

### Logbook Tips

This is some information to help you as you set up and record information in your logbook. There are three main things to remember about your logbook.

- (1) Everything you write in your logbook must be in blue or black ink only.
- (2) Logbooks are designed to be a work-in-progress. They are not meant to be perfect. If you make a mistake simply mark through the mistake and continue your work. If you mess up a whole page, simply mark an X through the entire page. Do NOT tear out any pages. Do make sure everything is legible.
- (3) There are many ways of organizing your logbook. As long as you include all of the necessary parts, the order is not important. The most crucial portion of the logbook is your data. Make sure you include qualitative and quantitative data.

### Logbook Tips, cont.

Below is an example of a format for a science project logbook. If yours is not in this exact order, do not stress. Remember, just make sure you label and include all parts. Also, number all of the pages in your logbook. A good place to put your numbers is the top or bottom right-hand corner.

- 1) Title Page: This should include your title (make it catchy), your name, school, and teacher's name.
- 2) Table of Contents: List the parts as you go through. You can add the page numbers at the end of your project.
- 3) Brainstorming: This is where you write all of the ideas you gathered at the beginning of the school year. Include your thoughts and feelings about your ideas.
- 3) Question and area of science
- 4) Purpose: This is why you are doing this experiment. Refer to the William's Class website for an easy purpose format.
- 5) Research: This may take several pages. Your research is the notes you took from your sources. Make sure you cite each resource as you are taking notes.

### Logbook Tips, cont.

- 6) Variables: Make sure you have an independent variable (what you are testing), dependent variable (what and how you will measure), and control variables (what you will keep the same for all groups throughout the experiment).
- 7) Materials list: Make sure it is a detailed list including sizes and measurements.
- 8) Procedure: Include enough details that anyone can pick up your logbook and duplicate your experiment.
- 9) Data Table: This is where you will record your quantitative data. Here is a website with information on making a data table, as well as an example. <http://www.brighthubeducation.com/science-homework-help/86665-how-to-make-a-science-data-table-for-projects-presentations/>
- 10) Data: The data portion of your logbook is very similar to a journal. Each entry needs to be dated and include data as well as your thoughts and observations.
- 11) Graph of your data: It is fine to print a copy of your graph and tape or glue it into your logbook.
- 12) Conclusion: Tell what you found from your experiment. Remember to include if your hypothesis was supported or rejected, along with data to back up your answer.
- 13) Reflections: Tell what you learned from this experience, as well as what you would do differently next time.

### Writing the Purpose Statement

The Purpose Statement should explain what it is you are trying to discover or prove. The Purpose should be written in a form of a statement. Try to make your purpose original and creative.

The statement should clearly explain:

1. The problem that you are trying to solve with your experiment.
2. Why you want to do this experiment.
3. How you think the information gained from the experiment will help other people.

Example of a Purpose Statement:

The purpose of this experiment is to find out how the density of plant cover affects soil erosion. I became interested in this experiment when the hillside next to our yard began to erode. The information from this experiment will help people to determine how many plants they should plant on their yards hillside.

Use the format below to create a quality purpose statement.

The purpose of this experiment was to \_\_\_\_\_

\_\_\_\_\_

I became interested in this experiment when \_\_\_\_\_

\_\_\_\_\_

The information gained from this experiment will help others by

\_\_\_\_\_

• - Independent Variable

What you are testing  
- Brand of fertilizer

How does IV  
affect DV ?

- Dependent Variable

Data → what you are measuring  
plant growth - height of plants in metric  
cm.

- Control Variables

everything that you  
keep the same

kind of plant, amt of fertilizer,  
amt of water, amt of sunlight

8 in =  
— cm

## Materials List

Number & list everything used for your project.

### Materials List (skip lines)

- 20 Big Boy tomato plants in 1 gallon container
- very specific potting soil
- Miracle Grow Long Lasting Potting Soil
- 1 mL measuring cup
- Vitamin K
- purified water

## Procedure (Skip lines)

- Step by step directions of how to do a project.

