# Sight-singing Using Tonic Sol-fa

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## Understanding a 1,000-year-old Singing System

When we hear someone sing the syllables *do re mi fa so la ti do*, many of us instinctively think of the cute little song that Julie Andrews taught the von Trapp children in *The Sound of Music*. ("Doe, a deer, a female deer" – remember?) Others may think back to our early school days, of putting Dick And Jane aside while the district music teacher taught us scales. But whatever we think, that system of singing wasn't cooked up by Oscar Hammerstein II or by some obscure professor. It has a name – **solmization** – and it has quite a history.

An eleventh-century monk, Guido d'Arezzo, was the scholar who first used the syllables of solmization. He noticed that each of the first six phrases of a popular hymn to John the Baptist was sung on a different ascending step, in a particular pattern. This song was in existence (c. 700 A.D.) long before the invention of the musical staff as we know it, before there was such a thing as a "major scale," and before there were even names for the distances up or down (such as "whole steps," "half steps," "major thirds," and "perfect fourths"). Notation in those days was a hazy concept, using symbols called *neumes* to indicate a movement up or down, but not being too precise about the exact intervals. Interpreting the neumes relied on the singer's memory of the individual songs.

This song to John the Baptist, however, was a "Top 10" tune for Guido and his peers. Everybody knew it. So, Guido took the first syllable of each of the first six phrases of their medieval chart-topper to represent very specific pitches, and voila – he had a handy and accurate way of communicating musical information (just as we can sing "Doe, a deer, a female deer," and then know exactly on which pitch to sing "Ray").

There were only six ascending pitches (Fig. 1). The song's "lyrics" were: *Ut queant laxis, Resonare fibris, Mira gestorum, Famuli tuorum, Solve polluti, Labii reatum*. The pattern of the syllables was *Ut*; up a whole step to *Re*; up a whole step to *Mi*; up a half step to *Fa*; up a whole step to *Sol*; and up a whole step to *La*.

