MUSIC IN OER

NDUS OER Conference

Tuesday, March 2, 2021

"Gee ... look at all the little black dots."

Where to Begin?

- Dr. Adam Hollingsworth
- Teach at ND State College of Science (5th year)
- Have taught K-12 and college for 23 years
- Also worked as a school administrator

- Soon after starting at NDSCS, a colleague introduced me to OER

OER Begins…Suddenly

- Student commented on textbook cost (~$250)
- *Suddenly* began a rapid search to find an OER replacement
- Found only one: Understanding Basic Music Theory by Catherine Schmidt-Jones
- Good book, but not quite what I was looking for

The Grants Begin!

- Won first grant to write an OER text
- Designed from the ground up for our “MUSC 101: Fundamentals of Music”
- Course introduces students to the basics of reading (and writing) standard Western music notation
- Wrote it to fulfill the three primary aspects of the course:
  - *Rhythm*
  - *Pitch*
  - *Harmony*

Considerations

- An introduction to the basics of reading (and writing) music notation
- Can be used as a “primer” for a music theory sequence
- But most students are using this class as humanities credit
- So, designed to be practical – be able to read some sheet music off the music store shelf
- Only the most common rhythms, pitches, and other musical symbols

Initial Design

- Started with an outline (basically a table of contents)

- Introduction
- The Physics of Music
- Rhythm
- Pitch
- Intervals (Harmony)
- Roadmap

Table of Contents

Introduction

- Introduce the course and its overall goals
- Set the tone for the book
- Very conversational and informal in its writing
- Avoided “scholarly” or formal writing style to encourage ease of reading and understanding

Also, this is the kind of stuff that should be in a foreword, I know. But again, in the real world, who read forewords? That's why I just stuck it in with the first chapter. Also, there isn't much to say about this topic, so why give it a whole thing of its own?

This book will cover the same kinds of things that are discussed in class. So, why have it? There are several reasons, all of which I think are pretty good. For one, it's good to get information in more than one way: by reading it, by hearing it, by trying it, etc. For another, if you already have it written down, you can pay closer attention in class and not worry about trying to write down absolutely everything. It frees you up to just write down some really important things, to listen carefully, and to try working through some examples on your own.

This book isn't just a textbook. It also includes many different opportunities to practice these things on your own. It's like the old saying goes, "If I hear, I forget; if I see, I remember; if I do, I *understand*." There's a lot of truth in that, so we'll be sure to *do* lots of things over the course of this class. And what's more, there will be lots of opportunities to ask questions. If you don't understand something, just ask! That's one of the best, tried-and-true methods for human beings to learn – the Q & A.

So, let's get started, then, with one of the first "nuts and bolts" questions of music – what is it? Seriously! Have you ever tried to define "**music**?" You'll run into lots of definitions from lots of people. I like to keep it simple, though.

Music is sound and silence, organized through time.

That pretty much covers it! From ancient music to the present, from Western music to the music of any other culture on the planet, that definition fits. Plus, it's simple! There's your first assignment: memorize that sentence.

What's that you say? Memorizing is stupid and old-fashioned? Nope, not really. It's true that it fell out of fashion, even among teachers who should know better. But unpopular things are not always bad things, and *memorization* is one example. There's a ton of research

out there that supports that notion. I won't go into it here but believe me: a little memorization is a good thing!

Next, we should get into the six main elements of music. Music is one, complete thing. However, just like you can spin a globe around and see different continents, all on the same Earth, you can look at different aspects of music. Here's the six that we'll be considering:

- Rhythm
- Melody (pitch)
- Harmony
- Timbre
- Texture
- Form

The first of these elements is **rhythm**. It's the most basic element that covers the "when" of music. **Melody** essentially talks about pitch: high notes like a flute or low notes like a tuba. **Harmony** combines different pitches together. **Timbre** is why one thing sounds like itself instead of something else. **Texture** has to do with how many things are all happening at the same time. **Form** considers how big "chunks" of music fit together. We'll take time throughout this book (and your class) to cover each of these elements in greater depth.

