1. An individual test run, resulting in an observation on a given response variable, is called a trial.
2. The complete set of trials forms the experiment.
3. The object on which a particular trial is carried out is termed the experimental unit.
4. A factor is any feature of the experimental conditions which is thought to cause variations in the response variable.
5. The object of any experiment will usually be to establish the effects of varying at least one factor.
6. Quantitative factors are those whose possible values can be arranged in order of magnitude e.g. temperature.
7. Qualitative factors are those whose possible values cannot be arranged in order of magnitude e.g. different fertilizers, makes of car.
8. The value that a factor takes in a particular trial is called the level of the factor.
9. Residual variation (or experimental error) is experimental variation caused by factors which have not been (or cannot be) controlled by the experimenter. These are the “nuisance factors” e.g. soil fertility, weather conditions.
10. The experiment should be designed so that the effects of interest can be separated from this residual variation.
11. In order to estimate the experimental error, more than one observation must be taken at each combination of factor levels. The number of such observations taken for each treatment combination is called the number of replications.
12. A designed experiment is one for which the analyst controls the specification of the treatment and the method of assigning the experimental units to each treatment.
13. 13. An observational experiments is one for which the analyst simply observes the treatments and the responses on a sample of experimental units.
14. A completely randomized design is a design for which independent random samples of experimental units are selected for each treatment
15. 15. The randomized block design consists of a two-step procedure: i) matched sets of experimental units, called blocks, are formed, each block consisting of *p* experimental units (where *p* is the number of treatments) . The *k* blocks should consist of experimental units that are as similar as possible. ii) One experimental unit from each block is randomly assigned to each treatment, resulting in a total of *n=kp* responses