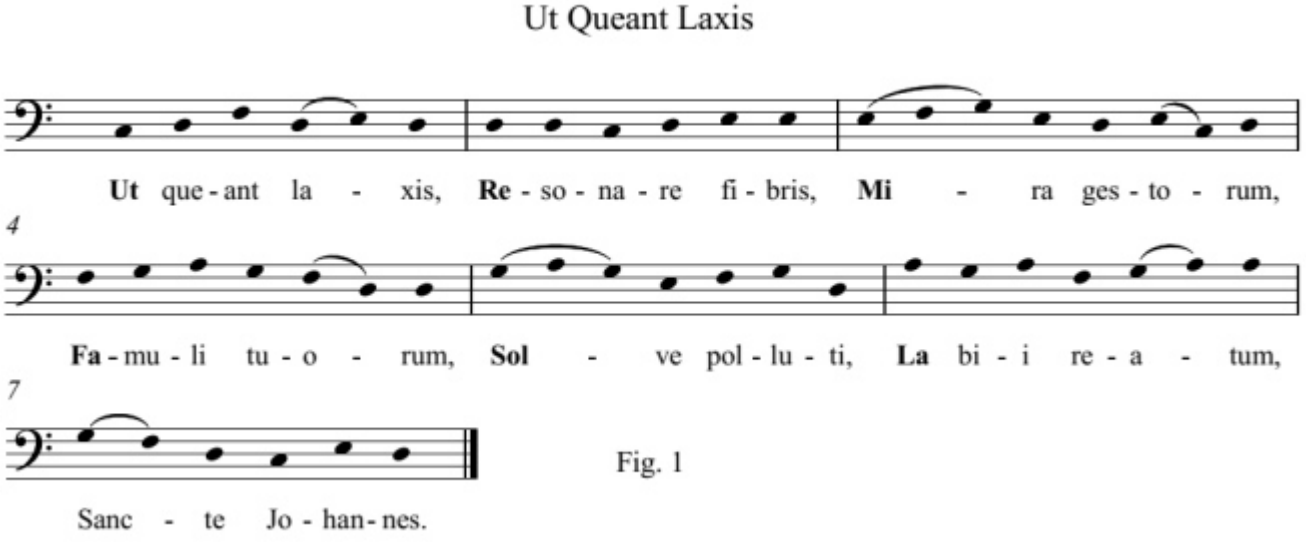



Fig. 1

These six steps made up what was called a *hexichord*. There were three different hexachords: the “natural” hexachord, beginning on C; the “hard” one, beginning on G; and the “soft” one, beginning on F. Because the range of each overlapped the next, singers would need to switch from one hexachord to another if a piece of music went beyond six notes. The hexachord system was used from the eleventh century into the seventeenth century.

## Fixed Do

By the late 1600’s, the seven-tone scale (which is what we are familiar with today) had evolved. To complete the octave, the syllable *si* – taken form the first letter in each word of “*Sante Iohannes*,” the last phrase of the hymn – was added, representing the seventh note. The syllable *Ut* was generally replaced by *Do* in order to keep the consistency of consonant followed by vowel. In France, *Ut* is still used for the note C. Sometime during the seventeenth century, *do* or *ut* was “fixed” at the pitch C, and the term “fixed-do” was coined.

The fixed-do system came to be called *Solfege* (French) or *Solfeggio* (Italian). It is used mostly in continental European countries. With this system, you call the treble (or G) clef “*Sol* clef;” D# is “*Re* sharp;” and the key of Bb major would be called “*Si* flat major.” The letter names aren’t used at all. Instead, the notes we know as C, D, E, F, G, A, B are called *Do, Re, Mi, Fa, Sol, La*, and *Si*.

Solfege is used mostly as a method of teaching music theory, and isn’t practical as a sight-singing or ear-training method. You would need to memorize the sound relationship of each pitch to every other pitch with in the context of every key – no easy feat for those who don’t have perfect pitch. Sight-singing in the key of C would be easy enough, but keys with several sharps or flats would be far more difficult.

## Movable Do

During the 1800’s, John Curwen, an English congregational minister, discovered that a Norwich woman, Miss S. A. Glover, was teaching a movable-do method of solmization. With this system, *do* always represented the tonic, or first degree, of the major scale.

Curwen thought it was a good idea, so he perfected the method, and founded a society, a college, and publishing firm to further promote it. At some point, the syllable *si* was dropped in favor of *ti*, because there would otherwise be two syllables that began with the letter s. In notation, the syllables were represented by the first letter: *d, r, m, f, s, l,* and *t*. This movable-do system is what today is known as tonic *sol-fa*.

This system is used in college ear-training and sight-singing courses in the United States. The *l* is dropped from *sol* in pronunciation and often in spelling (as in this article).

Because the ascending syllables from *do* to *do* have the “tune” of a major scale, no matter what key a piece is in, the tonic sol-fa syllables can be used as a tool for sight-singing (singing the correct pitches at first reading of musical notation). Also, because the major scale contains every interval (major and minor seconds, thirds, sixths, and sevenths, perfect fourths and fifths, and the tritone – which is both an augmented fourth and a diminished fifth) – tonic sol-fa provides a method for ear training (disciplining a singer to be able to recognize and sing

intervals) as well. When we are given a pitch on which to sing *do*, we can then find any other pitch in the scale beginning on that note, because we can remember the “tune” of the scale.

The pitches between the major scale degrees are known as *altered* notes, and will show up in a piece with *accidentals* (sharps, flats, and naturals that are not in the key signature). The altered notes in tonic sol-fa are sung with altered syllables (Fig. 2). In general, you would sing the raised notes with the *i* (long E) sound and the lowered notes with the *e* (long A) sound. The exception is re, which already having the Latin *e* (English long A), is changed to *ra* for the lowered pitch. (Some schools instead use *a* as in “aw” for all lowered pitches.)

