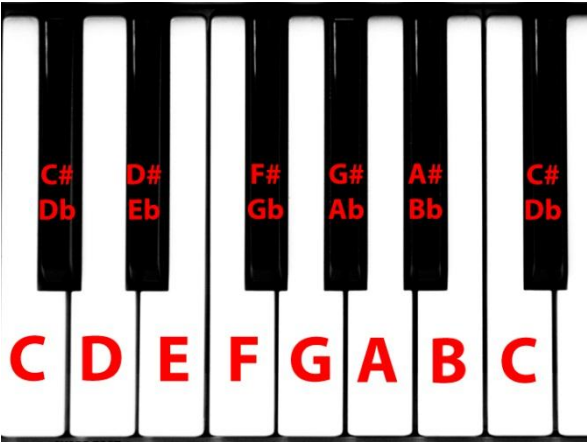
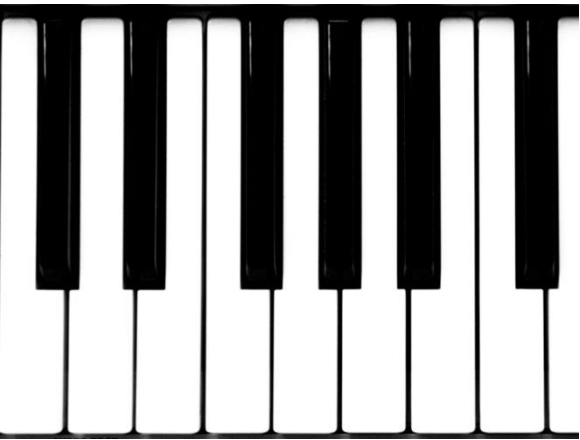


# Segment 1: Sharps and Flats

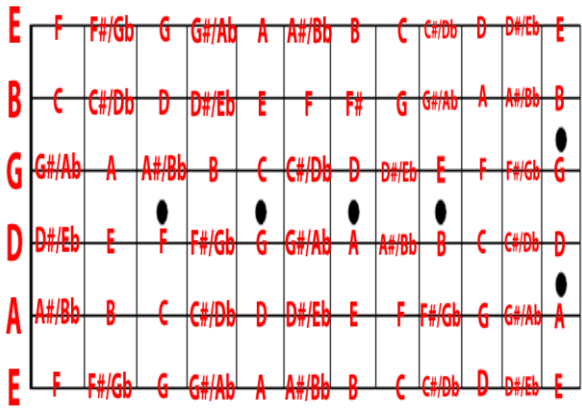
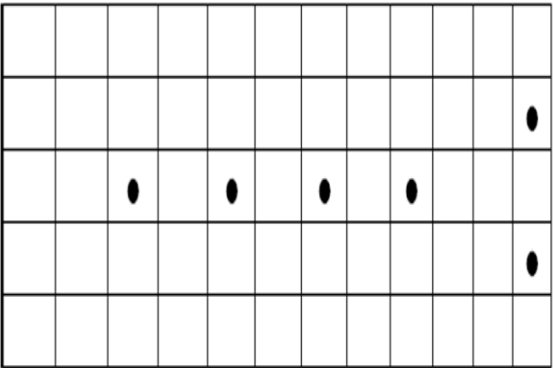
## Tones and Semitones:

When thinking about sharps and flats and tones and semitones etc, it may be useful to visualise an instrument - particularly for those who already play. Below are images of piano keyboards and guitar fretboards, in each case, there is a blank version and one which has been annotated with pitch names. Please feel free to download these images and use them to help you think about tones and semitones etc.

### PIANO:

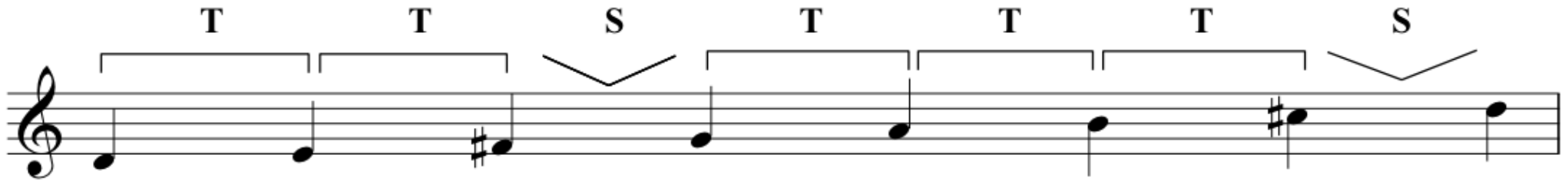


### GUITAR:



### D Major scale example:

In the video, we ask you to try to build D major. Clearly, we need to start on D and apply the pattern TTSTTTS - the image below illustrates this and it also shows us that this scale requires an F# and a C#.



