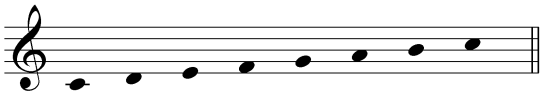
Lesson UUU: The Major Scale

Introduction:

The major scale is a cornerstone of pitch organization and structure in tonal music. It consists of an ordered collection of seven pitch classes. (A *pitch class* is the group of all pitches sharing the same note name—for example, all Cs or all B♭s.) The sound of a major scale is one with which you are no doubt familiar:

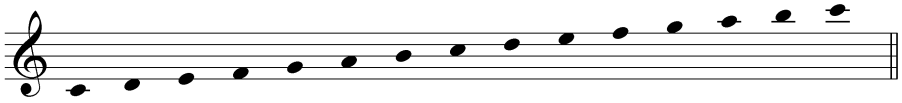
Example 1 (C-major scale):



Example 1 shows a C-major scale, so-named because it begins and ends on C. The beginning (and end) of such a scale is referred to as the *tonic* or *keynote*. All of the other notes in the scale are organized around this note.

The high C that ends the major scale in Example 1 can also act as the beginning of its own major scale. The following example demonstrates:

Example 2 (two octaves of C-major scale):



Here we see a C-major scale beginning on middle C and continuing upwards for two full octaves. Likewise, middle C could act as the high end of a C-major scale an octave below. The major scale (and other scales) can therefore continue indefinitely in both directions.

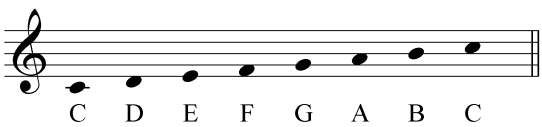
In this lesson, we will begin by examining how a major scale is organized and how to construct one. We will then go on to look at the relationships between its various members and how to refer to them individually.

Spelling a major scale:

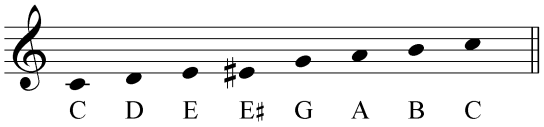
For study, scales are typically written in ascending order, spanning a single octave. When notating a scale, we begin with the keynote and use each of the seven note letter names (A, B, C, D, E, F, and G) until we return to the keynote. This is referred to as the *spelling* of the scale and is demonstrated in the following example:

Example 3 (spelling a C-major scale):

a. Correct:



b. Incorrect:

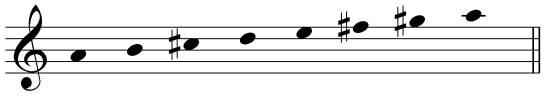


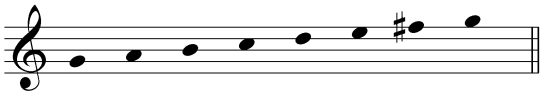
As you can see from Example 3a, the only repeated note letter name is the keynote (in this case, C) for a single octave of a major scale. To repeat any other note letter name would be incorrect, as in Example 3b which uses the letter E twice.

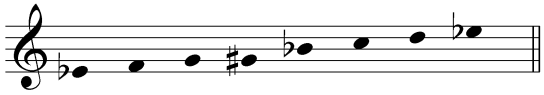
Note: At this point, the specific spelling of a scale may seem arbitrary. After all, E♯ and F are enharmonically equivalent, and the two scales shown in Example 3 sound identical. However, the specific spelling of an individual pitch has a direct effect on the implied musical meaning of that note—a concept that will become clearer in later lessons.

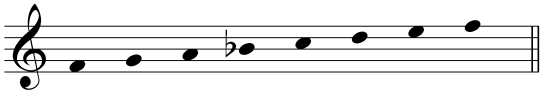
Activity UUU.1:

[multiple choice question]
Which of the following scales is spelled incorrectly?

a.


b.


c.


d.


