

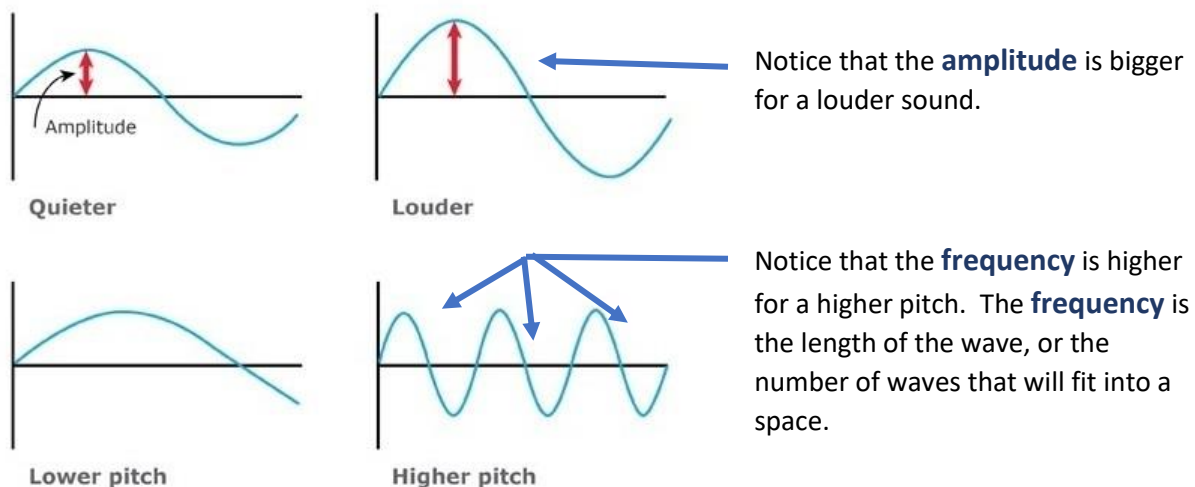
Exploring Sound 8: Sound Waves Review and Waves in Instruments

We've looked at drawings of **sound waves** that show a wiggly line to represent sound and done some experiments with singing into an **oscilloscope**.

Here's a diagram of what happens to those lines as sounds get louder and quieter, and higher and lower in pitch:

Here's the link to the **oscilloscope** we used:

<https://academo.org/demos/virtual-oscilloscope/>

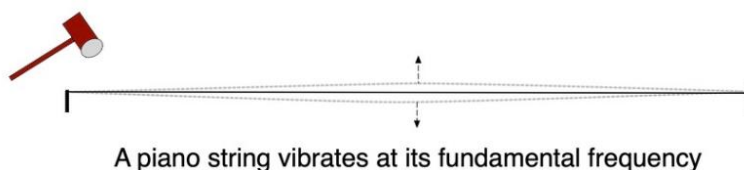


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Pitch on the Piano

We learned that the pitch that a string can create depends on:

- **length** and **thickness** (mass) → greater makes **lower pitch**
- **tension** → greater makes **higher pitch**

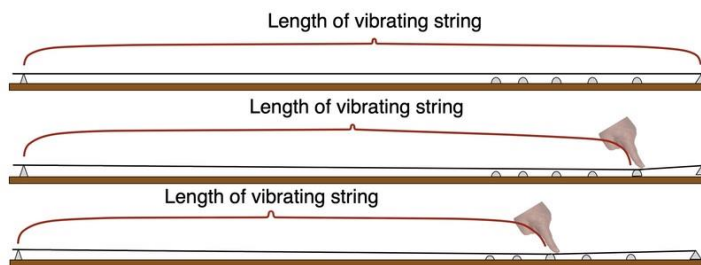


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Pitch on Other String Instruments

Other string instruments (violins, guitars, etc.) use the same methods as the piano.

They are also able to change pitches by stopping the string with a finger.



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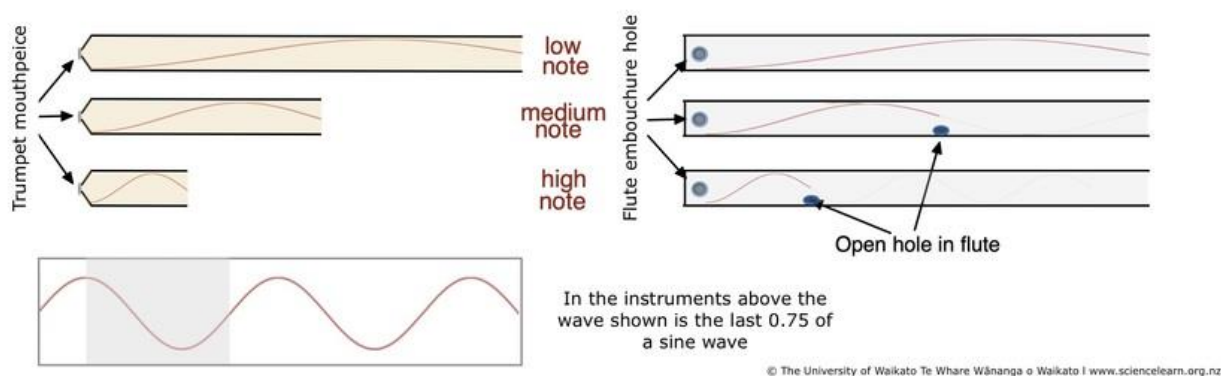
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Pitch on Wind Instruments

In wind instruments the air inside the instrument vibrates.

For **brass instruments** (trumpets, trombones, tubas, etc.) **pitch** is altered by:

- Pressing a button to **lengthen** the tube
- Moving the slide out and in on the trombone to change the **length** of the tube
- Changing the way the instrument is blown into to make the instrument play a different note of the **harmonic series**



For **woodwind instruments** (recorders, flutes, clarinets, saxophones, etc.) **pitch** is altered by opening up holes with the fingers which makes the tube shorter.

Woodwinds also use the **harmonic series** – notably to play notes an octave higher.

The Harmonic Series.



Note: the B \flat is out of tune