale from string 5 to string 4. All **G**s are numbered "1."



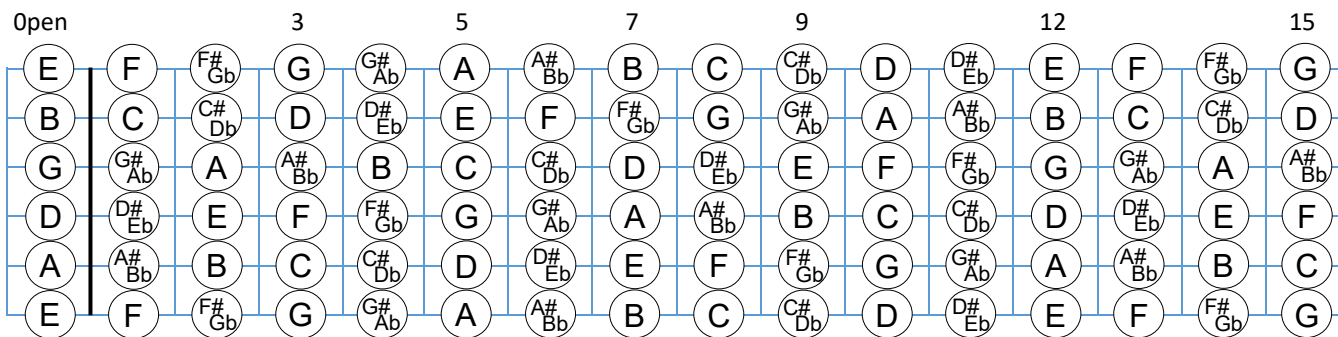
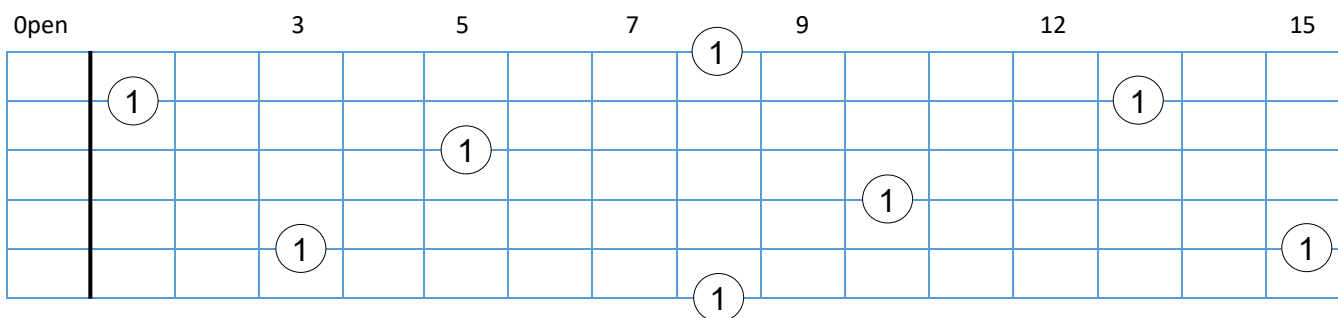
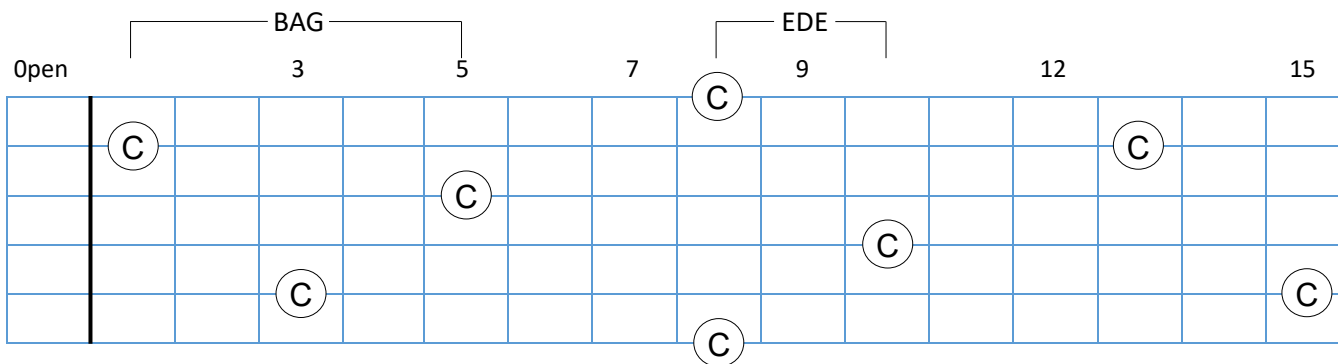
Here is the above mentioned example with the intervals combined on the **G** and **B** strings...



Finding the Notes

A great way to learn individual notes on the fretboard (and intervals) is the **BAG EDE** system. The system consists of two shapes or forms. The **BAG** form starts with a note on the **B** string. We then skip one fret and the same note (an octave lower) shows up on the **A** string. Then moving up the neck, we skip another fret and the same note (back up an octave) shows up on the **G** string. Then we move up to the fretboard to the **EDE** form, skipping two frets. We have the same note again on both **E** strings (one an octave higher and one an octave lower than the note we left on the previous **G** string). Now inside the **EDE** form, we skip one fret and find the same note again on the **D** string (an octave above the low **E** string and an octave below the high **E** string).

Two frets above the **EDE** form, the **BAG** form starts again. (These forms also work for intervals.)



The Circle of Fourths

How it works: It's incredibly helpful to know the notes in each key. The circle start with **C** (which has no sharps or flats), calling **C** - 1, **D** - 2, **E** - 3, **F** - 4, **G** - 5, **A** - 6 and **B** - 7. You can see how **F** is the fourth note in the key of **C** (also thought of as the **C** Major scale). In the key of **F** (which is the next key or note in the circle), **F** becomes 1, **G** - 2, **A** - 3, **Bb** - 4, **C** - 5, **D** - 6, **E** - 7. Therefore, **Bb** is the fourth note in the key or major scale of **F**. In the key of **Bb**, **Eb** is the fourth note and **Ab** is the fourth note in the key of **Eb** and so on. The actual notes in each key are as follows: **C - C D E F G A B C**

Flat Keys

F - F G A Bb C D E F

Bb - Bb C D Eb F G A Bb

Eb - Eb F G Ab Bb C D Eb

Ab - Ab Bb C Db Eb F G Ab

Db - Db Eb F Gb Ab Bb C Db

Gb - Gb Ab Bb Cb Db Eb F Gb

Sharp Keys

G - G A B C D E F# G

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

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

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

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

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