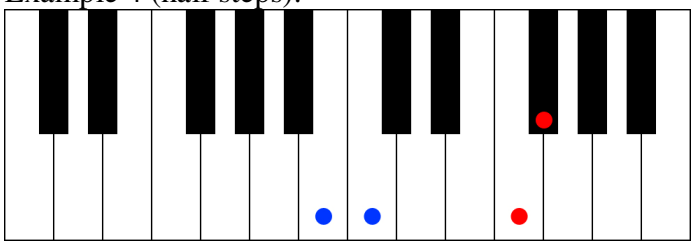
[Answer: C. Response if correct: "Correct! This scale is spelled incorrectly. Although this scale is spelled in ascending order and begins and ends on the keynote, the letter G is used twice (G and G♯)." Response if incorrect: "Incorrect. This scale is spelled correctly: it begins and ends on the keynote and uses each intervening letter name once and only once. Try again."]

Pitch relations in the major scale:

Major scales—and minor scales, as we'll discuss shortly—are named after their keynotes: C-major scales have C as their keynote, A♭-major scales have A♭ as their keynote, and so on. While the keynote may be the most important and defining pitch of any given scale, it is the organization of the notes in between—the other six *scale degrees*—that give each scale its unique identity.

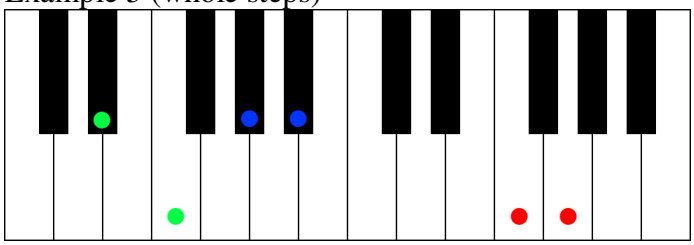
The distance from one scale degree to an adjacent scale degree is referred to as a *step*. As you may have already noticed, there are two sizes of steps: *half steps* (*semitones*) and *whole steps* (*tones*). You will find that it is very useful to visualize steps (and scales) as they would be played on a piano keyboard. Half steps are represented by adjacent keys on the piano keyboard:

Example 4 (half steps):



Example 4 shows that half steps can be formed between two white keys (blue dots) or between a white key and a black key (red dots). In either case, the two pitches are right next to each other (there is no pitch in between). Whole steps, on the other hand, are as big as two half steps:

Example 5 (whole steps)

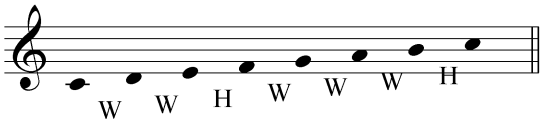


Every whole step—three of which are represented by the pairs of colored dots in Example 5—has exactly one pitch class in the middle. Notice that a whole step can occur between two black keys (blue dots), two red keys (red dots), or a black and a white key (green dots).

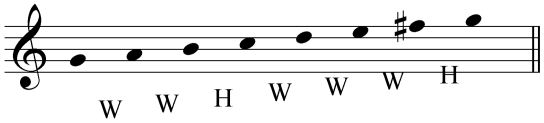
Every major scale features the same pattern of whole steps (tones) and half steps (semitones): W-W-H-W-W-W-H.

Example 6 (whole steps and half steps in major scales):

a. (C major)



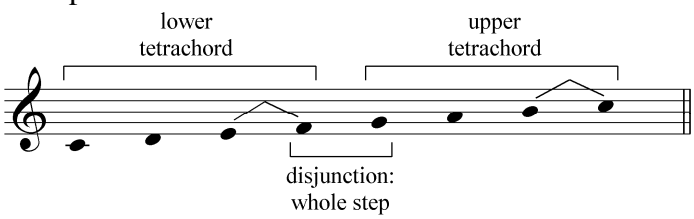
b. (G major)



Play or listen to the two scales in Example 6. Notice how similar they sound even though they begin on different pitches and contain different pitch classes (C major has F, while G major uses F♯). It is because both scales follow the same pattern of whole steps and half steps that they sound so similar.

If we divide the major scale into two *tetrachords* (groups of four consecutive notes), we find that each tetrachord follows the same pattern of whole steps and half steps:

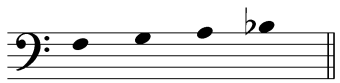
Example 7:



As Example 7 demonstrates, the major scale can be divided into two tetrachords, each of which follows the W-W-H pattern. The two tetrachords are themselves separated by a whole step. In C major, the lower tetrachord contains C, D, E, and F, while the upper contains G, A, B, and C. (The triangular brackets in Example 7 are a common shorthand way of indicating half-steps.)

