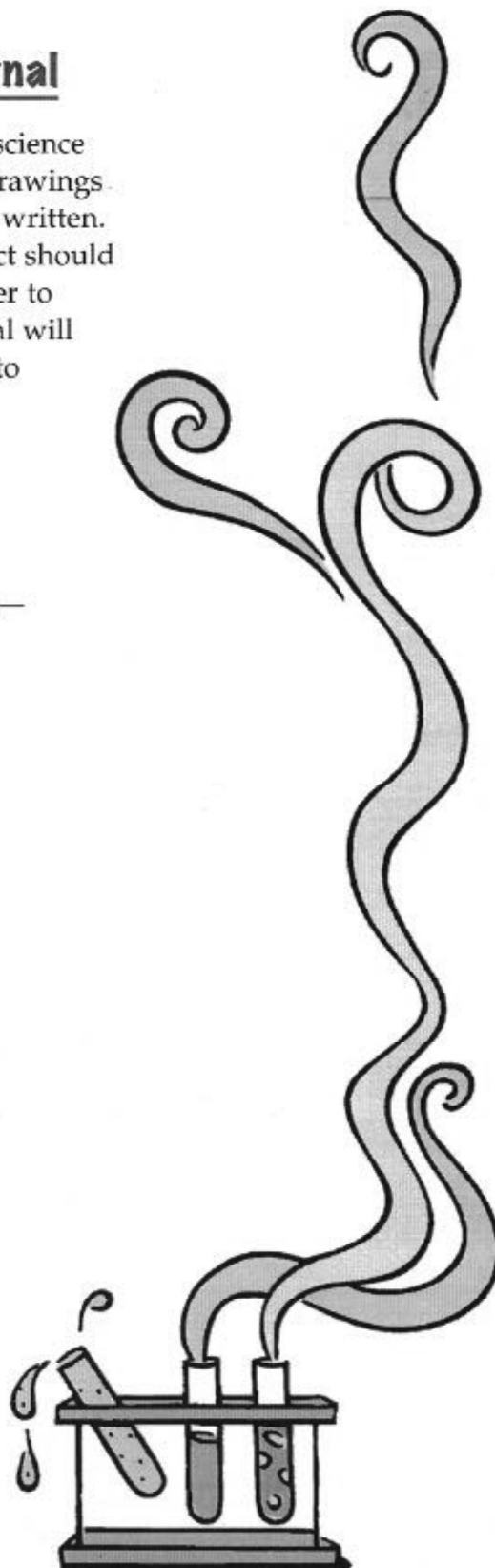


## Part One: The Science Journal

The Science Journal is one of four parts of a successful science fair project. This is where ALL ideas, thoughts, notes, drawings or sketches, research, information, results, and data are written. Everything that happens during your science fair project should be recorded here—the more detail, the better! Remember to write a date and time on every page. The science journal will be placed in front of your display board for the judges to read during the science fair.

The Science Journal may be a spiral or composition notebook. Once started, please do not remove any pages from your Science Journal or use it for other things. This notebook should be completely dedicated to your project. It is okay for there to be some mistakes—just be as neat and thorough as possible.



## **Part Two: The Research Paper** **Using the Scientific Method of Investigation**



The research paper may be typed or neatly handwritten. Each step must be explained thoroughly and clearly. Some of the steps require a rough draft that will be turned in to your teacher; others you will need to complete on your own. Rough draft worksheets are included at the end of this guide. Attach more pages if necessary.

Bring each of the rough draft pages to school for your teacher to review with you on the due date. After your teacher has reviewed and returned each page of your rough draft, you may write the final copy of your research paper, to be turned in with your project.

### **Step 1: State the Research Question**

What question are you trying to answer? Ask a question that you can answer through observation or experimentation.

### **Step 2: State the Purpose**

What is your reason for asking this question? What are you trying to discover?

### **Step 3: Background Research**

*The background research section may be optional for students in grades K-2. Check with your teacher.*

Following your teacher's directions, write a background research section. This section should be used to help you make a hypothesis. For grades 3-4, include ten to fifteen facts and cite one to three sources. For grades 5-6, include twenty to thirty facts, and cite three to five sources.

### **Step 4: Write a Bibliography**

Make a list of the sources you used to collect your background research. Your teacher can help guide you in using the proper format.

### **Step 5: Make a Hypothesis**

A hypothesis is a statement that predicts the outcome of your experiment, based on what you already know, and proposes an explanation that can be tested. What do you think that the answer to your research question will be? Remember, hypotheses don't need to be correct—they just need to be informed guesses! Never go back and change your hypothesis once your experiment is complete. You will learn something important whether your hypothesis is proven or disproven! If you have researched the topic of your project, then your research should help you make a good hypothesis. Hypotheses are often written using an "If..., then..., because...." format.

