Open Applied Music Theory

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Latest Update: April 12, 2019

Preface

This preface is to be rewritten once I have finished a release of this book. As of this moment, though, I am a young naive undergraduate student studying Computer Science and Mathematics. Why, then, am I writing a music theory book? I don't have a good reason for that, but here we go...

Fountain Pens and happy friends.

I remember the moment when I took my very first music theory course. I was a high schooler looking to register for some classes at a local community college for a program called Running Start. Calculus was full and so, being a clueless Sophomore, I took "Music Theory/Ear Training 1" as an easy class. Little did I know that I would be sucked into a new world that I never could have known before. Ron Bayer was my theory professor and he really showed me what music theory was capable of. No, it wasn't some silly ruleset that musicians use to shake their heads at others. No, it wasn't a silly set of restrictions that musicians use to make top pop hits. In a way, it can be seen like that, but I should have known better as a STEM nut. I discovered that music theory was theory just like Einstein's Theory of Relativity or the Theory of Heliocentrism developed by Copernicus, Kepler, and Galileo. Based on our observations, we've noticed things about how the world works. As we investigate further we begin to find ways to explain why these observations happen. Over time as we experiment and advance, we modify our understanding of the world. Some explanations we'll find to fail completely. Others we'll find still hold true. Many we will find to be obsolete, and proceed to make enhancements and adjustments.

But! Just because one system fails to completely explain a phenomenon does not mean we must scrap this idea completely. Many of us are familiar with the concept of relativity (Galilean Relativity for you physics folks) If you're standing on a cruise ship moving $5m/s$ and walk $.5m/s$ in the same direction as the ship, you'll be moving $5+.5 = 5.5m/s$ relative to an observer on land! Eventually, however, we found out that this addition identity doesn't hold true at high speeds. A very smart person named Albert Einstein developed a new model of Special Relativity in order to explain the newly observed phenomenon. And notice that many people will never get to the point of even learning special relativity even though Galilean relativity is incorrect. Why? Well because it's close enough and most of us don't care enough. The fact that there is a time dilation for someone driving a car on a freeway compared to a speed limit sensor doesn't matter. Even an engineer won't even necessarily

need to account for these effects. And these engineers are professionals! We're entrusting our lives to them yet they use theories that are incorrect?

Okay I'll admit that my analogy isn't the best, but I think music theory should be seen the same way. Music theory is a beautiful thing in the same way that physics, astronomy, chemistry, biology, [etc.] are all beautiful. That is, there is amazing elegance in it and some awesome applications if that's your thing. And that last part is important. Music theory isn't everyone's thing and that's okay. For someone is academia, it's important. For a composer, it's important. If you just wanna play your instrument, though? I would recommend you pick up some theory, but it's ultimately what you want to do with the hobby. I'm not trying to advocate for some kind of *almighty important music theory*.

Hobbies are hobbies :) If you're trying to be a music theorist, you're going to have some trouble if you refuse to learn theory. Otherwise, it'll probably make it more fun, but different things are worth it for different people. For me, I shunned music theory for far too long until I tried it and realized what it really was. When I was applying for university a couple of years ago, I planned to study music composition alongside computer science. Well... Not all things go to plan. :) Someday after school started, though, I started getting asked a lot of questions about theory from a friend. I got involved online in theory and composition communities. I got the chance to explain things to people.

One day, I met someone a little out of the ordinary. They asked me a question and I answered it. It was a question about polyrhythms and polymeter I wrote out an answer I thought was pretty good, but it didn't reach them. I wrote out another response. Still, it didn't reach them. I continued to converse until I began to write more and more elaborate explanations with numerous examples and from a ton of different perspectives. Finally after several days, they were finally confident in my response.

Teaching is hard. That's why I love it. Having an intuition for something really can cloud up a good explanation. How do you teach a baby to add numbers? It's so elementary that we do it unconsciously probably hundreds of times a day.

After this little polymeter polyrhythm fiasco I also happened to get into fountain pens. I spent all my time reading textbooks, watching the stock market, doing homework, playing tennis, etc. that I didn't really have any me-time. Yeah I know playing tennis is relaxing too, but not when other people are around. I then started to use fountain pens as an excuse to start writing. Anyways, I soon realized that it was annoying to have to wait for my hand to catch up with my brain, so I came up with the idea of writing a book starting with the material I already had worked on explaining or teaching to others. Here I am now.