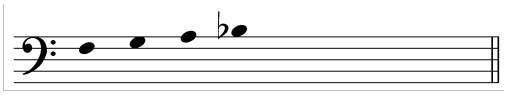
Activity UUU.2:

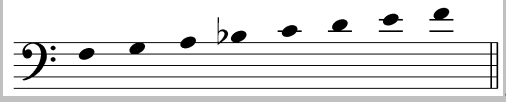
The exercises below refer to the following tetrachord:



Exercise UUU.2a
For which major scale would these four notes form the lower tetrachord.
[Answer: F or F major. Response if correct: "Correct! F-G-A-B♭ form the lower tetrachord of an F-major scale." Response if incorrect: "Incorrect: Try again. (Hint: The lower tetrachord of any major scale has the keynote as its lowest pitch.)"]

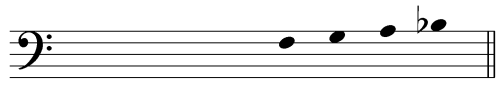
[Follow-up exercise:]
Complete the F-major scale by adding the upper tetrachord:

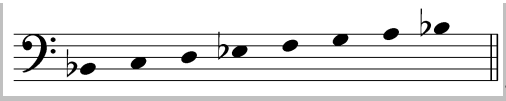


[Answer:  . Response if correct: "Correct!" Response if incorrect: "Incorrect. Try again. (Remember to follow the correct pattern of whole steps and half steps starting with the keynote.)"]

Exercise UUU.2b
For which major scale would these four notes form the upper tetrachord.
[Answer: B♭ or B♭ major. Response if correct: "Correct! F-G-A-B♭ form the upper tetrachord of a B♭-major scale." Response if incorrect: "Incorrect: Try again. (Hint: The upper tetrachord of any major has the keynote as its highest pitch.)"]

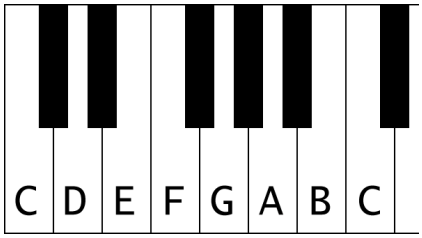
[Follow-up exercise:]
Complete the B♭-major scale by adding the lower tetrachord:



[Answer:  . Response if correct: "Correct!" Response if incorrect: "Incorrect. Try again. (Remember to follow the correct pattern of whole steps and half steps starting with the keynote.)"]

The half steps in a major scale are always found in the same place. One is found between the third and fourth scale degrees and the other between the seventh and eighth scale degrees. The following example shows a C-major scale on the piano keyboard:

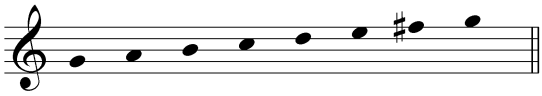
Example 8:



Visualizing C major is particularly useful as it uses only white keys. This makes the two half-steps very easy to see. Notice that on the piano keyboard, the keys E and F (the third and fourth white keys) have no black key in between them. The same is true for B and C. These two pairs of notes correspond to the half steps shown in Example 6.

Activity UUU.3:

Every major scale has two half steps. Identify the half steps in the following G-major scale:



Exercise UUU.3a
Name one pair of consecutive notes that form a half step in a G-major scale.
[Answer: B/C or F♯/G. Response if correct: "Correct!" Response if incorrect: "Incorrect. Try again."]

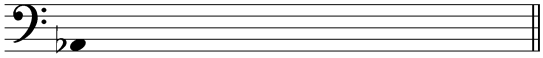
Exercise UUU.3b
Now identify *the other* pair of consecutive notes that form a half step in the G-major scale.
[Answer: B/C or F♯/G (the other answer from Exercise UUU.3a). Response if correct: "Correct!" Response if incorrect: "Incorrect. Try again."]

Building a major scale:

There are several ways of building a major scale like those we've discussed so far. One way is to take advantage of the fact that every major scale follows the same pattern of whole steps and half steps.

