NEATH PORT TALBOT COLLEGE
COLEG CASTELL NEDD PORT TALBOT

School of Maths & Science
Science Practical

To investigate the behaviour of rubber under increasing and decreasing load.

◆ **Aim**

To investigate the behaviour of rubber under increasing and decreasing load. To determine whether Hooke's law is obeyed. To determine the energy "lost" in the rubber in one loading and unloading cycle.

◆ **Introduction**

You will gradually load and unload a rubber band and note its corresponding extension. By plotting a graph of load against extension for loading and unloading it can be determined whether or not Hooke's law is obeyed. The energy "lost" can be determined from the graph.

◆ **Safety**

Control Measures

- The wearing of **safety goggles** at all times will be sufficient to take account of most hazards and significant risks.

- You are reminded of the need of good laboratory practice in order to maintain a safe working environment.

Hazards

General Hazard.   Make sure that the retort stand is securely fastened to the bench using a G – clamp.

◆ **Apparatus Required**

Rubber band, retort stand and clamp x 2, mass holder, assorted masses, metre rule, adhesive tape, pointer.

◆ **Procedure**

1. Support the rubber band using a retort stand and clamp.

2. Using another retort stand and clamp, place a metre rule alongside the rubber band.

3. Attach a 10g mass holder to the rubber band. Treat this as zero mass.

4. Read the position of the bottom of the mass holder to the metre rule. This will be your "initial reading". A pointer would help to read the measurements from the metre rule.

5. Gradually load the rubber band in 100g steps and record the extension. The extension is the new reading minus the initial reading.

6. Continue to do this until you have at least 8 readings.

7. Now gradually begin to unload the rubber band, again noting the load and the extension.

8. Plot a graph of load against extension and clearly mark the loading and unloading section of the graph.

9. Does the rubber band obey Hooke's law? What can you conclude?

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10. Calculate the energy "lost" during the loading – unloading cycle.

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