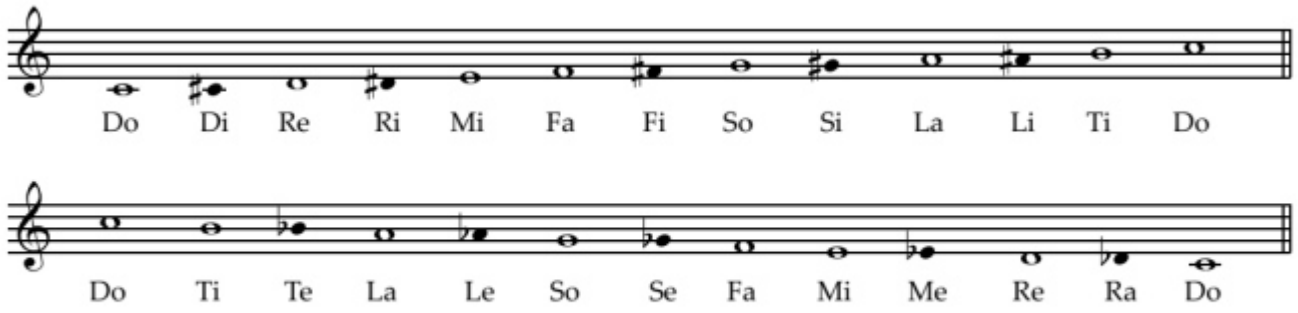



Fig. 2

A singer treats the minor scales as the relative minor of the major key, with or without altered notes (Fig. 3). You would sing the natural minor scale *la, ti, do, re, mi, fa, so, la* (no alterations). You use *si* instead of *so* for the raised seventh degree in the harmonic minor and the ascending melodic minor scale. Many scholars prefer *be* (pronounced “bay”) rather than *fi* for the raised six of the melodic minor scale.

