**Science Investigation Skills**

**Class Discussion**

A Science Investigation is planned, conducted, results collected; analysed and evaluated to make it a fair test.

**Planning**

In a fair test the experimenter poses a research question.

1. Write two research questions that could come from the two laboratory sessions on macronutrients..

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1. In a fair test the experimenter changes one \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ variable in order to observe and measure how the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ variable responds.
2. An hypothesis states the relationship between two variables.

Write two hypotheses that could be tested from the data presented in Table 2 below.

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1. Name one independent variable that could be tested in this experiment.

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1. Name four dependent variables that could respond in this experiment.

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1. Choose one dependant variable to test.

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1. Name three variables that would need to be controlled.

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**Results**

Table 2: Masses of three nutrients found in 100g of spring onion

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Type of nutrient | Mass per (100g) Serving  (g) | | | |
| Trial  1 | Trial  2 | Trial  3 | Average |
| glucose | 3 | 7 | 5 |  |
| starch | 10 | 12 | 8 |  |
| protein | 3 | 4 | 2 |  |

**Analysis of data**

1. Use the data in Table 2 to plot a graph.
2. Use the graph to describe the types and quantities of nutrients found in spring onions.

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**Evaluation**

In this section the reliability, accuracy and validity of the investigation is discussed.

**Valid or “Real”**

The data collected must test the variables that you state that you are testing.

**Example 1:** If you were to sit a test on Biology, but the test given to you was asking about Physics! It would not be a valid test.

**Example 2**: Data was recorded data about glucose, starch and proteins. You could not make valid generalisations about lipids.

1. Explain why.

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**Accurate Data collection or “Sharp”**

The equipment should have the appropriate scale marks.

**Example 1**: If the teacher did not use a marking key for each question.

**Example 2:** If you were to measure a volume of 2mL and you used a 100mL measuring cylinder, you would not get an accurate reading.

1. Explain why.

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**Reliable Data or “Consistent”**

Many sets of data must be collected to see if the data is consistent, or “repeatable”. This reduces the effects of individual differences.

**Example 1:** You have many assessments spread out over the year and the average is calculated as a guide to your grade.

**Example 2:** At least three trials should be set up and the average calculated.

1. Explain why

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