

Lesson VVV: Major Keys and Key Signatures

Introduction:

In tonal music, when a piece tends to use primarily the pitches of a single major or minor scale, it is said to be in that major or minor *key*. Such pieces typically have groups of accidentals called *key signatures*. The following excerpt from a Mozart sonata has a B^b-major key signature. It appears just after the clef at the beginning of each line:

Example 1 (W.A. Mozart, Sonata in B^b major, K. 281, mm. 1-8):



These key signatures provide a convenient way of saving time instead of writing out all of the necessary accidentals for a given key. Instead of writing a “b” before every B and E (as necessitated by the B^b-major scale), the key signature instructs the performer that every B and E are to be played as B^b and E^b respectively unless otherwise noted. Compare Example 1 with the following, which writes out the required accidentals instead of using a key signature. Note how cluttered the score appears compared to Example 1:

Example 2 (no key signature):



In this lesson, we will discuss how a key is established using the pitches of a major scale, how to determine a major key from a given key signature, and how to write key signatures on bass and treble clefs. We will also look at relationships between major scales and how to organize them with regards to one another.

Major keys:

Lesson UUU discusses the role of the tonic (the keynote) as the most prominent note of a major scale. When a piece is in a major key it takes the pitches from that major scale and gives the tonic a position of primary importance. The remaining scale degrees are treated according to a hierarchy relative to the tonic.

Consider the following familiar melody:

Example 3:



As you can see, this melody uses the pitches C, D, E, F, G, and A. All of these pitches belong to the C major scale (C, D, E, F, G, A, and B). This is a very good indication that this melody is in the key of C major. But all of these pitches also belong to the F major scale (F, G, A, B \flat , C, D, and E). To determine the key of this melody—C major or F major—we need to decide which note sounds most like the tonic. Listen to the melody again and consider which pitch, C or F, sounds more stable to your ear.

It is likely that you heard the pitch C as having greater stability. Simply looking at the melody, we can see that C occupies a more stable position than the pitch class F. The excerpt begins and ends on C, and C holds a prominent position at the end of m. 2 and the beginning of m. 5. Whenever F appears, on the other hand, it is given a shorter note-value, and is always within a descending stepwise passage toward C. Since the pitch class C is the most stable-sounding pitch in the melody, Example 3 is in the key of C major.

The melody from Example 3 can be written in any major key. The following example transposes it (rewrites it at a different pitch level) to E major by raising each note up two whole steps, putting E in the most stable position. The melody sounds the same, only higher:

Example 4:



Activity VVV.1:

Identify the key of each of the following melodies by considering which scale is represented by the present pitches and by looking for points of stability that might be the tonic note.

Exercise: VVV.1a

In what key is the following melody (“Ah! Vous dirai-je, Maman?” better known as “Twinkle, Twinkle, Little Star.”)?



[Answer: “B \flat ” or “B \flat major.” Response if correct: “Correct!” Response if incorrect: “Incorrect. Try again. (Hint: Look for stable pitches that might be the tonic.)”]

Exercise VVV.1b

In what key is the following melody (J.S. Bach, “Aus meines Herzens Grunde,” BWV 269, mm. 1-7)?



[Answer: “A” or “A major.” Response if correct: “Correct!” Response if incorrect: “Incorrect. Try again. (Hint: Look for stable pitches that might be the tonic.)”]

Key signatures:

Each major scale contains a distinct set of seven pitch classes. (Again, see Lesson UUU for a lengthier discussion of the major scale.) One major scale may share as many as six pitches with another, as we saw in Example 3, but not all. (Two major scales that share seven pitch classes in common are considered to be the same scale.) Since each major scale is unique in this way, a piece in a major key will draw from the same pitches as its corresponding major scale. These sharps and flats used in the corresponding major scale are usually written at the beginning of each line in a *key signature*.

