GreatHearts®

10th Grade

Music – Choir I: Intervals

March 23-27

Time Allotment: 20 minutes per day

Student Name: _____

Teacher Name: _____

Packet Overview

Date	Objective(s)	Page Number
Monday, March 23	1. Review scale construction – all major and minor forms. 2. Decode and define interval class.	3
Tuesday, March 24	1. Decode and define interval quality and diatonic intervals within the context of scale patterns.	6
Wednesday, March 25	1. Define interval quality in terms of half step sums. 2. Explain the origin and significance of perfect consonance	10
Thursday, March 26	1. Review interval class and quality 2. Practice identifying diatonic intervals by both their class and quality	16
Friday, March 27	1. Demonstrate understanding of intervals by taking a written assessment.	19

Additional Notes: In order to complete the tasks within the following packet, it would be helpful for students to have a piece of manuscript paper to write out scales and intervals on; I have included a blank sheet of manuscript paper to be printed off as needed, though in the event that this is not feasible students are free to use lined paper to hand draw a music staff.

I have also included answer keys to the exercises at the end of the packet. Parents, please facilitate the proper use of these answer documents (i.e. have students work through the exercises for each day before supplying the answers so that they can self-check for comprehension.)

For students that have access to a computer and/or the internet I will link online resources and exercises for further practice at www.musictheory.net Please note that this is not a required aspect of this packet and that these resources are purely supplemental.

I will be available to provide support via email, and I will be checking my inbox regularly. Please do not hesitate to reach out with questions or concerns during this time. For your reference my email is kevin.austin@greatheartsnorthernoaks.org

Academic Honesty

I certify that I completed this assignment independently in accordance with the GHNO Academy Honor Code.

Student signature:

_____

I certify that my student completed this assignment independently in accordance with the GHNO Academy Honor Code.

Parent signature:

_____

Monday, March 23

Music Theory Unit: Intervals
Lesson 1: Scale Review and Introduction to Intervals

Unit Overview: Scales, Intervals, and Pitch Relationships
As we have already seen, music relies on various foundational structures that govern how it unfolds. We usually call these foundational structures "elements" and they define independent features of music; e.g. melody, harmony, rhythm, dynamics, tempo, timbre, and form. For this unit we will be concerning ourselves with the foundations of melody, which is the linear dimension of music and its forward progression from one pitch to the next. We will seek to understand the various ways in which pitches can move to other pitches and to establish relationships between pitches.

Lesson 1 Socratic Questions: Keep these questions in mind as you study this lesson!
Why is it important to know how far apart pitches are? What are the ways in which we have already encountered different distances between pitches?

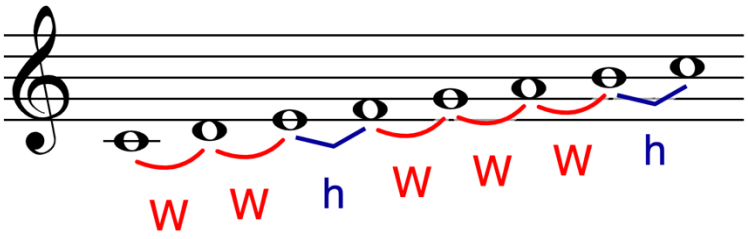
Objective: Be able to do this by the end of this lesson.
1. Review scale construction – all major and minor forms.
2. Decode and define interval class.

Introduction to Lesson 1: Scale Review
When we encounter melodies in music, it is most common for them to progress in a "stepwise" fashion; in other words, it is common for notes to progress on the staff from a line to a space, or a space to a line. We have already seen this in its most fundamental representation – scales!

First, let us recall that we have discussed both Major and Minor Scales.

A Major Scale *is an ordered series of pitches which follows the pattern WWhWWWh* (where "W" represents a whole step, and "h" represents a half step)

Here is an example of a major scale starting on C; we call this a "C Major" scale.

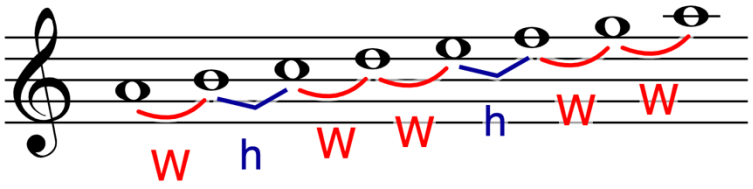


Further explanation on the major scale can be found here:
https://www.musictheory.net/lessons/21

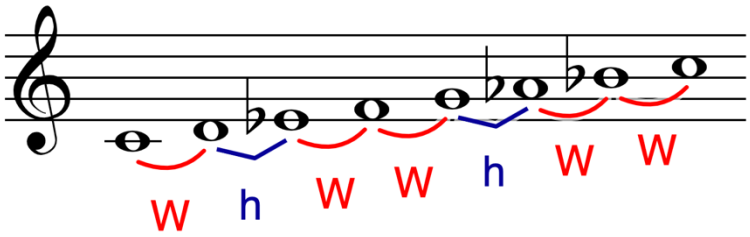
The Minor scale has three forms:

A Natural Minor Scale *is an ordered series of pitches which follows the pattern WhWWhWW; natural minor scales are related to major scales in that they can be achieved through a common key signature with a different starting pitch.*

Here is an example of an "a natural minor" scale; notice that it shares a key signature with C Major in that it has no sharps or flats.



Here is the same natural minor pattern but instead starting on the note C; notice the addition of accidentals (in this case, flats) in order to maintain the pattern.



1) The scale listed above is a c natural minor scale; how does it differ from the C Major scale?
   _____
   _____
   _____.

2) Which major scale is related to the c natural minor scale (i.e. which major scale has three flats in its key signature)? HINT: Use the circle of 5ths.
   _____.

A Harmonic Minor Scale *is a natural minor scale with a raised seventh scale degree which results in the following pattern WhWWh1½h.*

1) If we were to convert the c natural minor scale from above into a harmonic minor, what note would we change and how?
   _____.

A Melodic Minor Scale *is a natural minor scale with a raised sixth and seventh scale degree, which results in the following pattern WhWWWWh, however this is only in the scale's ascending form; in descent the melodic minor reverts to the natural minor pattern.*

1) If we were to convert the c natural minor scale from above into a melodic minor, what notes would we change and how?

   _____.

2) What would happen to those notes as the scale descends?

   _____.

Further explanation on minor scales can be found here: https://www.musictheory.net/lessons/22

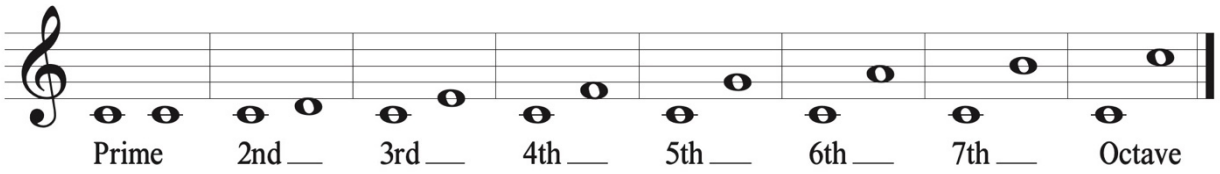
Lesson 1, Part 2: Intervals – "interval class"

While scales give us an understanding of how melodies might progress in stepwise patterns, that does not mean that melodies can only progress in this way. For this reason, it is helpful for us to consider the relationship between successive pitches beyond stepwise motion.

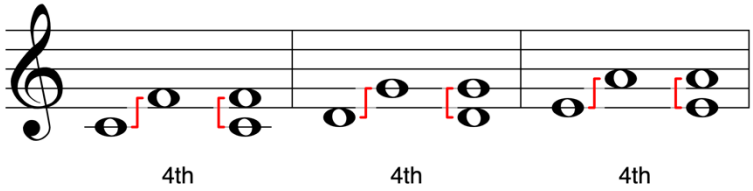
When we speak about the relationship between two successive pitches, we often use the term "interval."

An Interval *is the vertical distance from one pitch to the next.*

We can think of intervals as a twofold measurement. The first part of this measurement is what we call its "interval class." Interval class is not concerned with any accidentals attached to notes, instead it is the absolute distance as measured on the staff.



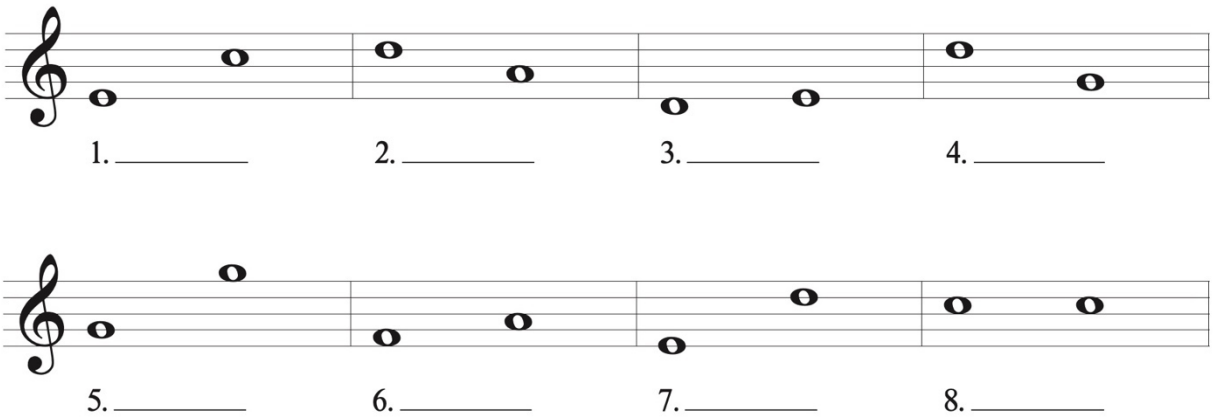
When we measure interval class, we always measure from the lowest note to the highest note, and we count the lines and spaces from the lowest note to the highest note including the notes themselves. For example: C–F, D–G, and E–A are all an interval class of a 4th because they occupy the same absolute distance on the staff.



