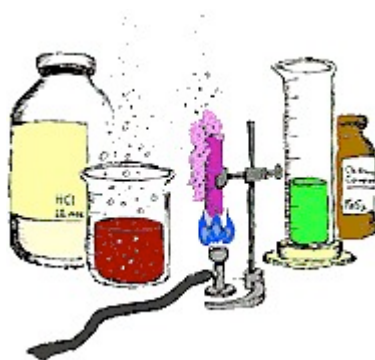


Science Fair

Information Packet

And Worksheet



1. Select a topic:



Try to pick an area of science that is interesting to you. Look in books and check the Internet for experiment ideas related to your topic. Find two or three simple experiments and then decide which one would be best to do, or pick an experiment of your own.

Buy a log book (black and white composition book) and put your three possible experiments in the book. Write down pros and cons of your three experiments.

Make sure the experiment you choose is a practical one that you could do, regarding your time, materials, ability to collect your data, etc. Write down all you will need to purchase for this experiment.

Write down everything you do in your log book. Use dates, places you go, books you use – all of it. You will need this information later.

For science fair experiment ideas, try the following web sites:

<http://school.discovery.com/sciencefaircentral/>

<http://pbskids.org/dragonflytv/scifair/>

<http://www.energyquest.ca.gov/projects/>

<http://www.all-science-fair-projects.com/>

2. Research your topic:



You've picked an experiment, now you need to research as much about the topic as you can. Find books on the topic. Download Internet information. See how this information relates to your experiment and **make connections**. Take notes for your research paper in your log book. Document your sources *as you take your notes* (you may forget the book title or Internet website after you've collected information) Use your *own words* in your notes.*



3. Plan and conduct your experiment:

Make a plan for carrying out your experiment. You should address **all** the following aspects of your experiment:

- Question (or Problem): You need to start with a question. What are you testing for in your experiment? What are you trying to find out?
- Hypothesis: What do you *think* will happen in your experiment? You base your hypothesis on the research you have done up to this point, using books and the Internet.
- Independent Variable: What is the thing you are going to purposely *change* in your experiment?
- Dependent Variable: What is the variable that is being observed, which changes *in response to* the independent variable?
- Constant: What is/are the thing/things that remain the *same* in your experiment?
- Materials: What materials do you need to conduct your experiment? Include all materials used to measure data, set up the experiment, etc.
- Procedure: What are the detailed steps you need to do, to conduct your experiment? You need to list **everything** that is done in the experiment, so that whoever reads your procedure will be able to repeat your experiment exactly.
- Conduct the Experiment: Now follow the procedure and conduct your experiment! **KEEP DETAILED NOTES ON WHAT YOU HAVE DONE AND WHEN. TAKE PRECISE MEASUREMENTS USING THE METRIC SYSTEM (SI)** (centimeters/not inches, milliliters/not liquid ounces, etc.)
- Data: What results did you gather? What have you used to measure or collect your data? How have you documented your data? What kind of graph did you use to represent your data?
- Take pictures, make sketches, write down any changes you observe, make notes if no changes are visible, etc. You will need this information later, when you are writing your report.



4. Analyze your results:

Once you have conducted your experiment, organize your notes in your log book. What were your results? Analyze your results. What happened here? *Why* do you think this happened? On what scientific principles do you base your analysis? Is what resulted in the experiment different from your hypothesis? Why/why not? What have you learned?

Make graphs and charts of your data to see patterns or trends.

Form a conclusion.



5. Write a report:

Write a detailed, typed report about your topic and how your experiment relates to your topic. Double-space, use 12 font, Times New Roman text, black ink, number your pages except for your title page, indent your paragraphs. Your report should be proofread and edited for mistakes. Perform a spell-check with your computer. **Have an adult check your paper for clarity and thoroughness.** Read it aloud to be sure all your sentences make sense to the reader. Your typed report should include the following:

·Title page: Center the following on the title page, double-space: Your name, your teacher's name, Science Fair Research Paper, the due date (Day, Month, Year)

·Table of contents with page numbers indicating parts of your paper (you probably can't complete this until you've finished the body of the paper.)