## Segment 2: Keys and Key Signatures

### Key Signatures:

In the video we talked about the fact that key signatures are very useful in helping with the appearance of written music. The following is the tune 'Twinkle Twinkle Little Star' written in the key of B (5 sharps) without a key signature. Although this is a very simple melody, you can see that writing sharps in front of the notes that need them makes the music look messy and difficult to follow - particularly if you were sight reading this music.



The image below is the same melody using the key signature for B major. In this case, the key signature tells us (right at the start of the line) that all Fs, Cs, Gs, Ds and As will be sharpen and this makes the music easier to read as it is not cluttered with accidentals.



## Circle of 5ths:

We talk about the circle of 5ths in the video but it may be helpful to have a more detailed look at it here. The following image shows the circle of 5ths so please feel free to [download it](#) and keep it for reference. In the context of the current lesson on key signatures, the circle of 5ths is a really valuable tool and a handy way to visualise many of the things that we have been talking about in this lecture, and those that follow. I want to highlight a few useful things at this point that will help you with key signatures but that will also be useful for thinking about scales and harmonic progressions later in the course.

### 1. The order of sharps and flats:

Just to reiterate from the video, when sharps and flats appear in a key signature, they always do so in a specific order. For sharps, the order is:

F C G D A E B (*clockwise round the circle of 5ths*)

For flats, the order is:

B E A D G C F (*anticlockwise around the circle of 5ths*)

### 2. Reading Key Signatures:

As we noted in the video, the circle of 5ths can also be used to help us *read* key signatures - that is, to see a written key signature and determine which key it signifies. This is simply a matter of counting the points on the circle. **REMEMBER**, if the key signature is one that uses sharps then we count **clockwise** from C (in the 12 o'clock position) and if it is one that uses **FLATS** then we count **anticlockwise**.

So - imagine a key signature with 3 sharps. We know that the sharps will be F, C and G (in that order) so we will count 3 steps from C.

C - G = 1

G - D = 2

D - **A** = 3

So we can say that the key represented by 3 sharps is **A major**.

Let's try one with flats; imagine a key signature with 6 flats. Again, we are simply going to count 6 steps round the circle of 5ths **anticlockwise** (because we're dealing with flats) from C. This time we get...

C - F = 1

F - Bb = 2  
Bb - Eb = 3  
Eb - Ab = 4  
Ab - Db = 5  
Db - **Gb** = 6

So, the key represented by 6 flats is **Gb major**.

Try this yourself and see how you get on. It is pretty simple when you get the hang of it - just remember to always count from C and to go clockwise for sharps and anticlockwise for flats. Remember, you will **NEVER** have a key signature containing sharps and flats.

### 3. Writing Key Signatures

We can use the circle of 5ths to help us write key signatures too - it's really just the reverse of what we have just noted above. So, if someone asks you to write the key signature for D major, you would simply count the steps from C until you get to D:

C - G = 1  
G - D = 2

So, D is 2 steps around the circle of 5ths from C - we know that the number of steps away from C tells us how many sharps (or flats) we need - therefore, D requires 2 sharps. We know the order of sharps to be F C G D A E B so if the key signature needs two sharps we use the first 2. So, D major needs F# and C#!