To be honest, at the time of me writing this–before writing any substantial part of the book–I don't know how far I'm going to get. In any case, I'd like to thank the imaginary friend for being there for me to brainstorm with. I'd also like to give thanks to my family, my friends, and my girlfriend for always supporting me in everything I do. Finally, I'd like to thank you guys, the community, for giving me the chance to share my knowledge to someone that cares (I'm assuming you care since you at least glanced at the end of the preface :). Here we go!

About

Ideologies

Music theory can sometimes be a really vague topic. We hear items about theory all the time. *Ooh, that's a perfect cadence* and *there's a picardy third!* But, what do these really mean? I mean yes, there's the definition that we can get on wikipedia or google, but so what? We can give labels all day, but labels are just labels. I can just as easily hear a random melody and say "*Oh wow this is truly exquisite. It's an perfectly implemented inverse sub-transit chain from the C to a B.* It's good to understand how to label certain ideas and concepts–after all, we need some way to communicate with one another–but, the hard part often has more to do with what we can do with this knowledge and how to expand on it. As I mentioned in the preface of this book, I view music theory in the same way as I view mathematics or physics. Knowledge of the field and its models evolves over time, but old "outdated" ideas can still be applied where appropriate. Also, there are differences between laws, theories, hypotheses, etc. This book is based on this ideology.

A different approach

With this view of music theory as a science, I hope to use a bit of a different approach. Don't worry though, there won't be heavy math involved :) (or at least not for most of the book). Moving on, the idea is of course to take the good parts of both artistic and scientific (these can be the same thing can't they?) styles of teaching, and combine it with a bit of traditional music pedagogy. To be honest, I'm unsure whether or not this really is a different approach. From my narrow experience with music education (I'm a computer science major after all!), it is a bit of a different approach. In any case, my hope is that this approach can help make music theory accessible for people of all disciplines who may not be super serious about music in academia. In any case, there are three main patterns you will see throughout the book:

- **Examples.** Examples are king in any type of teaching. When I learn things, I like to be amazed. I like to see something that's really cool, and something that is really cool just by itself. This book loves examples and will use it to help explain just about

every single concept that is taught. Sometimes we will introduce an excerpt and ask questions to hopefully bring forth some thought. Sometimes we will introduce an idea in words and then go forth to give examples. In both cases, we hope the examples can really get you thinking about the idea so that you can really understand what it means beyond just the name and how to identify it.

- **Theory (Concepts).** Intuition is a great thing. At the same time, it can be tough as it seems some people have a great intuition for things while other people may have a poor intuition for the same things. From my perspective, though, intuition can be taught. Intuition is something that is built up from experience. This isn't necessarily from direct experience, but experience in general. You might view a physical phenomenon and have an idea of what's happening based on what you've experienced in your life. When something is something people say "isn't intuitive" it's often something that is not experienced in a particular way in practice and in real life. This idea of intuition can be really powerful, but it can be hard to develop. This book tries to develop intuition in order to build practical skills even when you might not be consciously thinking about what you may be doing.

- **Practice.** For some people, intuition comes easy. Notes and chords, rhythm, melody– they might just pop up not unlike how you might read a book or generate your speech. It's often easiest to learn a language quickly by moving to a place that speaks that language, or at least by having constant exposure to the language whether you understand everything or not. After maybe even as short as a month, you might be able to hold your own conversation with natives if you put effort into it! The goal of this book isn't to be like a workbook you'd find in your introductory Music Theory class, but to set up the foundations for you to grow efficiently even after you've forgotten about the book and left it in the dust. We want to give easy opportunities to practice, as well as some tools to help you practice theory in (almost) whatever way you want to. After all, there is over a thousand years of music to learn from! :)

Intuition is a really nice thing to have, and that's why this book is so focused on it. While I'm a bit of a theory nut, I know a lot of you performers and (sorry!) wannabe pop stars will be a bit bored spending an entire week reading a single piece of music. Music should be fun! When you have to think about every single thing you're doing to write, improvise, perform, etc. it can be a bit draining. That's probably why some people (incorrectly) say that music theory can limit your creativity. By now, I'd think you know I strongly disagree with that idea, but I see why! With a developed intuition for music theory, though, you won't have to always think super hard every time you look at some music. Ideally, you'd unconsciously have an implied "understanding" of what was happening so that you can make something better out of it than if you didn't have that intuition.

