

How Does a Piano Make Sound?

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The piano was invented around 1700 by Bartolomeo Cristofori in Florence, Italy. It was dreamed up because musicians were asking for a keyboard instrument that was capable of dynamic variations, that is, the ability produce sounds of different volumes. In other words, loud and soft. Other popular keyboard instruments of the day, such as the harpsichord, clavichord and organ, were not dynamically flexible enough to suit the musicians.

The actual term “piano” is an Italian musical term meaning “soft”. Piano is an abbreviation of the actual name for the instrument, which is “pianoforte”, which means “soft-loud”. The reason for the name is that the piano was the first keyboard instrument in which dynamic variations were possible and easy to control. To add a little confusion to the issue, we use the term “pianoforte” to describe the modern piano, and the term “fortepiano” to describe early versions of the instrument.

There are several major components to every piano, whether it is the smallest apartment upright or the largest concert grand. They include the keyboard with eighty-eight black and white keys, the case, strings, cast-iron frame, wooden sounding board, hammers, mechanism (which is called the “action”) and the pedals.

The keys are used to control the sound – that is, which notes are played and how loud they sound. The hammers, which are made of felt, actually produce the sound in conjunction with the strings, which are made of steel, or in the case of the lower strings, steel wound with copper. For the upper notes, there are three strings. As we get lower on the piano, it changes to two strings, and then one for the lowest notes. The frame holds the strings at the correct amount of tension to keep the piano in tune. It is made from cast iron because the average grand piano has about twenty tons of pressure from the strings pulling on the frame. The pedals also have some control over the sound. The pedal most often used is the damper pedal, which when pushed down, holds the dampers off the strings and allows the piano to keep sounding longer, even when the pianist has let go of the key.

When a key is pushed down, it sets in motion the action or the mechanism of the piano, which is basically a series of levers. The action throws the hammer against the string, and a gadget called the “escapement” allows the hammer to bounce off immediately. This causes the string to vibrate, which produces the sound. At the same time, a small felt pad called a damper is raised off the string to allow it to keep sounding as long as the key is held down. When the key is released, the damper falls back to the string and “damps” or stops the vibration of the string. The sound is amplified by the sounding board, which is a large, thin piece of wood that lies immediately under the strings, in the case of a grand piano, or immediately behind the strings in the case of an upright. The faster a key is pushed down, the faster the hammer hits the string, and the louder the sound is. It makes no difference to the piano how hard the pianist pushes – the volume

of sound depends entirely on the speed of the key, and therefore the speed of the hammer. Notice how everyone likes a pianist with a light touch.

Pianos sound slightly different depending on a number of things. The quality of the sounding board, hammers and strings probably play the largest part, but there are also a number of design variations between the different manufacturers that cause pianos to either sound singing and mellow, or brilliant and percussive, or any number of gradations in between. The sound of the piano also changes dramatically depending on the skill and touch of the individual pianist.

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