Let's say you were asked to build an A♭-major scale (a major scale beginning on A♭). A good place to start would be to write A♭ on the staff:

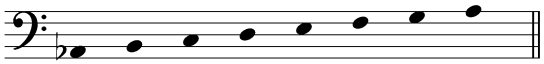
Example 9:



Note: When writing music on a staff, accidentals are always placed to the left of the note they're applied to, as in Example 9. When referring to them in written prose—as in the text of this lesson—they are written as you would say them out loud, with the accidental coming just after the pitch-letter name: "A♭ major."

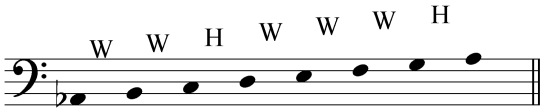
Since the major scale uses each of the pitch-letter names only once before reaching the tonic note again, we can fill in the rest of the noteheads to help ensure that we're spelling the scale correctly. Don't worry about accidentals yet—those will come in the next step.

Example 10:



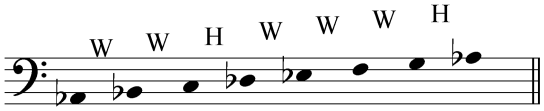
As we've seen, every major scale follows the same pattern of whole steps and half steps. You may find it helpful at first to write the pattern above or below your scale:

Example 11:



Once the noteheads are in place, completing the major scale is simply a matter of working from left to right and making sure each note conforms to the pattern. The step from A♭ to B is larger than it should be: A♭ to B is three semitones instead of two. Since we can't change the initial A♭, our only alternative is to lower the B to B♭. A♭ to B♭—a whole step—is the first step of the Ab-major scale. Moving from B♭ to C is already a whole step, so C needs no accidental. Then we see that C to D is a semitone larger than the half step we need it to be. Lowering D to D♭ will solve this problem. And so on, until we arrive back at the keynote (if your scale began with an accidental, don't forget to put one on the ending keynote as well!):

Example 12:

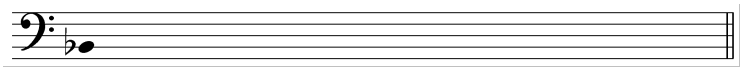


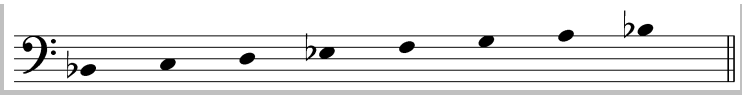
As Example 12 shows, the A♭-major scale requires four flats (B♭, E♭, A♭, and D♭) to conform to the pattern of whole steps and half steps. Other scales will require sharps to maintain the pattern, but major scales will never use both sharps and flats in the same scale.

Activity UUU.4:

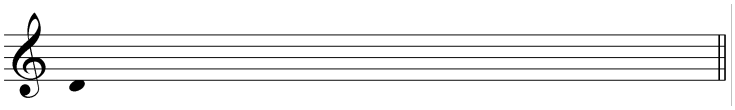
In each of the following exercises, you will be given the keynote of a major scale. Fill in the remaining seven scale degrees ($\hat{2}$ through $\hat{8}$).

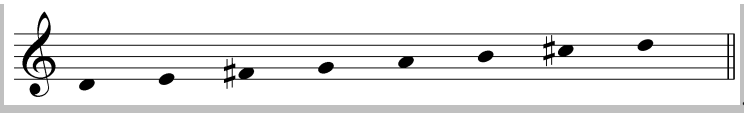
Exercise UUU.4a
Build a B♭-major scale:



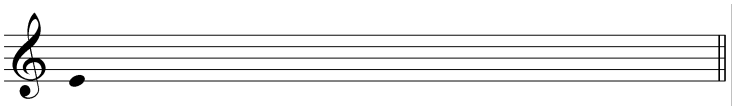
[Answer:  . Response if correct: "Correct!" Response if incorrect: "Incorrect. Try again. (Hint: Use the pattern of whole steps and half steps to determine each consecutive step of the scale.)"]