Notice also that we have unique names for a "1st" and an "8th" which we call a "prime" and an "octave" respectively.

Further explanation on interval class can be found here: https://www.musictheory.net/lessons/30
*note: in this online resource they refer to interval class as "generic interval"

Closing: Check your understanding of the lesson by identifying interval class of the following intervals. Remember that we always measure from the lowest note to the highest note.



Tuesday, March 24

Music Theory Unit: Intervals
Lesson 2: Interval Class vs Interval Quality

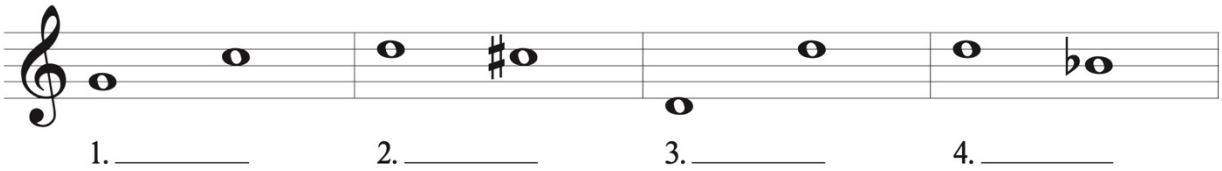
Lesson 2 Socratic Guiding Questions: Keep these questions in mind as you study!
Why might the absolute distance on the staff be an incomplete measurement of an interval? What does the staff omit that might also affect an interval's size?

Objective: Be able to do this by the end of this lesson.

1. Decode and define interval quality and diatonic intervals within the context of scale patterns.

Introduction to Lesson 2: interval class revisited
Yesterday we looked at how to approach pitch relationships that extend beyond stepwise motion. We defined an *interval* as the vertical distance between two consecutive pitches and we saw fit to measure the absolute distance between pitches using the staff. We called this absolute distance between pitches "interval class."

1) Identify the following interval classes. Remember that we measure the interval class from the lower note to the higher note by counting lines and spaces, and that accidentals have no effect on the absolute distance.

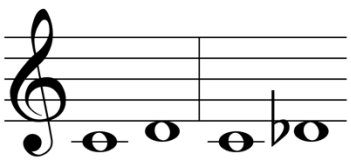


1. _____ 2. _____ 3. _____ 4. _____

2) Consider further your answer to #3 above. Yesterday we saw that there were two interval classes that had a unique name and one of them appears in problem #3. What is the other unique interval class? What is its absolute distance?

_____.

Part 2: Interval Quality
While interval class is a measurement of absolute distance on the staff, and thereby unaffected by accidentals, we should consider if there is an effect that those accidentals do have. Let's first compare the interval class of the following: C-D and C–Db



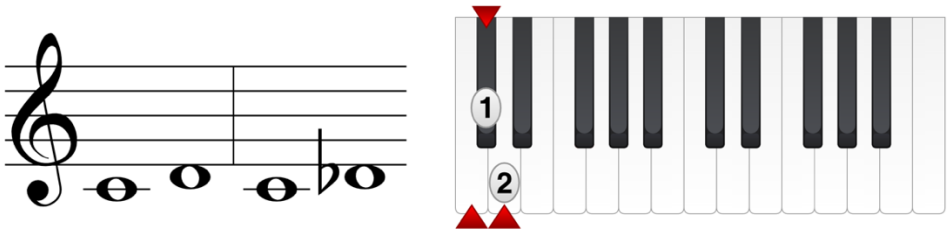
We would say that regardless of the accidental, both of these have an interval class of a 2nd because the lower note is on the first leger line below the staff and the higher note is on the space just above it.

But we have to ask: Are they actually the same or does the accidental change the measurement in some way? (Respond to this question on the lines provided before moving on).

_____
_____.

To answer the question of the effect of an accidental accurately, let's consider their distance on the keyboard.

- C–D is shown from the first white key to the next white key (with a black key in between)
- C–Db is shown from the first white key to the black key immediately next to it (i.e. there is no key in between)



From our understanding of scales, we would call the first interval (C–D) a whole step and the second interval (C-Db) a half step. This is significant because while these both have an interval class of a 2nd, and their absolute distance on the staff is the same, their specific distance shown on the keyboard is in fact different!

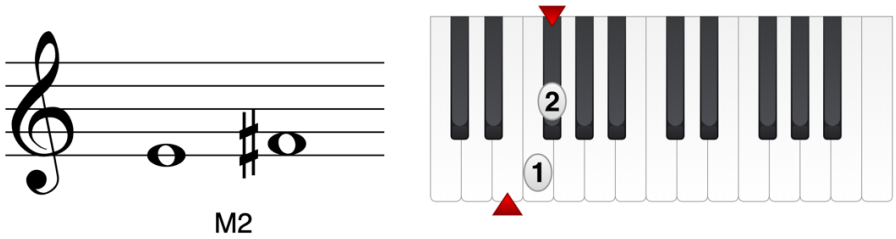
To express this difference, we are going to apply a second part to our interval measurement (if you recall, yesterday I said we could think of intervals as a twofold measurement). This second part is what we call "interval quality."

- C–D is a whole step, or two half steps
- C–Db is a half step

Even though both of these intervals have an interval class of a 2nd we can see that one is bigger, and one is smaller. To mark this difference in quality we will adopt musical terms (derived from Latin) that mean "bigger" and "smaller"; you've seen them before… Major and minor.

Since C–D, being two half steps, is the bigger of the two we call it a Major 2nd (abbreviated: M2). C–Db, being only one half step, is smaller so we call it a minor 2nd (abbreviated: m2)

Consider the distance between E–F#. What is its interval class and interval quality?

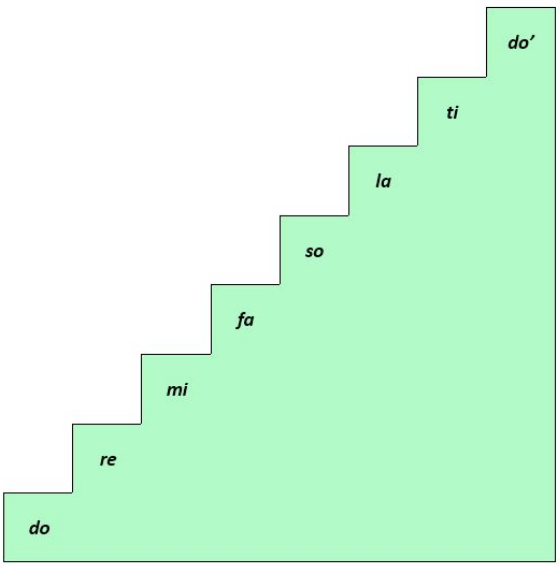


Because E–F is normally a half step distance, when we add the accidental to F, and make it F#, the interval becomes a half step larger. So, we would call it a Major 2nd.

*HINT: the difference between a Major and a minor interval of the same interval class is always a half step, which is the same factor by which an accidental raises or lowers a note.

Diatonic Intervals: the intervals within a major scale

Let's extend this concept across our major scale, and to do this we will consider the solfege pattern, which is a movable relationship that we have seen before: Do Re Mi Fa So La Ti Do'



On the tone ladder to the left, write in the whole steps and half steps in between each of the solfege syllables.

Then consider the absolute distance (interval class) and the specific distance (number of half steps) between the low Do and each of the syllables in turn. Write them on the lines that follow; the first is done for you.

Do – Re: 2nd; two half steps .
Do – Mi: _____
Do – Fa: _____
Do – So: _____
Do – La: _____
Do – Ti: _____
Do – Do': _____

Now consider each solfege syllable in relation to the high Do'. In other words what is the absolute distance (interval class) and the specific distance (number of half steps) between each of the solfege syllables and the high Do'? Again, write them on the lines that follow; the first is done for you.

Ti – Do': 2nd; one half step .
La – Do': _____
So – Do': _____
Fa – Do': _____
Mi – Do': _____
Re – Do': _____
Do – Do': _____

1) In comparing the two lists do you notice anything similar or different between them?

_____
_____
_____

2) Do all of the interval classes have a difference in interval quality or are there some that are the same between the lists?

_____
_____
_____

Closing: Check your understanding of the lesson by answering the following questions in complete sentences.

1) What is an interval class? Is interval class affected by the presence of accidentals?

2) What in an interval quality? Why is it necessary?

3) When considering diatonic intervals (i.e. the intervals that arise in the major scale) are there any interval qualities that don't appear to change? If so, do we notice anything interesting about these intervals? (BONUS: who discovered these intervals first?)

Wednesday, March 25

Music Theory Unit: Intervals
Lesson 3: Interval Quality as Composite of Half Steps/ Perfect Consonances

Lesson 3 Socratic Guiding Questions: Keep these questions in mind as you study!
Why is the relationship between interval class (absolute distance) and interval quality (specific distance? Are there any patterns that we can use to help identify intervals (both class and quality)?

Objective: Be able to do this by the end of this lesson.

1. Define interval quality in terms of half step sums.
2. Explain the origin and significance of perfect consonance

Introduction to Lesson 3: interval quality continued
Yesterday we saw that the absolute distance between two notes on the staff could result in the same *interval class*, while the specific distance – which considers the effect of accidentals – could be different resulting in a different *interval quality*. This phenomenon arose when we examined the intervals within the major scale as related to either the high Do' or the low Do. This resulted in a set of intervals which we called *diatonic intervals*, meaning that they are a product of a scale pattern which uses whole steps and half steps to span an octave.

