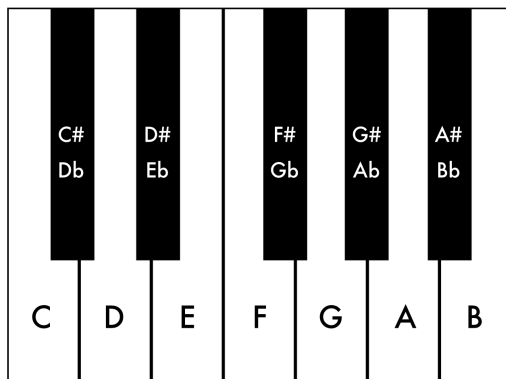


Music Theory Basics Handout

For Students of Jacob Shipley

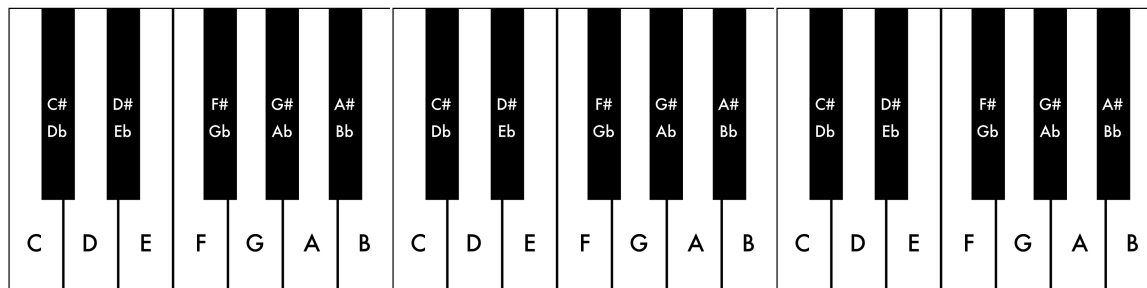
In **Western music** we have 12 tones represented using the letters A through G. This is most easily shown on a piano:



Note: It's weird, but we start counting at C even though it's the third letter of the alphabet. Don't ask. It's complicated.

Also, the notes on the left are lower notes than the notes on the right!

Now get this... IT REPEATS:



Still, the notes on the left are lower than the notes on the right, but every time you see another letter C, we have restarted the same 12 notes, but higher! Also, every time we hit another C, that is called an **Octave** (Oct = 8 and that's because in most **Keys** - we'll talk about them later - have seven notes in them. The second time you see the first note - in this case, C - would be number 8)

How can the same note also be higher/How does an Octave work? Well, it has to do with math and something called Hz (hertz - no not the car rental service), but the simple answer is that the C on the left vibrates exactly **half of the amount of times per second** as the C in the middle. The C in the middle vibrates exactly half of the amount of times per second as the C on the right.

If that doesn't make sense, for now just trust me. They're the same note. :)

Now, you'll notice in between the white keys there are **black** keys. And on those **black** keys symbols like: **#** and **b**

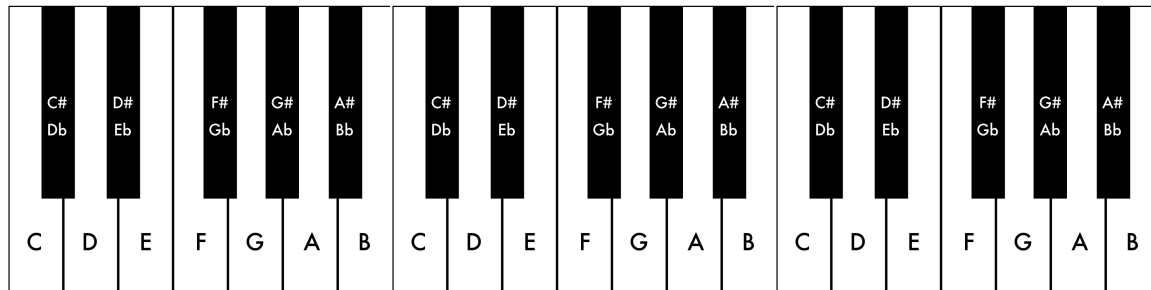
= Sharp = Slightly Higher. So for instance, a C# (C Sharp) is HIGHER than a C

b = Flat = Slightly Lower. So for instance, a Db (D Flat) is LOWER than a D

You may also notice that **C#** and **Db** share a black piano key. Guess what?!