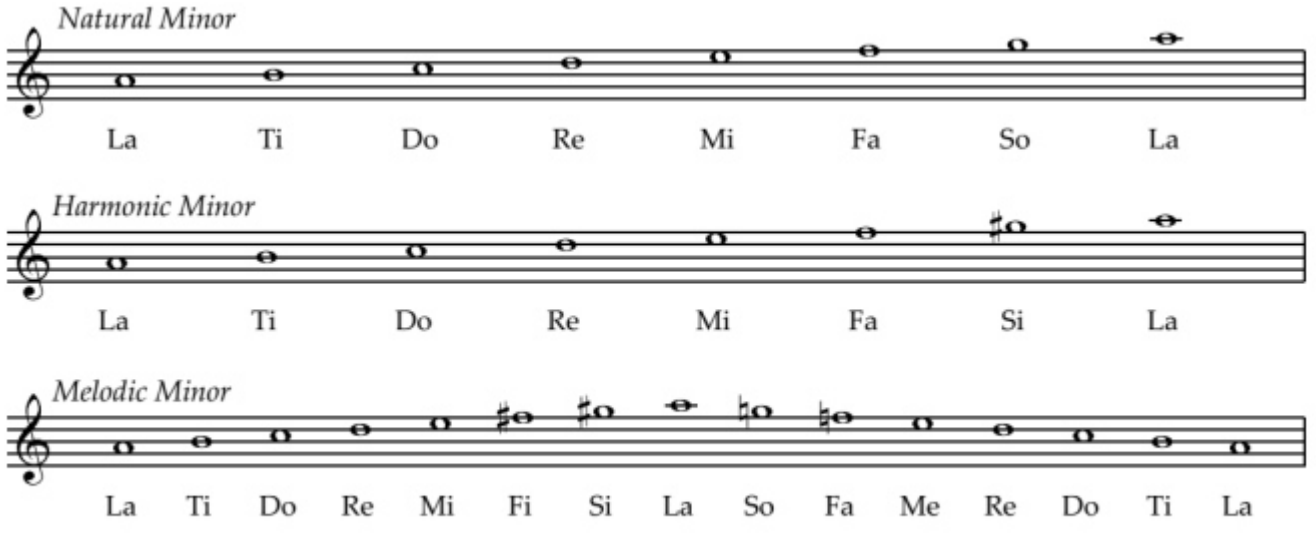



Fig. 3

**By the Numbers**

Tonic sol-fa is similar to the sight-singing method of singing the actual *scale degrees* (as numbers). This is known as the **number system**. The numbers 1, 2, 3, 4, 5, 6, 7, 8 (or 1) have the same tune as *do, re, mi, fa, so, la, ti, do*, so both systems can work in the same way. But there are a few problems with the number system. First, “seven” is a two-syllable word, so there

is a rhythmic discrepancy. There are further problems with rhythm when you try to sing altered notes. You can sing “lowered” or “flat” along with the number, but you’d find it quite difficult to sing “low-ered se-ven” on a sixteenth note.

Another problem with the number system for sight-singing is that many of the numbers are made up of consonants and vowels that are difficult to pronounce – particularly on high notes, and when complicated by the tightness or lack of support that many sight-singers experience due to being “on the spot.” Tonic solf-fa, on the other hand, uses single syllables that end with open vowels and are easy to pronounce on nearly any pitch.

One way in which singers can successfully apply the number system is to think the numbers and sing a syllable such as la or ah. But in the early stages of learning to sight-sing, it is difficult to think one word and sing another. Tonic sol-fa allows us to sing the same syllable that is our cue to the pitch.

Even though it takes some time to learn the syllables, tonic sol-fa is a method that can work well for most people. But remember that the method is essentially a means to an end. Just as the foreign language student strives to actually think in that language, the sight-singing student works toward being able to think in the language of musical pitches and intervals – without the intermediate step of syllables. The ultimate goal is to pick up an unfamiliar piece of music and just sing it!

Sidebar 1

**Finding Your ‘Best Key’**

I am often asked by vocal students who don’t play an instrument, “What is my best key?” or “What key do I sing in?”

This is actually a misphrased question, because there isn’t one best key in which a vocalist will be able to sing every song in his or her repertoire.

Each song has a particular range of notes. For example, “Old MacDonald” has a range of six notes – from the 5$^{th}$ degree of the scale up to the 3$^{rd}$, or, from *so* to *mi* (in tonic sol-fa). If it’s in the key of C, the notes would be from G up to E.

Another song with a range of six notes is “Twinkle, Twinkle, Little Star.” Though its range contains the same number of notes as “Old MacDonald,” the notes are from the 1$^{st}$ degree to the 6$^{th}$, or *do* to *la*. In the key of C, the notes would be from C up to A.

**Different Options**

If these two songs are played in the same key, they are sung in quite a different part of the vocal range. But because both songs span only six notes, they can easily be sung in many different keys, depending on the extent of the vocalist’s range.

On the other hand, look at “The Star Spangled Banner,” which has a range of 12 notes, from the 1$^{st}$ degree up an octave to the 5$^{th}$, or from *do* to the second *so*. This song might be difficult for a singer to perform comfortably in more than two or three different keys.

So the question isn't really what is your best key, but what is your best range – and, what key should each particular song you sing be put in, to best accommodate that range. To get the answer, you'll need a piano and someone who knows a little music theory.

**Test the Extremes**

The first thing is to find your lowest and highest notes at different volume levels. For instance, if you're comfortable with a low G when you sing quietly, this would be your lowest note for ballads. But you may not be able to belt out a low G, so for rock and roll, your low note might only be a B, or Bb.

Next, go through your entire repertoire and figure out each song's range of notes. If you have sheet music, look for the lowest and highest notes. If you have learned the song from a recording, you'll need to listen for the lowest and highest notes and find them on the piano.

Next, ask your theory-knowledgeable friend what key the song is in. They should be able to figure it out from sheet music, or by ear from a recording.

If the song is too high or too low for you, you'll need to decide how many half-steps to move the key up or down to fit the song into your range.

