Science Fair Project Set Up Instructions

1) Hypothesis Statement
2) Materials List
3) Procedures
4) Safety Instructions
5) Data Table

1) How to write a HYPOTHESIS STATEMENT

Use the following format:

If (*IV*) **is** (*increased, decreased, changed*)**, then** (*DV*) **will** (*increase, decrease, change*) **because** (*reason based on prior research*)**.**

Hypotheses Tips

- ***A hypothesis is a statement, not a question.*** Your hypothesis is not the scientific question in your project. The hypothesis is an educated, testable prediction about what will happen.

- ***Make it clear.*** A good hypothesis is written in clear and simple language. Reading your hypothesis should tell a teacher or judge exactly what you thought was going to happen when you started your project.

- ***Keep the variables in mind.*** A good hypothesis defines the variables in easy-to-measure terms, like who the participants are, what changes during the testing, and what the effect of the changes will be.

- ***Make sure your hypothesis is "testable."*** To prove or disprove your hypothesis, you need to be able to do an experiment and take measurements or make observations to see how two things (your variables) are related. You should also be able to repeat your experiment over and over again, if necessary.

  To create a "testable" hypothesis make sure you have done all of these things:
  - Thought about what experiments you will need to carry out to do the test.
  - Identified the variables in the project.
  - Included the independent and dependent variables in the hypothesis statement. (This helps ensure that your statement is *specific* enough.

- ***Do your research.*** You may find many studies similar to yours have already been conducted. What you learn from available research and data can help you shape your project and hypothesis.

2) How to create a MATERIALS LIST

Your materials list should be a very clear description of exactly what you need for your project or experiment. It should be so exact, that someone who wanted to do your same experiment could go to the store with your list and buy exactly the same things and exactly the same amount of everything that you used.

Do not include the things that are not directly related to performing your experiment, like paper and a printer to record your observations or pens and pencils needed to record results. This list is only for things that you need to **do** the science of the project.

- Type a detailed **list** of the items you needed to complete your experiments. (use numbers or bullets)
- This should include a detailed list of all the equipment and materials you need. You must be specific enough so that someone could **exactly duplicate your experiment**.
- Use brand names and/or numbers for every item on your list.
- Be specific about the amounts used.
- ALL MEASUREMENTS must be METRIC (SI).

Example:

Item #1: Beaker: plastic, 600 mL, Nalgene®

Item #2: etc.

Item #3: etc.

3) How to write PROCEDURES

Your procedures need to be NUMBERED.

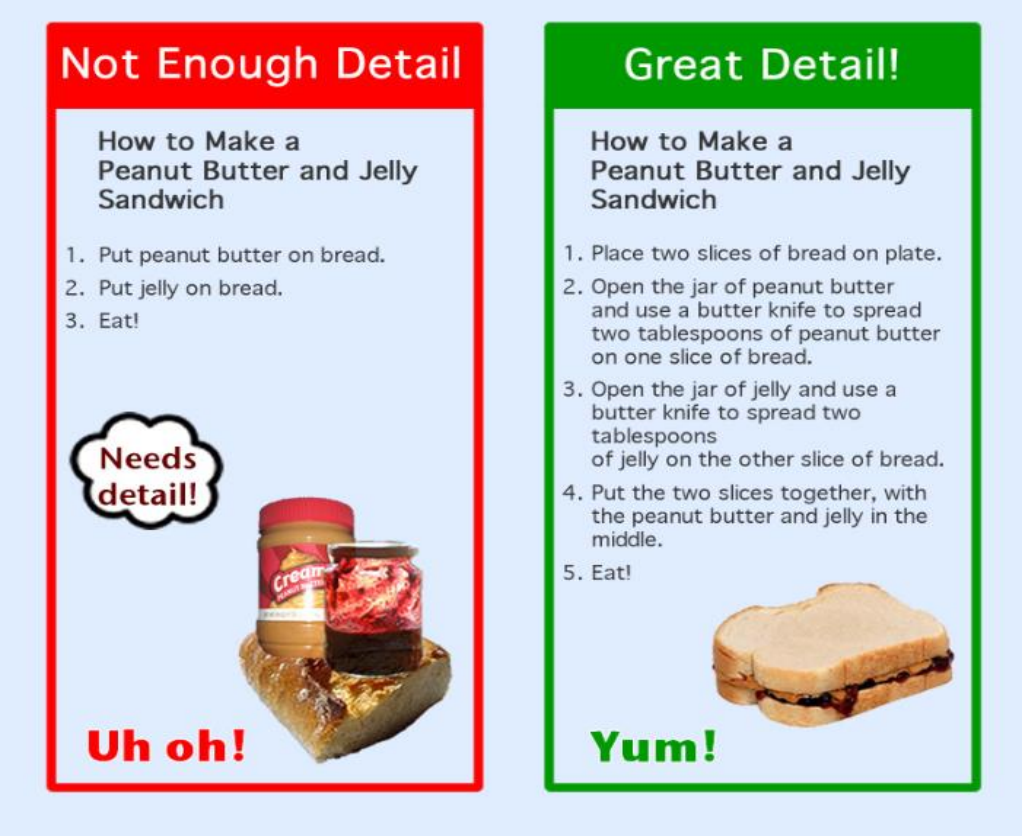
Step #1, Step #2, etc.

or

1) 2) 3) etc.

The procedures are a set of very specific instruction about how you are going to conduct your experiment. Your project procedures need to be clear and specific so that your science fair project could be REPEATABLE. This means that someone else could perform your experiment by following your detailed procedures and GET THE SAME RESULTS.

Consider the image below. What happened to the sandwich on the left?



Sadly, no one could eat the sandwich on the left. It doesn't even look like a sandwich! The problem is a lack of detail. If you have never made a peanut butter and jelly sandwich, the very precise and detailed directions on the right would be necessary to make the sandwich correctly. Details are the most important part of any experiment because without detail, it would be nearly impossible for someone else to replicate your experiment.

4) What is meant for SAFETY INSTRUCTIONS?

The purpose of including safety instructions in your scientific procedures is to identify any precautions that may need to be followed in completing this experiment.

Safety should be a primary concern for every science experiment. Even though you might not think your project has safety concerns, almost any tool or technique, no matter how safe, can be used in an unsafe manner. At the same time, many potentially dangerous tools are perfectly safe if they are used in the proper way.

Answer some/all of the following questions to determine what areas might pose a potential safety concern. Make sure you address all safety issues in your project proposal so your adult supervisors are aware of any issues ahead of time. Your teacher will then evaluate your project based on the following questions:

- Where will the experiment be performed?
- What safety gear will be used?
- Who will be supervising the experiment?
- Are you knowledgeable about or do you have training in the procedures being used?

Tips for writing Safety Precautions

First give a short description of the rule and then give a reason why each rule applies to your experiment.

Safeguarding your experiment could be one of your precautions.

> ***Example:*** *1. No Horseplay because goofing around might break something or hurt the experiment, meaning I would have to start all over again.*

5) How to setup a DATA TABLE

- Include all of YOUR project variables into the table format shown below.
- Don't forget to include units of measure where applicable. (metric)
- Adjust your table if you happen to have more than 3 trials or levels.
- Include your CONTROL GROUP as one of the levels (*labeled as CONRORL*).

Your Data Table must be formatted like this:

The Effect of the IV on the DV				
IV (metric)	DV (metric)			
	Trial #			Average
	1	2	3	
Level 1				
Level 2				
Level 3				

Note:

The rough draft of your data table may be created by hand on notebook paper.

Your final draft will be more formal.

Here is a link with additional instructions on:

How to Create a Data Table in Excel