Formally, the word is defined as follows:

Diatonic – *(of a scale, interval, etc.) involving only notes proper to the prevailing key without chromatic alteration.*
(of a melody or harmony) constructed from a diatonic scale.

This means that diatonic intervals are intervals that result from a given key signature with no added accidentals that are outside of that key.

If we consider the major scale as our diatonic pattern, and we compare intervals related to the tonic note (i.e. the most important note: Do/Do') we see the following relationships arise. Keep in mind that the following intervals are all ascending intervals – that is the first solfege syllable is lower than the second – and that we always measure intervals from the lower to the higher note. (HINT: it may be helpful to sing through these intervals as you compare them.)

Solfege	Class	# of ½ steps
Do – Do	Prime	0
Do – Re	2nd	2
Do – Mi	3rd	4
Do – Fa	4th	5
Do – So	5th	7
Do – La	6th	9
Do – Ti	7th	11
Do – Do'	Octave	12

Solfege	Class	# of ½ steps
Do' – Do'	Prime	0
Ti – Do'	2nd	1
La – Do'	3rd	3
So – Do'	4th	5
Fa – Do'	5th	7
Mi – Do'	6th	8
Re – Do'	7th	10
Do – Do'	Octave	12

1) When comparing the table above, which interval classes result in a difference in interval quality? Which ones don't?

We can see from the table above that diatonic intervals have in fact two main groups: those interval classes whose interval quality varies by a factor of a half step, and those where there is no variance. The former group (which includes 2nds, 3rds, 6ths, and 7ths) we saw yesterday when we examined the 2nd and saw that C – D was bigger than C – Db; we called the bigger interval a Major 2nd (M2) and the smaller interval we called a minor 2nd (m2).

There is then the latter group (prime, 4th, 5th, and octave) which did not show a variation in quality. How might we treat these intervals? Do you think that we still have a Major/minor distinction? Why or why not? (Respond to these questions before moving on.)

Think about how these intervals sound; try singing a prime, a 4th, a 5th, and an octave using solfege, or if you have access to a piano try playing them. You may also choose to access an online version here: https://www.onlinepianist.com/virtual-piano

1) What is unique about these intervals with regard to the way that the sound? How might we describe this quality of sound?

Before we consider these types of intervals, consider the manner in which they were understood within the context of music history…

The following passage is from Boetheus' *Five Books on Music.* Read and annotate the passage then answer the questions that follow in complete sentences.

CHAPTER THE TENTH

How Pythagoras Investigated the Proportions of Consonances

This, then, was the principle reason why Pythagoras abandoned the judgment of his ears in favor of the cogency of principles. He would not trust the hearing of any individual human natures since this varies according to external causes, including even the seasons themselves. Nor would he rely on instruments since these are variable and inconstant; strings, for example, are affected by the humidity or dryness of the air, and their pitches by the width or fineness of their gauge. And since something similar holds true in regard to all the other instruments, he deemed it ill-advised to put much trust in any of these.

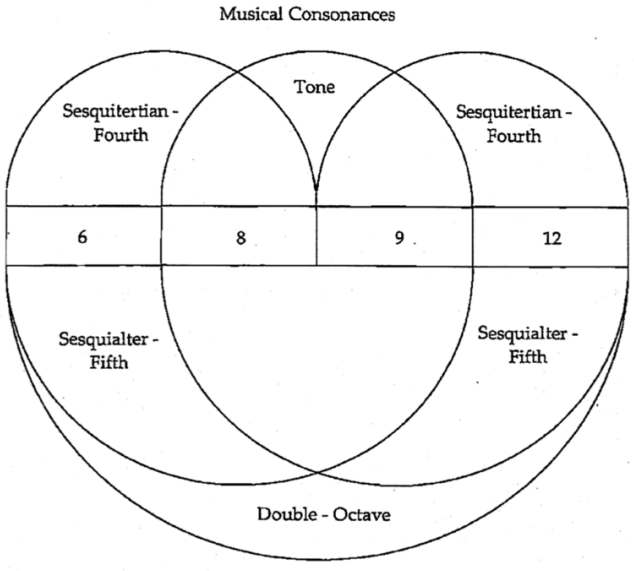
Being then for a time, in a state of some distress, he sought a way to discover with certainty and sureness the determining factors of consonances. Meanwhile, by a certain divine inspiration, while passing by the shops of the smiths, he heard the beats of the hammers somehow producing from diverse sounds one concord. Finding himself then suddenly so close to what he had been so long inquiring about, in amazement he approached the work. Attending for some time, he thought it was the force of the blows that produced the diversity of sounds. And in order to prove this more firmly, he ordered that they exchange hammers among themselves. But the property of the sounds did not depend upon the muscles of the men, but it followed upon the exchanged hammers. When therefore he noticed this, he examined the weight of the hammers. Now there were some five hammers. Among these, one was double the weight of another, and these two yielded the diapason consonance. In addition, that which was double of the first formed a sesquitertian with a third, and according to this ratio the diatessaton sounded. But of the two remaining, one which was heard to produce a diapente consonance with the other, was found to stand to it in a sesquialter ratio. But these two, to which the previous double was proved to be a sesquialter and a sesquitertian, were discovered to have a sesquioctave ratio to each other. But the fifth, which was in-consonant to all, was rejected.

1) What was Pythagoras searching for? Why do you suppose he didn't trust in the hearing of individual human natures?

2) What role does wonder play in Pythagoras' discovery? How does he respond to this moment of wonder?

3) At the end of the passage we read, "But the fifth, which was in-consonant to all, was rejected." Why do you suppose Pythagoras rejects this hammer?

Pythagoras defines the interval relationship between the pitches produced by the hammers in the following way:



The whole numbers render the ratio relationship 6:8:9:12. Pythagoras discovers the 6:12 (or simplified 1:2) ratio first which he calls the *diapason*. This is the equivalent to our "octave." He then defines the 6:9 (or 2:3) as the *sesquialter*, which is our "5th"; as well as the 6:8 (or 3:4) as the *sesquitertian*, which is our "4th".

These are the same intervals that earlier we saw had no variation in their interval quality (e.g. Do – Fa is the same specific distance as So – Do'). For Pythagoras, these intervals were the most important because they were built on the ratio between the first numbers (6:8:9:12 can be expressed alternately as 1:2:3:4) and he called these the musical consonances.

In modern music theory we retain this principle and we call this group of intervals Perfect Consonances; by extension, the interval classes of prime, 4th, 5th, and octave have an interval quality that we define as "perfect."

Closing: Check your understanding of the lesson by answering the following questions in complete sentences.

1) What is a diatonic interval?

2) What is the fundamental difference between the two groups of diatonic intervals?

3) Why do we call certain diatonic intervals "perfect?" Which interval classes have a perfect quality?

Thursday, March 26

Music Theory Unit: Intervals
Lesson 4: Review of Interval Class and Interval Quality

Lesson 4 Socratic Guiding Questions: Keep these questions in mind as you study!
Why is the relationship between interval class (absolute distance) and interval quality (specific distance? Are there any patterns that we can use to help identify intervals (both class and quality)?

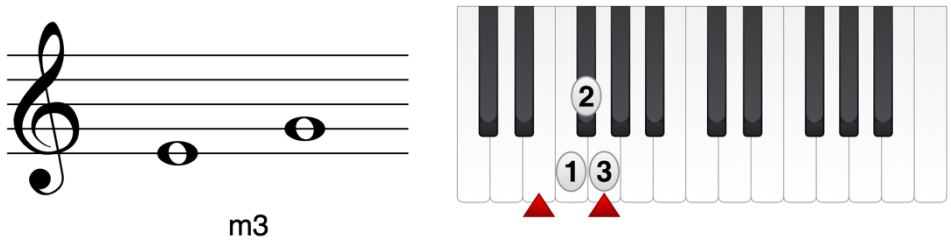
Objective: Be able to do this by the end of this lesson.

1. Review interval class and quality
2. Practice identifying diatonic intervals by both their class and quality

Introduction to Lesson 4: Interval Identification

As we have seen, there are differences between and interval's class (its absolute distance on the staff) and an interval's quality (its specific distance measured in half steps). Some interval classes (2nd, 3rd, 6th, and 7th) have variations in their quality, in that one type is bigger than the other, and we identify this variation with the terms "Major" and "minor." Other interval classes (prime, 4th, 5th, and octave) have no variation in their quality, and we identify these as "perfect."

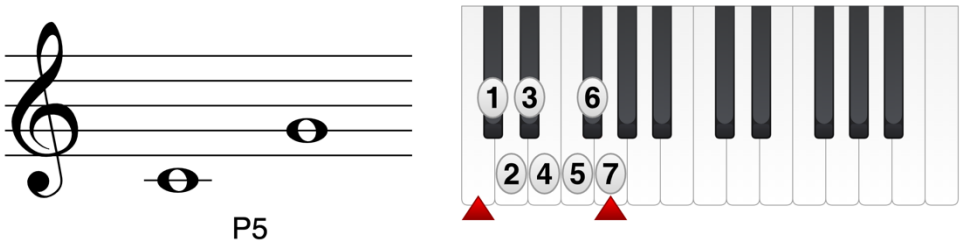
We can then apply this understanding to intervals that we see in context. Consider the interval: E – G.



m3

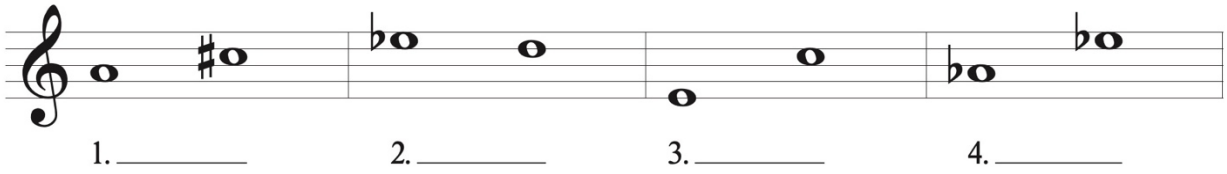
On the staff we can see that the absolute distance is a 3rd, which is its interval class. When we measure its specific distance on the keyboard, we see that it is only 3 half steps, which is the smaller of the two possibilities for 3rds. Accordingly, we identify the interval from E – G as a "minor 3rd."