It's a good idea to keep a list of all the songs in your repertoire. Include the title, original artist, or composer – and the key! Then, when you sit in with a band, you can refer to your list and say to the bandleader, "I do 'God Bless the Child' in Bb."

Sidebar 2

**Building Sight-singing Skills With Tonic Sol-fa**

How do you use the tonic sol-fa system to sight-sing a piece of music? The first thing you need to *do* is to find where do is on the musical staff.

The key signature is the group of sharps (#) or flats ($b$) that are found at the beginning of each line of a piece of music. When people say the "key of C," or "key of A$b$" they are essentially saying that *do* is the note C or A$b$, respectively. Even if you don't know how to read the notes themselves, learning these simple rules should enable you to find do in any piece of music, and then sight-sing the pitch relationships. (You'll still have to know how the duration of the notes – the rhythmic values – are indicated, to sing music at sight.)

Rule 1: When there are no sharps or flats in the key signature, *do* is found on the second from the top space of the treble clef and the second from the bottom space of the bass clef. This is the key of C major.

Rule 2: When there is one flat in the key signature, *do* is found on the bottom space of the treble clef and the second from the top line of the bass clef. This is the key of F major.

Rule 3: When there are two or more flats, *do* is found on the same line or space as the second to the last flat (reading left to right). Since the flat is already on that line or space, the key's name would include the flat, as in "key of B$b$, or E$b$."

Rule 4: When there are any number of sharps, *do* is found on the next line or space up from the last sharp (reading left to right).

With these four rules, you can find do in any key signature. The rest of the syllables fill the consecutive lines and spaces up or down from *do*.

If there are accidentals (extra sharps or flats that appear in the music, and are not in the key signature), you will need to make an adjustment – up a half-step for sharps, or down a half-step for flats – and sing the altered syllable that corresponds. Natural signs are also used as accidentals to raise or lower pitches. That is, natural signs cancel out sharps or flats, lowering or raising the marked notes back to their original pitches. If there are sharps in the key signature, the natural sign will lower the pitch, so you sing it as if it were a flat. If there are flats in the key signature, the natural sign will raise the pitch, so you sing it as if it were a sharp.

Practice sight-singing with any piece of music you can get your hands on, and you will eventually become an efficient reader. Sight-singing is a valuable tool for many applications, from choral singing to studio recording.

Sidebar 3

**Ear Training with Tonic Sol-fa**

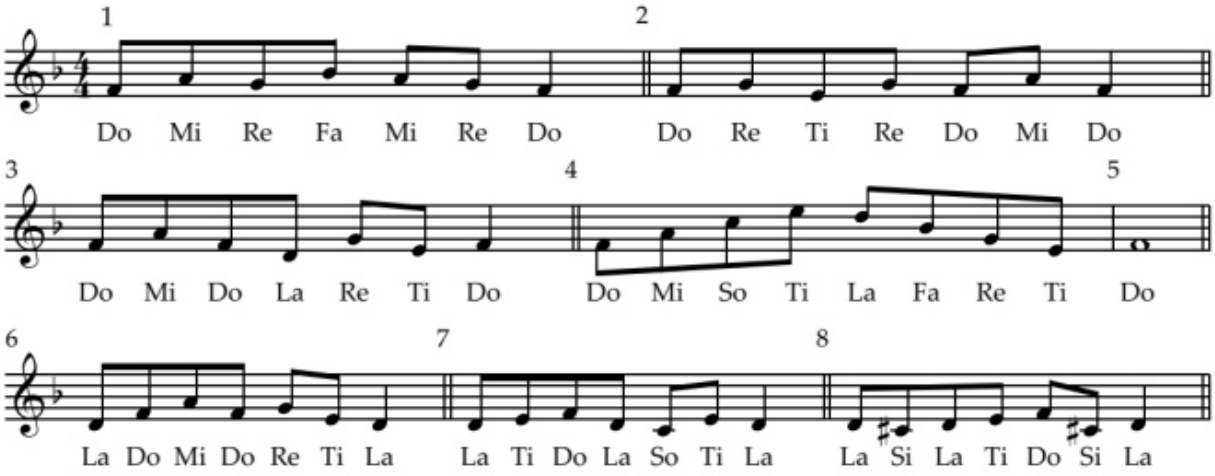
The tonic sol-fa system can really help in ear-training – that is, developing skill at hearing, identifying, and vocalizing musical intervals. Here are some exercises that show how to do that.

