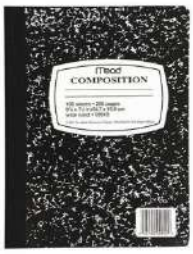
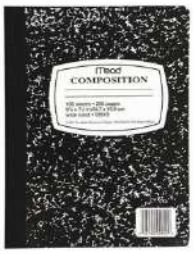


Science Fair Logbook



Whether you are a research student or a first-time science fair student, a logbook is a crucial part of any research project. It is a detailed account of every phase of your project, from the initial brainstorming to the final research report. The logbook is proof that certain activities occurred at specific times. Here are a few pointers that are easy to follow. They should help keep you organized, and certainly will impress any science fair judge. It's a great opportunity to show off all your hard work!

Important Notes:

- Use a hard-bound notebook or composition book like the one you see above.
- NEVER use pencil! Use a blue or black ink pen only.
- NEVER erase or use white-out! If mistakes occur, mark it out with ONE neat line.
- NEVER tear a page out of your logbook!
- NEVER redo something to make it neater. Neatness isn't important. Getting your thoughts and data recorded is the important part of the project.
- NEVER place loose papers in the logbook. They are easily lost.
- ALWAYS date every entry every time you make research notes or an entry in your logbook.
- ALWAYS use the metric system when measuring or recording amounts. Example: Use centimeters, meters, milliliters, liters NOT inches, feet, cups, or gallons.

Logbook Set-Up:

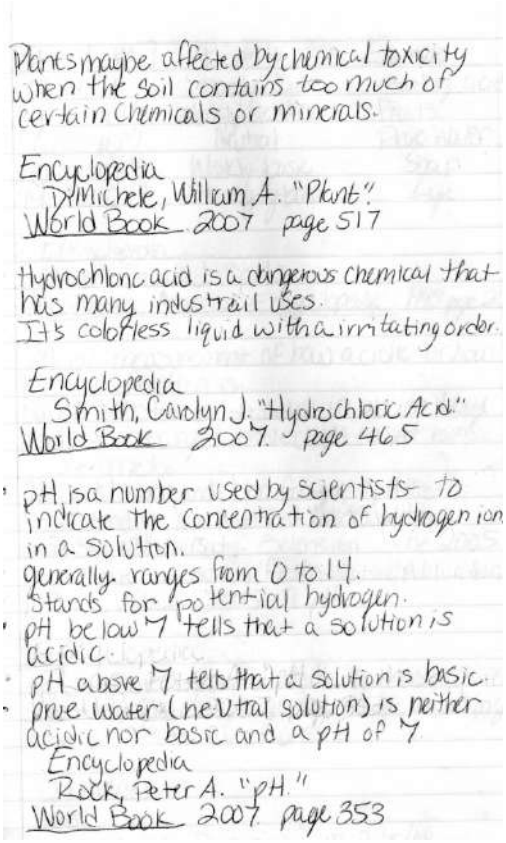
1. Label the front cover of the composition book with the following information:
    a. Your first and last name
    b. Eagle's Landing Middle School
    c. 295 Tunis Drive, McDonough, GA. 30253
    d. (770) 914-8189
    e. Teacher Name
2. Leave the first page blank for your table of contents. This page will be the last thing you complete for your logbook after all entries have been made.
3. After the table of contents, number the remaining pages of the logbook.
4. Use tabs to separate the sections of your logbook.

Logbook Sections:

1. Deadline Schedule: Glue this schedule onto page 1 of your logbook. It will help keep you on track with due dates.
2. Background Research: Include all notes taken while researching in the media center or online. This information will be used to write your research report. You should also record the source information for your works cited page. Do this for EVERY website, book, encyclopedia, magazine, or interview that you use for information. A minimum of 5 sources is required for this project. You must follow proper citation format (see sample section for guidelines).
3. Problem Statement: Write the research question you have in statement form. The problem statement is the entire purpose for doing your research and completing your experiment.
4. Hypothesis: After conducting research, write a hypothesis for what you think the answer to the research question is going to be. It is an "educated" guess in the form of a statement.
5. Experimental Setup: Include in this section:
    a. Materials: Make a DETAILED list of all materials you will be using in the experiment. Be specific! For example, if you will be watering plants, you should list the EXACT amount of water you will use.
    b. Procedures: Make a NUMBERED step-by-step list of everything you will do in the experiment. Your procedures and materials should be so complete that someone could take your logbook and do the same exact experiment.
6. Variables: This section should include the independent variable, the dependent variable, all constants, and the control if it applies. See your science fair packet for a description of each of the terms.
7. Data Collection: Remember to date every entry!!! Your detailed observations made throughout the experiment should be recorded in this section. This includes data collected, what you are doing, AND what you see/smell/hear/feel. Be VERY specific about everything going on in the experiment. See the sample page to get an idea of how it should look.
8. Results: Include pictures you have taken throughout the experiment, data tables created to organize your data, charts and graphs, and a summary of the data.
9. Analysis/Conclusion: **Using your data**, discuss the outcome of the experiment. Did your data support your hypothesis? Did it not support your hypothesis? How do you know?
10. Reflections: What would you do differently next time? What part of the experiment could be changed to improve the procedures? How could you extend your research?