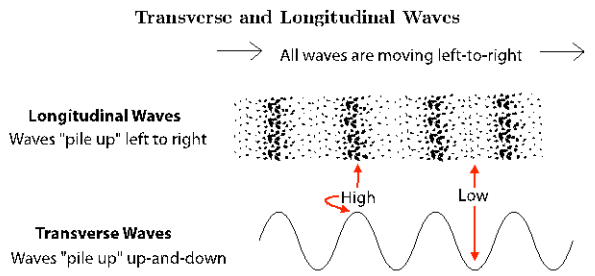
Are you ready? Then, let's go!

Physics of Music

- A fascinating chapter from the Schmidt-Jones text
- I borrowed some material from there (an advantage of OER)
- Lays a lot of groundwork for the “why” of music theory and music notation
- Doesn’t cover the details or the mathematics of this topic – just the general ideas:
  - *What is sound?*
  - *Longitudinal waves (a.k.a. compression waves) vs. transverse waves (a.k.a. sine waves)*
  - *Amplitude vs. frequency (just the idea of greater vs lesser amounts of these)*

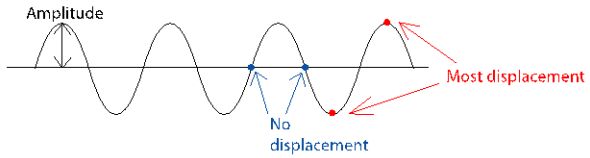
longitudinal wave bouncing back and forth between the two stationary ends of the slinky. Pretty cool, huh?

As cool as that is, it's very difficult to draw. That's why we usually show sound waves not as they are (longitudinal waves) but as the much easier to draw transverse wave. Here's how they connect. The longitudinal (or compression) wave shows where the air molecules (or other medium) is bunched together in areas of high pressure. It also shows where the air molecules are spread further apart (think of one of those Newton's cradles with the balls on a string, bouncing back and forth) in areas of low pressure. Moving over to the transverse wave, we can show the areas of high pressure with the graph on the high part. The areas of low pressure are represented with the wave on its low end. Take a look at this illustration to see what I mean:

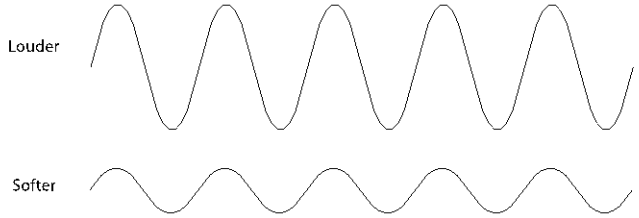


With the simple picture that transverse waves show us, we can break down the two main components of any sound: amplitude and frequency. Let's look at amplitude first. **Amplitude** refers to how powerful the wave is, or how much energy it contains. As musicians, we would call this how *loud* the sound is, or its dynamic level. The more energy, the louder the sound. Going back to the transverse wave, we can draw a line through the middle of the graph. This shows the air molecules at rest, as if there was no sound at all. If we measure from that mid-line

to the "top of the hill," we can find the wave's amplitude. The higher the hill, the higher the amplitude, the louder the sound. Take a look:



Here's another illustration comparing loud with soft:



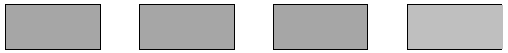
The other aspect of the sound wave to think about, beside the amplitude/loudness is frequency. The **frequency** refers to how frequently, or how often, we see the top of the wave pass by. The more quickly the waves pass by, the higher the frequency. The higher the frequency, the higher the pitch. Think of high pitch as being like a bird chirping or a flute or violin playing. A low pitch, which has low frequency, would be more like a fog horn blowing or a bass playing. Frequency is measured in Hertz (abbreviated as Hz), which counts how many times the top of a wave passes by every second. Humans can hear things as low as 20 Hz and as high as 17,000 Hz. That tuning note that you hear before an orchestra concert is what we call an "A" in music. It clocks in at 440 Hz. Here are a couple more illustrations to help. First,

Rhythm

- Pulse vs. rhythm
- The organization of pulse (just the most common)
  - *Duple (2 in a measure)*
  - *Triple (3 in a measure)*
  - *Quadruple (4 in a measure)*
- Measure lines
- Rhythmic symbols (again, just the most common ones) for both notes and rests: whole, half, quarter, eighth, and sixteenth

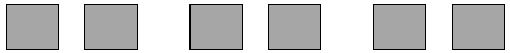
Either one without the other ruins the music. If all you have is the pulse, with no rhythm, it's very boring. Thump, thump, thump, going on and on. But if all you have is rhythm, with its longs and shorts, but with no pulse to give it structure, it would just sound like random noises. That'd just be annoying. You really need to have both rhythm and pulse to make music work.