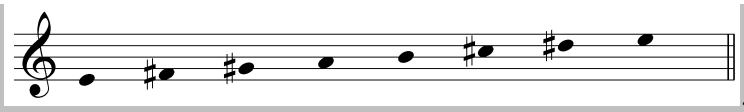
Exercise UUU.4b
Build a D-major scale:



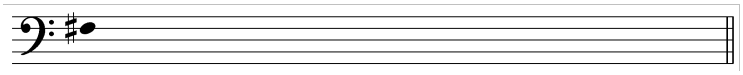
[Answer:  . Response if correct: "Correct!" Response if incorrect: "Incorrect. Try again. (Hint: Use the pattern of whole steps and half steps to determine each consecutive step of the scale.)"]

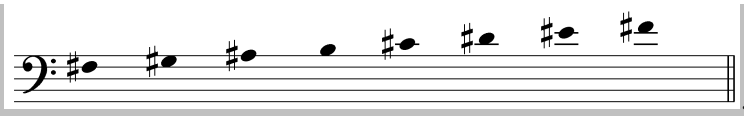
Exercise UUU.4c
Build an E-major scale:



[Answer:  . Response if correct: "Correct!" Response if incorrect: "Incorrect. Try again. (Hint: Use the pattern of whole steps and half steps to determine each consecutive step of the scale.)"]

Exercise UUU.4d
Build an F♯-major scale:

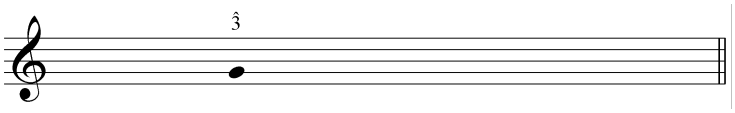


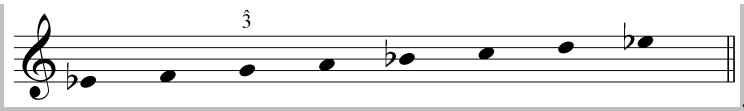
[Answer:  . Response if correct: "Correct!" Response if incorrect: "Incorrect. Try again. (Hint: Use the pattern of whole steps and half steps to determine each consecutive step of the scale.)"]

Activity UUU.5:

For each of the following exercises you will be given a pitch and told what major scale degree it represents. It is up to you to fill in the remainder of the scale. The keynote of the scale may or may not have an accidental.

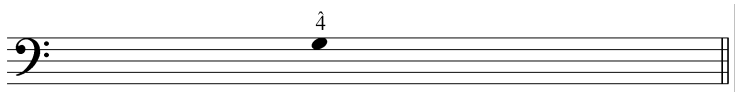
Exercise UUU.5a
Build a major scale in which G is $\hat{3}$:

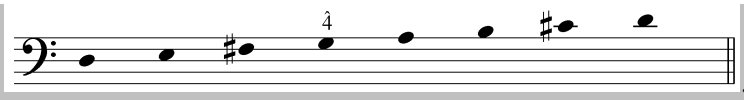


[Answer: 

. Response if correct: "Correct! G is the third degree of an E♭-major scale." Response if incorrect: "Incorrect. Try again. (Keep in mind that the keynote of the scale may or may not have an accidental.)"]

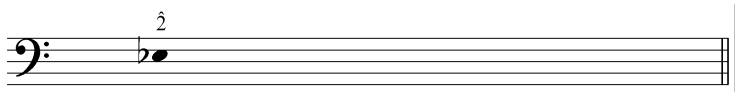
Exercise UUU.5b
Build a major scale in which G is $\hat{4}$:

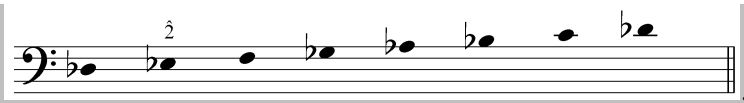


[Answer: 

. Response if correct: "Correct! G is the fourth degree of a D-major scale." Response if incorrect: "Incorrect. Try again. (Keep in mind that the keynote of the scale may or may not have an accidental.)"]