Sample logbook pages:

Sample Research Entry



Plants maybe affected by chemical toxicity when the soil contains too much of certain chemicals or minerals.

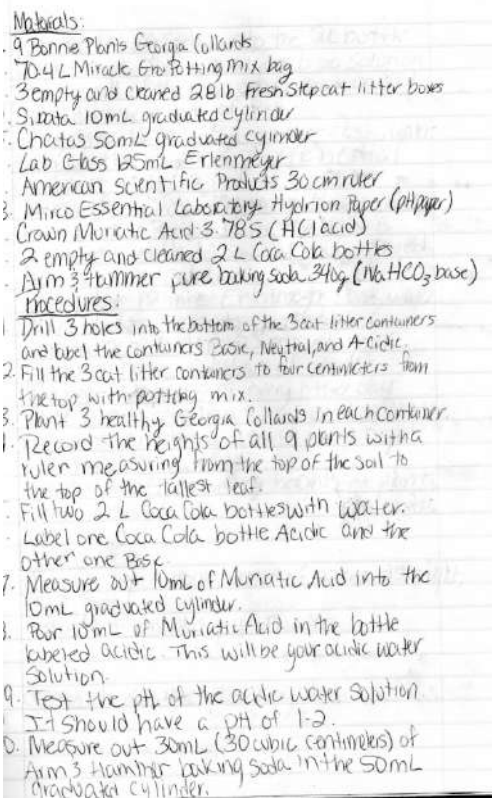
Encyclopedia
Dymichele, William A. "Plant".
World Book 2007 page 517

Hydrochloric acid is a dangerous chemical that has many industrail uses.
It's colorless liquid with a irritating order.

Encyclopedia
Smith, Carolyn J. "Hydrochloric Acid."
World Book 2007 page 465

pH is a number used by scientists to indicate the concentration of hydrogen ion in a solution.
generally ranges from 0 to 14.
Stands for potential hydrogen.
pH below 7 tells that a solution is acidic.
pH above 7 tells that a solution is basic.
pure water (neutral solution) is neither acidic nor basic and a pH of 7
Encyclopedia
Rock, Peter A. "pH."
World Book 2007 page 353

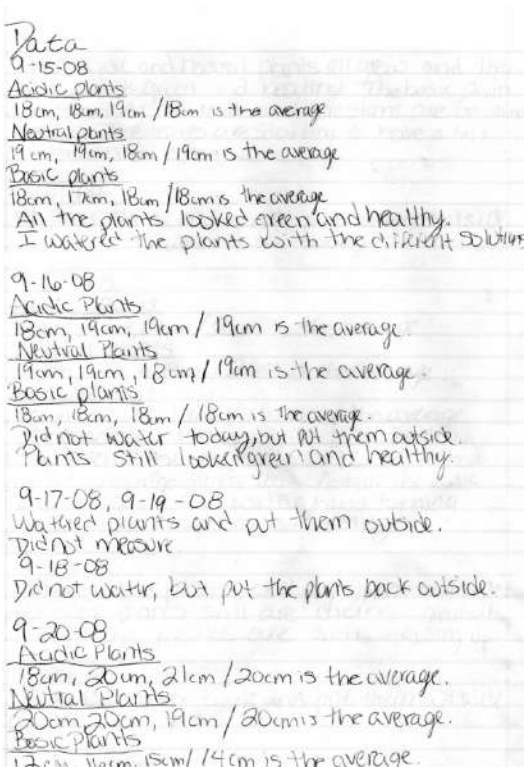
Sample Materials & Procedures Page



Materials:
- 9 Bonnie Plants Georgia Collards
- 70.4 L Miracle Gro Potting Mix bag
- 3 empty and cleaned 28 lb Fresh Step cat litter boxes
- Sizzata 10mL graduated cylinder
- Chatos 50mL graduated cylinder
- Lab Glass 125mL Erlenmeyer
- American Scientific Products 30 cm ruler
- Mirco Essential Laboratory Hydrion Paper (pH paper)
- Crown Muriatic Acid 3.78 S (HCl acid)
- 2 empty and cleaned 2 L Coca Cola bottles
- Arm & Hammer pure baking soda 340g ($NaHCO_3$ base)