**Tune-up**

1. Choose a major scale is comfortable for your vocal range (or the vocal ranges of your singing group). While playing each note on the piano, sing the ascending and descending scale using the *syllables do, re, mi, fa, so, la, ti, do, ti, la, so, fa, mi, re, do*.
2. Sing the same scale again, only a cappella (without accompaniment) and see how close you are to ending on the correct pitch. (Check by playing the final note on the piano.)
3. Repeat steps 1 and 2 until your pitch accuracy is 100%.

**Melodic Patterns**

1. Play and sing the patterns shown below (transpose them to a comfortable key).
2. Sing each of the patterns again a cappella and check the final do against the piano.
3. Make up patterns and practice singing the correct syllables. To keep it simple, start with *do* and make up short (five or six note) melodies that end with *do*.



Card Games

(Write each of the seven syllables on a separate 3 x 5 index card. Make three or four cards for each syllable.)

1. Shuffle the cards and draw three to five cards at a time. Beginning and ending with *do* (in addition to the cards drawn), sing the syllables in the order they were drawn. Check your accuracy against the piano.
2. For a greater challenge, draw a larger number of cards and omit the *do* at the beginning and end.

(Once you are successful with the major scale syllables, you can make cards with the altered syllables: *di, ri, fi, si, li, te, le, se, me*, and *ra*, and shuffle them into the stack.)

Intervals

In music, an *interval* is what we call the distance between two notes. When you sing the first note in a scale (*do*) and then move up to the second note in the scale (*re*), you're singing the distance of a second. An interval can be the distance up or down from any note in the scale. For example, if you sing *fa* and then move down to *re*, you are moving the distance of a third. Counting *fa* as the first note in the interval, *re* would be the third one down.

Practice the following intervals melodically (one note at a time) which is the only way you can sing them by yourself; or harmonically, by playing one of the notes on the piano and singing the other, or by harmonizing with a friend.

1. Sing **seconds**, first ascending: *do-re, re-mi, mi-fa, fa-so, so-la, la-ti, ti-do*; and then descending: *do-ti, ti-la, la-so, so-fa, fa-mi, mi-re, re-do*.
2. Sing **thirds**, first ascending: do-mi, re-fa, mi-so, fa-la, so-ti, la-do, ti-re; and then descending: do-la, ti-so, la-fa, so-mi, fa-re, mi-do, re-ti.
3. Sing **fourths**, first ascending: do-fa, re-so, mi-la, fa-ti, so-do, la-re, ti-mi; and then descending: do-so, ti-fa, la-mi, so-re, fa-do, mi-ti, re-la.
4. Sing **fifths**, first ascending: do-so, re-la, mi-ti, fa-do, so-re, la-mi, ti-fa; and then descending: do-fa, ti-mi, la-re, so-do, fa-ti, mi-la, re-so.
5. Sing **sixths**, first ascending: do-la, re-ti, mi-do, fa-re, so-mi, la-fa, ti-so; and then descending: do-mi, ti-re, la-do, so-ti, fa-la, mi-so, re-fa.
6. Sing **sevenths**, first ascending: do-ti, re-do, mi-re, fa-mi, so-fa, la-so, ti-la; and then descending: do-re, ti-do, la-ti, so-la, fa-so, mi-fa, re-mi.

First practice the intervals in order as shown here, until you can sing quickly and accurately. Then make a set of "interval cards" (ascending third, descending seventh, etc.) and draw one card from that set and one from your syllable cards to practice intervals at random.