

# Re: Measurement of pitch

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*Source:* <http://sci.tech-archive.net/Archive/sci.physics/2006-12/msg01223.html>

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- *From:* [matt271829-news@xxxxxxxxxxx](mailto:matt271829-news@xxxxxxxxxxx)
  - *Date:* 7 Dec 2006 04:38:20 -0800
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Tom Potter wrote:

"OG" <[owen@xxxxxxxxxxxxxxxxxxxx](mailto:owen@xxxxxxxxxxxxxxxxxxxx)> wrote in message  
[news:4tou9nF156p8vU1@xxxxxxxxxxxxxxxxxxxx](mailto:news:4tou9nF156p8vU1@xxxxxxxxxxxxxxxxxxxx)

<[tdp1001@xxxxxxxx](mailto:tdp1001@xxxxxxxx)> wrote in message  
[news:1165381044.657388.249430@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx](mailto:news:1165381044.657388.249430@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx)

OG wrote:

"John Bailey"  
<[john\\_bailey@xxxxxxxxxxxxxxxx](mailto:john_bailey@xxxxxxxxxxxxxxxx)> wrote  
in message  
[news:08ran2labqmc71frg5mat6v05k66o0i3v8@xxxxxxxx](mailto:news:08ran2labqmc71frg5mat6v05k66o0i3v8@xxxxxxxx)

On 4 Dec 2006 16:29:27  
-0800,  
[matt271829-news@xxxxxxxx](mailto:matt271829-news@xxxxxxxx)  
wrote:

Hi

At what  
time in  
history were  
the range of  
frequencies  
of audible  
sounds  
first roughly  
known?  
Who made  
the first  
scientifically

## Re: Measurement of pitch

accurate  
measurement  
of the  
frequency  
of a sound  
wave, and  
when?

"Mersenne's description in his Harmonic universelle (1636) of the first absolute determination of the frequency of an audible tone (at 84 Hz) implies that he already demonstrated that the absolute–frequency ratio of two vibrating strings, radiating a musical tone and its octave, is as 1 : 2.

### Fascinating

And I found this description of how he did it "The first major step toward defining pitch into an exact number of vibrations per second – its frequency – was Mersenne in the 1600s, who stretched a brass wire 138 feet and counted its vibrations by eye. He then stretched smaller wires until they matched the tuning of an organ pipe and scaled up the numbers from the long wire and correctly calculated its frequency."

[http://digitalcontentproducer.com/mag/avinstall\\_measure/](http://digitalcontentproducer.com/mag/avinstall_measure/)

Mersenne's method was not as good as the method used by the Pythagoreans.

Maybe, but the OP's question was regarding the first scientific measurement of ACTUAL frequency rather than relative frequency, which was

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Pythagoras' work.

Apparently "OG" didn't get the message.

Comparing a frequency directly to a frequency standard such as middle C, is more precise and more fundamental than comparing a frequency to an artificial, politically set, real number, pseudo-frequency such as the second.

As Maxwell pointed out when he formulated Dimensional Analysis, a measurement consists of two parts, a reference unit, and a number that represents the number of these reference units in the quantity to be measured.

The Pythagorians probably used the most stable instrument available to them, as their reference "atomic clock" against which to compare all other things that cycled, vibrated, or could be made to ring, perhaps including days, months, years, etc.

Hopefully "OG" will explain what "ACTUAL frequency" really is.

This seems a valid point. To measure frequency you need some reference time measure, and if huge accuracy is not required then one cycle of a vibrating string (or pendulum if you like) seems as good as anything. The string or pendulum in question could no doubt be specified exactly, but I doubt that it could be made physically perfect enough for super-precision time measurements. (And I'm also not sure if the frequency of a string or pendulum doesn't vary very slightly depending on amplitude, so that would need to be specified too.)

And the question remains: could Pythagoras relate the frequency of his vibrating string to other phenomena? Would he have had any clue how many vibrations corresponded to one of his heartbeats, for instance?

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