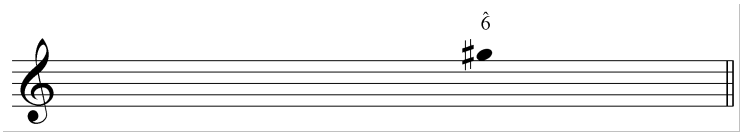
Exercise UUU.5c
Build a major scale in which E♭ is $\hat{2}$:

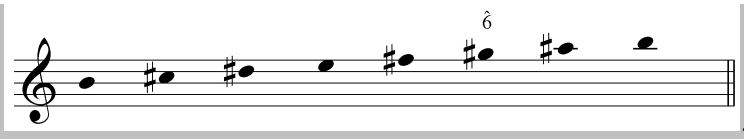


[Answer: 

. Response if correct: "Correct! E♭ is the second degree of a D-major scale." Response if incorrect: "Incorrect. Try again. (Keep in mind that the keynote of the scale may or may not have an accidental.)"]

Exercise UUU.5d
Build a major scale in which G♯ is $\hat{6}$:



[Answer: 

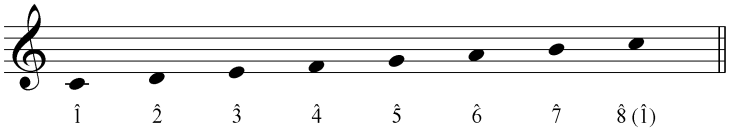
. Response if correct: "Correct! G♯ is the sixth degree of a D-major scale." Response if incorrect: "Incorrect. Try again. (Keep in mind that the keynote of the scale may or may not have an accidental.)"]

Scale degree labels:

Because the pattern of whole steps and half steps discussed above is the same for every major scale, we can use labels for each scale degree with respect to a given keynote. The three main types of labels that we will give scale degrees in this lesson are *scale-degree numbers*, s*olfège syllables*, and *scale-degree names*.

Labeling with scale-degree numbers is the most straightforward systems: each scale degree is given a number 1 through 8. Scale degree numbers are distinguished from other types of numbers by the caret (^) that appears above each digit: $\hat{1}$, $\hat{2}$, $\hat{3}$, $\hat{4}$, $\hat{5}$, $\hat{6}$, $\hat{7}$, and $\hat{8}$. The following example demonstrates:

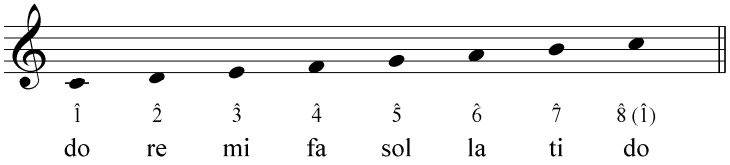
Example 13 (major scale with scale-degree numbers):



As we saw earlier, the keynote can function as the beginning of a scale or the end. Hence, $\hat{8}$ and $\hat{1}$ are used interchangeably, depending on the context.

When singing, it is convenient to give each scale degree a single-syllable name. *Solfège syllables*, as they are commonly called, are most often used when practicing vocal performance, but can also be used to refer to scale degrees in general.

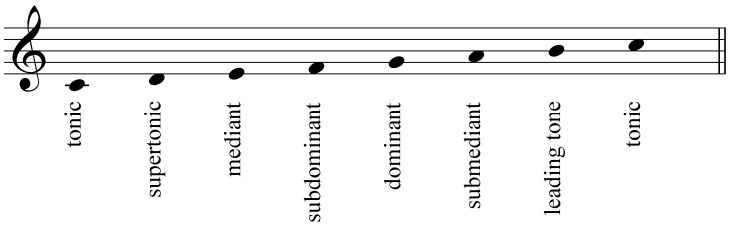
Example 14 (major scale with solfège syllables):



As popularized by the Broadway musical *The Sound of Music*, solfège syllables are particularly useful for how they help familiarize us with the relationships between various scale degrees. Becoming acquainted with solfège syllables will be a tremendous help in memorizing and performing music.