THEY'RE THE SAME NOTE! Cool? Yes. Confusing? Maybe.

Want to know something even more confusing? You may have noticed that there are **no black keys in between E and F and between C and B.**



That's because there is **no such thing** as **E#/Fb** and **B#/Cb**. Why didn't they make it so that every note had a black key in between and just go from A to F? Idk. Maybe they thought it looked prettier.

INTERVALS:

What is an interval? It's the space between something!

In Western music, our smallest interval is what we call a **Half Step**.

A **Half Step** is the distance between one note and the next. On our keyboard, this is regardless of whether a key is white or black. A **Whole Step** is two half steps - for instance from C to D is a **Whole Step**, but from C to C# is a **Half Step**.

There are much larger intervals, but first, let's talk about how to build a **Scale!**

THE C MAJOR SCALE

All major scales are built out of a combination of whole steps and half steps. The easiest to look at is the **C Major Scale**:

C D E F G A B C

Look at it. Ooh and aah. Pretty isn't it?

Now, lets break down the intervals between all of those notes!

C to D is a Whole Step

D to E is a Whole Step

E to F is a Half Step

F to G is a Whole Step

G to A is a Whole Step

A to B is a Whole Step

B to C is a Half Step

So the intervals that build the **C Major Scale** are:

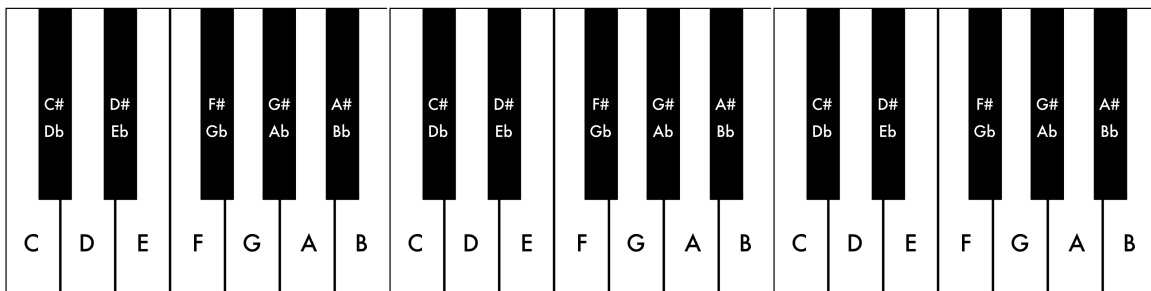
C (whole) D (whole) E (half) F (whole) G (whole) A (whole) B (half) C

Or without the notes:

Whole Whole Half Whole Whole Whole Half

Now the REALLY COOL thing about this is... it works on **EVERY MAJOR SCALE**

Lets take a look at the **G Major Scale** and build it all together:



Starting on G, we go up a Whole step to A, then another Whole Step to B, then a Half Step to C, a Whole step to D, a Whole Step to E, a Whole Step to F#, and finally a half step back to G

So the **G Major Scale** goes: G A B C D E F# G

Now YOU try with the following scales:

D Major Scale: D

A Major Scale: A

E Major Scale: E

B Major Scale: B

F# Major Scale: F#

C# Major Scale: C#

For all of these scales, you will use **only sharps**.

The following scales use **only flats**.

F Major Scale: F

Bb Major Scale: Bb

Eb Major Scale: Eb

Ab Major Scale: Ab

Why do some scales use Sharps and others use Flats?

