

Palm Pipes

Exploratorium Snackbook

What to do?

Bang the open end of the PVC pipe against the palm of your hand and you'll make a musical sound. Try this several times to get the right sound.

Using the color-coded musical note sheet provided, pick up the pipe marked with the color on the music sheet. Play the song!

What's going on?

A pulse that starts at your palm as compression makes four complete transits of the tube (up as a compression, down as an expansion, up as an expansion, and down as a compression) before one whole cycle is completed.

This four-part cycle corresponds to one wavelength of a sound, or one single vibration. A series of these repeated cycle is the source of the sound you hear when you 'play' one of the pipes.

The length of the tube affects the note that the tube produces. Because the speed of sound waves is the same in all tubes, the length of the tube has a direct effect on the time it takes for a compression-expansion pulse to makes its four transits of the tube. The longer it takes for the pulse to complete it cycle and start over again, the fewer cycles per second, or vibrations. The fewer vibrations per second the lower the frequency and lower musical note. Longer pipes produce lower notes.