The *key signature* is a collection of sharps or flats that indicates which notes should be raised or lowered so that they belong to the key. In C major, there are no sharps or flats in the key signature, just as there are no sharps or flats in the C major scale. In keys other than C major, the key signature is written to the right of the clef, just before the time signature, at the beginning of each line of music. In Example 4 we transposed “Twinkle, Twinkle, Little Star” to the key of E major. The following example shows the same melody in E major but here makes use of a key signature instead of writing out all the accidentals:

Example 5:

a. (without key signature):

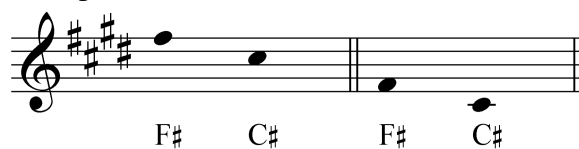


b. (with key signature)



E major has four sharps (F#, C#, G#, and D#), all of which appear in the key signature. (Even though D# is not used in this melody, the accidental is left in the key signature. Doing so makes it clear that this excerpt is in E major.) Sharps or flats in the key signature affect more than just the notes whose line or space they share:

Example 6:



The sharps in the key signature are centered on the line or space of the note to which they apply. (As you’ll see momentarily, the same is true of key signatures using flats. The head of the flat accidental is centered on the line or space of the note it affects.) The first sharp of the key signature in Example 6 (centered on the top line of the staff) applies to the note on the same line, making it F#. Likewise, the

second sharp of the key signature (centered on the third space on the staff) applies to the note on the same space, making it C[#]. The accidentals appearing in the key signature apply to *every* instance of that pitch class. The F and C in the second half of Example 6 are both sharp even though the key signature does not include an accidental on their respective space and line.

Activity VVV.2:

Identify the major key represented by each of the following key signatures:

Exercise VVV.2a

Which major key does the following key signature represent?



[Answer: “D” or “D major.” Response if correct: “Correct!” Response if incorrect: “Incorrect. Try again. (Hint: Which major scale has two sharps?)”]

Exercise VVV.2b

Which major key does the following key signature represent?



[Answer: “B^b” or “B^b major.” Response if correct: “Correct!” Response if incorrect: “Incorrect. Try again. (Hint: Which major scale has two flats?)”]

Exercise VVV.2c

Which major key does the following key signature represent?



[Answer: “A” or “A major.” Response if correct: “Correct!” Response if incorrect: “Incorrect. Try again. (Hint: Which major scale has three sharps?)”]

Exercise VVV.2d

Which major key does the following key signature represent?



[Answer: “E^b” or “E^b major.” Response if correct: “Correct!” Response if incorrect: “Incorrect. Try again. (Hint: Which major scale has three flats?)”]

Pitches specified by the key signature can be canceled out by an accidental next to a note, as in the following example:

Example 7 (W.A. Mozart, Piano Sonata in E^b major, K. 282, mm. 1-4):

This piece is in E^b major, which has three flats (B^b, E^b, and A^b) as specified by the key signature. The natural sign (♮) next to the A on the last eighth note of the first measure cancels out the A^b of the key signature. This cancelling out of A^b lasts only as long as the measure the accidental appears in. By the second measure, all As should again be flatted according to the key signature.

Note: You will frequently come across accidentals that may seem unnecessary. The flat next to the A on the fourth beat of m. 2, for instance seems superfluous, given the A^b in the key signature. Such accidentals are referred to as “courtesy accidentals.” They occur after a previous accidental altered a given pitch (in this case, the A natural at the end of the first measure) to remind the performer that a scale degree has gone back to normal as specified by the key signature.

Writing key signatures:

In Lesson UUU we discussed how one octave of a major scale can be divided into two tetrachords, an upper and a lower, each of which follows the same a W-W-H step pattern. In C major, for example, the lower tetrachord would be (C, D, E, F) and the upper (G, A, B, C). Since the pattern of whole steps and half steps is identical in each major tetrachord, they can both be used interchangeably as either the upper *or* lower tetrachord of a major scale. The upper tetrachord of a C-major scale (G, A, B, C) could, for example, also serve as the lower tetrachord of a G-major scale:

Example 8:

Notice how similar these two scales are. They have six pitch classes in common (G, A, B, C, D, and E), differing in only one note: C major has F, while G major has F[#]. Scales like these that share six out of their seven pitch classes are referred to as *closely related*. Their key signatures, therefore, will differ by

only one accidental. (C major has no sharps, G major has one sharp.)