Let's start applying pulse and rhythm directly to music. In order to represent pulse in written music, we need to organize it somehow. Just think of a long string of pulses going on and on. It'd be dizzying, or at least, somewhat hypnotic.

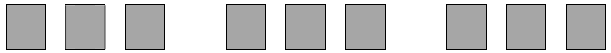


We need to organize all those pulses into smaller groups that we can think of more completely. There are many different ways of grouping pulses. For the purpose of this book (remember, very practical), let's focus on the three most common groupings that you find in the most popular music: duple, triple, and quadruple.

Duple:



Triple:



Quadruple:

Quadruple pulse (or beat) is the most common kind of pulse out there. Turn on any radio station, any streaming music service, and something like 90% of what you hear will be quadruple meter. As you might have guessed, **quadruple** pulse groups the beat into fours. This grouping of four beats finds its way into classical music, jazz, pop, country, hip-hop; the list goes on. Other common groupings include **triple** (groups of three) and **duple** (groups of two).

These groupings of pulses are called measures or bars. In written music, the end of a measure (or bar) is shown with a vertical line, like this:

Sometimes, you might see a pair of vertical lines, called a double bar, that looks like this:

A double bar shows the end of a section or "chunk" of music, much like the end of a chapter in a book. Another type of double bar shows the end of an entire piece of music, like the end of a book. It looks like this:

Let's take a really quick detour here. I said quick, so don't panic. We are starting to get into written music, also known as music notation. This idea of music notation has been around

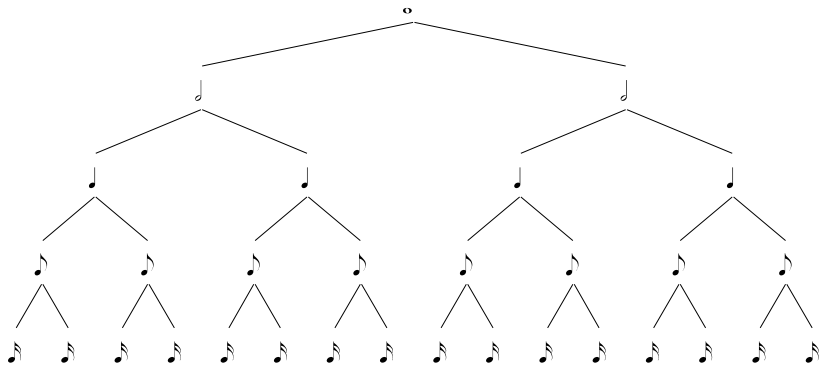
almost as long as written words. And like those written words, musical notation has taken many different shapes and forms around the world and through the millennia. What we're focusing on, in this book, is modern Western musical notation. That doesn't mean that all music must be written down. In fact, a lot of music is passed along orally, just by copying the person who is singing or playing it. It also doesn't mean that Western music notation is the best way or the only way to write down music, because it isn't. There are many ways. But remember, we're staying practical here. The goal of the course is to help you sing or play your favorite tune off the shelf of your local music store. That music uses Western music notation, like we're showing you in this book.

Let's get back to our big idea of the chapter: rhythm. Remember how we talked about two different aspects of that? Pulse and rhythm? We've been talking about pulse and how it can be grouped (usually in fours, threes, and twos, called quadruple, triple, and duple). But we also have rhythm that plays against those steady beats with long and short values, right? Those are represented with a series of different symbols that show different lengths. We can call them notes.

Each one of these notes are half the length of the one before it. There are many different note lengths, but we're going to focus on the five most common ones, the ones you'd see on that sheet music in the store. Those notes are as follows:

- Whole note 𝅝
- Half note 𝅗𝅥
- Quarter note ♩
- Eighth note ♪
- Sixteenth note 𝅘𝅥𝅯

See how they always split in pairs? Two notes combine to form the note above. And, each note splits in half to form the notes below. Take a look at this:



Let's look at each individual note type and its parts. This will help you to identify each type of note and how it looks different from the others. With practice, this will get to be easy for you. Come to think of it, that's how most of life works, right? You're always going to get the hang of it with enough practice!

We'll start with the whole note. It features a **note head**, which is common to all five of the note types that we're looking at in this book.