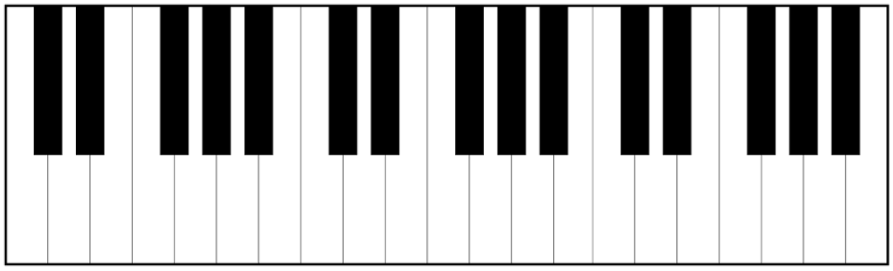
Alternately, when we identify the interval from C – G, we see that it is a 5th and its specific distance is 7 half steps, so we label it a "Perfect 5th."



P5

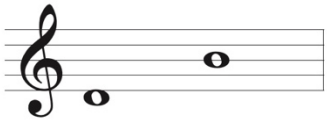
Practice identifying the following intervals with both an interval class and an interval quality. Remember that we always measure from the lowest note to the highest note. Use the keyboard provided when determining the specific distance (interval quality).





Using Diatonic Keys to ID Intervals

Remember that we also observed intervals as products of the diatonic scale. This means that we can use our understanding of solfege relationships and key signatures to help us identify intervals as well. Let's observe this process with the interval from D – B. For your reference I have included a circle of fifths in the back of the packet.



First, we should see that the absolute distance between D and B results in an interval class of a 6th. From here we have two options either Major or minor.

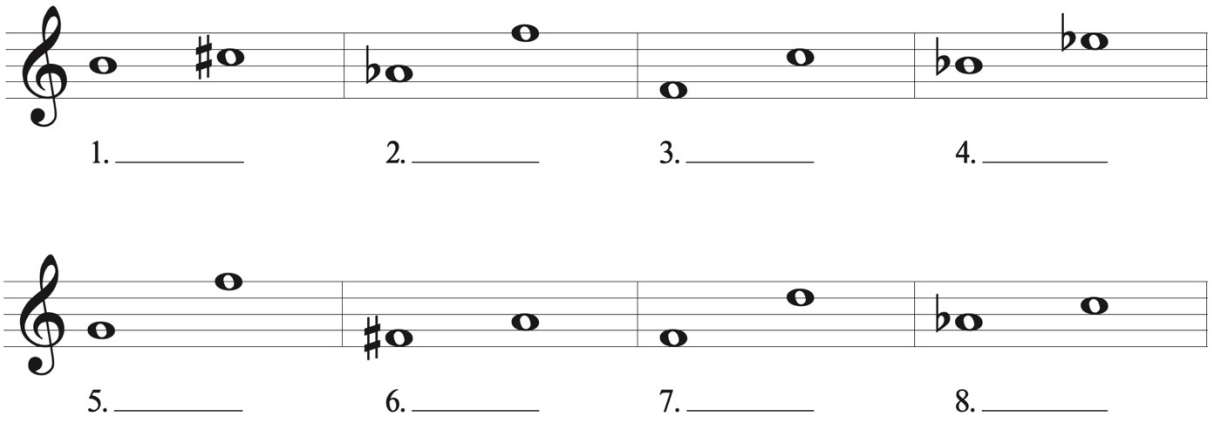
- If the interval is Major, it should fit the pattern Do – La
  (where D = Do, and B = La)
- If the interval is minor, it should fit the pattern Mi – Do'
  (where D = Mi, and B = Do')

This means that we can temporarily treat the interval as if it belonged to one of two diatonic keys; either D Major or B Major.

The circle of fifths tells us that in D Major we have two sharps (because D is clockwise two positions from C) and those sharps are F# and C# according to the order of sharps. This means that all of the other notes in that key are natural. Therefore, D and B are both present in the key so we can say it does fit Do – La, thus it is a Major 6th.

Alternately, treating B as Do', the key of B has five sharps; the fourth of which is D#. This means that D natural is not in the key of B Major and so the interval does not fit the minor pattern Mi – Do'.

Closing: Check your understanding of the lesson by identifying the following intervals (both their interval class and interval quality)



Extra practice with interval identification can be found here:
https://www.musictheory.net/exercises/interval

Friday, March 27

Music Theory Unit: Intervals
Quiz: Diatonic Intervals

Objective: Be able to do this by the end of this lesson.

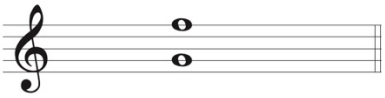
1. Demonstrate understanding of intervals by taking a written assessment.

Quiz: Diatonic Intervals

To assess your understanding of this week's lessons you will complete the following quiz on diatonic intervals. Please allot yourself 20 minutes to take the quiz. You may use the theory reference sheet (which includes a piano keyboard and the circle of fifths) during the quiz for your reference.

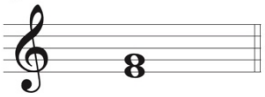
Quiz: Diatonic Intervals

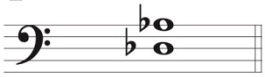
Name these intervals. Give both the interval class (e.g. 2nd, 3rd, etc.) and the interval quality (e.g. Major, minor, or perfect).

