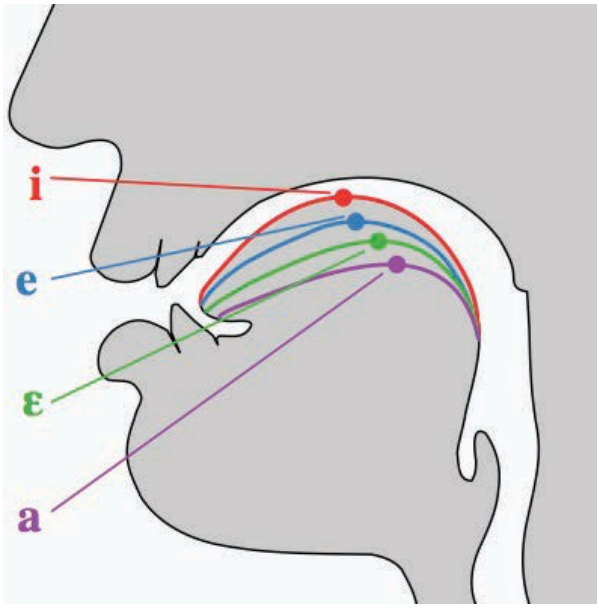
The Human Voice as a Performing Force

The human voice is the most intimate of all the music instruments in that it is the one that most of us are innately equipped. We breathe in, and, as we exhale, air rushes over the vocal cords causing them to vibrate. Depending on the length of the vocal cords, they will tend to vibrate more slowly or more quickly, creating pitches of lower or higher frequencies. The muscles in the larynx contract, causing the vocal cords to close, and air pressure forces them open. This closing and opening can happen hundreds of times a second. To reach a higher pitch vocal cords vibrate more rapidly. Changing the shape of your vocal cavity allows for different timbres and vowel sounds. Changing the position of the mouth and lips allows for further variety in sound and to produce consonants. Because men tend to have thicker and longer vocal cords, they tend to have lower voices than women, whose vocal cords tend to be shorter and slimmer. The natural speaking voice exhibits some variation in pitch. One's voice often rises at the end of a question. When you have a cold and the vocal cords are swollen, you often speak in lower pitches than normal. Singing generally differs from speaking in that it uses a wider range of definite pitches that often occur in a regular meter (discussed later). By range, we mean the number of pitches, expressed as an intervallic distance. A trained opera singer might have a range of three to four octaves, whereas the average person has a range of a little over an octave.

Additionally, as we speak, we generally focus on consonants, which articulate the beginnings and ends of syllables and help make our meaning plain. In singing, performers often focus on the vowels, as vowels tend to carry better than consonants. Also, the meaning of the words is sometimes deemed less significant than the melodies themselves.



Position of the larynx for various vowel sounds
Author: User "Badseed"
Source: Wikimedia Commons

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In Western music, voice ranges are typically split into four categories:

- Bass: lowest male voices; sing in a low **register**, below middle C (middle C being the C approximately in the middle of the range of the piano)
- Tenor: highest male voices; sing in a register around and below middle C
- Alto: lowest female voices; sing in a register around and above middle C
- Soprano: highest female voices; sing almost exclusively above middle C

Western classical music tends to use all four of these ranges, whereas melodic register and range in jazz, rock, and pop tends to be somewhat more limited. As you listen to jazz, rock, and pop, pay attention to ranges and registers used as well as any trends. Is most female jazz vocalists altos or sopranos? Do most doo-wop groups sing in higher or lower registers? Different musical voices exhibit different musical timbres as well, as you heard earlier with Louis Armstrong and Ella Fitzgerald.

Non-Acoustic Instruments

Electric sounds and instruments: instruments can be electric in several ways. In some cases, an acoustic instrument, such as the guitar, violin, or piano may be played near a microphone that feeds into an amplifier. In this case, the instrument is not electric. In other cases, amplifiers are embedded in or placed onto the body of an acoustic instrument. In still other cases, acoustic instruments are altered to facilitate the amplification of their music. Thus, solid body violins, guitars, and basses may stand in for their hollow-bodied cousins. Another category of electronic instruments is those that produce sound through purely electronic or digital means.

Synthesizers and the modern electric keyboard, as well as beat boxes, are examples of electronic instruments that use wave generators or digital signals to produce tones. Synthesizers are electronic instruments (often in keyboard form) that create sounds using basic wave forms in different combinations. The first commercially available compact synthesizers marketed for musical performance were designed and built by Dr. Robert Moog in the mid-1960s. A staple of twenty-first century music, synthesizers are widely used in popular music and movie music. Their sounds are everywhere in our society. Synthesizers are computers that combine tones of different frequencies. These combinations of frequencies result in complex sounds that do not exist in nature. Listen to the recording below of Bjork, which incorporates a live band with a variety of strange and interesting synthesized sounds.

Solid-state electronics have enabled the synthesizer to shrink in size from its early days in the 1970s. Compare the number of electronic components in the photo of Keith Emerson's "rig" with the much smaller keyboard synthesizers used by Chick Corea linked below.

Chick Corea, Live at North Sea Jazz 2003
https://www.youtube.com/watch?v=SL34LYIWQ6M

Early Minimoog by R.A. Moog Inc. (ca. 1970)
Author: User “glacial23”
Source: Wikimedia Commons
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Synthesizers can also be used to imitate the complex sounds of real instruments, making it possible for a composer to create music and have it played without having to hire a real orchestra. The video below features music created using sample-based synthesis, a method that incorporates recorded audio “samples” to approximate the sound of an orchestra through a computer.

Vienna Symphonic Library
https://www.youtube.com/watch?v=Cwbgp26g-QQ

Today, the ability to make high quality recordings is within the reach of anyone with a laptop and a microphone. But only a few years ago, recordings were an expensive endeavor available only to those with the financial backing of a record label. Musicians of the twenty-first century have access not only to recording technologies, but also to new and cutting-edge tools that are fundamentally changing how music is created, enjoyed, and disseminated. The synthesizer discussed above can be a recording technology, but there are others such as Auto-Tune.

Auto-Tune is a technique originally invented to correct for intonation mistakes in vocal performances. However, the technique quickly evolved into a new form of expression, allowing singers to add expressive flourishes to their singing. Eventually, the technique was used to turn regular speech into music, making it possible to create music out of everyday sounds. Listen to the clip below of the musical group, the Gregory Brothers, who regularly use Auto-Tune to create songs from viral Internet videos and news clips.

Obama Mixtape: 1999 - Songify the News Special Edition
https://www.youtube.com/watch?v=eq1FIvUHtt0

Looping is another technique that musicians now use to create music on the spot. The technique involves recording audio samples which are then repeated or "looped" over and over again to a single beat. The performer then adds new loops over the old ones to create complex musical backdrops. The clip below features a street musician named Dub FX, who uses only his voice, a loop pedal, and some audio effects to replicate the effect of a full band.

Dub FX
https://www.youtube.com/watch?v=lvyDy15vW6U

Boss RC-50 Loop Station
Author: User "Massygo"
Source: Wikimedia Commons