**7 Science: Designing your own Fair test Experiment**

You will have many experimental investigations to complete a high school. These are important assessment items in Junior and senior school. To plan and complete an experiment with a report, you must first design and plan a “fair test” experiment.

A fair test is one in which you have controlled all variables except the one which you are deliberately varying. In your investigation, the variable you are going to vary deliberately is called the *independent variable*. The variable you are going to measure its effect on is called the *dependant variable*.

The steps to design a fair test experiment are outlined below along with an example (on vacuum cleaners). Use these steps as a guide to planning any investigation. Your teacher may ask to see your plan before you do an experiment, especially in senior school.

**1 *Which variable are you going to investigate?***For example, you might decide to investigate which vacuum cleaner removes dirt from carpet the best. The brand is your independent variable

**2 *Write a very brief description of how you could test this variable?***For example, you might decide to use different vacuum cleaners to suck up a certain amount of dirt. The amount of dirt is your dependant variable.

**3 *What will you need to do the test?***To test a number of different vacuum cleaners, you might need to ask some friends if you can use theirs. You may also need a sample of carpet, some sand or dirt and a balance.

**4 *List the variables that could affect the test and any possible problems – and CONTROL them!.***For example, the type of vacuum cleaner head, the reach of the handle, the amount of suction and the power of the vacuum cleaner might affect the outcomes of the test. Think of any problems that could occur in the testing. For example, are there any possible dangers to you or others with the products you are testing?

**5 *Design and carry out a fair test.***You must design a test that alters only one variable (the dependant variable, in this example it is the brand of the vacuum cleaner) and keeps all other variables the same. For example, to make this a fair test for all vacuum cleaners, the same head and speed would need to be used for all the vacuum cleaners. The same carpet would need to be tested and it would need to be vacuumed in a set pattern. The same amount of sand (e.g. 100 g) would need to be spread across the carpet. This could then be weighed and you could work out what percentage of the sand was collected by each vacuum cleaner.

**6 *Repeat your test****.* If only one test is carried out, the results may be inaccurate. To get results that are more accurate it would be better to carry out three trials and take an average. This is especially true for the vacuum cleaner example. You might push the vacuum cleaner across the floor slightly harder with some brands than others. If three trials are carried out and an average calculated, then you are reducing error in your procedure and obtaining results that are more accurate.