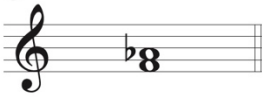
Example 

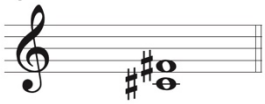
m7

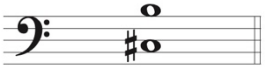
---

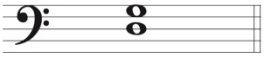
1 

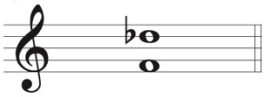
2 

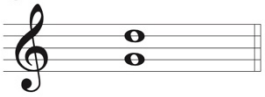
3 

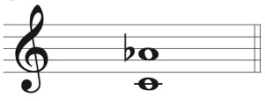
4 

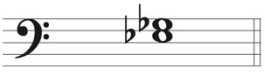
5 

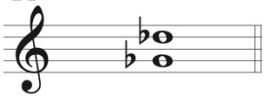
6 

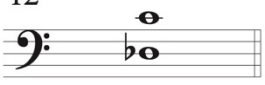
7 

8 

9 

10 

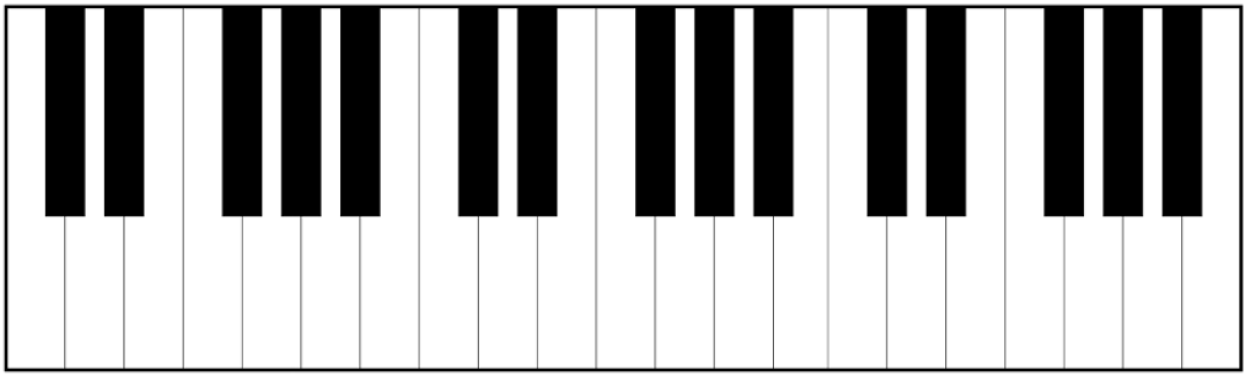
11 

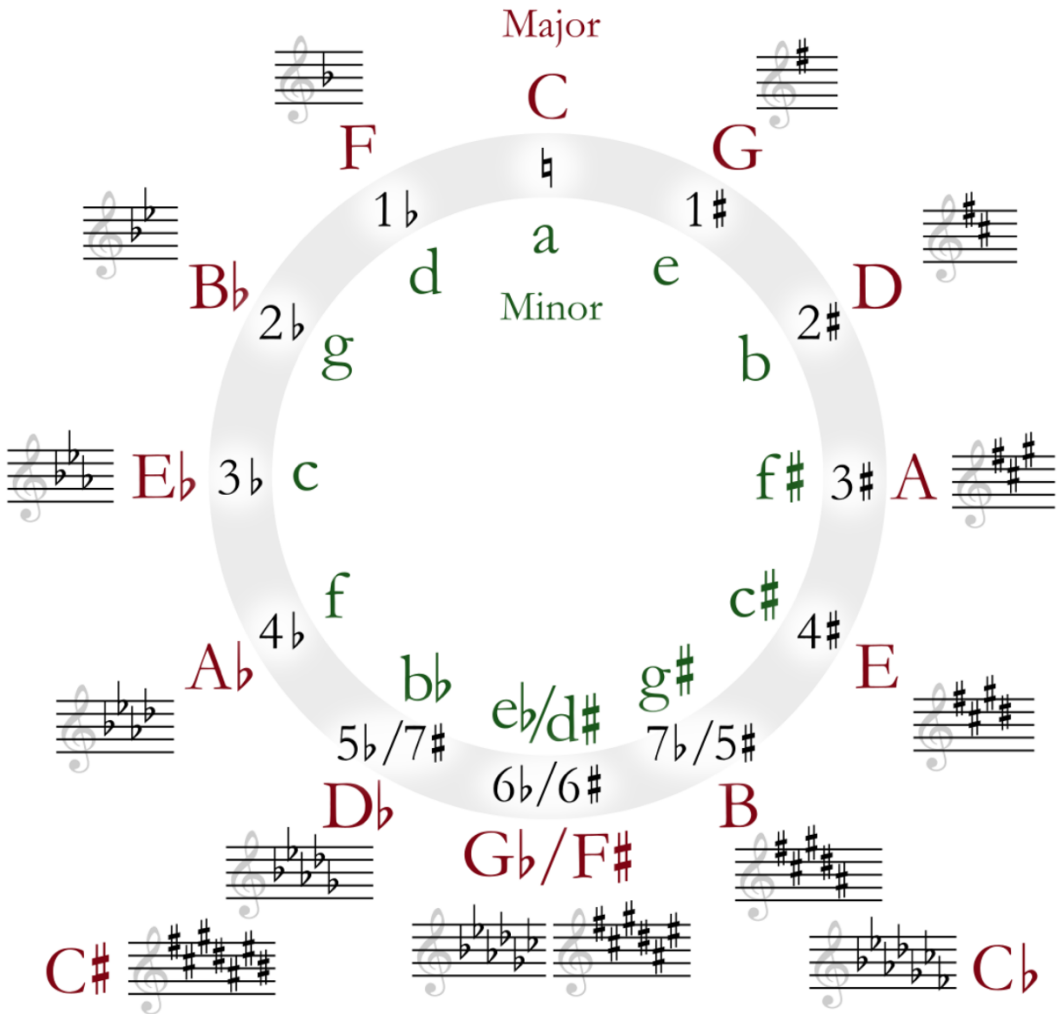
12 

13) What is a "perfect" consonance? How does Pythagoras' study of them demonstrate their perfection?

Music Theory Reference Sheet

This sheet may be used as a study aid during the week's lessons, as well as a theory reference during the quiz on Friday.





GreatHearts®

10th Grade

Music – Choir I: Intervals

March 23-27

Time Allotment: 20 minutes per day

Student Name: Answer Key

Teacher Name: _____

Music – Choir I: Intervals
March 23-27

GreatHearts®

Monday, March 23

Music Theory Unit: Intervals
Lesson 1: Scale Review and Introduction to Intervals

Unit Overview: Scales, Intervals, and Pitch Relationships
As we have already seen, music relies on various foundational structures that govern how it unfolds. We usually call these foundational structures "elements" and they define independent features of music; e.g. melody, harmony, rhythm, dynamics, tempo, timbre, and form. For this unit we will be concerning ourselves with the foundations of melody, which is the linear dimension of music and its forward progression from one pitch to the next. We will seek to understand the various ways in which pitches can move to other pitches and to establish relationships between pitches.

Lesson 1 Socratic Questions: Keep these questions in mind as you study this lesson!
Why is it important to know how far apart pitches are? What are the ways in which we have already encountered different distances between pitches?

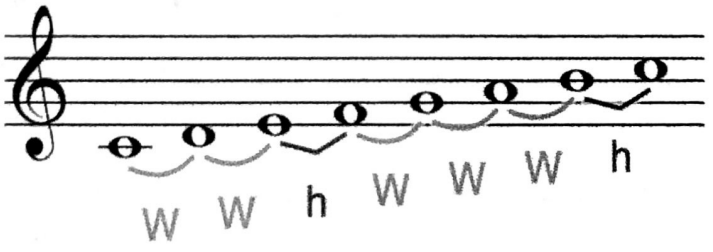
Objective: Be able to do this by the end of this lesson.
1. Review scale construction – all major and minor forms.
2. Decode and define interval class.

Introduction to Lesson 1: Scale Review
When we encounter melodies in music, it is most common for them to progress in a "stepwise" fashion; in other words, it is common for notes to progress on the staff from a line to a space, or a space to a line. We have already seen this in its most fundamental representation – scales!

First, let us recall that we have discussed both Major and Minor Scales.

A Major Scale *is an ordered series of pitches which follows the pattern WWhWWWh* (where "W" represents a whole step, and "h" represents a half step)

Here is an example of a major scale starting on C; we call this a "C Major" scale.



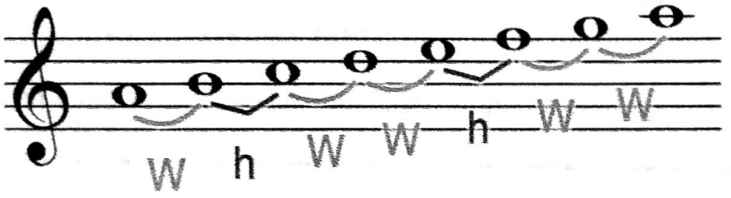
Further explanation on the major scale can be found here:
https://www.musictheory.net/lessons/21

GreatHearts

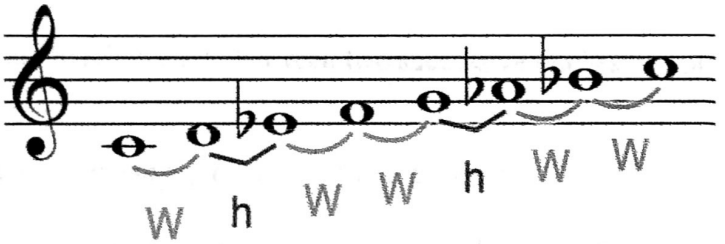
The Minor scale has three forms:

A Natural Minor Scale *is an ordered series of pitches which follows the pattern WhWWhWW; natural minor scales are related to major scales in that they can be achieved through a common key signature with a different starting pitch.*

Here is an example of an "a natural minor" scale; notice that it shares a key signature with C Major in that it has no sharps or flats.



Here is the same natural minor pattern but instead starting on the note C; notice the addition of accidentals (in this case, flats) in order to maintain the pattern.



1) The scale listed above is a c natural minor scale; how does it differ from the C Major scale?
The C Major scale has no accidentals; the c minor scale has 3 flats: B♭, E♭, and A♭.

2) Which major scale is related to the c natural minor scale (i.e. which major scale has three flats in its key signature)? HINT: Use the circle of 5ths.
c natural minor → E♭ Major.

A Harmonic Minor Scale *is a natural minor scale with a raised seventh scale degree which results in the following pattern WhWWh1½h.*

1) If we were to convert the c natural minor scale from above into a harmonic minor, what note would we change and how?
We would raise the 7th scale degree: B♭ → B♮.

GreatHearts®

A Melodic Minor Scale *is a natural minor scale with a raised sixth and seventh scale degree, which results in the following pattern WhWWWWh, however this is only in the scale's ascending form; in descent the melodic minor reverts to the natural minor pattern.*

1) If we were to convert the c natural minor scale from above into a melodic minor, what notes would we change and how?
We would raise the 6th and 7th scale degrees; B♭→B♮ A♭→A♮

2) What would happen to those notes as the scale descends?
They would become flat again. The scale becomes natural minor in descent.

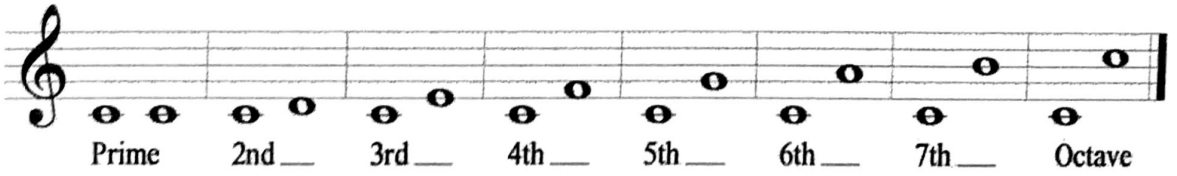
Further explanation on minor scales can be found here: https://www.musictheory.net/lessons/22

Lesson 1, Part 2: Intervals – "interval class"
While scales give us an understanding of how melodies might progress in stepwise patterns, that does not mean that melodies can only progress in this way. For this reason, it is helpful for us to consider the relationship between successive pitches beyond stepwise motion.

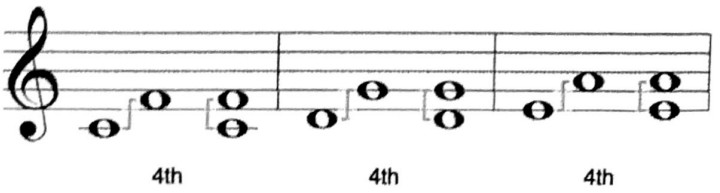
When we speak about the relationship between two successive pitches, we often use the term "interval."