Coverage

This book is an applied music theory book, and as such, will cover aspects of music theory that are useful for reading music, performing music, and writing music. As of this writing, I have yet to write any actual part of the book and so it is difficult to say what will and what won't be covered. In general, though, I hope to discuss both introductory, intermediate, and advanced content. Anything that could be a help to a musician can show up here :)

This book is a living book that will always be changing. As an open source book, I invite you guys to contribute if you have anything you'd like to add or change. This process will be explained in more detail in the future when it is more complete.

Who is this book for?

Anyone with an interest in music can use this book. That being said, basic topics may not be covered as in depth as other sources since there are many great educational materials already out there. The intermediate and advanced material is where the focus of this book is, but keep in mind that it will take time for the material to accrue. If you're currently studying music, this book may be a good supplement that will hopefully give some good alternate perspectives or tips and tricks.

As for instruments, there is no primary instrument that will necessarily be referred to. Different instruments may pop up in the book to help illustrate an idea, but there is no assumption that the readers will all know any specific instrument.

How to get the most out of this book

As I've mentioned before, this book follows an approach that hopes to be accessible for people from all disciplines, whether it is music-related or not. This book is meant to be easy to read, but also hold a bit denser content for use as supplementary material. This is not meant to be reference material per se. While it will contain summaries and cheat sheet-esque sections, there may be small details that are not covered completely. I think it is important to note caveats and details, but as an *applied* music theory book, not all details are completely relevant in practice.

As for reading the book, you can feel free to read it like a novel. The text should generally be concise, but not in a way that makes it difficult to read or understand. Remember, this book is not meant to be reference material. If you would like, read the book from start to finish. If there is material that you already understand well, feel free to skip it. The book will mention when other chapters might be important or helpful, but the chapters are designed to flow one after another, as well as be able to stand alone.

Contents

Disclaimer

This book is currently in a highly volatile state. You might be reading something and tomorrow when you check the latest version, the whole book might be backwards. As I am about to start the real content of the book, chapters are probably going to be very out of order and content and examples may be missing. The main goal of this period of development is to just begin to get stuff down on paper. This is not a finished product. Well it might never be truly "finished", but this is not something that is ready to be "published" you might say. In any case, thank you for showing interest in this book so early on! If you have anything you'd like to say, please let me know!

Part I

The basics

Chapter 0

Meta

While there is a good deal of information in the about section , there are a few essentials that I would say are important for "everyone" to read. I know many will probably skip around between chapters and not read this, but that's okay. It totally makes sense to skip stuff you know well and if that's the best way to make use of this book, I encourage it! Anyways, moving on...

0.1 Cross-References

There are often times places where the book will mention an idea or topic that has been discussed in more detail before (lower chapter numbers is all this means), or will be discussed in more detail in future chapters. It's understandable that our teaching might not be the best or that certain things might be easy to forget or hard to remember the details of. Additionally, we understand if you want to skip around in the book. To make navigation easier, we will include references that look like §-98.76.5/31415. The first number (98) represents the chapter number, the second number (76) represents the section number, and the third number (5) represents the subsection number. Additionally, this is just the number that would be seen before a chapter/section/subsection title. The first two numbers are what would be displayed in the table of contents for a chapter or section. The number after the slash (31415) is the page number where the topic appears. We will scatter these references throughout the book.

0.2 Structure

The structure is not set in stone yet, but for now, we will go with a basic chapter structure. This is a template which will help with familiarity, but may not always be followed. In general, we will start with an example. These examples will probably be curious little things that you might have seen before, but the idea is that it gets you thinking. After the example is shown, we will hopefully walk you through what it means and lead into the explanation of

the topic at hand. At the end of the chapter, there will be some questions or supplementary material to think about or look at. When this book is further along, there will be more information.

0.3 Checkpoints

Checkpoints will look like this:

Checkpoint #1

This is a checkpoint! What page is this checkpoint on???

The purpose of a checkpoint is to keep you thinking and applying the information even as you're reading. Checkpoints are a way to begin to poke at some questions to help build your intuition for music theory. These checkpoints will have questions or thoughts to consider. After you (hopefully) thought about these ideas for a little bit, you can go to the end of the book to find an answer or response.

0.4 Asides

Asides will look like this:

Aside: This is an aside!

My favorite colors are yellow, blue, and pink!

Asides are boxes that will carry some interesting ideas that aren't exactly important or essential. Another way to think about these are fun facts. The content may be of a subject other than music theory, of history, or a somewhat irrelevant idea.

