JOHN CURTIN College of the Arts
COLLEGE OF THE ARTS

Year 11 General Integrated Science

Science Inquiry Skills

Feedback

1. Averages.

When you write numbers to the right of a decimal point you are indicating the order of accuracy of the measurement. If the table gives data to no decimal place then it is telling you that the measurement was taken at that level of accuracy.
If you write average values to one or more decimal places then you are saying that the measurements have been more accurate than the original data. This cannot be so!
The rule is keep your averages to the same level of accuracy as the data given in the table.

a. Check the order of accuracy of the data and adjust the averages results accordingly. The decimal points show how precisely the measurements were taken. So you cannot make the average 42.6 for example, when all the values for the data have no decimal places.

b. Do not include data in the calculation for the average if the cell is empty!

2. Hypothesis

Make sure that you can;

a. Recognise the independent variable.
b. Name the two variables by using the names given in the table. See *Table 1* below
c. Think of the trend for the values of each variable.
d. State the relationship between the two trends.

Review the concept of "Visualising the Hypothesis" which can be found in the GeoScience Workbook and on our website: http://integratedsciencegeneral.weebly.com/planning-the-investigation.html

Independent variable (units)	**Dependent variable (units)**			
	Trial 1	Trial 2	Trial 3	Average

Table 1: A typical Results Table

3. Controlled experiment

A scientific investigation in which both the control group and experimental group(s) are kept under similar variables apart from the one factor under study. This so the effect or influence of that factor can be identified or determined. All variables, other that the independent variable, should be controlled, or kept the same.

4. **Graphing and Predicting values.**

Most students have the checklist for graph-construction down pat;
Marks are deducted for the following;

1. variables plotted on wrong axes
2. points plotted unclearly or very thick line on graph (can lose a mark for each badly plotted point)
3. line graph not used (bar graph loses two marks)
4. scales wrong (meaning unequal intervals within a scale unless break marks are used)
5. units not marked on scales
6. axes unlabelled
7. mistakes in plotting points
8. no title
9. no key or incorrect key
10. graph does not use more than 50% of the space available on the grid on the X or Y-axis
11. graph extrapolates beyond the data (eg. extending the line to 0)
12. graph with break in the middle
13. title must be descriptive ie. name both variables and the relationship between them
14. line of best fit drawn rather than joining the points

Interpolation is predicting **in** between the line.
Extrapolation is predicting outside the line… **extra** to the line.

5. Accuracy – "sharpness" of the measurement

Accuracy refers to the "sharpness" of the measurement. So use the appropriate measuring equipment and avoid errors such as parallax.

6. Reliability – reducing the effect of individual differences.

Reliability relates to getting similar results each time you gather data.

- Conduct the test many times.
- Conduct the test in the same conditions each time.

At least three trials are conducted in an investigation so that the effect of individual differences is decreased. This leads to RELIABILITY.

7. Validity

Validity means testing what you really set out to test.

8. Evaluation

Consider the fairness of the test. A fair test has these aspects that you should consider;

- control of variables
- accuracy
- reliability
- validity
- errors