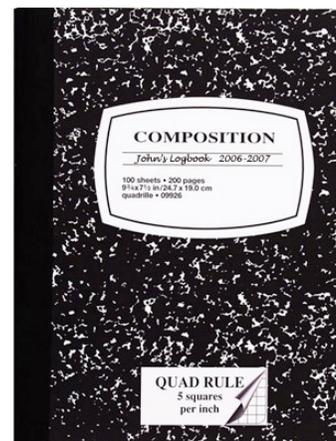


4.0 KEEPING A SCIENTIFIC NOTEBOOK OR LOG

One of the most important aspects of doing a science fair project is documentation. Every experiment should be reproducible and the entries in your notes should be sufficient for someone else to reproduce the experiment.

The first thing to do when beginning a science fair project is to get the notebook. You will work out your thinking and the development of your problem in the notebook. The scientific notebook is a bound or spiral book with pages that are not removable. The validity of your documentation partly depends upon insuring the work has not been tampered with or pages removed.



When preparing the notebook there are several things that need to be done.

1. Write your name inside the front cover.
2. Every page in the notebook must be numbered from the start. If the book pages are not already numbered, number every page in order at the upper corner along the outside edge of the pages.
3. Divide the book into sections and start a table of contents. Successful students typically divide their logbook into at least four sections (see box).
 - a. In the first section, begin your quest for ideas by listing topics or problems that you might investigate, and your thoughts about each.
 - b. Make a section of the notebook for literary research. For each literary research session, write the name of the library, the date, and the time visited at the top of a new page. List the resources you examine. If you take notes from a text, head the notes with all the information you will need to make a citation. Use the margins to enter the page of the reference from which the notes were taken. This will give you easy access to the “who,” “what,” “where,” and “when” that you’ll need when writing your research paper.
 - c. The next section contains experimental research or engineering design including the research plan, data collection, and data analysis.
 - d. The last section is the daily log where daily activities related to the research project are recorded. After the experiment is recorded, head a new page with “Discussion” or “Interpretation” before writing your inferences. Start a new page to write the “Conclusion.” Remember, the better the records you keep, the easier it is to validate your work.
4. When making a new entry, begin on a new page. Date each page as you use it.
5. The notebook must include all the steps of the scientific method, from the inception of the project to its completion. Scientific notebooks include literary and experimental research, the development of your idea or product and its evaluation, and all calculations. Entries made by people other than you must be signed and dated by those people.
6. You can keep a log or daily journal in a section of your scientific notebook, or in a separate book. If you plan to use a separate book for your log or daily journal, use the

Suggested Table of Contents for a Logbook:

- ⌘ Choosing a Project
- ⌘ Literary Research
- ⌘ Experimental Research
- ⌘ Daily Log

same type of bound book. The logbook is the chronological record of events during the experimentation.

When making entries in your notebook, follow these guidelines.

- Write the entry immediately after the work was performed.
- Write the date of the entry at the top of the outside margin of every page.
- Sign and date every entry.
- Mark and title each section clearly.
- Write legibly and in clear, understandable language.
- Use the active voice in the first person when making an entry so it clearly indicates who did the work. Your experimental entries should read like a story. Illustrate as necessary - a picture can be worth a thousand words!
- Record everything - no detail is insignificant.
- Title, label, and date all graphs and tables.
- Tape, staple, or paste computer print-outs, photographs, etc. into logbook.
- Have anyone who witnesses your work sign as a witness and date the entry.
- Never remove or obliterate an entry from your notebook. What you think is "a goof" may later turn out to be to be a great asset!

5/21/06
average

red pattern	cv ⁺ cv ⁺ sc ⁺ sc ⁺	51	50	49	60	54	53
both normal	cv ⁺ cv ⁺ sc ⁻ sc ⁻	2	0	0	0	1	1
→200	cv ⁺ cv ⁺ sc ⁺ sc ⁻	0	0	0	0	0	0
average	cv ⁺ cv ⁻ sc ⁺ sc ⁺	0	0	2	0	0	0
43	cv ⁺ cv ⁻ sc ⁺ sc ⁻	91	90	95	91	93	92
9	cv ⁺ cv ⁻ sc ⁻ sc ⁻	2	1	0	0	0	1
1	cv ⁻ cv ⁻ sc ⁺ sc ⁺	0	0	0	0	0	0
9	cv ⁻ cv ⁻ sc ⁺ sc ⁻	1	1	0	0	0	0
80	cv ⁻ cv ⁻ sc ⁻ sc ⁻	53	58	54	49	52	53
9	genotypic ratio = 146 cv ⁺ sc ⁻ : 53 cv ⁻ sc ⁺						
1	phenotypic ratio ≈ 3 altered smooth : 1 normal scalloped						
9	* crossing over = 50% average						
39	cv ⁺ cv ⁺ sc ⁺ sc ⁺	30	32	23	32	23	28
	cv ⁺ cv ⁺ sc ⁺ sc ⁻	19	19	13	24	13	18
cv ⁺ sc ⁻	cv ⁺ cv ⁻ sc ⁺ sc ⁺	1	1	7	6	4	4
	cv ⁺ cv ⁻ sc ⁺ sc ⁻	17	21	24	20	13	19
h:	cv ⁺ cv ⁻ sc ⁻ sc ⁺	58	56	69	68	20	64
	cv ⁺ cv ⁻ sc ⁻ sc ⁻	20	17	17	18	21	19
	cv ⁻ cv ⁻ sc ⁺ sc ⁺	1	2	4	1	2	2
	cv ⁻ cv ⁻ sc ⁺ sc ⁻	26	21	20	15	20	20
ff:gn:	cv ⁻ cv ⁻ sc ⁻ sc ⁻	28	31	23	16	34	28
	genotypic ratio = 129 cv ⁺ sc ⁻ : 23 cv ⁻ sc ⁺						
	d: 2 cv ⁻ sc ⁺ : 2 cv ⁻ sc ⁻ = 5:1:1:1						
	phenotypic ratio = 5 smooth : 1 altered : 1 normal : 1 altered : 1 normal : 1 scalloped						