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P1 Making measurements

P1.02 Measuring length

- Need to be straight, not curved
- Scale should be precise

1. Micrometer screw gauge

- Micrometer screw gauge - used to measure very small distances
- e.g) thickness of a wire

2. Measuring volume

- Regular shape - use formula and measurement rules to calculate
- Liquid - use cylinders
 - Should be read at an horizontal angle
 - For 5cm³ liquid, better to use 10cm³ cylinder than 1dm³ cylinder

3. Measuring volume by displacement

- Used when objects do not have a regular shape

4. Units of length and volume

Length

- 1 decimetre(dm) = 0.1m

Volume

- 11 cubic decimetre(dm³) = 0.001m³

P1.03 Density

Density: how concentrated its mass

- Density of water = 1.0kg/dm³ & 1.0g/cm³ & 1000 kg/m³

$$\text{Density}(p) = \frac{\text{Mass}(m)}{\text{Volume}(v)}$$

1. The method of displacement

1. Partly fill a measuring cylinder with water and note its volume
2. Put the object in the water so that it's entirely submerged, note the new volume
3. Calculate subtracted volume of the object
4. Calculate density after measuring its mass using balance

P1.04 Measuring time

- Use analogue clock or digital clock
- Use stopwatch

1. Measuring short intervals of time

- **Period:** time for one swing of a pendulum(from left to right and back again)
- Use stopwatch
- Measure several times - decrease inaccuracy - more reliable

