# WJEC England Physics A Level

## SP C1 01 : Basic Physics
### Practical notes

## 1. Determination of the Density of Solids

The density of regular solids (eg. prisms) can be determined by weighing them, to find their mass, m, and measuring dimensions to calculate volume, V.

**Equipment:**
- Regular solids
- Calibrated balance ±0.1g
- Vernier calipers ±0.01mm
- Ruler ±0.1cm

**Method:**
1. Determine the mass of your chosen object using the balance. Make sure it is zeroed before use.
2. Take measurements, using the vernier caliper and ruler as appropriate, and calculate the volume of the solid:
   a. Volume of a cube = length³
   b. Volume of a sphere = $\frac{4}{3}\pi r^3$
3. Use the mass and volume to calculate density using the equation:

$$\text{Density} = \text{mass} / \text{volume}$$
$$\rho = m / V$$

## 2. Determination of Unknown Masses by Using the Principle of Moments

**Equipment:**
- Metre ruler, with a nail through it at the 30cm mark
- Masses (200g and 150g)
- Thread
- Clamp and stand

**Method:**
1. Set up the equipment, with the nail through the ruler clamped in the clamp stand.
2. Attach the 200g mass to the short end of the ruler using the string and record the distance at which the mass must be placed for the ruler to balance horizontally.
3. Calculate the mass of the ruler.
   a. 200 x distance of mass from pivot = $m$ x 0.2
   b. This is because the weight of the ruler acts at its centre, which is at 0.5m (so 0.2m from the pivot).
4. Remove the 200g mass and replace it with an unknown weight.
5. Find the distance, $d$, at which the system balances.
6. The unknown weight, $W$, can be calculated by:
   0.2 x weight of ruler = $d$ x $W$
7. The corresponding mass can be calculated by:
   Mass = weight / 9.81
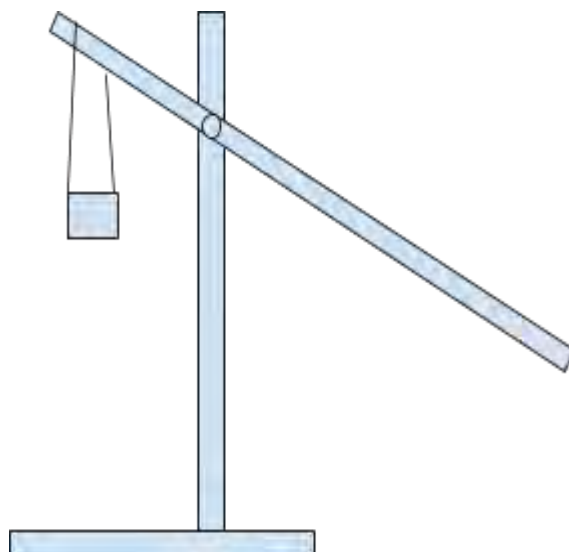
**Safety:**
- Falling masses may cause injury. Wear appropriate footwear and take care not to stand under the hanging masses.