Now, let's look at the half note. In addition to the note head, it also adds a **stem**. This stem can either face up or down. More on the up/down thing later on, once we start talking about pitch and melody.

Rhythm

- Beaming
- Dots (lengthen a note)
- Time signatures (again, the most common)
  - *Simple: 2-4, 3-4, 4-4, 2-2, 3-2, 4-2*
  - *Compound: 6-8, 9-8, 12-8*
- Counting (i.e. “1 & 2 e & a”)
- Tuplets

Practice 3.3 – What's "dot," doc?

Name: _____

Practice writing each of the different note types. Write each one at least *five* times. Check with your instructor and see how you did!

1. Write out the eighth notes (𝅘𝅥𝅮) that are "inside" of this dotted quarter note (𝅗𝅥.).

𝅗𝅥. =

2. Write out the quarter notes (𝅘𝅥) that are "inside" of this dotted half note (𝅗𝅥.).

𝅗𝅥. =

3. Write out the half notes (𝅗𝅥) that are "inside" of this whole note (𝅝).

𝅝 =

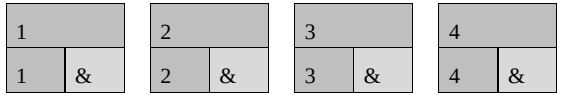
4. Write out the half notes (𝅗𝅥) that are "inside" of this dotted whole note (𝅝.).

𝅝 . =

5. Write out the sixteenth notes (𝅘𝅥𝅯) that are "inside" of this eighth note (𝅘𝅥𝅮).

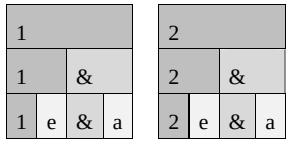
𝅘𝅥𝅮 =

Quadruple

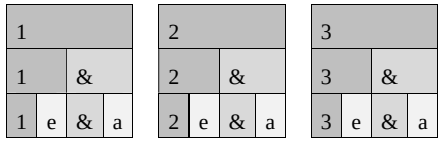


The next layer down is as far as we go. Each half can break into half, also. The bit before the “&” is called “e” and the bit that’s after the “&” is called “a.” At this level, duple meter can be counted as “1 e & a 2 e & a.” Triple meter counts as “1 e & a 2 e & a 3 e & a.” Finally, quadruple meter counts as “1 e & a 2 e & a 3 e & a 4 e & a.” Here’s another picture:

Duple



Triple



8. $\frac{2}{4}$ Circle one: Duple Triple Quadruple

Circle one: Quarter note pulse Half note pulse

9. $\mathbf{C}$ Circle one: Duple Triple Quadruple

Circle one: Quarter note pulse Half note pulse

10. $\frac{4}{2}$ Circle one: Duple Triple Quadruple

Circle one: Quarter note pulse Half note pulse

11. $\mathbf{\Cslash}$ Circle one: Duple Triple Quadruple

Circle one: Quarter note pulse Half note pulse

12. $\frac{3}{4}$ Circle one: Duple Triple Quadruple

Circle one: Quarter note pulse Half note pulse

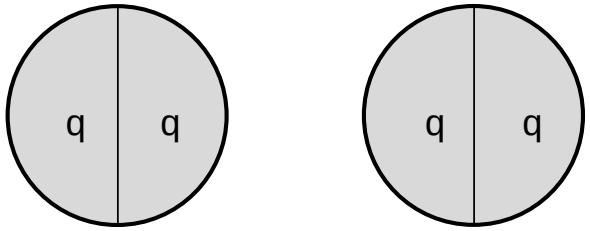
Part 2

Insert measure lines (bar lines) in the appropriate places.

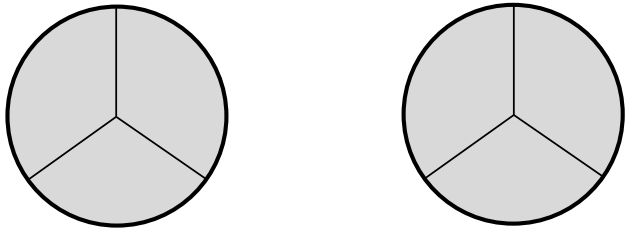
1. $\frac{4}{4}$ 

2. $\frac{2}{4}$ 

3. $\frac{2}{2}$ 



The difference with *compound* meters is that the beats split into *thirds*. Take a look, using our graphical circle example.