·Introduction – in your own words, tell why you picked the topic, the experiment – if you took good notes in your logbook, you can simply retell your experience of picking the topic. Talk about the scientific concepts and ideas about which you are experimenting. **Discuss how your experiment relates to the topic.** Briefly discuss what you did in your experiment.

·Hypothesis: Explain your hypothesis. This should be taken directly from your logbook. (Do **not** change your hypothesis *after* you have collected your data.)

·Materials List and Procedure – Your materials list and procedure should be accurately typed up in your paper. Simply type what you have noted in your logbook. Include in your procedure the independent variable, dependent variable, constant variable of your experiment.

Main body of your paper. **Two to four pages about your experiment and the science behind it.** All the following items need to be addressed in the main body of your paper in complete sentences, complete paragraphs:

- ✓ Describe the aspect or area of science your experiment involves.
 - ✓ Discuss in depth your topic/aspect/area of science.
 - ✓ What did you test for in your experiment and how did you test for it?
 - ✓ What had you predicted in your hypothesis?
 - ✓ What were the results of your experiment?
 - ✓ Was your hypothesis validated or refuted? Explain.
 - ✓ What do you *conclude* from your results?
 - ✓ How does your experiment and its results relate to the research you did on your topic?
 - ✓ What would you do differently next time?
- Cite your work. Use at least three sources. Cite all your sources according to the MLA examples:

Book

Okuda, Michael, and Denise Okuda. **Star Trek Chronology: The History of the Future.** New York: Pocket, 1993.

Website

Lynch, Tim. "DSN Trials and Tribble-ations Review." **Psi Phi: Bradley's Science Fiction Club.** 1996. Bradley University. 8 Oct. 1997 <<http://www.bradley.edu/campusorg/psiphi/DS9/ep/503r.html>>.

- It is very important that you do not *plagiarize*, or take the words of others as your own. Do not “cut and paste” from the Internet or use other’s words as yours. **A grade of incomplete (0) will be given to plagiarized research papers.**

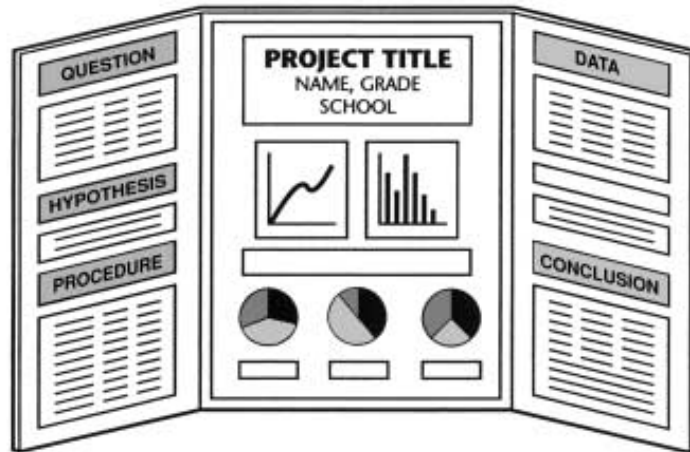
6. Make your display:



You have asked a question, formed a hypothesis, outlined a procedure, collected data and formed a conclusion. You have created charts and graphs of your data, showing your results and created a typed research paper connecting information you have gathered to your actual experiment.

Now create a beautiful display board, which explains your experiment for everyone to see! Purchase your display board at an office supply store. Special “science fair” lettering (Problem, Hypothesis, etc.) is available at these stores.

Use the format below for your display board, except do NOT put your name, grade, school on the front of the display board.