### **Appearance of Key Signatures:**

It is important that we make sure that key signatures are written in the correct way - that is, that we ensure they are displayed properly. This is important because we need to be able to glance quickly and recognise them. When we get used to looking at key signatures we often recognise them by their appearance, rather than by looking at every single individual sharp or flat. The one thing to be aware of is that the way key signatures look can vary depending on the clef. We discuss clefs later this week but for now, the following is a useful graphic showing how key signatures look in each of the common clefs:

#### 1. Key signatures with SHARPS:

|             | C major<br>(A Minor)                                                                | G major<br>(E Minor) | D major<br>(B Minor) | A major<br>(F# Minor) | E major<br>(C# Minor) | B major<br>(G# Minor) | F# major<br>(D# Minor) | C# major<br>(A# Minor) |
|-------------|-------------------------------------------------------------------------------------|----------------------|----------------------|-----------------------|-----------------------|-----------------------|------------------------|------------------------|
| Treble Clef |   |                      |                      |                       |                       |                       |                        |                        |
| Bass Clef   |   |                      |                      |                       |                       |                       |                        |                        |
| Alto Clef   |   |                      |                      |                       |                       |                       |                        |                        |
| Tenor Clef  |  |                      |                      |                       |                       |                       |                        |                        |

2. Key Signatures with FLATS:

**C major**   **F major**   **Bb major**   **Eb major**   **Ab major**   **Db major**   **Gb major**   **Cb major**  
**(A Minor)**   **(D Minor)**   **(G Minor)**   **(C Minor)**   **(F Minor)**   **(Bb Minor)**   **(Eb Minor)**   **(Ab Minor)**

Treble Clef

Bass Clef

Alto Clef

Tenor Clef

The image displays musical notation for the C major scale and its relative minor, A minor, across four staves: Treble, Bass, Alto, and Tenor. Each staff begins with a double bar line, followed by a sequence of notes for C major, then another double bar line, and finally a sequence of notes for A minor. The notes are: C major (C, E, G, C, E, G, C, E, G, C) and A minor (A, C, E, A, C, E, A, C, E, A). The notation is consistent across all four staves, with the clef changing to accommodate the range of the notes.

## Segment 3: Minor Keys and Minor Scales

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### Major/Minor Relationships:

One of the most important things that we need to get to grips with when thinking about minor keys and scales is the relationships between major and minor. In the video we talked about 'relative majors' and 'relative minors', for example so let's just have a quick recap of this.

If we have a major key and would like to find its relative minor, the easiest way to do this is to find the 6th degree of the major as this is the tonic of the relative minor. So, let's take the example of A major and try to find its relative minor. We simply find the 6th degree (remembering any sharps) of this scale and this gives us our answer:

1 = A  
2 = B  
3 = C#  
4 = D  
5 = E  
**6 = F#**

So, it's as simple as that. **F# is the relative minor of A.** But, what does this mean...? Well, in really simple terms, this means that the key of F# minor has the same key signature as A major and therefore is built from all the same notes. However, orientating this key around F# means that the notes have a different internal relationship and that's what makes us feel the different tonality, i.e. *minor* as opposed to major.

### Different types of minor scale:

As we noted in the video, there are a number of different types of minor scale but we are just focussing on the three most common (*arguably*) in this lecture. Let's have a closer look at them here:

#### 1. Natural Minor (AKA the Aeolian Mode):

This is the easiest of the minor scales to get to grips with because it doesn't require any alterations. Basically, it is just the relative major scale running from the 6th degree. So, in the case of our example of A major above we worked out the the relative minor was F# minor. So, we can say that F# natural minor is essentially the scale of A major from F# - F#. That is to say:



AUDIO EXAMPLE: [https://class.coursera.org/musictheory-001/wiki/Video\\_3%3A](https://class.coursera.org/musictheory-001/wiki/Video_3%3A)

## 2. Harmonic Minor:

The harmonic minor is the next most simple of the minor scales as it is simply the natural minor with a raised 7th. So, sticking with F# Minor at the moment this gives us:



AUDIO EXAMPLE: [https://class.coursera.org/musictheory-001/wiki/Video\\_3%3A](https://class.coursera.org/musictheory-001/wiki/Video_3%3A)

As we can see, E is the 7th degree of the scale so we have raised it by a semitone. This gives us the harmonic minor scale.

## 3. Melodic Minor:

The melodic minor is a bit more complex as its *ascending form* differs from its *descending form*. This is illustrated very clearly in the video but, just to recap, the ascending form of the melodic minor is the natural minor with a raised 6th and 7th degree - whereas the descending form has these notes lowered again and is, thus, essentially the natural minor. So, the whole scale is:



AUDIO EXAMPLE: [https://class.coursera.org/musictheory-001/wiki/Video\\_3%3A](https://class.coursera.org/musictheory-001/wiki/Video_3%3A)

It is a good idea to play or sing these and get used to the sound of each of the scales.

