N5 Biology Problem Solving:

Averages:

- Add all the values (numbers) together and divide by how many you have added.
- Eg. 10 + 15 + 5
- Divide by 3 because 3 numbers were added. Answer = 10.

Ratios;

- You must divide all numbers by the same. Simplify it as much as possible but they must all be whole numbers i.e. no decimals.
- E.g. 35 : 21 : 14 all these numbers divide by 7 so the simple whole number ratio is 5 : 3 : 2

Percentages

- To calculate a number as a percentage, divide the number you are trying to find by the total and multiply by a hundred.
- Eg dividing your test score by the total.
- 22 out of 30 = 22 / 30 x 100 = 73%

Percentage change

- Difference divided by the original value multiplied by 100.
- E.g. 50 bacteria at the start, after 5 hours they had multiplied to 700, what is the percentage change in number?
- Difference = 700 - 50 = 650. Divided by the starting value = 50
- 650 / 50 x 100 = 1300

Graphs & charts

- Remember the SLURP rule. Copy labels directly from the table column headings.
- Do not miss out on anything including the **units**.
- You must put a starting value in the origin for each individual axis. This might be zero, but not always.
- Use a ruler to help you plot your points this will reduce the risk of you skipping boxes.
- Remember each box on a scale must be the same value. If you have 10 boxes between 0 and 1. You must have 10 boxes between 1 and 2, 2 and 3 and so on.

Relationships

- As one thing changes it affects another. You must mention both.
- Variables – the only variable that can be changed is the one being investigated. Constant variables, you need to give an example not already mentioned in the question text or diagram.
- Do not use the word amount. You must say the
    - volume of solution… or
    - the pH of….. or
    - the concentration of… the …..
    - the mass of… etc.

Control

- A control is set up to make a comparison. You must state that everything is set up exactly as in the experiment but without the variable being investigated.

Reliability

- The results can be made more reliable by repeating the experiment in exactly the same way.

Validity

- Only one variable should be changed in an experiment to ensure it is a valid investigation.