Tuning Fork Lab

Introduction: This wave lab is to see the frequency of the waves in a certain time. There are different types of waves; there are mechanical waves and electromagnetic waves. But this lab will be involving sound waves which are mechanical waves. These sound waves will be tested by using a tuning fork and special utensils for measuring waves. As we test this lab we have to verify if our frequency measured in hertz is the same as the one stamped on the tuning fork. By doing this we are going to see if our data is accurate by using a special calculator and a sound detector device. We will be measuring four different types of tuning forks.

Materials: We will be needing a tuning fork and a kit that included a special calculator and a sound device that measures time.

Procedure: First we have to connect the cables to the sound measuring device and to the calculator. Then as we turn on the devices, we push on the Applet button on the calculator. After that we select Stream Smart. We push reset to delete the previous data. The screen will ask you if you want to reset and you will press yes. Later get the tuning fork and press start on the calculator. Hit the fork for a while and then press stop. Push pan to gather the data and find the pretty parts of the wave. Press pan again to leave the data in place. After all of that you will have to press trace, by this you are trying to find the time between ten wavelengths.

Data: **1.** T_1=2.276s - T_2=2.296s = 0.02s

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Subtract the time between the ten wavelengths.

$\frac{0.002}{10}$= 2

↑

Then you divide that by how many wavelengths there were during the time period.

$T = \frac{1}{.002} = 500\text{Hz}$

↑

Then plug it into the formula. And divide to get the hertz.

$\frac{500-512}{500} \cdot 100 = -2.4\%$

↑

Subtract the hertz you got to the original hertz from the tuning fork. Divide the results to the original hertz and then multiply by one hundred.

The difference between the original hertz and the one that we calculated was -2.4% percent away. Sometimes it depends on what material you use to hit the tuning fork and measuring it in a certain way.

2. T_1=6.136s - T_2=6.167s = 0.031s

$\frac{0.031}{10}$= 3.1 →→→→→→→ $\frac{322.58-341}{341} \cdot 100 = -5.4\%$

3. T_1= 5.143s - T_2= 5.167s = 0.024s

↓

$\frac{0.024}{10}$= 2.4

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$\frac{1}{2.4}$= 416.67Hz

↓

$\frac{416.67-480}{480} \cdot$ 100 = -13%

4. T_1= 7.993s - T_2= 8.036s = 0.043s

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$\frac{0.043}{10}$= 4.3

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$\frac{1}{4.3}$ = 232Hz

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$\frac{232-256}{256} \cdot$100 = -9.3%

Conclusion: As we tested these tuning forks, we see that our measuring is slightly off by a small amount of percentage. For The tuning fork number one, we found that the original hertz in -2.4% away from our calculations. The second tuning fork we found that it was -5.4% away from the original hertz to our calculations. The third tuning fork we found that the percentage between the original hertz to our calculations was -13%. It seems as if it's a big percent, but it's not because if you see at the calculations very close you can see that every number is a little off. As we see the fourth one, the original hertz to our calculations was -9.3% the difference.Each of these data observations has been very difficult due to the static in the air around us. Though, we still found our data very precisely and almost accurately. Each one of these data has many things in common. All of them are almost a bit percent off from the original hertz. We also saw that our percentage came out negative due to the small number on our testing. Sound waves are very easy to hear and if you measure it with the right tools, we can see how many waves are shown as long as you talk or make some noise.