

Musiknow 101 Octaves

You'll learn what an octave is, what it sounds like and what's special about it

1. An octave is to do with pitch. It's the name given to the gap between one note and the one 8 notes above or below it – hence the name.

2. Several well known songs begin with a jump of an octave from the low note to the high one: “Somewhere over the Rainbow”, “Bali Ha'i”, “The Lonely Goatherd” (High on a hill). Sing the beginnings of any of these songs that you know. Pick a lowish note to start, as you have to jump up an octave.

The nursery rhyme “Hot Cross Buns” starts with a jump down of an octave. Sing that one if you know it, starting on a highish note.

3. All sound is the result of vibration. The source of the sound vibrates, causing the air to vibrate and our ears react to the vibrations. The faster the vibrations, the higher the sound. When two notes are an octave apart, the higher one is vibrating exactly twice as fast as the lower.

Pythagoras wasn't only interested in triangles. He explored the mathematical relationships between vibrating strings of different lengths. If you want to find out more, search “harmonic series” on the internet.

4. It is this mathematical relationship that give the octave its special quality. Unless you listen very carefully, the two notes seem as one. The sound waves match so closely, the two notes are almost indistinguishable. It's a bit like words rhyming.

No other gap between two notes sounds so similar. Some of the gaps sound pleasant, while others clash, but you can always hear the two pitches.

5. Typically, men's and women's voices are about an octave apart. We are able to sing songs in unison – using the same notes, with the women singing an octave above the men. The women's vocal cords vibrate twice as quickly as the men's. When any one of us sings a low note then jumps to the note an octave higher our vocal cords have to vibrate twice as fast. If you try it with a hand on your throat (gently!) you can feel things changing. The vibrations are far too fast to count. Even a man's lowest notes vibrate at about 100 times a second.

6. Musicians give notes letter names to describe their pitch, using the first 7 letters of the alphabet. If you play an A and the next A up, you play an octave. All the As, whether low, middling or high blend with each other, because they relate to each other by a vibration ratio of 1:2.

7. Lots of instruments come in larger and smaller versions an octave apart. Piccolos are an octave above a flute, bass clarinets are an octave below a clarinet. If you've played the recorder, you probably know that the descant recorder – the size most commonly played by children, has the same fingering as the tenor, which is twice the size.