Procedures:
1. Drill 3 holes into the bottom of the 3 cat litter containers and label the containers Basic, Neutral, and Acidic.
2. Fill the 3 cat litter containers to four centimeters from the top with potting mix.
3. Plant 3 healthy Georgia Collards in each container.
4. Record the heights of all 9 plants with a ruler measuring from the top of the soil to the top of the tallest leaf.
5. Fill two 2 L Coca Cola bottles with water.
6. Label one Coca Cola bottle Acidic and the other one Basic
7. Measure out 10mL of Muriatic Acid into the 10mL graduated cylinder.
8. Pour 10mL of Muriatic Acid in the bottle labeled acidic. This will be your acidic water solution.
9. Test the pH of the acidic water solution It should have a pH of 1-2.
10. Measure out 30mL (30 cubic centimeters) of Arm & Hammer baking soda in the 50mL graduated cylinder.

Sample Data Collection Page



Data
9-15-08
Acidic Plants
18cm, 18cm, 19cm / 18cm is the average
Neutral plants
19 cm, 19cm, 18cm / 19cm is the average
Basic plants
18cm, 17cm, 18cm / 18cm is the average
All the plants looked green and healthy.
I watered the plants with the different solutions

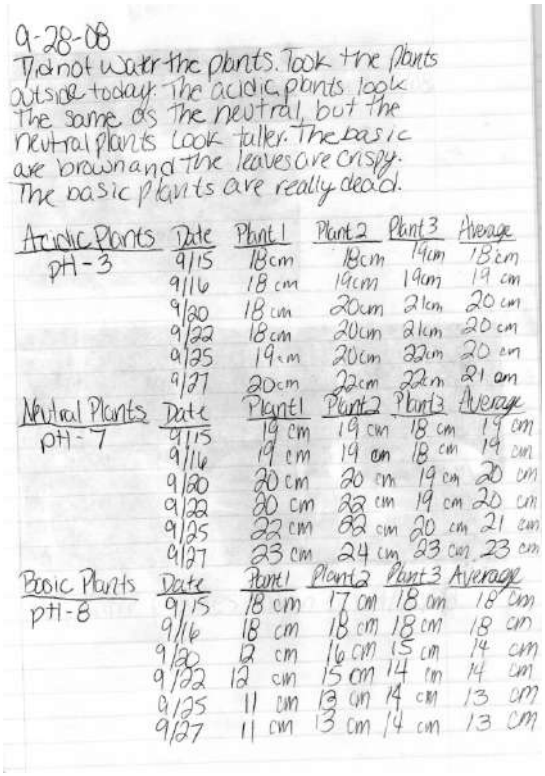
9-16-08
Acidic Plants
18cm, 19cm, 19cm / 19cm is the average
Neutral Plants
19cm, 19cm, 18cm / 19cm is the average
Basic plants
18cm, 18cm, 18cm / 18cm is the average.
Did not water today, put them outside.
Plants still looked green and healthy.

9-17-08, 9-19-08
Watered plants and put them outside.
Did not measure

9-18-08
Did not water, but put the plants back outside.

9-20-08
Acidic Plants
18cm, 20cm, 21cm / 20cm is the average.
Neutral Plants
20cm, 20cm, 19cm / 20cm is the average.
Basic Plants
[illegible] 15cm / 14cm is the average.

Sample Results Page with Organized Data



9-28-08
Did not water the plants. Took the plants outside today. The acidic plants look the same as the neutral, but the neutral plants look taller. The basic are brown and the leaves are crispy. The basic plants are really dead.

Acidic Plants pH-3	Date	Plant 1	Plant 2	Plant 3	Average
	9/15	18cm	18cm	19cm	18cm
	9/16	18 cm	19cm	19cm	19 cm
	9/20	18 cm	20cm	21cm	20 cm
	9/22	18 cm	20cm	21cm	20 cm
	9/25	19cm	20cm	22cm	20 cm
	9/27	20cm	22cm	22cm	21 cm

Neutral Plants pH-7	Date	Plant 1	Plant 2	Plant 3	Average
	9/15	19 cm	19 cm	18 cm	19 cm
	9/16	19 cm	19 cm	18 cm	19 cm
	9/20	20 cm	20 cm	19 cm	20 cm
	9/22	20 cm	22 cm	19 cm	20 cm
	9/25	22 cm	22 cm	20 cm	21 cm
	9/27	23 cm	24 cm	23 cm	23 cm

Basic Plants pH-8	Date	Plant 1	Plant 2	Plant 3	Average
	9/15	18 cm	17 cm	18 cm	18 cm
	9/16	18 cm	18 cm	18 cm	18 cm
	9/20	12 cm	16 cm	15 cm	14 cm
	9/22	12 cm	15 cm	14 cm	14 cm
	9/25	11 cm	13 cm	14 cm	13 cm
	9/27	11 cm	13 cm	14 cm	13 cm