Let's put some notes on that to make it a little more musical. We'll talk about time signatures later.

Pitch

- Letter names
- Clefs: treble and bass (just the most common)
- References to the keyboard
- Ledger lines
- Accidentals (sharps, flats, naturals, and just a brief mention of double sharps and double flats)

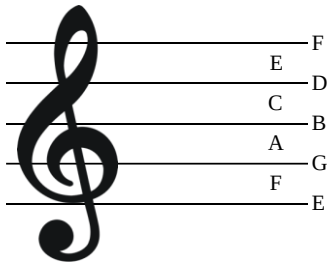
The staff is a collection of lines (in modern times, five) with spaces in between. Each line and space is assigned a different letter. That way, depending on the line or space on which we find the notes placed, we know how high or low it should be. There's one other piece that we add to every staff: a clef.

The clef, placed at the beginning of every staff, tells us which lines and spaces refer to which letter (pitch). There many different clefs. But honestly, you'll probably only run into two or three in most of the music that you'll see in the music store, choirs, and bands. To keep practicality in mind, we'll just focus on two of them: the treble clef and the bass clef.

The treble clef is the most commonly-used clef in music. If you were to do an internet search for "music," the treble clef is going to pop up a lot. It's the symbol that most people think of first when asked to come up with a musical figure. The treble clef looks like this:

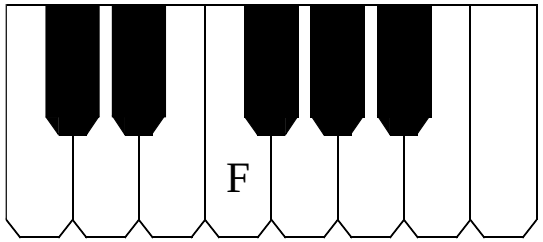
!

The treble clef is used for higher pitches, like for flutes, violins, soprano singers, and the like. When you see the treble clef, you know that the bottom line is an E. The next line up is a G, followed by B, D, and F. We label the bottom space as F, followed by A, C, and E. Here it is, all put together:

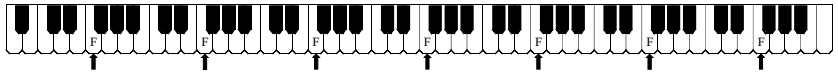


This is true for every pair of black keys across the entire keyboard. Take a look:

The other landmark is F. Find a group of three black keys. Just to the left of them, we have an F.

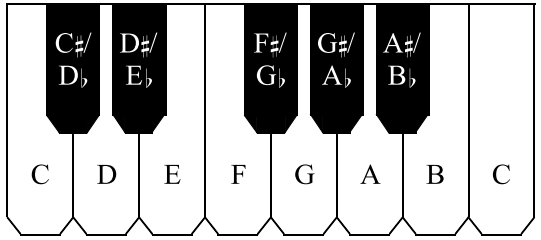


Again, this is true for every group of three black keys across the whole keyboard. Take a look:



Now, let's layer those two landmarks on top of each other to get this:

We'll lay it out on this keyboard below:



It really depends on your perspective. Is that black key higher than F? Or is it lower than G? That will give you the right name. Higher than F is F♯. Lower than G is G♭. Same note, different names, depending on your perspective.

In a sense, you've already done that. Informally, people will probably address you by your first name. In a more formal setting, you might be called by your last name. In those cases, the right name to be used will depend on your perspective, too. See what I mean?

Let's practice identifying some notes with accidentals. Relate them to the keyboard, too.

If you can raise or lower a note by a half step, there should be a way of undoing it, too – a "reset" button, so to speak. That's exactly what the **natural** sign does for us. It looks like this:

♮

Try writing some accidentals, for practice!

Intervals

- Basic numeric part of intervals
- Quality of intervals (counting half-steps)
- Inversions

Roadmap

- Symbols that redirect players on the page (saves paper)
  - *Repeats*
  - *Endings*
  - *DS and DC*
  - *Codas*
- Tempos (both fixed and varying)
- Dynamics (both fixed and varying)
- Style considerations

Future Considerations

- Additional practice sheets
- Audio examples
- Video examples
- Chapter on scales
- Chapter on chords

Questions?

- My contact information:

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