***Planning your experiment 3rd Year Investigation Topics***

Once you consider yourself an expert about your topic, plan your road ahead. Your plan should include the following:

1. Devise a simple and clear sentence that states the purpose of your experiment. What do you want to find out? Remember, the shorter the statement, the better it will be.
2. Figure out what the "independent variable(s)" will be in your experiment. That is, what things or conditions (food, amount of water you will use, the size of the particles, the type of flowers, type of materials etc.) that you are going to change to see how whatever it is that you are testing (flower lastability, amount of gas produced, best thermal insulator etc.) reacts.
3. If you think you know enough to have a good idea about what may happen, then make an educated guess as to what you think will happen. We call an educated guess like this a "hypothesis." Remember, your experiment will test your hypothesis. That is, it might prove it wrong, but it can never prove it to absolutely unquestionably right. Science advances when scientists set out to prove ideas wrong. If the idea withstands rigorous testing, only then should you have any confidence in it.
4. Next, you'll need to devise a detailed procedure outlining exactly how you will conduct the experiment. Step-by-step. So ask yourself at each step what you need to do to make absolutely certain that errors or outside influences aren't creeping in that can affect your experiment without you knowing about it. This is the most critical part of the whole process! Don’t forget to think about safety.
5. Finally, think about the data you are going to get. How will you make sense of it? What will you do to figure out what it all means? Will you average it, plot it, do some calculations? You must know in advance what you will do to analyze you data, lest you fall into the trap of looking at the results, and then selecting a method of analyzing it that unfairly favours your hypothesis.

## *Preparation and planning Investigation 1*

1: Try to word your investigation as a problem statement (*sentence or question that identifies the thing that you are going to change and what will change as a result)*.

2. Can you predict what you think is going to happen in this investigation *(a statement about what you think the answer to the problem statement will be).*

How will you make sure it is a fair test?

3: What are you going to change ***(the independent variable)***

What intervals are you going to make you measurements at?

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How many times are you going to repeat each measurement?

What you are going to measure that will change as a result of changing the independent variable *(the dependent variable)*

What are the Constants *(fixed variables)* in this experiment?

Are there any safety considerations in this experiment? If so, what are they and how are you going to cater for them?

4. Resource list *(make a list of all the resources that you will need to carry out your investigation: include any equipment, chemicals or apparatus you might need).*

How will you set up your equipment?

Give a detailed account of how you are going to conduct this experiment.

5: How are you going to present your data?

## *Preparation and planning Investigation 2*

1: Try to word your investigation as a problem statement (*sentence or question that identifies the thing that you are going to change and what will change as a result)*.

2. Can you predict what you think is going to happen in this investigation *(a statement about what you think the answer to the problem statement will be).*

How will you make sure it is a fair test?

3: What are you going to change ***(the independent variable)***

What intervals are you going to make you measurements at? For example in topics one how long are you going to leave the peas to soak? In topic 3 what temperature readings are you going to take your measurements? (In topic 2, what plants are you going to use?)

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How many times are you going to repeat each measurement?

What you are going to measure that will change as a result of changing the independent variable *(the dependent variable)*

What are the Constants *(fixed variables)* in this experiment?

Are there any safety considerations in this experiment? If so, what are they and how are you going to cater for them?

4. Resource list *(make a list of all the resources that you will need to carry out your investigation: include any equipment, chemicals or apparatus you might need).*

How will you set up your equipment?

Give a detailed account of how you are going to conduct this experiment.

5: How are you going to present your data?