It's because we never want to double up on the alphabetical letters in the scales. For instance, if in that original **G Major Scale**, we used a Gb instead of F#, it would look like this:

G A B C D E Gb G

Where'd F go? JUSTICE FOR F

WHAT IS A KEY?

Now its even more confusing because I'm no longer talking about those things that were on the piano. I'm talking about **a group of notes (or scale) that make up the basis for a piece of music.**

There are MANY different types of keys; Major, Minor, Harmonic Minor, Modal keys, etc...

But for now, let's talk about **Major** keys! Specifically the key of **C Major**.

Now, you might have notice, "hmm, C Major, I've heard that before..."

Well, it all goes back to that **C Major Scale** from earlier on in our conversation! (Conversation? What conversation? I'm not even talking at you, I'm just writing...)

What are the notes in the key of **C Major**? The same notes in the **C Major Scale**! (see, that's nice and easy, right?)

So we have the notes **C D E F G A B C**

Every note we play purely in the key of **C Major**, will be one of those notes.

And, using those notes we can build what is called a **Chord**!

WHAT IS A CHORD?

A **chord** is a group of more than 1 note, usually at least 3, played at the same time to make a sound together.

Some chords sound **assonant** (complimentary and pleasant), others **dissonant** (uncomfortable and/or crunchy), but **all are considered a form of harmony** whether you like it or not.

Just the same way we have different types of keys, we have many different types of chords; **major, minor, diminished, augmented, etc...**

But let's first take a look at a **Major Chord**. And specifically, a major chord in the **key of C Major**. Even better, a **C MAJOR CHORD**:

In a **C Major Chord** (also written as Cmaj, or simply C) we have three notes (this chord could also be called a **Triad** - three notes).

We have a C, an E, and a G

How did I get here?

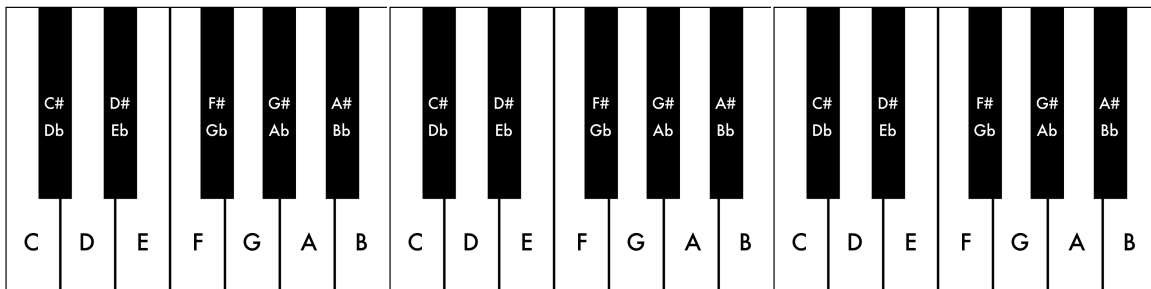
Each **major triad** is made up of a **root** (the name of the chord), a **major third**, and a **perfect fifth**.

Alright I just said a lot. What the heck is a major third and a perfect fifth?

A **Major Third** is an interval equal to **2 Whole Steps (4 Half Steps)**

A **Perfect Fifth** is an interval equal to **3 1/2 Steps (7 Half Steps)**

Both of these intervals are in relationship to the **Root** of the chord.



So, looking at our piano again, we can see that E is 2 whole steps above C and G is 3 and 1/2 steps above C!

Now, **not every chord in the key of C is Major**. Some are **Minor**. Let's take a look at the second chord in the key of C Major, **D Minor**.

Dm (lower case m stands for minor) is made up of notes from the intervals: Root, a Minor Third, and a perfect fifth. We already know that the root will be the first note in the chord, D, and we can find our Perfect Fifth using what we learned already, but what is a **Minor Third**?