Science Fair Worksheet

1. Problem/Question – *What is the question I am trying to answer by doing my experiment?*

2. Hypothesis – *What do I **think** will happen in my experiment **before** I actually do it? This is a “guess” based on what I know about my topic so far.*

3. **Procedure** and Materials Needed– *What exactly am I doing to do to conduct this experiment? I need to list everything so that anyone who reads this can do my experiment.*

Materials List

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Procedure – Step-by-Step

1.

2.

3.

4.

5.

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7.

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9.

10.

- Independent Variable: What is the thing you are going to purposely *change* in your experiment?

- Dependent Variable: What is the variable that is being observed, which changes *in response to* the independent variable?

- Constant: What is/are the thing/things that remain the *same* in your experiment?

Introduction to your paper:

- ✓ Describe the aspect or area of science your experiment involves.

- ✓ Discuss in depth your topic/aspect/area of science.

More information about your topic:

More information about your topic:

How does information you are learning about the topic relate to your own experiment?

✓ What did you test for in your experiment and how did you test for it?

✓ What had you predicted in your hypothesis?

✓ What were the results of your experiment?

✓ Was your hypothesis validated or refuted (was it proven correct by the experiment, or proven wrong?) Explain.

✓ What do you *conclude* from your results?

✓ How does your experiment and its results relate to the research you did on your topic?

What would you do differently next time?

Rubric for Report and Presentation - Possible 100 Points

	Beginning 0-3	Developing 4-6	Accomplished 7-9	Exemplary 10	Score
Introduction	Does not give information about what to expect in project	Gives very little information	Information given, but not clear or well developed	Presents a concise lead-in to the report	
Background research for the paper	Little or no background information is given in the research paper, or background information is not related to experiment	Some background information is given in the research paper, information given is somewhat related to experiment	Background information given, information is related to the experiment	Thorough background information is given, information is clearly related to the experiment	
Problem/Question	Does not present a clear problem or question	Presents a problem/question but it is unrelated to the research or conclusions	Presents a problem/question somewhat related to the research or conclusions	Presents a problem/question directly addressed with the research and conclusion	
Procedure	Procedure not done in logical sequence, steps missing, variables not named: (independent, dependent, control variables)	Procedure done in logical sequence, some steps missing, some variables not named	Most steps are understandable, sequential, some lack detail, variables named	Presents easy-to-follow steps which are logical and detailed, all variables named	
Data and Results	Missing information, data inaccurate, carelessly done, metric measurements not used	Some inaccuracies and/or illegible or carelessly done, metric system attempted	Few inaccuracies, neatly done, metric system used	Neatly completed and accurate, metric system used	
Conclusion	Does not present explanations for findings, or presents illogical explanations, does not address questions suggested in packet	Presents illogical explanations for findings, addresses a few questions suggested in the packet	Presents logical explanations for findings, addresses many questions suggested in packet	Presents a logical explanation for findings and addresses all of the questions	
Grammar, spelling, punctuation, capitalization, citation, clarity in research paper	Very frequent grammar, spelling, punctuation, capitalization errors, paper not understandable, not complete, sources not cited, or not cited correctly	Several grammatical errors, paper lacking some clarity, not complete, sources cited, but not correctly	Some grammatical errors, paper is mostly error-free, understandable, sources cited correctly	Grammar and spelling correct, paper clear, thorough and understandable, sources cited correctly	
Presentation of the display board	Display board is carelessly done, incomplete, very little effort	Display board is lacking some requirements, done with little effort	Display board includes most or all requirements, effort is evident	Display board is neat, includes all requirements, best effort is put forward	
Connection of research and experiment	No connection is made between the experiment and the information offered in the research paper	Some connection is made between the experiment and the information offered in the research paper	Connections are made between the experiment and the information in the research paper	Clear, direct connections are made between experiment and the information in the research paper	
Timeliness for log book checks, research paper and display	None or very few of the deadlines for the project and the research paper were met	Some of the deadlines for the project and the research paper were met	Most of the deadlines for the project and research paper were met	All of the deadlines for the project and the research paper were met	

Total:

For more detailed help with your

