

Reading and Recording Data

All data should be recorded as accurately as possible.

Qualitative Observations

These observations are just as important to record. Use terms that are descriptive. Avoid duplications and confusion. Clear and colourless are not the same. Remember to look for changes in colour, transparency, temperature and state.

Quantitative Observations

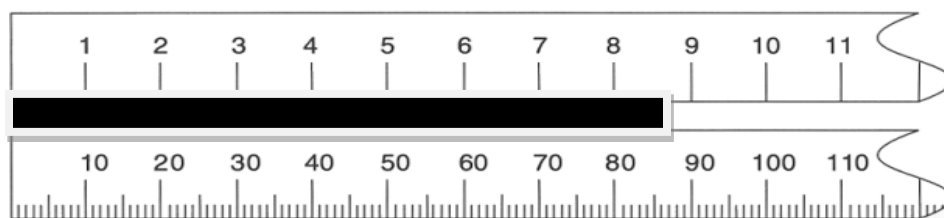
When recording quantitative data, uncertainties are included and there should be agreement in the number of decimal places reported.

- Scaled or analog measurements are accurate \pm one half of smallest scale division.
- Liquids should always be read from the bottom of the meniscus (curve of the liquid)
- Look at any dials or scales straight on to avoid parallax (misreading numbers due to the angle).
- Digital measurements are accurate \pm one of the last digit.

If readings are fluctuating and do not settle in a reasonable period of time, note the fact and make the error \pm half of the range of the fluctuations.

Examples

1. The size of the black line with the border using each of the three rulers below (dm/cm/mm)



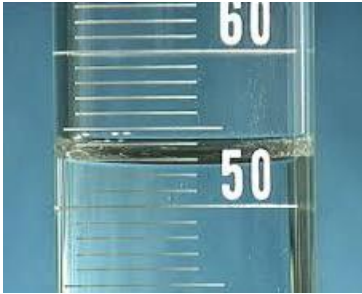
For large divisions, the estimate of uncertainty depends on the skill of the observer:

Observer 1: $l = 8.7 \pm 0.1$ cm

Observer 2: $l = 8.7 \pm 0.3$ cm

For small divisions, the estimate of uncertainty would be half of the smallest division: $l = 8.75 \pm 0.05$ cm

2. Recording the volume level of the following liquids:



$$v = 52.80 \pm .05 \text{ ml}$$



$$v = 6.6 \pm 0.1 \text{ ml}$$



$$v = 6.60 \pm .05 \text{ ml}$$

3. The reading on the following dial: $p = 142 \pm 1 \text{ mm Hg}$



4. The reading from the following digital balance: $m = 45.0 \pm 0.1 \text{ g}$