### **Step 6: List the Materials**

Every item that you will use to do the experiment should be listed in the materials section. A common format is to list items in the order in which you will use them.

### Step 7: Describe the Procedure

The procedure describes the experiment in a step-by-step sequence. It may help to think of the procedure as a recipe, in which every step is clearly explained. How will your materials be used, and how and when will they be measured? Another person should be able to follow the procedure of your experiment and get the same, or similar, results.

### Step 8: Perform the Experiment

Following the procedures from Step 7, conduct your experiment. If you realize that new steps or materials are needed, you may go back and revise those sections. But remember not to revise your original hypothesis.

### Step 9: Record the Results

Record detailed records of the results of your tests and observations. Results should always be explained in a written format first, followed by graphs, charts, and/or tables.

### Step 10: Make a Conclusion

After getting the results in Step 8, make a conclusion. According to your results, was your hypothesis proven or disproven? (Remember, it is okay for your hypothesis to be disproven!) Was there anything in the experiment that you would change if the hypothesis were retested? How could you change or expand this experiment if you were going to do it again? What did you learn from the experiment? How could this information be used to help people or to make the world a better place?

### Step 11: Write an Abstract

An abstract is a one-page summary of your project. It should state your research question, purpose, and hypothesis. It should include your procedures, but you do not need to be as precise as you were in the procedures section; describe your steps more generally. Your results and conclusion should also be included. The abstract is meant to give a quick explanation of your project to someone before they start to read your paper and examine your display.

### Step 12: Acknowledgments (optional)

Thank the people who helped you with your project.

### Step 13: Create a Title Page and Table of Contents

The title page should include a title for the project. (It is okay to restate the research question if you can't think of a good title.) Also include your full name, your grade, your teacher's name, your school's name, and the school year. After placing each section of your paper in order, number your pages, and then write a table of contents.

### Step 14: Proofread Everything Carefully!

#### The Final Order Of Your Research Paper Should Be:

(Typed)  
Title page  
Table of Contents  
Acknowledgments (optional)  
Abstract  
Research Question  
Purpose  
Background Research  
Hypothesis  
Materials  
Procedures  
Results  
Conclusion  
Bibliography



## Part Three: The Display Board

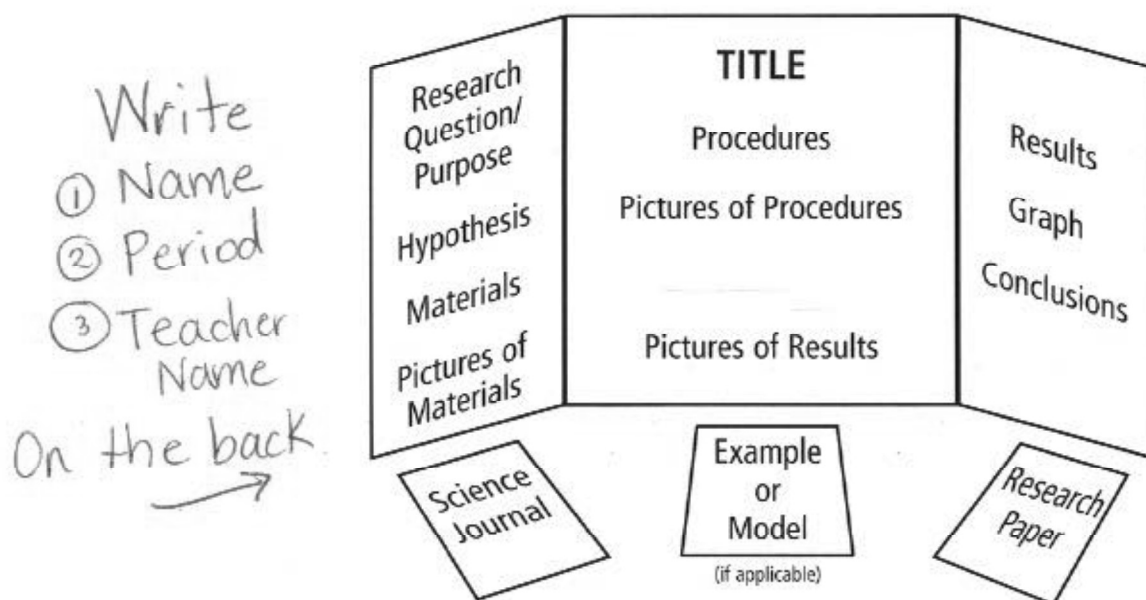


Standard display boards are 36" tall and 48" wide. For privacy reasons, and to make sure that the judges are impartial, most science fairs do not allow your name or any faces to be displayed on the front of your board or anywhere else in your displayed materials. Your teacher will provide you with any other special rules for your region.

