Stationary waves on a string

A diagram of this experiment is shown on P184 of the AS textbook. For this experiment, different groups will use the same type of string but under different tension. Record the tension in your string here:

String tension

You should also record the length of the string from the vibration generator to the top of the pulley here:

String length

Try not to move the vibration generator during the experiment. You could mark its position on the table using a dry-wipe marker or some masking tape.

You are to adjust the frequency of the signal generator until different standing waves are formed on the string. For each standing wave, record the frequency and the wavelength. Think carefully about the best way of measuring the wavelength. Collect data for the fundamental up to the fifth overtone, so you will have six rows of data in your results table. Do not bother with repeats – we don't have time.

The relationship between wave speed **c**, frequency **f** and wavelength **λ** is: **$c = f\lambda$**

This can be rearranged to give **$\lambda = c/f$** which can also be expressed as **$\lambda = c \times 1/f + 0$**

Add another column to your table for **1/f**, and calculate **1/f** for each row.

Plot a graph with **λ** on the y axis and **1/f** on the x axis. Calculate the gradient. What does this represent?

Compare your answer with other groups using different string tension. Are the results what you would expect?