Chapter 1

Notation

If you've never played a musical instrument and have never been involved in music, I'm not sure how you found this book, but we will gloss over the basics. I will recommend https://www.musictheory.net/ as a better resource for introductory theory. We are not affiliated in any way, but it may be a bit better than just reading through this. In practice, there might be a bit of overlap between that website and this book for the first few chapters. The approaches are different, but in any case, I encourage you to checkout different resources. Different things work for different people. If you decide this book doesn't work well for you, I won't be offended :) But if you don't mind, it would be nice to know what didn't work and maybe how we could improve the book!

Moving on, this chapter will be largely labeling (hence the name "notation"). I mentioned that labeling isn't really the cool part about theory nor is it necessarily the hardest part (not that it's always trivial, but that's for later). Still, it's important for communication and that's why we label things in general. It's good to use words as a way to communicate most effectively and efficiently instead of using buzz words as a way to build your ego because you think you know something other people don't. Love music! Words are a tool, not a direct cure for insecurities you might have.

1.1 Notes

Picture of some notes here Even if you have never played a musical instrument in your life, you probably have seen **notes** somewhere. Here, we will give some labels to the different parts of the notes. All of these are notes, but you'll notice that they look different. This is because we draw notes differently depending on how long we want them to be played. We'll go into the details later. For now, let's give names to the parts of these notes.

Picture of some more notes, but with labels too Now let's put these notes somewhere familiar...

1.2 The staff, clefs, and ledger lines

1.2.1 The staff

Picture of notes on the staff with some clefs These 5 lines are called the **staff** and is where the notes sit. While the type of note determines the duration, the notes' placement on the staff determines the pitch. Higher up on the staff means a higher pitch while lower on the staff means a lower pitch. These notes can be placed on either a line or on a space which is in between two lines. We'll talk about what these mean later.

In terms of pitches, notes are named with letter from A-G. These letters form a ring, and so if you reach G and go one note further, you'll get back to A. This might seem weird at first, but you can think about a clock and how that works. When you reach 12 o'clock and go one further, you go back to 1 o'clock even though it may be the 13th hour of the day. Each line or space represents one note. If a given line is the note "D", the space above is the note "E" and the space below is the note "C".

1.2.2 Clefs

You'll also notice some strange looking symbols here on the staff. Those symbols are called clefs and they give reference to which lines or spaces represent which pitches. These pitches are represented by letters between A and G.

clock figure These clefs, then, determine what letter or note each line and space represent. The clef on the left is called the **treble clef**. The treble clef is also called the "G clef" because the line it circles (the second line from the bottom) is the note G. In this case, the lines, from bottom to top, are EGBDF. The spaces, consequently, are FACE. Understanding this will require some memorization at first, but eventually should be automatic and intuitive. Remember that the notes are in order. In the worst case, remember one single note and count from there.

The clef on the right is called the **bass clef**. The bass clef is also known as the "F clef" because the two dots surround the note F (second line from the top). I'll leave the sequence of lines and spaces for your exercise.

1.2.3 Ledger lines and the Grand Staff

figure of ledger lines Sometimes, we will have notes that go above the range of the staff, either above or below. In those cases, we will use something called ledger lines. They are lines above or below the staff that we place notes on. Think of it like extending the number of lines on the staff above and below. You can keep counting just like before. In the example, then, the note on the ledger line below the staff is C. Since the staff has a treble clef on it,

we know that the second line is a G. The bottom line is then E and if we count two more (one space and then one line), we will get to C.

If you look at the ledger line above the staff on a bass clef, you'll notice that note is also a C. This is actually the same note as the C below the staff on a treble clef. We can put these two staves together. This is called a grand staff and is often used for instruments like piano which have wide ranges and can play multiple notes at once. The C note that lies in between the staves is called **middle C**. If we throw a curly brace on the left side of the two staves, we can formally connect then and notate a grand staff.

1.3 Articulations and Accidentals

picture of accidentals and articulations In these pictures, you'll now notice some additional markings near the notes. These markings modify some attribute about the notes.

1.3.1 Articulations

picture of articulation part of the above picture These are different markings that can affect different things about the notes and how they are played. There are tons of different markings and it's good to know the common ones. They are basically just definitions, though, so we won't cover this in great detail. Someday this book may include a cheat sheet of as many articulations as we know and what each of them mean. Sometimes, they also can have different meanings depending on the instrument. As a result, this is maybe a bit more suited for a composition book or performance books.