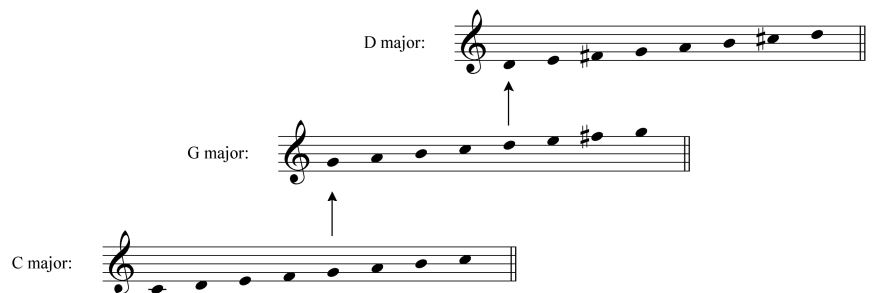
The following example shows the key signatures for C and G major, and takes the process one step further, using the upper tetrachord of G major (D, E, F[♯], G) as the lower tetrachord of D-major. Each subsequent scale, in other words, begins on the fifth degree of the scale before it (as shown by the arrows):

Example 9 (sharp keys):

a. key signatures:



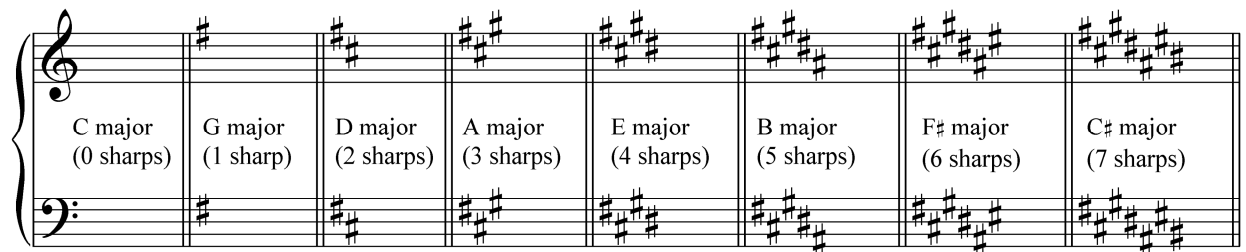
b. scales:



We can see a pattern beginning to emerge. G major is built on scale degree $\hat{5}$ of C major and has one sharp (F[♯]). D major is built on scale degree $\hat{5}$ of G major and has *two* sharps (F[♯] and C[♯]). We could continue the pattern by building a major scale on scale degree $\hat{5}$ of D major (A) and would arrive at A major, which has *three* sharps (F[♯], C[♯], and G[♯]). And so on...

The following example shows all of the sharp key signatures up through seven sharps—from C major, in which none of the notes require an accidental, to C[♯] major, in which every note is sharped:

Example 10 (sharp key signatures):



The sharps or flats in a key signature must be written in a particular order and position on the staff. Notice how none of the sharps are written on ledger lines and that the key signatures are adjusted depending on which clef is assigned to the staff. It is important that you memorize not only the order in which particular sharps are added to the key signature (F[♯], C[♯], G[♯], D[♯], A[♯], E[♯], B[♯]), but also the pattern in which they are added on the staff.

Note: You may find it helpful to come up with mnemonic devices to help remember these patterns. The order of sharps as they are added to a key signature, for example, can be remembered by the sentence: “**F**ather **C**harles **G**oes **D**own **A**nd **E**nds **B**attle.”

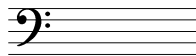
There is also a useful, quite easy trick for determining the tonic of a sharp key. In every sharp key, the right-most accidental of the key signature is the leading tone of the key. Say the key signature has five sharps: F[♯], C[♯], G[♯], D[♯], A[♯]. A[♯] is the leading tone for the B major scale. Therefore, the key is B major.

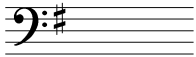
Activity VVV.3:

Write out each of the following sharp key signatures. Be sure to write each sharp on the appropriate line and in the correct order.

Exercise VVV.3a

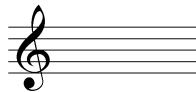
Write out a G-major key signature on the staff provided:




[Answer: . Response if correct: "Correct! G major has one sharp." Response if incorrect: "Incorrect. Try again."]

Exercise VVV.3b

Write out an F#-major key signature on the staff provided:




[Answer: . Response if correct: "Correct! F# major has six sharps." Response if incorrect: "Incorrect. Try again."]

