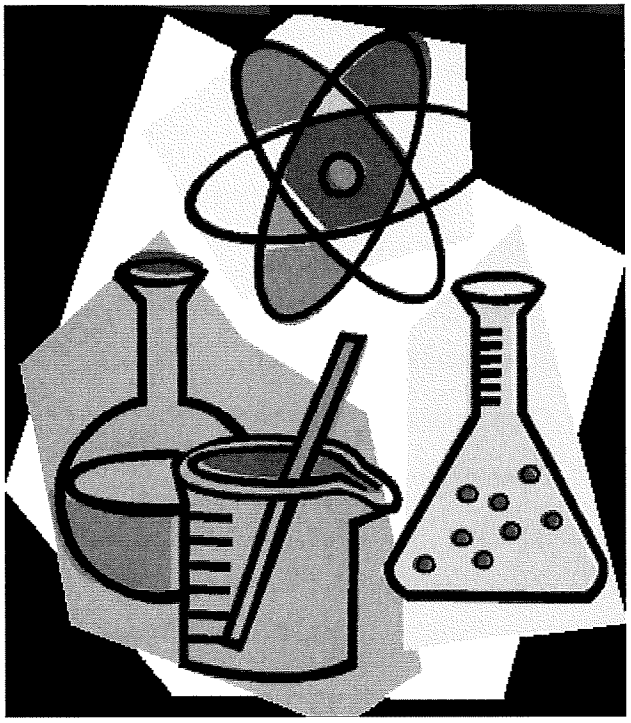
Science Fair Manual

2024-2025



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Additional Information:

- How to put a science fair board together and what should be in a Science Log Book
- Helpful Website and Glossary of Science Project Terms

Part 1: Choosing a Topic

Hernando County Science Fair is affiliated with SSEF, State Science and Engineering Fair. All projects must follow state guidelines and rules. Before beginning any project you must contact your local school science fair director or the district science fair coordinators to help guide you with state rules and specific dates for state paperwork or you will be disqualified from participating in the Hernando County Secondary District Science Fair.

When developing a topic or purpose for your project you must remember that your project needs to follow the scientific method. Your topic/purpose will be stated in question form and must be open-ended (not answered with a yes or no).

For example:

How will the mass of the car **affect** the speed in which it travels?

How does the amount of water **affect** the height of a plant?

Your question:

_____

_____

_____

Now turn your topic/purpose into a Project Title by changing your question into a statement.

For Example: The Effect of the Amount of Water on Plant Growth

Your title: _____

Part 2 – Research

In order to formulate a hypothesis you must first do your research. Your research needs to include at least 5 sources from reputable websites (not Wikipedia, ask.com or EHow).

Step one: formulate 5 questions to research:

Example: What affects the speed of a car?

How is speed calculated?

My Questions:

1. _____

2. _____

3. _____

4. _____

5. _____

Step 2: Find your sources and cite them according to MLA format. Example:

"Giant Panda." Amazing Animals of the World. Grolier Online, 2009. Web. 20 May 2009.

My sources:

1. _____

2. _____

3. _____

4. _____

5. _____

(See Appendix A for more information on MLA formatting and creating a work cited page)

Part 3: Hypothesis

Your hypothesis is your prediction, based on research, on the outcome of your project. A hypothesis should be written using the; if…then…because format.

Example: **If** a car has more mass **then** the speed of the car will decrease **because** the addition of mass will increase the friction on the wheels therefore slowing the car.

The **IF** statement includes your independent variable (what you are going to change). For example, the hypothesis above indicates that you will be changing the mass of the car.

The **THEN** statement includes your dependent variable (what you are going to measure). For example, the hypothesis above indicates that you will be measuring speed.

The **BECAUSE** part of the hypothesis includes your research to help explain your prediction. You do not need to say "my research says…" just state the information.

Use the following to help you format your hypothesis:

If _____

Then _____

Because _____

_____

_____.

Part 4 – Variables

There are 4 variables which you will identify for your project: independent, dependent, constants, and control.

Independent (Test): This is the variable you will be changing on purpose in order to see the results. For example: the mass of the car.

My Independent Variable: _____

Dependent (Outcome): This is the variable you will be measuring.

For example: The speed of the car.

This variable must be measurable using metric units. Qualitative measurements like: color, taste, or texture are not measurable and cannot be used as your dependent variable.

My Dependent Variable: _____

Constants: Your constant variables (the only variable with numerous items) includes everything that must be kept the same in order to make sure your experiment is valid.