Our final system for labeling scale degrees gives each a name according to its position relative to the keynote and its function within the scale:

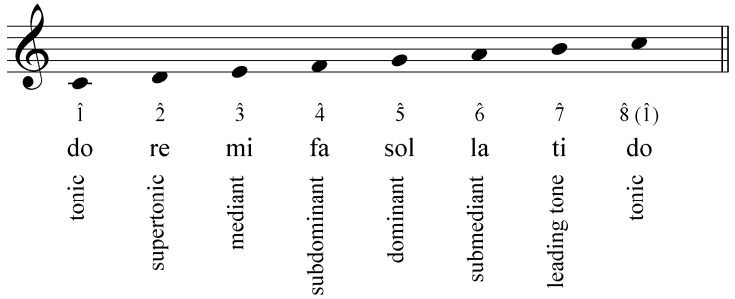
Example 15 (major scale with scale degree names):



The tonic—another, common name for the keynote—is central to this system. In other words, all of the other labels indicate the position of the scale degrees relative to the tonic. The dominant is four steps above the tonic, the subdominant is four steps below the (upper) tonic. The mediant is two steps above the tonic, the submediant is two steps below the (upper) tonic. The supertonic, as the name implies, is just above the tonic, while the leading tone is a semitone below. These names will be particularly useful when it comes to discussing functional harmony.

It may seem redundant to have three labeling systems for the scale degrees, but each has a different and useful purpose. It is essential that you familiarize yourself with all three and be able to use them interchangeably.

Example 16 (three ways to label scale degrees):

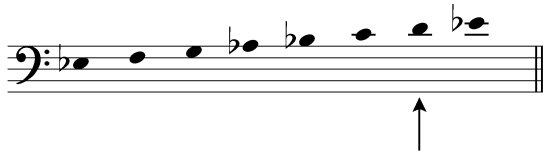


Activity UUU.6:

Identify the solège syllable, scale-degree number, or scale degree name as specified for each of the following scales:

Exercise UUU.6a

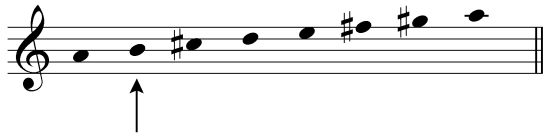
What is the scale-degree number for the note indicated by the arrow in the following Eb-major scale?



[Answer: "7." Response if correct: "Correct!" Response if incorrect: "Incorrect. Try again."]

Exercise UUU.6b

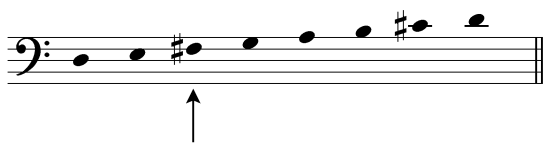
What is the solfège syllable for the note indicated by the arrow in the following A-major scale?



[Answer: "re." Response if correct: "Correct!" Response if incorrect: "Incorrect. Try again."]

Exercise UUU.6c

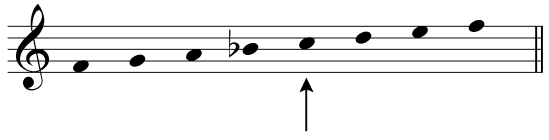
What is the solfège syllable for the note indicated by the arrow in the following D-major scale?



[Answer: "mi." Response if correct: "Correct!" Response if incorrect: "Incorrect. Try again."]

Exercise UUU.6d

What is the scale-degree name for the note indicated by the arrow in the following F-major scale?



[Answer: "dominant." Response if correct: "Correct!" Response if incorrect: "Incorrect. Try again."]

Conclusion:

The major scale, one of the most important building blocks of tonal music, consists of seven distinct pitch classes called scale degrees arranged in a specific pattern. It begins and ends with the most important pitch, the keynote (or tonic), by which we name the scale. Each pitch letter name is used only once (except for the keynote, which is typically repeated at the end of the scale).

Every major scale is built of two tetrachords separated by a whole step, each of which follows the same pattern of whole steps and half steps internally: W-W-H. The overall pattern of a major scale, therefore, is: W-W-H-W-W-W-H. Every major scale follows this same pattern and it is this specific pattern that gives the major scale its unique sound.

There are three common systems for labeling scale degrees: scale-degree numbers ($\hat{1}$, $\hat{2}$, $\hat{3}$, etc.), solfège syllables (*do*, *re*, *mi*, etc.), and scale-degree names (tonic, supertonic, mediant, etc.). Each system has a different purpose and you should be able to use all three interchangeably.