A Minor Third = 1 and 1/2 Steps (a half step LESS than a Major Third)

So, using this math, the notes in a Dm chord are: D F and A

You might have noticed that while all this math is SUPER FUN, there might be an easier way to find the different chords that make up a key. No? Well I'll tell you anyway!

Let's look at the notes in the key of C again:

C D E F G A B C

The notes in a **C Major Chord** are: C E G

The notes in a **D Minor Chord** are: D F A

Basically, if you play frogger and jump over a note from the root and skip the 2nd and 4th note, you get the notes of each chord in a key! So let's keep going:

The Third chord in the key of C Major has notes: E G B (I skipped over F and A)

But what I don't know about this chord is whether it is major, minor, or something else! So we reverse engineer that math with the notes - G is only a minor third higher than E so in the key of **C Major**, the third chord is **E Minor**. Let's do this with the rest of them:

4th Chord: F A C (major third) = F Major

5th Chord: G B D (major third) = G Major

6th Chord: A C E (minor third) = A Minor

7th Chord: B D F (minor third PLUS a Flatted Fifth (3 whole steps), not a perfect fifth) = B Diminished (Don't ask - you won't need to know this for a while)

Now simply put the chords in the key of **C Major** are:

1. C Major
2. D Minor
3. E Minor
4. F Major
5. G Major
6. A Minor
7. B Dim

FUN FACT: Just the same way that the intervals to build a major key work for all keys, these basic chord types work for all major keys! So in every major key the 1st chord will be major, the 2nd minor, the 3rd minor, the 4th major, and so on.

You will often see these written in **Roman Numerals** with Uppercase numerals showing a Major chord and lower case showing a Minor chord:

I ii iii IV V vi vii(dim)

EXTENDING THESE CHORDS INTO SEVENTHS:

Okay, so we've talked about roots, thirds, and fifths, but we can actually keep going with **Sevenths!** Same principle as before where we just skip to the next note. So our C Major chord with a 7th added will be:

C E G B

For our purposes, there are **two types of sevenths:**

Major 7th: 5 and 1/2 steps from the root (or a half step below the octave)

Flat 7th, sometimes called Minor 7th: 5 steps from the root (or a whole step below the octave)

B is only a half step below C so the chord C E G B = **C Major 7** (also written Cmaj7)

Let's do this for the rest of the key of C Major using what we already know about the chords:

2nd Chord: D F A C

C is a Whole step below D so this is a **D minor 7 (Dmin7)**

Fun fact!

The VAST MAJORITY of minor chords have flat 7ths so we can just call them Minor 7ths

3rd Chord: E G B D

D is a Whole step below E so this is **Emin7**

4th Chord: F A C E

E is a Half Step below F so this is **Fmaj7**

5th Chord: G B D F

F is a Whole step below G (flat 7th), but the rest of the chord is major so we will simply call this a **G7** - this implies a major third, but a flat 7th

6th Chord: A C E G

G is a whole step below A so this is an **Amin7**

7th Chord: B D F A

A is a whole step below D and the rest of the chord is Diminished so we simply call this **Bdim7**

However: if the 7th was only a half step below the root of a diminished chord, it is called a **Half Diminished Chord** (again, you won't need to know this for a while)

Now, putting this all into those Roman numerals, it will look like:

Imaj7 **ii**7 **iii**7 **IV**maj7 **V**7 **vi**7 **vii**dim7

(remember the lower case implies minor already)

HOW DOES THIS APPLY TO OTHER KEYS?

Let's take a look at the key of **G Major!** We know the notes in the key of **G Major** are:

G A B C D E F#

So we can simply plug each of those notes into the slots of the Roman numerals and find all of the chords in the key of **G Major**:

Gmaj7 **A**min7 **B**min7 **C**maj7 **D**7 **E**min7 **F#**dim

CAN YOU DO THE SAME WITH THE OTHER MAJOR KEYS?

D Major:

A Major:

E Major:

B Major:

F# Major:

C# Major:

F Major:

Bb Major:

Eb Major:

Ab Major: