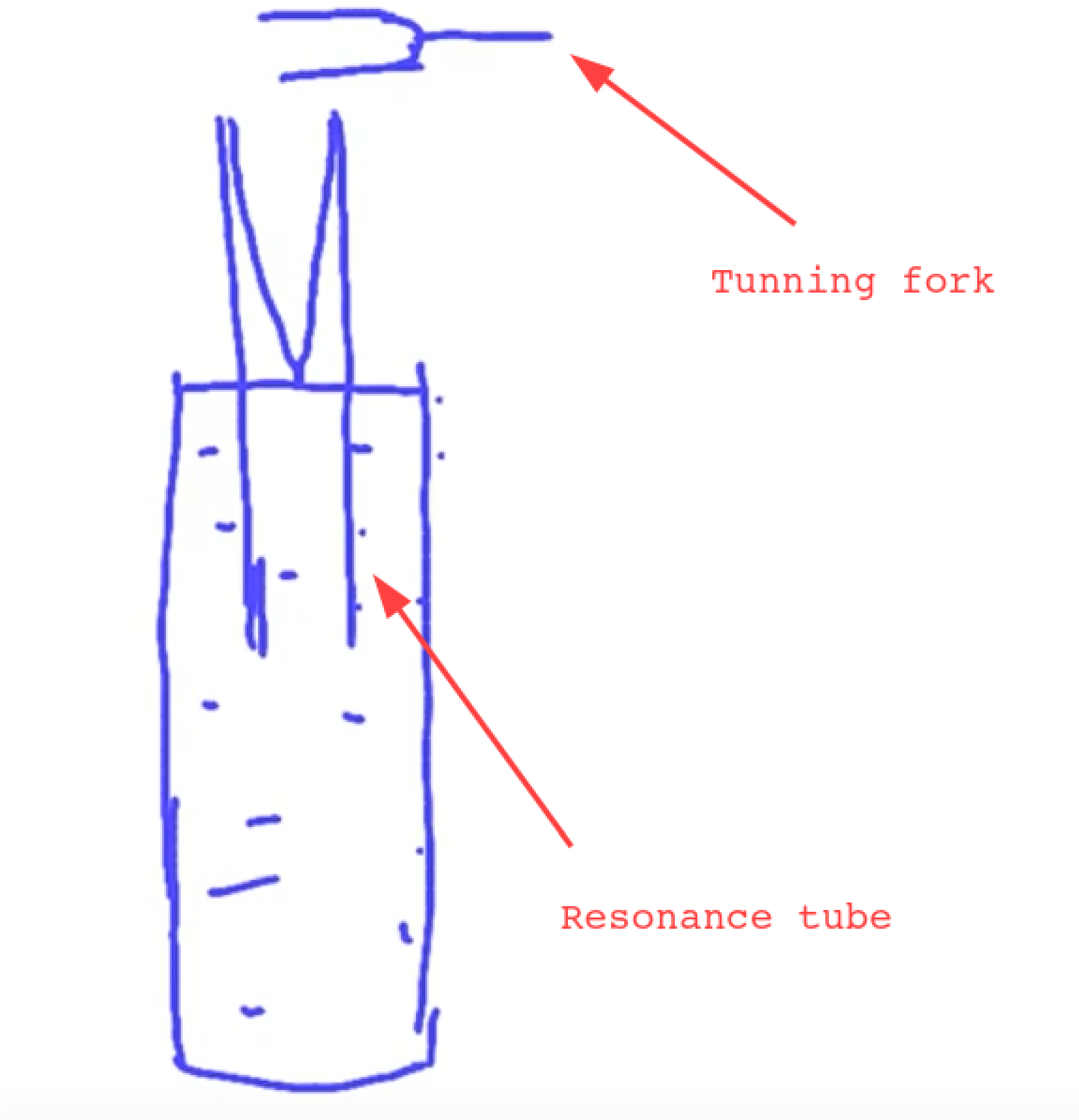
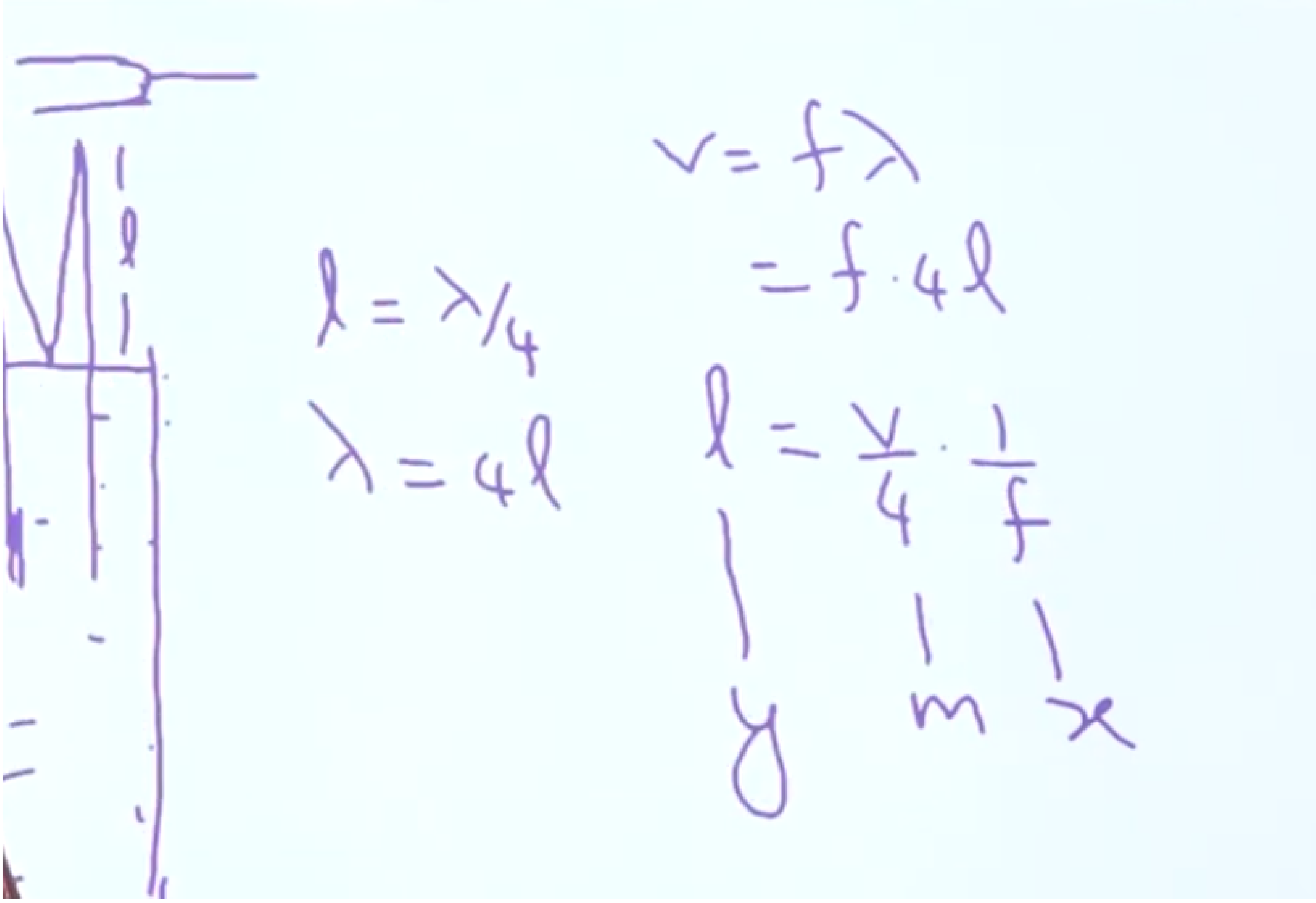
- Initial setup