1.3.2 Accidentals

picture of some notes with accidentals These markings are **accidentals**. To understand this idea, let's first take a look at a piano keyboard.

picture of keyboard Here, you'll see that there are white keys and black keys. Can you find any patterns? There should be a repeating pattern every 12 keys made up of groups of 2 black keys and groups of 3 black keys. Counting the white keys, there are 7 notes before you complete a cycle of the pattern. Remember the letters we assigned to these notes? A-G? That's also 7 letters. These letters match up with the white keys on a keyboard with C being the first white note to the left and adjacent to any group of two black keys.

picture of keyboard and some labels So now, we need a way to notate those black keys that are in between some white keys. We do this using accidentals. There are four accidentals in figure PLACEHOLDER. The first two are sharps and the second two are

flats. The first sharp is just a standard sharp and raises the pitch by what is called a **semi-tone**. A semi-tone is the distance between two adjacent keys on the keyboard. Looking at the keyboard this can mean white key to black key, black key to white key, and white key to white key. The second sharp is a double sharp. This is just the equivalent of two sharps which raises the pitch by a total of 2 semi-tones or 1 **whole tone**.

Flats do the opposite. The third symbol lowers the pitch by one semi-tone and the fourth symbol is a double flat that lowers the pitch by 2 semi-tones. Here is how it looks on a keyboard:

picture of keyboard with notes labeled You'll notice that every key has multiple names like C♯/D♭. This should make sense. We have learned so far that naked (without accidentals) or **natural** notes A, B, C, . . . , G are just the plain white keys. The first black key in a group of two is immediately to the right of what we learned to be C and so that note is C♯. At the same time, we know that that key is to the left of D and so it must be D♭. This is called **enharmonic equivalence**: two different note spellings that sound the same.[1] This also means that D note is C𝄪 and E𝄫, but we left that off the diagram because it would be too messy.

One thing to note, however, is the adjacent white keys. E and F are two white keys that are directly next to each other. That means that E♯does not actually land on a black key like most other accidentals. This isn't necessarily confusing, but can be a common mistake to make since E♯ and similar notes don't show up in music as much as other notes.

[1]We'll find later that this isn't always 100% true. With different temperaments enharmonic equivalences can sound different, but this doesn't really apply as much anymore with modern standards

Chapter 2

Fundamental Ideas

Now that we have explained basic notation, we can move onto a bit more substantial concepts. There are fundamental ideas which will be explained here. These ideas are something maybe akin to learning how to add and subtract numbers in math.

2.1 Notes and Rests (durations)

2.1.1 Naked Note Durations

Picture of some notes here with labels From left to right, the notes decrease in duration by a factor of two. If we look at the names then we can kind of think of them as fraction values and compare the relative magnitudes of these fractions. A whole note (𝅝) would be like 1, and a half note (𝅗𝅥) would be like $\frac{1}{2}$. Therefore, a half note is half the duration of a whole note. Similarly, a quarter note (♩) is like $\frac{1}{4}$ and a sixteenth note (𝅘𝅥𝅯) is like $\frac{1}{16}$. In this case $\frac{1}{16}$ is 4 times smaller than $\frac{1}{4}$ and so a sixteenth note is four times shorter than a quarter note. Another way to think of this is that there are four sixteenth notes in a quarter note.

Another way to think of it is visually. Each thing that is added on halves the duration of the note. This is most obvious with quarter notes and shorter. Each time you add a flag, the note halves in duration. This idea is true for shorter durations too. If you take a whole note and add a stem, it becomes a half note which is half the duration. If you take the half note and fill in the circle, it becomes a quarter note which is, again, half the duration.

2.1.2 Dotted Notes (with Augmentation Dots)

The first one on the left is actually not an accidental nor an articulation. It might actually be better fit above in the notes section, but is here with the other disconnected markings for now. It's simply called a dot. Just like it looks. The dot lengthens whatever it is after by a factor of $\frac{1}{2}$. Remember how there are two quarter notes in the space of a half note?

In this case, there would be a dotted quarter note and a eighth note in the space of a half note. There are two eighth notes in the space of a quarter note and so if a dotted quarter note is 1.5 times the duration, it should last the equivalent duration of 3 eighth notes. There are two quarter notes in a half note which is 4 eighth notes and so that would leave us with $4 - 3 = 1$ eighth note in addition to the dotted quarter note to fill the space of a half note.

