Construction Instruction

So, you're building this one string guitar… When you play the guitar without pushing down on the string at all, the note you want is C_4.

The frequency this note should have is 262 Hz. You can check it with the Vernier probe.

Suppose you use the computer to test the frequency and it was too low. What could you do to get it to just the right frequency?

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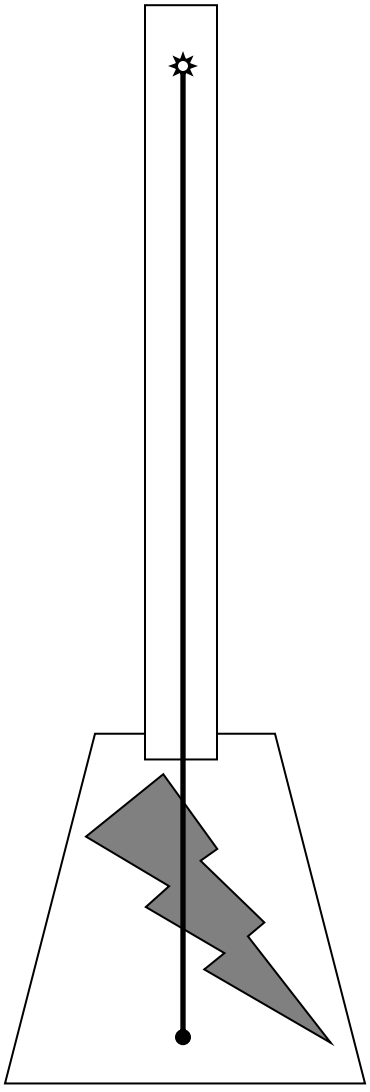
List the frequency and ratio to C_4 for each note.

note:	frequency (Hz)	ratio to C_4 (f / fC_4)	Length of string
C_4	261.63		
D_4	293.66		
E_4	329.63		
F_4	349.23		
G_4	392.00		
A_5	440.00		
B_5	493.88		
C_5	523.25		

Suppose you want to play every note in the next octave C_4 – C_5. by placing "frets" on the guitar. Use the total length of string divided by ratio to C_4 to determine where each of the frets would be, and **then draw them in on the guitar shown**. (Remember C_4 is the length of the whole string.)



What if we were trying to do the same thing with a "flute"

Do you want the tubes to be open or closed? OK, so how long should the first tube be??? Remember that $v=f*\lambda$ and that the speed of sound is 345 m/s. So, depending on what frequency you want you just need to calculate the wavelength, and then cut the tube to the right size.

note:	frequency (Hz)	λ (in meters)	Length of tube λ / 4
C_4	261.63	345 / 262 = 1.32	1.32 / 4 = .329m
D_4	293.66		
E_4	329.63		
F_4	349.23		
G_4	392.00		
A_5	440.00		
B_5	493.88		
C_5	523.25		

Remember if the tube is closed, the length of the tube is ¼ the wavelength. So you can find the lengths of the tubes by dividing you wavelength by 4.

<u>Label the length for each tube</u>, and then draw a line to show where to cut it.