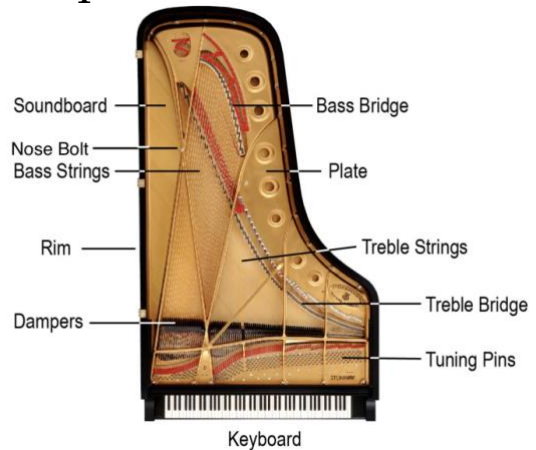


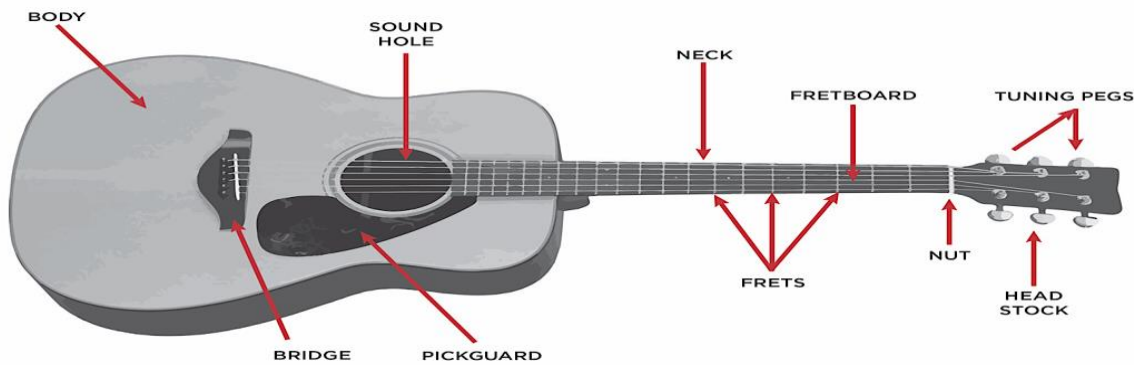
## Compared to a Piano



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Instruments are machines with fixed and moving parts designed to make sound(s). They have been categorized into families such as wind instruments, string instruments, or percussion instruments. One of the most common characteristics that many instruments share is the fact that most are made entirely or partially out of wood, but the wooden parts do not behave the same or perform the same function in all instruments. For example: a clarinet tube functions as a structural wooden tube that encloses an air column whereas a piano soundboard is an amplifier that is supple and vibrates to make the strings sound louder. Let's look at some other instruments compared to the piano to see how they relate.

The acoustic guitar, a crowd favorite, is essentially a wooden box with a hole in it and strings running over the hole. The strings are fixed at one end to a bridge and held at the other end by pegs that can be turned to tighten or loosen and tune the strings like the tuning pins in a piano. The guitar body is made of a stiff bottom panel, a stiff rim, and a more supple and flexible top panel. The top panel must be flexible because one of its jobs is to accept vibration from the strings attached to the bridge which is fixed to the top panel and send the vibrations into the box or resonance chamber to grow into a sound that is emitted from the tone hole. The rim and back panel must remain stiff so as to support the top panel in its vibration otherwise it will vibrate weakly and produce a lower quality sound. Looking at the piano, we have strings attached to tuning pins and to a fixed hitch pin but running over a bridge connected to the soundboard. The soundboard is a thin, flexible piece of wood supported by the stiffness of the surrounding rim. Pianos do not have a back panel under the soundboard, but they do have a structure of thick beams of wood to reinforce the rim's stiffness. A piano with lid closed forms a resonance chamber with no tone hole. To release the sound, the lid must be opened, mimicking a tone hole. Unlike a guitar, the piano's resonance chamber is above the soundboard instead of underneath it.



Let's look at the violin, which has a very similar design to the viola, cello, and double bass. Unlike the guitar, the strings on a violin are fixed at one end to a tailpiece, but like the guitar and piano, are wound around tuning pins/pegs at the other. The violin has a bridge that is held to the body by string tension alone. Violins also have a small dowel called the sound post inside the body wedged between the foot of the bridge and the back panel. This post helps to transfer stiffness from the back panel to the bridge on one end while the other foot of the bridge vibrates the supple top panel. The sound post can be compared to the piano's nose bolt which is a long bolt near the middle of the soundboard connecting the metal plate to the heavy wooden beams underneath the soundboard. Though it does not have connection with the bridge, it helps to maintain stiffness of the parts surrounding the soundboard all with the intention of allowing the soundboard to move freely. Like the guitar, the violin also has a resonance chamber with two curvy tone holes called f-holes. The top panel of the violin is more curved than the top panel of a guitar making it like the slightly curved or crowned piano soundboard. This curve promotes resonance.

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A piano may seem larger and unlike a violin or guitar, but the instruments have a lot in common structurally and are similarly affected by changes in the environment like all wooden instruments. Luthiers (craftsmen who work on guitars and violins) invented a device called a Dampit which is a cylindrical sponge surrounded by a rubber tube that you insert into the wooden body of a guitar or violin through the tone hole. When damp, this device will slowly let out moisture to help maintain a good level of humidity in the instrument while it's in its case and to prevent cracking of the wood. A piano has a similar device you can have installed called a Damp-Chaser system which is fixed below the soundboard and is a more advanced and controlled way to do what a Dampit does. This just shows that wooden instruments have the same needs whether they are massive furniture pieces like a piano or small compact pieces you can sling over your shoulder and bring to the park like a guitar.

Love your guitar like you love your violin like you love your piano.