Display boards should be easy to read and appealing to look at. They should have enough "flash" to make people interested, but not so much that it distracts them from understanding what you did for your project. Information on your display board should be typed and carefully proofread. Font sizes of each section heading should be large enough to clearly separate that section from the rest. Text size should be large enough to easily read when standing in front of your display board. The font size of titles should be large enough to read from across the room.

**TIP** The style of your font should not vary from one section of your text to another section—this will make your board look too "busy" when people are trying to read it. The project and section titles may have different styles from the text, but these should also remain consistent. Many people use colored construction paper mounted behind each section to make their boards stand out. Use rubber cement, a glue stick, or two-sided tape to stick each section to your board. School glue may make the paper wrinkle.

There are no hard-and-fast rules for exactly how to organize your board. Before you glue everything onto your board, place each section where you think it would look best. It is recommended that the amount of information in each of the panels look balanced, without too much empty space in any panel. Your board should include the following: Title, Research Question, Hypothesis, Materials, Procedure, Results (including any graphs, tables, charts, and pictures), and Conclusion. Many boards also include an abstract, background research, and bibliography. Where you place each of these on the board is up to you, but remember that people tend to start at the left hand side and read toward the right. In front of your display board you should place your science journal, your research paper, and examples or models that help explain your project (if applicable). Below is a common way to set up your display board:



## **Part Four: The Oral Presentation**

Your teacher may assign you a date on which you will present your science fair project to the class. Some schools also ask you to present your project to the science fair judges; if this is the case, then the class presentation will be excellent practice.

Tips for a great oral presentation:

- Make sure that your science journal, research paper, and display board are complete, neat, and proofread.
- Be prepared. Practice your presentation as many times as possible. Use index cards to write down your main points. Your index cards should not be read aloud; by practicing your presentation enough times, you should know what to say without even looking at your cards. They are to be used only if you need a reminder as you are presenting.
- Point to your board when explaining graphs or pictures, but do not read off your board.
- Practice in front of friends and relatives. Give them an opportunity to ask questions or provide feedback, and remember that it's okay to say, "I don't know." Remember, it is always better to say that you don't know the answer than to make one up!
- In case you are asked, make sure that you can clearly explain how your results were measured. For example, if you used a scale to measure weight, know what type of scale you used. Be able to show how to balance the scale and what weights you used.
- Be enthusiastic, and smile during your presentation. Stand straight and speak clearly and loudly enough to be heard by everyone in your audience. Make sure that your audience knows how proud you are of your project.
- Dress well. Wearing nice clothes shows that you are proud of your project and want to represent it in the best way possible.
- Stay within the length of time your teacher has provided for your presentation.

You may be expected to present your entire study, including your research question, purpose, background research, hypothesis, materials, procedure, results, and conclusion. Make sure that you share any special challenges or unexpected outcomes. Be prepared to answer questions at the end of your presentation.



**Research Paper Rough Draft:**  
**Research Question/Purpose**

Name \_\_\_\_\_ Due Date \_\_\_\_\_

Parent/Guardian Signature \_\_\_\_\_ On Time? Yes/No

**State the Research Question**

What question are you trying to answer? Ask a question that you can answer through observation or experimentation.

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**State the Purpose**

What is your reason for asking this question? What are you trying to discover?

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**Teacher Comments/Suggestions:**

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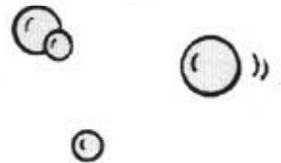
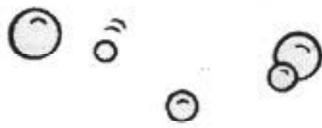
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## Research Paper Rough Draft: **Materials/Procedure**

Name \_\_\_\_\_ Due Date \_\_\_\_\_

Parent/Guardian Signature \_\_\_\_\_ On Time? Yes/No

### **List the Materials**

Every item that you will use to do the experiment should be listed in this section.

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### **Describe the Procedure**

The procedure describes the experiment in a step-by-step sequence. It may help to think of the procedure as a recipe, in which every step is clearly explained. How will your materials be used, and how and when will they be measured? If each step is carefully explained, another person should be able to follow the procedure of the experiment and get the same, or similar, results. Use the back of the paper or separate sheets if you need more space.

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### **Teacher Comments/Suggestions:**

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