When scientists conduct experiments they record their observations and measurements and analyse them so that patterns and trends become clear. Inferences about what happened and why lead to predictions of what might happen in the future or in experiments under different conditions.

**Observations and Measurements**

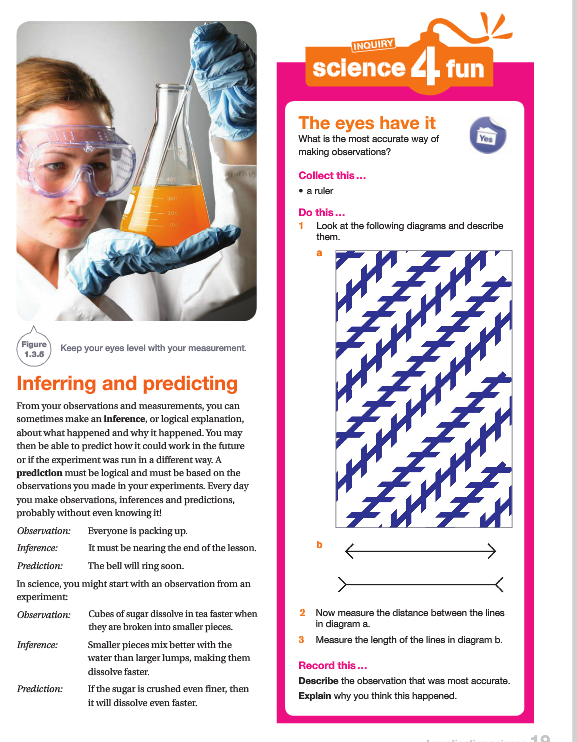
* Qualitative Observations – A descriptive record as diagrams or words.
* Quantitative Observations – Measurements that include numbers and units.
* Units – Measurements are useless unless units are included.
  + Distances are measured in millimetres (mm), centimetres (cm), metres (m), kilometres (km)
  + Masses are measured in milligrams (mg), grams (g), kilograms (kg) or tonnes (t)
  + Volume is measured in millilitres (ml), or litres (L)
  + Time is measured in seconds (s), minutes (min), or hours (h)
  + Temperature is measured in degrees Celsius (0C)

**Taking Accurate Measurements**

Follow these procedures to ensure accurate measurements:

* Each person takes their own measurement and everyone’s average results.
* Make sure you take measurements at eye level to minimise parallax error.
* The measuring device starts at zero.
* Writing down measurements.
* Avoiding fractions like ½ or ¼ in measurements. Use decimals instead e.g. 9.5 kg not 9 ½ kg
* Making sure that everyone in the group has a copy of the results before leaving the lab.

**Inferring and Predicting**

* An **observation** is a statement of fact about what actually happened.
* An **inference** is a logical explanation about what happened and why it happened.
* A **prediction** is what might happen in the future or if the experiment was run in a different way.
* ****Examples: