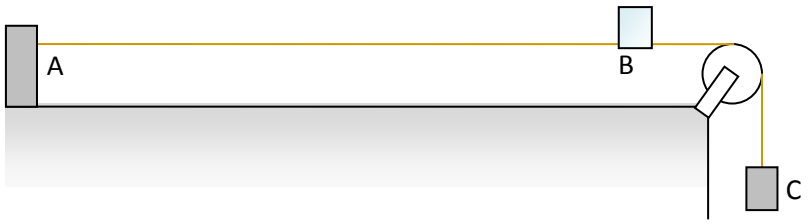
PRACTICAL 1.3.4 -4

- ✓ **Define** and use the terms: Elastic limit, *Stress, Strain, Young's Modulus, Ultimate Tensile Strength, Elastic Deformation* and *Plastic Deformation*
- ✓ Carry out an experiment to **determine** the Young modulus of a metal in the form of a wire.

You are to investigate the extension of a thin copper wire as a tensile force is applied.



- Measure the diameter of the wire and calculate the area in m^2.
- Firmly clamp the wire between two blocks at A. How will you make it secure?
- Twist a strong loop in the wire at C so you can attach a mass hanger.
- Use a piece of sellotape to mark the wire so the distance AB is about 1.50m. This will be your initial length, l_o.
- As end C is loaded with 0.100kg masses the distance from A to the tape will increase as the copper stretches. How can you measure this accurately and precisely?
- Record your data until the copper snaps. MAKE SURE THE MASSES DO NOT FALL ON YOUR FEET
- Calculate the stress and strain for each value of load added.
- Plot a stress (y-axis) vs strain (x-axis) graph and draw an appropriate curve of best fit.
- On your graph label the Elastic Limit and Ultimate Tensile Strength then calculate Young's Modulus for Cu.

Equipment Required:

- SAFETY GLASSES (WIRE CAN SNAP AND FLY INTO EYES)
- About 2.0m 32 SWG copper wire
- G clamp, wooden blocks, bench pulley, 100g slotted masses and hanger, sellotape, ruler, micrometer/calliper