For example: race car, ramp, stop watch, length of the ramp

My Constant Variables: _____

_____

_____

Control Variable: This is the variable used as a basis of comparison. The control variable usually does not receive the independent variable.

For example: the car without any weight added

My Control Variable: _____

Part 5 - Safety

Safety is a major concern when students are completing projects. As teachers it is our job to make sure a student, an animal, another human being or the environment is not hurt because of a science fair project. That is why it is important that all safety aspects of a project are reviewed. This includes working with any material or object that poses potential risk or harm in any way. Students working with any object containing a potential risk must show knowledge of the safety procedures needed to work with that material or object. This also includes proper disposal of materials and objects that could also cause risks to the environment and all living things within that environment.

Students who need to attach MSDS (Material Safety Data Sheets) should refer to the websites listed on page 3 of this manual. Some projects which will require MSDS include: household chemicals and fertilizers. Your teacher will let you know if MSDS forms are needed for your project. Some MSDS can be found at www.msdssearch.com. Once the MSDS is found students simply attach the MSDS sheet to their procedures and cite as one of their sources on the Works Cited page of their report. All safety procedures must be included in the procedures!

Some products such as microwave ovens, drills or electric saws may not have MSDS sheets. Instead refer to the safety information for those products on line at the manufacture's website or use the directions and safety information which came with the package.

Finally, there are basic safety issues.

- Always washing hands after handling soil
- Wearing oven mitts when picking up hot water in a glass beaker
- Wearing goggles when working chemicals such as bleach.
- Having someone steady a ladder as the experimenter climbs up.

If You Can Think of a Safety Issue Include it in you Procedures!!!

Use the space below to record any safety issues associated with your project and what steps will be taken to address these issues. **Then write your safety procedures in your science project journal in the format below**.

Safety Assessment(Issue)	Safety Precaution
EX: Bleach may cause damage to skin or eyes	Wear gloves and goggles

See Appendix B for an example

Part 6 – Materials

Your materials list will include all the materials, supplies, tools, and safety equipment you will need in order to successfully carry out your experiment. Your list should be very specific and include amounts in metric units. Your list should be numbered or in list form using bullet points.

For example:

- 3 AA Energizer batteries (NOT just batteries)
- 250 mL distilled water (NOT ½ cup water)
- Protective goggles (2 pairs)

See the example below of a material list:

- 2 20-liter buckets
- 1 4 liter pitcher
- 20 2 liter plastic containers
- 1 kitchen baster
- 500 mL measuring cup
- 1 stop watch
- 1 clock
- 1 permanent ink marker
- 20 Wide Range pH Test Tabs
- 20 Dissolved Oxygen Test Tabs
- 20 Ammonia #1 Test Tabs
- 20 Ammonia #2 Test Tabs
- 20 Nitrate #1 Test Tabs
- 20 Nitrate #2 Test Tabs
- 60 Test bags with plastic roll top
- 4 1 mL Test Tubes with screw caps
- Latex gloves
- 1 metric gram scale
- 1 package 1.47 kg Miracle-Gro Nature's Care Organic Bone Meal
- 1 package 1.47 kg Miracle-Gro Organic Blood Meal
- 1 package 20 kg Nature's Pride Manure
- 1 package 1.47 kg Cottonseed Meal 7-3-2
- 1 Petri dish
- 1 large spoon
- 8 liters pond water from Challenger Swamp
- Pond water Tour Color Chart for analyzing pH, Ammonia, Nitrate, and DO

Part 7 – Procedures

When writing your procedures, remember that you are writing a step-by-step guide for your science experiment. The procedure list should be so detailed that anyone could follow the steps and replicate your experiment exactly. Procedures need to include safety precautions, such as putting on goggles, parental supervision, or wearing oven mitts.

Procedures should be numbered in list form. Do not forget to include repetition (completing at least 3 trials) in your procedures. Also, include how you will label containers or samples.

See checklist for requirements:

_____ Procedure is listed step-by-step and numbered.

_____Procedure is written using command statements.

_____Procedures contain NO personal pronouns (I, you, your, me, my, etc.)

_____Materials included in specific detail (including size, type, brand, amount, temperature) where used in procedure. (For example, if your step says "Cut…." be sure to state with what you will be cutting—"Using scissors, cut…")

_____Explains in detail how, with what instruments, and in what units dependent variable and ALL other measurements will be made.