Here we have a set of tunning forks which means we can change the `f`. So that should be taken as the independent variable `x`. So as a result of changing the `f`, the dependent variable `l` is going to change. Therefore, we get an equation like this to draw a graph

$$
\begin{aligned}
l &= \frac{\lambda}{4} \\
\lambda &= 4l \\
\\
v &= f\lambda \\
\therefore l &= \frac{v}{4}\frac{1}{f} \\
y &= mx
\end{aligned}
$$

> From the gradient we can find `v`

If we include end correction in this, we get an equation like this.

$$
\begin{aligned}
l + e &= \frac{\lambda}{4} \\
\lambda &= 4(l + e) \\
\\
v &= f\lambda \\
l + e &= \frac{v}{4}\frac{1}{f} \\
\therefore l &= \frac{v}{4}\frac{1}{f} - e \\
y &= mx + c
\end{aligned}
$$

> Here, end correction will be given my the intercept

Important point

> All the ones we had in the previous practical about 14 - Finding the velocity of sound in air using resonance tube and a tuning fork applies here too.

- When doing the experiment, why do we have to start with the tunning fork with the highest frequency and then so on?

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Because the tunning fork with the highest frequency will give the smallest length. Therefore, its better to start with the lowest length and increase the length as we go so that we dont have to restart the whole process again, and we can start from the previous length.

We can do this because for the next tunning fork which is of less frequency than before, the length is going to be less.
f1 --> l1
f2 --> l2 where f1 > f2, then l2 > l1. Because when frequency reduces, the resonance length increases

By this was, we can easily get the fundemental overtones of the tunning forks very easily without missin any also.
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From the above equation, we can make a conclusion as below.

$$l \propto \frac{1}{f}$$

Therefore, when `f` reduces, `l` has to increase

- Why do we use a hammer with rubber head to vibrate the tunning forks?

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Because we need to use something that is soft and not hard so that it wont damange the properties of the tunning forks.
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