Uncertainty

1a. A 20mm leaf is measured using a ruler with 1mm markings. What is the absolute error?

0.5mm on either side of the measurement
So absolute error is **±1mm**

b. Using your answer from 1a, calculate the percentage uncertainty.

(1mm/20) x 100 = 5%

2. The temperature of a water-bath was measured as 67.5 °C using a thermometer with an absolute error of ± 0.5 °C. Calculate the percentage uncertainty.

(0.5/67.5) x 100 = 0.7%

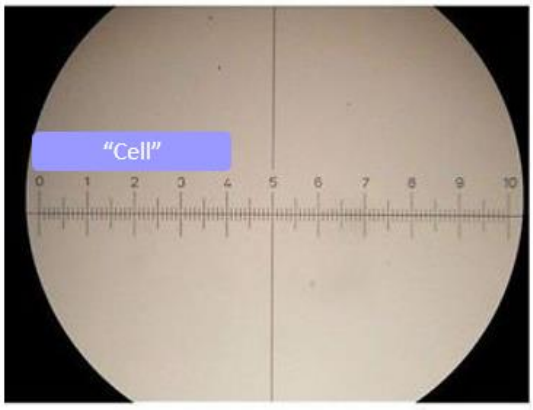
3. An object is 0.14m in length. This was measured using a 30cm ruler. The absolute error of the ruler is ± 1cm. Calculate the percentage uncertainty.

0.14**m =** 14cm
(1cm/14cm) x 100 = 7.1%

4. The mass of a sunflower is 300g and has an uncertainty ± 5g. The volume of the sunflower 4cm^3 is has an uncertainty of ± 0.2cm^3. Calculate the **overall** percentage uncertainty.

Mass % uncertainty = (5/300) x 100 = 1.7%
Volume % uncertainty = (0.2/4) x 100= 5%
Overall uncertainty= 6.7%

5.



- The diagram shows a stage micrometre where each division is 0.1mm.
- Use this information to calculate the percentage uncertainty of the measured cell.

Cell measures 4mm
Uncertainty= 0.05mm + 0.05mm = ±0.1mm (as you get uncertainty at each end of the length measurement)
% uncertainty = (0.1/4) x100 = 2.5%