_____All measurements listed in metric units.

_____All safety issues addressed. Safety should be addressed in each step as needed not just at the beginning or end. (For example, "Using scissors and carefully cutting away from the body, cut…")

_____Number of trials included and adequate.

_____All constant variables described throughout procedure.

_____Describes how the independent variable will change throughout the experiment.

_____Another individual can duplicate this experiment based on procedure written.

_____MSDS attached if needed.

See Appendix C for an example of a complete procedures list.

Part 8 – Research Plan Attachment

Your Research Plan is basically a summary of your project so far. It will be used to obtain approval at the Scientific Review Committee meeting before experimentation will be allowed to begin.

Your Research Plan will be a typed 2 -3 page document which will include the following information:

1. Investigative Question (Part 1)
2. Hypothesis (Part 3)
3. Procedures (Part 6)
4. Data Analysis (This is a simple statement explaining how you will collect, measure, and record data) For example: *The distance the car travels will be measured to the nearest centimeter using a meter stick. The distances will be recorded on a data tables, averages calculated, and comparisons of data made.*
5. Work Cited (from Part 2)
6. Safety (Part 7)

See Appendix D for an example of a completed Research Plan

**Research plans are very important for the Science Review Committee and State Science Fair Committees. This is the form that is used to determine eligibility and analyze safety. **

Part 9 – Experimentation

The time is finally here for you to start collecting data. Remember that no experimentation can begin before project approval from your science teacher!

What you will do:

1. Get your journal ready so you can record all your observations and data!
2. Record safety procedures in your journal before you begin. (Ex: Put on goggles, have parent supervise)
3. Conduct your experiment and collect data using metric units.
4. Complete at least 3 trials (the more the better!)
5. Record all data in your journal on a data table.
6. Record observation in your journal.
7. Take pictures of EACH step of your project. Do not photograph your face or the face of anyone but show your work – this is your time to prove you did the work!

Once you have collected your data you will be creating computer generated data tables and graphs. However, your journal should contain all of your data.

Part 10 – Data Analysis (tables and graphs)

For this part of your project, you will be creating computer generated data tables and graphs. The following guidelines should be followed when creating both your table and graphs. See Appendix E for examples of both a data table and graph.

Data Tables:

- Your data table will have the heading "Results" centered and bolded at the top of the page with your title underneath "The Effect of _____ on _____"
- Each column should be labeled with the appropriate information and what units of measure are being used. (Ex: Distance in cm)
- Should include the mean (average) of all the trials)
- Should fill the entire page (you can increase the font size but use Times New Roman)

Graphs:

- Your graph will also have the heading "Results" centered and bolded at the top of the page with your title underneath "The Effect of _____ on _____"
- The Dependent Variable goes on the Y-Axis (make sure it is labeled)
- The Independent Variable goes on the X-axis (also labeled)
- Include metric units
- Include data from all 3 (or more) trials and the mean (average)
- Make sure to include a key.
- Your graph needs to be colorful (color printing is available in the library at a cost of $0.25 per page)

There are many websites which will help create graphs – the following is an easy one to use: http://nces.ed.gov/nceskids/createagraph/default.aspx

See Appendix E or example

Part 11 – Conclusion

You have made it! You are now ready to wrap things up and write a conclusion. The conclusion must be typed and be at least 3 -5 paragraphs in length. Your conclusion should include the following information:

1. Was your hypothesis supported or not.
2. What did your data tell you? Include numbers (mean, median, mode and range).
3. Discuss trends you can see in the graphs.
4. Discuss how the control variable was different from the experimental variables.
5. Include conditions or reasons why your data may have turned out the way it did.
6. Discuss how your data supported or did not support your hypothesis.
7. Discuss why your results turned out the way they did.
8. Discuss application of your results (how this information is useful in the real world)
9. Discuss possibilities for future experimentation.

** You conclusion should flow, use good transitions, be easy to read, and demonstrate an understanding of your project. The conclusion needs to be typed using proper paragraph structure, using Times New Roman 12 point font, and be double spaced. **

See Appendix F for example

Part 12: Abstract

See Appendix G for an example

This is a graphic organizer to help you organize your abstract. Your abstract should be 3-5 paragraphs long and can NOT exceed 250 words. It is a summary of your experiment. Scientist read this first to see if it is what they are looking for before they read the entire report. It's like reading the back of a book to see if you are interested in what it is about. It is actually the first page in your final binder project binder.

Hypothesis

Brief Explanation of the Procedure

- This needs to be in paragraph form.
- This should flow and not be choppy.
- This is a summary of the procedures, not everything has to be here.

Brief Overview of your Data

- This might be a summary of your data analysis portion of your conclusion.