Remember how I said that dots lengthen *whatever* they are after by a factor of $\frac{1}{2}$? I deliberately used "whatever" instead of "note" because there can be notes with $2, 3, 4, \ldots, \infty$ dots. Of course you won't really see more than 2 or maybe 3 in real world cases. In any case, though, they should be easy to understand if you already understand regular dots. They just multiply the duration of the thing before the dot by 1.5.

figure of subdivision If we have a double dotted half note, well let's just break it down. The first dot adds half of the half note. Half of a half note is a quarter note. Now for the second dot we add another half of that. Half of a quarter note is an eighth note. In total, we have one half note plus a quarter note plus an eighth note. An additional dot would add a sixteenth note and so on. *Fun fact: if there were infinite dots after a given note, the resultant note would have a duration equal to precisely twice the original note.*

2.1.3 Subdivision

Explain subdivision here

2.1.4 Rests

Explain rests here

2.1.5 Ties

Explain ties here

2.2 Meter and Time Signatures

2.2.1 Meter

Meter is something that describes how music is organized with respect to time. In other words, it is something that determines how we should group notes together, as well as how we can count to the music. By this second definition, it becomes evident that meter is not always clear cut. For a given piece of music, it is possible that meter can be argued, but in many circumstances it *is*, in fact, clear.

Moving on, there are are multitude of different meters. These can be split in two ways in western music. **Duple**, **triple**, and **quadruple** meter determine how we count the music. In other words, this determines the grouping of the beats. **Simple meter** and **compound meter** determine how we subdivide the beat.

picture of subdivisions and groupings As a result, duple meter would be counting in groups of two beats, triple in groups of three beats, and quadruple groups of four beats. Simple meters divide each beat into two, while compound meters divide each beat into three.

These two classifications can be combined to give the meters we commonly use in western music. As an example, a simple quadruple music would be groups of four beats where each beat is divided into two. A compound duple meter would be groups two beats where each beat is divided into three.

example of these meters

2.2.2 Time Signatures

picture of time signatures on staff We notate meter using time signatures. The bottom number determines the type of note that represents one beat (or a third of a beat in the case of compound meter) while the top number determines how many of the aforementioned notes should be grouped together.

Let's start with the bottom number. The bottom number of a duple meter determines directly the type of note that represents a beat. Remember how we thought of note durations as fractions? This bottom number would be the denominator of the fraction above. An eighth note would then be the number 8, a half note would be the number 8, etc.

For a compound meter, the bottom number represents a subdivision of the beat. Since compound meters first divide by three, a meter where a dotted quarter note is the beat would have the denominator of an eighth note on the bottom. This is because there are three eighth notes inside of a dotted quarter note. Overall, however, you can remember this as a way to remember the note to use to count for the top number.

The top number is simple with respect to this. It simply represents how many of the notes (as denoted by the bottom number) should be grouped together. Let's look at a 3/4 time signature.

3/4 time signature with a measure The 4 on the bottom means to count the top number by quarter notes, and the 3 on the top number means that the meter groups notes 3 quarter notes as a time. This also is a good way to see the the type of meter since the

numbers are unique in this way.[1] Numbers 2, 3, and 4 on the top often denote simple meters while numbers 6, 9, and 12 often denote compound meters. 2/4, 3/4, and 4/4 are likely the most common simple meters you'll see. 6/8, 9/8, and 12/8 are likely the most common compound meters you'll see. That being said, there are also simple meters like 2/2 and compound meters like 6/4 that you'll see around so having a denominator of 4 does not necessarily mean simple meter.

2.2.3 Measures

Remember the groupings that are denoted by the top number with respect to the bottom number? Each of those groups fit in what is called a **measure**.

Aside: Test

Content

Checkpoint #1

Content

measure picture A measure is denoted as a part of a score and is separated by bar lines. There are different types of bar lines like repeat bar lines, double bar lines, and ending bar lines. They mean different things and will be defined at the end of this chapter. Time signatures are a way to notate the meter of a piece of music where measures separate/hold groups of notes.

[1] This is not necessarily true. There are situations where meter numbers may mean different things, but there are other ways to make sure this is counted right. In the future this may be elaborated on because we understand that the idea of time signatures is very confusing with respect to everything.

Part II

Appendix

Checkpoint Solutions

Chapter 1

1. Answer

Chapter 2

1. Another Answer