### Finding the relative MAJOR:

So far, we have talked about finding the relative minor of a major. As we have discovered, this is actually fairly easy to do. Obviously, however, this is only half the picture. What if you are asked to write or play something in a minor key? Clearly, there is an important relationship between the minor and its relative major - it's the major scale that we draw our notes from.

So, what if someone asks you to play A minor. The first thing we need to do is to work out the relative major. Well, the tonic of the relative major is a **minor 3rd** above the tonic of the minor. So, in this case, we know the minor tonic is A so we count up 3 notes from A. This gives us:

1 = A  
2 = B  
3 = **C**

Next, we have to check if this is a **minor 3rd**. Remember, a minor 3rd is an interval of 3 semitones. So,

1 = A - A#  
2 = A# - B  
3 = B - **C**

C is a minor 3rd above A - so C is the relative major of A minor.

You should spend some time working out the pairs of related majors and minors and try to become familiar with them.

## Segment 4: Intervals

---

### Calculating Intervals:

As we said in the video, in order to calculate and fully describe an interval we need 2 pieces of information:

1. The numeric interval (e.g. a 3rd, or a 7th etc.)
2. The quality (e.g. major, minor, diminished etc.)

The numeric interval is fairly easy to find as we simply count from the lowest note to the highest (***inclusive***). So, have a look at the following interval:



As we can see, the lower note is a C and the higher note is an A. So, in order to count this we start on C and count:

C = 1  
D = 2  
E = 3  
F = 4  
G = 5  
A = **6**

As such, we can say that A is a 6th above C. Now, we need to find the *quality*...

A nice way to do this is to imagine that we are in the major key of which the lower note is the tonic. So, in this case, the lowest note is C so we imagine that we are in the key of C major. So, the question is, would we find an A natural in the key of C major...?

The answer is yes so we can say that this is an interval of a **major 6th**.

Let's recap and then discuss some more complex examples.

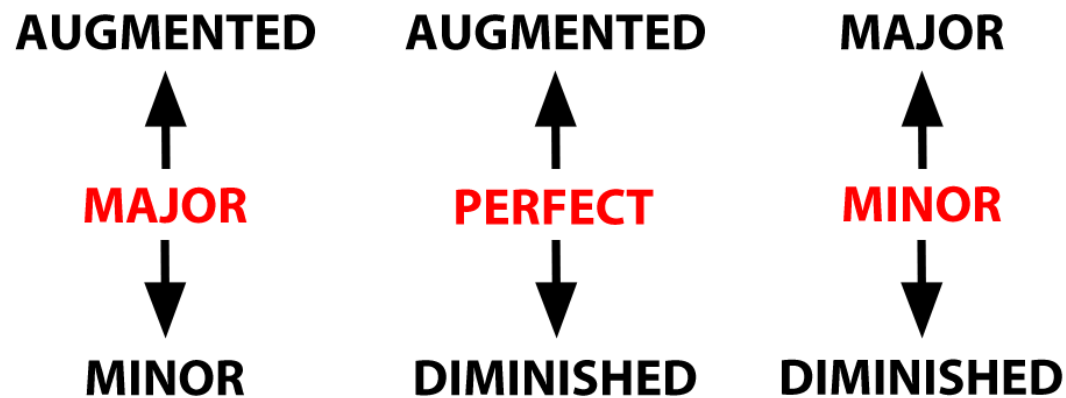
By imagining that we are in the major key of which the lowest note is the tonic, what we are essentially doing is working out whether the upper note would be found in this major scale. Major scales are useful starting points because, unlike minor scales they are constant, i.e. we don't alter them in the same way we do with minor

scales. Consequently, we know that the internal intervals are always the same. Just to remind you, have a look at the following table:

**Quality of intervals in major scales/keys:**

| Interval | Quality |
|----------|---------|
| Unison   | Perfect |
| 2nd      | Major   |
| 3rd      | Major   |
| 4th      | Perfect |
| 5th      | Perfect |
| 6th      | Major   |
| 7th      | Major   |
| 8ve      | Perfect |

Also, look at the following image which illustrates how intervals change when the size of the interval is increased or decreased:



With that information in mind, let's have a look at the following interval, which is very similar to the one that we just looked at:



In the first example we worked out that C - A was a major 6th because A is the 6th degree of the C major scale. As this interval is C - Ab we know that it is also a 6th but this time, the interval is a semitone smaller than before because the upper note has been lowered by a semitone. So, using this logic we can say that a major interval that is made smaller by a semitone becomes a minor interval. So, this interval would be fully described as a **minor 6th**. We should also note that this is the 6th degree of C natural minor! This is obviously no coincidence but, for now, let's work with the major scale as our basis and we can work out alterations from this pattern using the method outlined above.