An Interval *is the vertical distance from one pitch to the next.*

We can think of intervals as a twofold measurement. The first part of this measurement is what we call its "interval class." Interval class is not concerned with any accidentals attached to notes, instead it is the absolute distance as measured on the staff.



When we measure interval class, we always measure from the lowest note to the highest note, and we count the lines and spaces from the lowest note to the highest note including the notes themselves. For example: C–F, D–G, and E–A are all an interval class of a 4th because they occupy the same absolute distance on the staff.

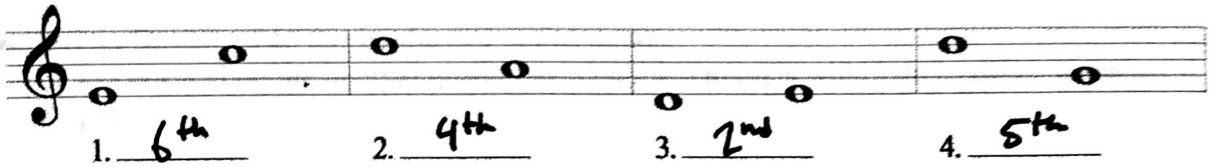


Notice also that we have unique names for a "1st" and an "8th" which we call a "prime" and an "octave" respectively.

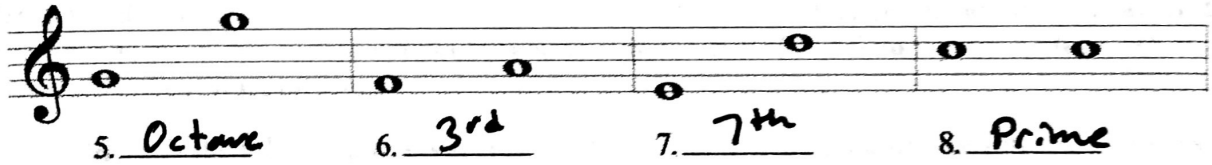
GreatHearts®

Further explanation on interval class can be found here: https://www.musictheory.net/lessons/30
*note: in this online resource they refer to interval class as "generic interval"

Closing: Check your understanding of the lesson by identifying interval class of the following intervals. Remember that we always measure from the lowest note to the highest note.



1. 6th
2. 4th
3. 2nd
4. 5th



5. Octave
6. 3rd
7. 7th
8. Prime

GreatHearts®

Tuesday, March 24

Music Theory Unit: Intervals
Lesson 2: Interval Class vs Interval Quality

Lesson 2 Socratic Guiding Questions: Keep these questions in mind as you study!
Why might the absolute distance on the staff be an incomplete measurement of an interval? What does the staff omit that might also affect an interval's size?

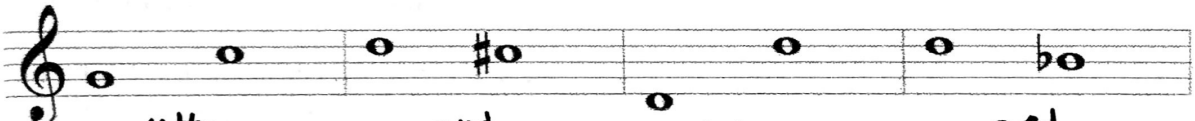
Objective: Be able to do this by the end of this lesson.

1. Decode and define interval quality and diatonic intervals within the context of scale patterns.

Introduction to Lesson 2: interval class revisited

Yesterday we looked at how to approach pitch relationships that extend beyond stepwise motion. We defined an *interval* as the vertical distance between two consecutive pitches and we saw fit to measure the absolute distance between pitches using the staff. We called this absolute distance between pitches "interval class."

1) Identify the following interval classes. Remember that we measure the interval class from the lower note to the higher note by counting lines and spaces, and that <u>accidentals have no effect</u> on the absolute distance.



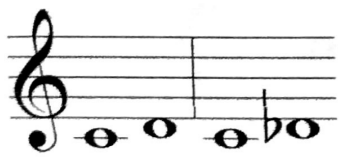
1. 4th 2. 2nd 3. Octave 4. 3rd

2) Consider further your answer to #3 above. Yesterday we saw that there were two interval classes that had a unique name and one of them appears in problem #3. What is the other unique interval class? What is its absolute distance?

Prime = 1st or no change in note.

Part 2: Interval Quality

While interval class is a measurement of absolute distance on the staff, and thereby unaffected by accidentals, we should consider if there is an effect that those accidentals do have. Let's first compare the interval class of the following: C-D and C–Db



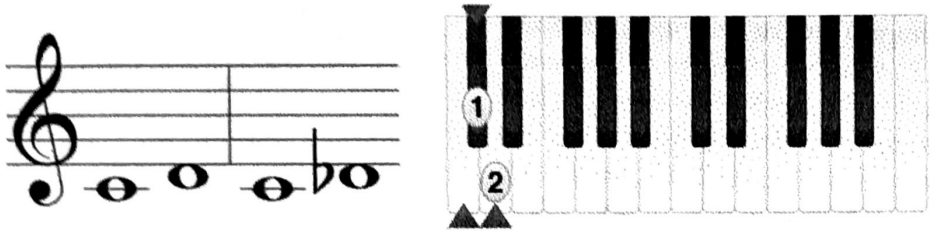
We would say that regardless of the accidental, both of these have an interval class of a 2nd because the lower note is on the first leger line below the staff and the higher note is on the space just above it.

But we have to ask: Are they actually the same or does the accidental change the measurement in some way? (Respond to this question on the lines provided before moving on).

A flat moves the note down a half step so they are different in terms of their half step measurement.

To answer the question of the effect of an accidental accurately, let's consider their distance on the keyboard.

- C–D is shown from the first white key to the next white key (with a black key in between)
- C–Db is shown from the first white key to the black key immediately next to it (i.e. there is no key in between)



From our understanding of scales, we would call the first interval (C–D) a whole step and the second interval (C-Db) a half step. This is significant because while these both have an interval class of a 2nd, and their absolute distance on the staff is the same, their specific distance shown on the keyboard is in fact different!

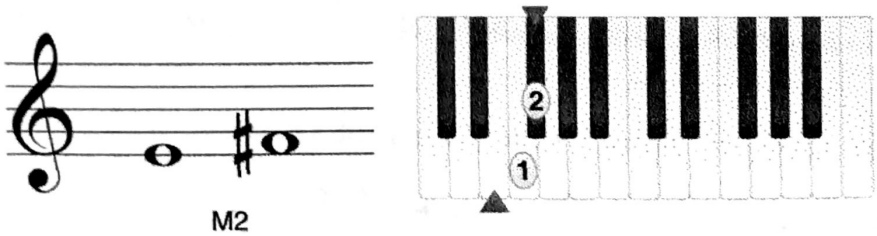
To express this difference, we are going to apply a second part to our interval measurement (if you recall, yesterday I said we could think of intervals as a twofold measurement). This second part is what we call "interval quality."

- C–D is a whole step, or two half steps
- C–Db is a half step

Even though both of these intervals have an interval class of a 2nd we can see that one is bigger, and one is smaller. To mark this difference in quality we will adopt musical terms (derived from Latin) that mean "bigger" and "smaller"; you've seen them before… Major and minor.

Since C–D, being two half steps, is the bigger of the two we call it a Major 2nd (abbreviated: M2). C–Db, being only one half step, is smaller so we call it a minor 2nd (abbreviated: m2)

Consider the distance between E–F#. What is its interval class and interval quality?



M2

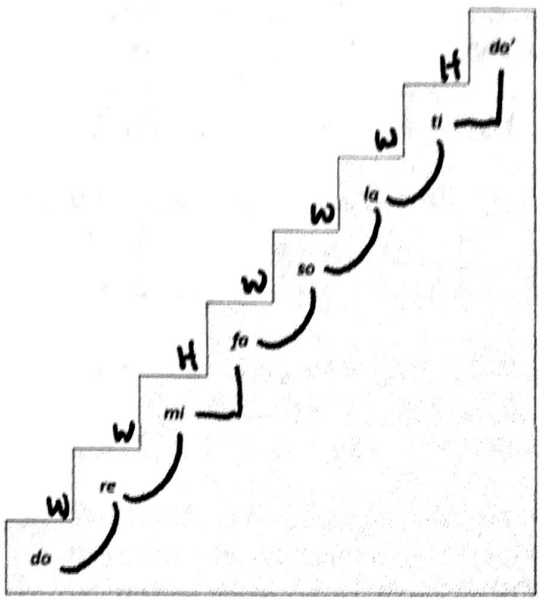
Because E–F is normally a half step distance, when we add the accidental to F, and make it F#, the interval becomes a half step larger. So, we would call it a Major 2nd.

*HINT: the difference between a Major and a minor interval of the same interval class is always a half step, which is the same factor by which an accidental raises or lowers a note.

GreatHearts

Diatonic Intervals: the intervals within a major scale

Let's extend this concept across our major scale, and to do this we will consider the solfege pattern, which is a movable relationship that we have seen before: Do Re Mi Fa So La Ti Do'



On the tone ladder to the left, write in the whole steps and half steps in between each of the solfege syllables.

Then consider the absolute distance (interval class) and the specific distance (number of half steps) between the low Do and each of the syllables in turn. Write them on the lines that follow; the first is done for you.

Do – Re: 2nd; two half steps
Do – Mi: 3rd; 4 half steps
Do – Fa: 4th; 5 half steps
Do – So: 5th; 7 half steps
Do – La: 6th; 9 half steps
Do – Ti: 7th; 11 half steps
Do – Do': Oct.; 12 half steps

Now consider each solfege syllable in relation to the high Do'. In other words what is the absolute distance (interval class) and the specific distance (number of half steps) between each of the solfege syllables and the high Do'? Again, write them on the lines that follow; the first is done for you.