- 1) Gather your materials
- 2) Remove 2 pieces of bread from the bag
- 3) Spread Peanut butter with knife



## Science Project Background Research Paper

The purpose of the background research paper is to find out all you can on your topic. You need this knowledge to be able to write a hypothesis, which is an educated guess based on research.

The best place to start is look at your question. For example, our class example is: Which brand of fertilizer is best for tomato plant growth? I need to conduct research on tomato plants, what they need to be healthy, what nutrients they need, etc. I also need to research fertilizers, the different kinds, how they are made, etc. All of this research needs to be written as notes in the research section of your logbook. I would recommend putting the source at the top of the page, and using a separate page for each source. Keeping organized will help when you go to write your paper. Also, look to see if experiments similar to yours have already been conducted. If they have, tell what others have found, what you liked about these experiments, and what you plan to do differently, if anything.

Begin your paper with an introductory paragraph. Briefly tell what your experiment is about. After the introduction, begin telling what you learned from your research. Keep the information organized and make sure it flows. End your paper with a concluding paragraph. There is a minimum of a page and a half for this paper.

Your paper needs to be typed double spaced in Times New Roman with 12 point font. It also must include a bibliography. The easiest way to do this is by using EasyBib ([HYPERLINK "http://www.easybib.com"](http://www.easybib.com) [www.easybib.com](http://www.easybib.com)). The bibliography needs to be alphabetized on a separate sheet.

## Hypothesis

### The Hypothesis should follow these rules:

1. A hypothesis is your question that has been reworded into a form that can be tested by an experiment.
2. You only need one hypothesis for each question you have.
3. You must have research to back up your hypothesis.

Should always include why. ...because...

**Examples of a Hypothesis:**

Miracle Grow will be the best fertilizer for tomato plant growth because it has the most nitrogen which is crucial for plant growth.

Grass will do a better job at preventing soil erosion on the hillside than shrubs. I base my hypothesis on the idea that there are more roots in the grass than the shrubs.

### Graphing Your Results

Now that you have completed your experiment and collected your data, it is time to analyze and display your results. You will need to have a graph in your logbook, your research report, and on your backboard. Remember, save your graph once you have it finished so you can simply make multiple copies and/or copy & paste as needed.

There are several ways of graphing data. You can make a graph using Microsoft Word. Simply click on “Insert”. Next, click on “Chart”, and choose which type of chart you want. Word will direct you from there. For those with an Excel program on your computer, this is another easy option. I have found the following website that has good instructions on making a simple graph.

<http://www.ncsu.edu/labwrite/res/gt/gt-bar-home.html#cb2>

## Graphing, cont

Another website with a simple-to-use graphing application is on Kid Zone

<http://nces.ed.gov/nceskids/createagraph/>

Some key basic information on graphs is: make it simple and easy to read. Place your **independent variable on the x-axis** of your graph and the **dependent variable on the y-axis**. If you have further questions or want more examples, google has a lot of great web sites for reference.

### Abstract

Include the following to create your abstract:

1. Your project's purpose statement.
2. The hypothesis.
3. A description of your independent variable and the control / constants.
4. A description of what variable you are manipulating (changing) in your experiment.
5. How you went about measuring and observing the variables / controls.
6. Your results and data collected from your experiment.
7. Your conclusion statement.

**Include all of the following to create a successful abstract:**

The purpose of my science fair project was \_\_\_\_\_  
\_\_\_\_\_

My hypothesis for this project was (tell why based on research) \_\_\_\_\_  
\_\_\_\_\_

The control variables in my experiment were \_\_\_\_\_  
\_\_\_\_\_

The independent variable in my experiment was \_\_\_\_\_  
\_\_\_\_\_

The way that I measured the responding or dependent variable was \_\_\_\_\_  
\_\_\_\_\_

The results of this experiment were \_\_\_\_\_  
\_\_\_\_\_

The results show that my hypothesis should be (give brief reason why to accept or not; Accept or reject your hypothesis)  
\_\_\_\_\_

If I were going to do this experiment again in the future or expand on this experiment, I would \_\_\_\_\_