Exercise VVV.3c

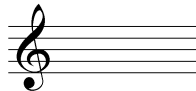
Write out an D-major key signature on the staff provided:




[Answer: . Response if correct: "Correct! D major has two sharps." Response if incorrect: "Incorrect. Try again."]

Exercise VVV.3d

Write out an E-major key signature on the staff provided:



[Answer: . Response if correct: "Correct! E major has four sharps." Response if incorrect: "Incorrect. Try again."]

Flat key signatures can be determined similarly, though here, the *lower* tetrachord of each scale becomes the *upper* tetrachord of the next closely-related key. Instead of going up four steps from the tonic to begin each subsequent key on scale degree $\hat{5}$, we must go *down* four steps from the tonic and start on scale degree $\hat{4}$. F major, for example, begins on scale degree $\hat{4}$ of C major and has one flat (B^b):

Example 11 (flat keys):

a. key signatures:

b. scales:

B^b major begins on scale degree 4̂ of F major and has two flats (B^b and E^b). If we were to continue, the next key would be E^b major which would have three flats (B^b, E^b, and A^b). And so on...

The following example shows all of the flat key signatures up to seven flats:

Example 12 (flat key signatures):

Again, it is essential that you remember the order in which flats are added to key signatures and the pattern in which they are notated on the staff.

Note: The order of flats as they are added to a key signature can be reversing the mnemonic for sharp keys: “**B**attle **E**nds **A**nd **D**own **G**oes **C**harles' **F**ather.”


The second to last accidental in a flat key signature will tell you the key. E^b major, for example, has three flats: B^b, E^b, and A^b. The second to last (E^b) is the tonic of the key!

Activity VVV.4:

Write out each of the following flat key signatures. Be sure to write each flat on the appropriate line and in the correct order.

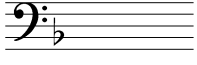
Exercise VVV.4a

Write out an A^b-major key signature on the staff provided:

[Answer: . Response if correct: “Correct! A^b major has four flats.” Response if incorrect: “Incorrect. Try again.”]

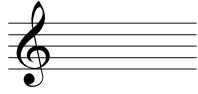
Exercise VVV.4b


Write out an F-major key signature on the staff provided:

[Answer: . Response if correct: “Correct! F major has one flat.” Response if incorrect: “Incorrect. Try again.”]

Exercise VVV.4c

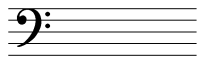
Write out an D^b-major key signature on the staff provided:

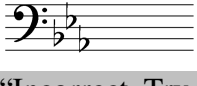


[Answer: . Response if correct: “Correct! D^b major has five flats.” Response if incorrect: “Incorrect. Try again.”]

Exercise VVV.4d

Write out an E^b-major key signature on the staff provided:



[Answer: . Response if correct: “Correct! E^b major has three flats.” Response if incorrect: “Incorrect. Try again.”]

As you can see from Examples 10 and 12, we typically divide keys into two categories: “sharp keys” (those whose key signatures consist of sharps) and “flat keys” (those whose key signatures consist of flats). In tonal music, you will never see a key signature with a mixture of sharps and flats. You may, however, encounter natural signs in a key signature when the accidentals of a previous key signature must be canceled out as in the following excerpt where the key changes to E major in m. 17:

Example 13 (F. Chopin, Etude No. 10, Op. 10, mm. 16-17):



Conclusion:

A piece that draws primarily from the pitches of a single major scale is said to be in that major key. Within a key, pitch classes are organized hierarchically—primarily around the tonic which is heard as the most stable and grounding degree of the scale. A piece in G major, for example, will use pitch classes from the G major scale and will treat the pitch class G as the most important. Other scale degrees will be treated accordingly, relative to the tonic.

A key signature is a symbol—a collection of sharps or flats—that indicates the key of a particular piece or passage. Key signatures are written just to the right of the clef and appear at the beginning of each line of music. A sharp or flat indicated by the key signature applies to every instance of that pitch-letter name, not just those on the line or space on which it is written. They remain in effect throughout the entire piece unless they are cancelled out by another accidental or a new key signature. Key signatures are always written in a particular pattern on the staff and must be adjusted to match the clef.