Ti – Do': 2nd; one half step
La – Do': 3rd; 3 half steps
So – Do': 4th; 5 half steps
Fa – Do': 5th; 7 half steps
Mi – Do': 6th; 8 half steps
Re – Do': 7th; 10 half steps
Do – Do': Oct.; 12 half steps.

1) In comparing the two lists do you notice anything similar or different between them?
2nds, 3rds, 6ths, and 7ths have different sizes.
4ths, 5ths, and Octaves have the same sizes.

2) Do all of the interval classes have a difference in interval quality or are there some that are the same between the lists?
2nd, 3rd, 6th, and 7th have Major / minor variations
4th, 5th, and Octave do not, because they are the same number of half steps.

GreatHearts

Closing: Check your understanding of the lesson by answering the following questions in complete sentences.

1) What is an interval class? Is interval class affected by the presence of accidentals?

Interval class is the absolute distance between pitches as represented by an ordinal number (e.g. 2nd, 3rd, etc.)
Interval class is not affected by accidentals.

2) What in an interval quality? Why is it necessary?

Interval quality is the specific distance between pitches as measured by half steps.

It is important because some interval classes have a variation in half step measurements. This difference is represented by the terms Major or minor.

3) When considering diatonic intervals (i.e. the intervals that arise in the major scale) are there any interval qualities that don't appear to change? If so, do we notice anything interesting about these intervals? (BONUS: who discovered these intervals first?)

Prime, 4th, 5th, and Octave interval classes do not appear to change.

This is interesting because these intervals are organizing intervals. e.g. Octaves are how we define the start and end of (diatonic) scales. 5ths are used to generate the circle of 5ths

Bonus: Pythagoras!

Wednesday, March 25

Music Theory Unit: Intervals
Lesson 3: Interval Quality as Composite of Half Steps/ Perfect Consonances

Lesson 3 Socratic Guiding Questions: Keep these questions in mind as you study!
Why is the relationship between interval class (absolute distance) and interval quality (specific distance? Are there any patterns that we can use to help identify intervals (both class and quality)?

Objective: Be able to do this by the end of this lesson.

1. Define interval quality in terms of half step sums.
2. Explain the origin and significance of perfect consonance

Introduction to Lesson 3: interval quality continued
Yesterday we saw that the absolute distance between two notes on the staff could result in the same *interval class*, while the specific distance – which considers the effect of accidentals – could be different resulting in a different *interval quality*. This phenomenon arose when we examined the intervals within the major scale as related to either the high Do' or the low Do. This resulted in a set of intervals which we called *diatonic intervals*, meaning that they are a product of a scale pattern which uses whole steps and half steps to span an octave.

Formally, the word is defined as follows:

Diatonic – *(of a scale, interval, etc.) involving only notes proper to the prevailing key without chromatic alteration.*
(of a melody or harmony) constructed from a diatonic scale.

This means that diatonic intervals are intervals that result from a given key signature with no added accidentals that are outside of that key.

If we consider the major scale as our diatonic pattern, and we compare intervals related to the tonic note (i.e. the most important note: Do/Do') we see the following relationships arise. Keep in mind that the following intervals are all ascending intervals – that is the first solfege syllable is lower than the second – and that we always measure intervals from the lower to the higher note. (HINT: it may be helpful to sing through these intervals as you compare them.)

Solfege	Class	# of ½ steps
Do – Do	Prime	0
Do – Re	2nd	2
Do – Mi	3rd	4
Do – Fa	4th	5
Do – So	5th	7
Do – La	6th	9
Do – Ti	7th	11
Do – Do'	Octave	12

Solfege	Class	# of ½ steps
Do' – Do'	Prime	0
Ti – Do'	2nd	1
La – Do'	3rd	3
So – Do'	4th	5
Fa – Do'	5th	7
Mi – Do'	6th	8
Re – Do'	7th	10
Do – Do'	Octave	12

GreatHearts

1) When comparing the table above, which interval classes result in a difference in interval quality? Which ones don't?

2nd, 3rd, 6th, and 7th result in different qualities

Prime, 4th, 5th, and Octave are not different

We can see from the table above that diatonic intervals have in fact two main groups: those interval classes whose interval quality varies by a factor of a half step, and those where there is no variance. The former group (which includes 2nds, 3rds, 6ths, and 7ths) we saw yesterday when we examined the 2nd and saw that C – D was bigger than C – Db; we called the bigger interval a Major 2nd (M2) and the smaller interval we called a minor 2nd (m2).

There is then the latter group (prime, 4th, 5th, and octave) which did not show a variation in quality. How might we treat these intervals? Do you think that we still have a Major/minor distinction? Why or why not? (Respond to these questions before moving on.)

They could still be said to have a quality - just one that doesn't change.

They are not going to have a Major/minor distinction, because we don't observe that variation.

Think about how these intervals sound; try singing a prime, a 4th, a 5th, and an octave using solfege, or if you have access to a piano try playing them. You may also choose to access an online version here: https://www.onlinepianist.com/virtual-piano

1) What is unique about these intervals with regard to the way that the sound? How might we describe this quality of sound?

These intervals either sound very similar or very pleasing to the ear.

We might say they sound stable, pure, or pleasant.

Before we consider these types of intervals, consider the manner in which they were understood within the context of music history…

Music – Choir I: Intervals
March 23-27

GreatHearts®

The following passage is from Boetheus' *Five Books on Music.* Read and annotate the passage then answer the questions that follow in complete sentences.

CHAPTER THE TENTH

How Pythagoras Investigated the Proportions of Consonances

This, then, was the principle reason why Pythagoras abandoned the judgment of his ears in favor of the cogency of principles. He would not trust the hearing of any individual human natures since this varies according to external causes, including even the seasons themselves. Nor would he rely on instruments since these are variable and inconstant; strings, for example, are affected by the humidity or dryness of the air, and their pitches by the width or fineness of their gauge. And since something similar holds true in regard to all the other instruments, he deemed it ill-advised to put much trust in any of these.

Being then for a time, in a state of some distress, he sought a way to discover with certainty and sureness the determining factors of consonances. Meanwhile, by a certain divine inspiration, while passing by the shops of the smiths, he heard the beats of the hammers somehow producing from diverse sounds one concord. Finding himself then suddenly so close to what he had been so long inquiring about, in amazement he approached the work. Attending for some time, he thought it was the force of the blows that produced the diversity of sounds. And in order to prove this more firmly, he ordered that they exchange hammers among themselves. But the property of the sounds did not depend upon the muscles of the men, but it followed upon the exchanged hammers. When therefore he noticed this, he examined the weight of the hammers. Now there were some five hammers. Among these, one was double the weight of another, and these two yielded the diapason consonance. In addition, that which was double of the first formed a sesquitertian with a third, and according to this ratio the diatessaton sounded. But of the two remaining, one which was heard to produce a diapente consonance with the other, was found to stand to it in a sesquialter ratio. But these two, to which the previous double was proved to be a sesquialter and a sesquitertian, were discovered to have a sesquioctave ratio to each other. But the fifth, which was in-consonant to all, was rejected.

1) What was Pythagoras searching for? Why do you suppose he didn't trust in the hearing of individual human natures?

(Answers will vary)

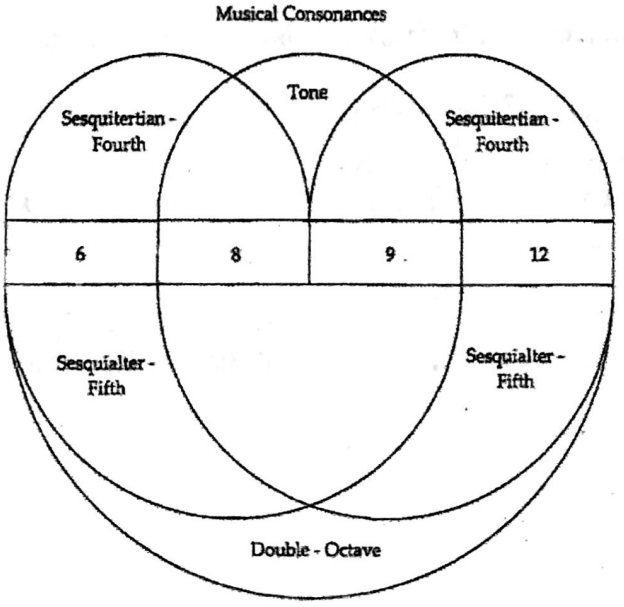
2) What role does wonder play in Pythagoras' discovery? How does he respond to this moment of wonder?

(Answers will vary)

3) At the end of the passage we read, "But the fifth, which was in-consonant to all, was rejected." Why do you suppose Pythagoras rejects this hammer?

(Answers will vary)

Pythagoras defines the interval relationship between the pitches produced by the hammers in the following way:



GreatHearts®

The whole numbers render the ratio relationship 6:8:9:12. Pythagoras discovers the 6:12 (or simplified 1:2) ratio first which he calls the *diapason*. This is the equivalent to our "octave." He then defines the 6:9 (or 2:3) as the *sesquialter*, which is our "5th"; as well as the 6:8 (or 3:4) as the *sesquitertian*, which is our "4th".

These are the same intervals that earlier we saw had no variation in their interval quality (e.g. Do – Fa is the same specific distance as So – Do'). For Pythagoras, these intervals were the most important because they were built on the ratio between the first numbers (6:8:9:12 can be expressed alternately as 1:2:3:4) and he called these the musical consonances.