OK, now for a trickier example - again, using this method, for ease of calculation. Have a look at the following example:



So far we have said "imagine you are in the key of which the lower note is the tonic...". This is fine but we hit a snag when we come to an example like this - there is no such key as D# major. Don't worry though, using the method that we have outlined above there are a couple of easy ways to get around this:

Option 1 - cancel both accidentals:

In this case, we can simply ignore both accidentals! This leaves us with the same interval but transposed down a semitone. So, if we imagine that this is D - C (i.e. ignoring the sharps) we can quickly work out that D - C is a 7th. D major WOULD have a C# so D - C# is a major 7th - in this case, the interval is a semitone smaller and is thus a minor 7th. So, if D - C is a minor 7th, D# to C# is also a minor 7th.

Option 1 - cancel the accidentals on the lowest note:

If we want to stick to the method where we imagine that we are in the major key of which the lower note is the tonic then we need to imagine that the lowest note is D **natural**. If we do this then we have D - C# which we know to be a major 7th. When we then put the accidental back in we are raising the lower of the two notes and thus making the interval smaller by a semitone. As we know, when we make a major interval smaller we get a minor interval. Again, we can say that this interval is a **minor 7th**.

### Compound Intervals:

How do we deal with something like the following interval:



Well, if we count from the bottom note to the top one we see that it is more than an octave - its an 11th, in fact. To describe this as an 11th could be considered to be slightly problematic, however, as (a) dealing with large numbers gets confusing and (b) the fact that this interval is C - F means that it does sound like a perfect 4th, in some ways. To get around dealing with such large intervallic numbers, we relate intervals of larger than an octave to their simple equivalents. So, in this case, the simple equivalent is a perfect 4th so we call this a **compound** perfect 4th. The word compound in this case lets us know that the interval is actually out-with the octave!

### More Practice:

Intervals can be tricky but the best way to get to grips with them is by doing as much practice as you can. The site [musictheory.net](http://musictheory.net) is wonderful for this and you can use it to practice many elements of this course. For interval practice, [click here](#). The exercise is set to be fairly easy but you can customise it using the controls in the top right hand corner of the screen.

## Segment 5: Ledger Lines and Clefs

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### Clefs:

So far in this course we have talked mostly about the treble clef. As we note in this video there are some other common clefs and we'd like to just take a minute to discuss these here.

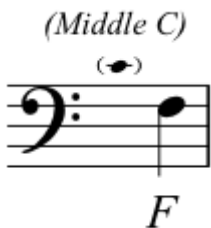
#### *The treble clef:*

The treble clef is also known as the G clef because, as can be seen from the image below, the fat loop of the clef circles around the 2nd line from the bottom and assigns the pitch name G to this line. The graphic also shows the position of middle C. If you need to recap this then please go back and watch lecture 1, video 1 again.



#### *The bass clef:*

The bass clef is, arguably, the next most common clef and we introduced it in this video. The bass clef is also known as the F clef as the 2 dots of the clef (see the image below) are positioned around the 2nd line from the top and assign the pitch name F to this line. Again, the position of middle C is shown in this graphic.



#### *The alto clef:*

The alto clef commonly used for music to be played by the viola or alto trombone, for example. The alto clef is known as a C clef as the line in the middle of the two curved loops of the clef is MIDDLE C (see the graphic below).



*Middle C*

### **The tenor clef:**

The tenor clef commonly used for music to be played by the cello in its upper register, for example. The tenor clef is also known as a C clef as the line in the middle of the two curved loops of the clef is MIDDLE C (see the graphic below).



*Middle C*

### **Ledger Lines:**

As we mentioned in this video and in lecture 1, we can temporarily extend the range of the stave by adding ledger lines - this can be done above or below the stave. The following images show ledger lines being used above and below staves using each of the clefs that we have discussed so far.

### **Treble Clef:**



### **Bass Clef:**



*Alto Clef:*



*Tenor Clef:*