In modern music theory we retain this principle and we call this group of intervals Perfect Consonances; by extension, the interval classes of prime, 4th, 5th, and octave have an interval quality that we define as "perfect."

Closing: Check your understanding of the lesson by answering the following questions in complete sentences.

1) What is a diatonic interval?
A diatonic interval is one that exists inside a diatonic scale or key signature

2) What is the fundamental difference between the two groups of diatonic intervals?
One group has a variance that we call Major and minor
the other does not which we call perfect.

3) Why do we call certain diatonic intervals "perfect?" Which interval classes have a perfect quality?
We call ✱ prime, 4th, 5th, and octave interval classes perfect because their ratios are derived from the first numbers (1:2:3:4)

Moreover, they are perfect because they don't have diatonic variation (i.e. Major/minor).

Thursday, March 26

Music Theory Unit: Intervals
Lesson 4: Review of Interval Class and Interval Quality

Lesson 4 Socratic Guiding Questions: Keep these questions in mind as you study!
Why is the relationship between interval class (absolute distance) and interval quality (specific distance? Are there any patterns that we can use to help identify intervals (both class and quality)?

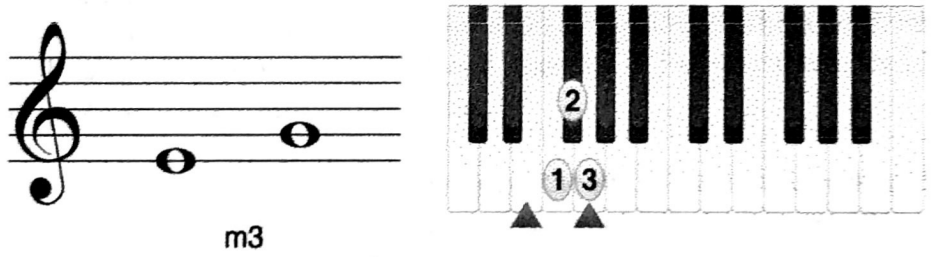
Objective: Be able to do this by the end of this lesson.

1. Review interval class and quality
2. Practice identifying diatonic intervals by both their class and quality

Introduction to Lesson 4: Interval Identification

As we have seen, there are differences between and interval's class (its absolute distance on the staff) and an interval's quality (its specific distance measured in half steps). Some interval classes (2nd, 3rd, 6th, and 7th) have variations in their quality, in that one type is bigger than the other, and we identify this variation with the terms "Major" and "minor." Other interval classes (prime, 4th, 5th, and octave) have no variation in their quality, and we identify these as "perfect."

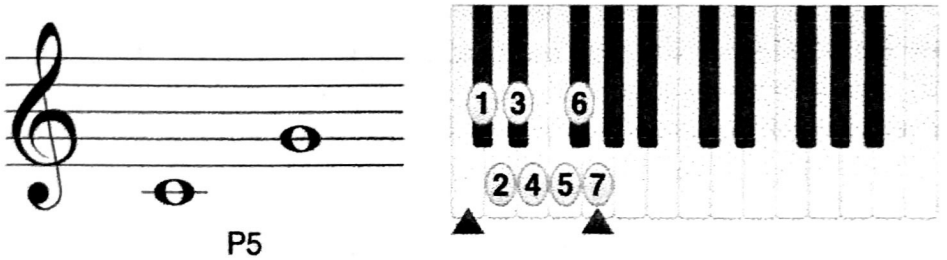
We can then apply this understanding to intervals that we see in context. Consider the interval: E – G.



m3

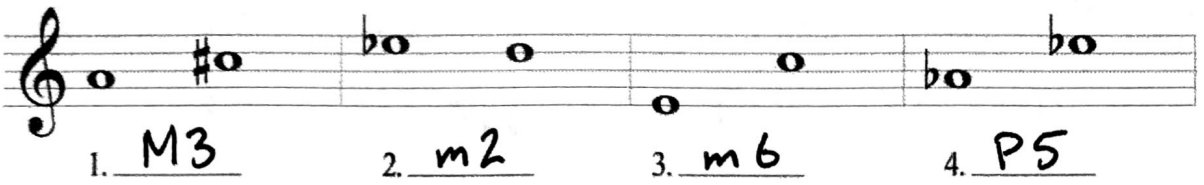
On the staff we can see that the absolute distance is a 3rd, which is its interval class. When we measure its specific distance on the keyboard, we see that it is only 3 half steps, which is the smaller of the two possibilities for 3rds. Accordingly, we identify the interval from E – G as a "minor 3rd."

Alternately, when we identify the interval from C – G, we see that it is a 5th and its specific distance is 7 half steps, so we label it a "Perfect 5th."



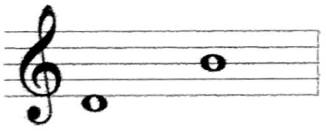
P5

Practice identifying the following intervals with both an interval class and an interval quality. Remember that we always measure from the lowest note to the highest note. Use the keyboard provided when determining the specific distance (interval quality).



Using Diatonic Keys to ID Intervals

Remember that we also observed intervals as products of the diatonic scale. This means that we can use our understanding of solfege relationships and key signatures to help us identify intervals as well. Let's observe this process with the interval from D – B. For your reference I have included a circle of fifths in the back of the packet.



First, we should see that the absolute distance between D and B results in an interval class of a 6th. From here we have two options either Major or minor.

- If the interval is Major, it should fit the pattern Do – La (where D = Do, and B = La)
- If the interval is minor, it should fit the pattern Mi – Do' (where D = Mi, and B = Do')

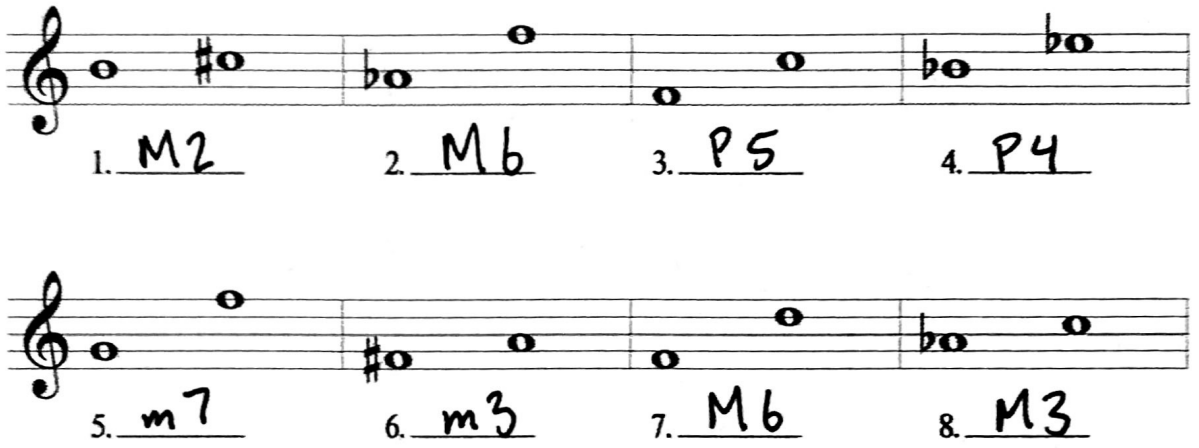
This means that we can temporarily treat the interval as if it belonged to one of two diatonic keys; either D Major or B Major.

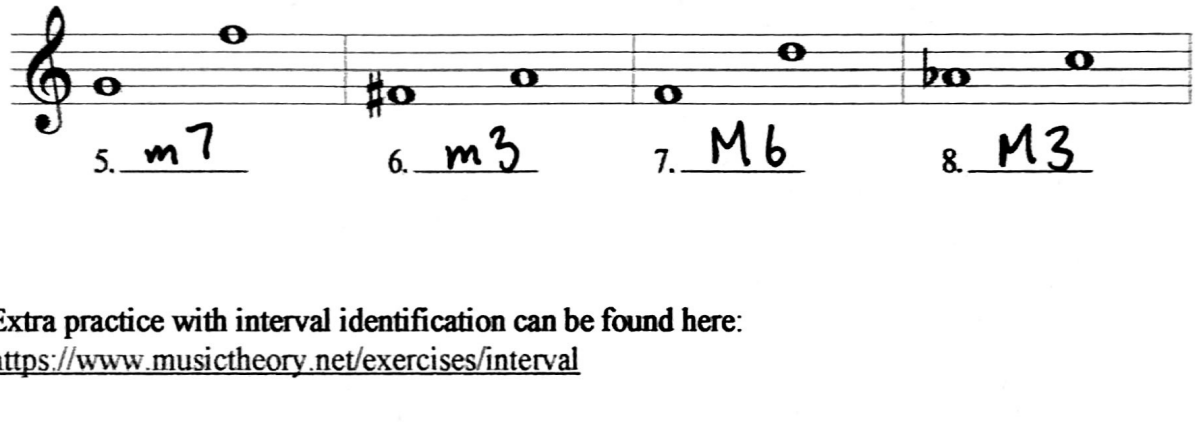
The circle of fifths tells us that in D Major we have two sharps (because D is clockwise two positions from C) and those sharps are F# and C# according to the order of sharps. This means that all of the other notes in that key are natural. Therefore, D and B are both present in the key so we can say it does fit Do – La, thus it is a Major 6th.

Alternately, treating B as Do', the key of B has five sharps; the fourth of which is D#. This means that D natural is not in the key of B Major and so the interval does not fit the minor pattern Mi – Do'.

GreatHearts®

Closing: Check your understanding of the lesson by identifying the following intervals (both their interval class and interval quality)





Extra practice with interval identification can be found here:
https://www.musictheory.net/exercises/interval