Brief Overview of your Conclusion

- Summarize your conclusion.

Application

- How does it benefit us to know this information?
- Who benefits from this information?
- Where can this information be applied to our daily lives?

Part 13: Table of Contents

You will need to create a Table of Contents for your Final Project Binder. Below is a template for you to copy. This is the order in which items should appear in your final binder.

When you put your binder together make sure to use page protectors and label each section with tabs. This makes it very easy for judges and makes for a nice presentation.

Table of Contents

1. Abstract
2. Purpose and Hypothesis
3. Research report
4. Variables
5. Safety Precautions
6. Materials Needed
7. Procedure
8. Results: Data Table
9. Results: Graph
10. Data Analysis
11. Conclusion
12. Works Cited
13. Photographs

Appendix A

MLA Works Cited Information

The Basics:

1. The bibliography page should always start with a new page with a centered title "Works Cited".
2. Font should be 12-point, Times New Roman
3. Use the Hanging Indentation so the first life of an entry is flush with the left margin and the second line is indented by ½ inch
4. The entries should be alphabetized by authors last name or title of article (ignoring "A", "An" or "The")
5. Publication names should be in *Italics.*
6. Pay attention to the examples for rules on capitalization, abbreviation, and punctuation.
7. For dates with use (10 January 2015) or (January 10, 2015) as the format. Just be consistent.
8. If the information is not available just skip and move to the next item and cite what you can.

Format Examples:

- **BOOKS**:

  Author's Last Name, first name. *Book title.* City of publication. Publishing Publishing company. Publication date.

  EXAMPLE:

  Dell, R.M. Understanding *Batteries.* London, UK: The Royal Society of Chemistry. 2001.

- **WEBSITE or WEBPAGE:**

  Author's last name, first name. "Title of work or article." *Title of site, Project, or database.* Editor. Date of Publication. Name of any Sponsoring organization, university, or institution. Date you got the Information. <Full URL>.

  EXAMPLE:

  Brain, Marshall. "How Batteries Work." *Howstuffworks.* 1 August 2006. University of Maryland. 10 January, 2015. <http.//home.howstuffworks.com/battery.htm>.

  "Learning Center." *Energizer.* Everready Battery Company. Inc. 10 January 2015. http://www.energizer.com/learning/default/asp.

Appendix B

Sample Safety Precautions

Assessment: Skin burn can occur when touching solar cell during and right after Experiment.

Precaution: Avoid touching solar cell during experiment and wait a few minutes after using the solar cell before touching it since solar cell can be hot after prolonged exposure to sun.

Hazardous Device—The hazardous device that will be used in this experiment is the 3% methanol in distilled water.

Assessment: Harmful if inhaled or absorbed by the skin and causes irritation to eyes, skin, and respiratory tract.

Precaution: Wear mask, safety goggles, and rubber gloves.

Precaution: Avoid skin contact with methanol.

Precaution: Wash hands thoroughly with soap after handling methanol.

Precaution: Only use methanol in wide-open areas.

Precaution: Keep container of methanol tightly closed when not in use in a cool, dry, and well-ventilated area.

Assessment: Flammable.

Precaution: Keep methanol away from sparks, flames, and heat.

Precaution: Keep container of methanol tightly closed when not in use in a cool, dry, and well-ventilated area.

Disposal—N/A. All methanol in the methanol fuel cell will be used. If trace amounts of excess methanol is found, pour in sink and flush with large quantities of water.

Appendix C

Example of Procedures

1. Insert either end of the launch tube into the wide opening in the elbow joint.
2. Place the open end of the hose (the end without the plastic fitting) over the open end of the elbow joint.
3. Slide the collar up the hose and over the end of the elbow joint to lock it into place. Note: If a collar comes off of the hose, replace it. Notice that one side of the collar is a little wider than the other.
4. Put the collar back on with the wider end first.
5. Insert the free end of the hose (the end with the plastic fitting) into the hole in the pump.
6. Slide the other collar up over the fitting as far as it will go.
7. Place the rocket on the launch tube.
8. Mark the bottom edge of the poster board as 0 degrees.
9. Mark the right side of the board as 90 degrees.
10. Use a protractor to draw a 30 degrees angle from the bottom of the poster board.
11. Extend the line across the poster board with a marker.
12. Have a parent nail 2 stakes into the ground along the side walk.
13. Have a parent nail the poster board to the 2 stakes so that the board stands on its own.
14. Use electric tape to mark the corner of the poster board as the starting point.
15. Hold the launch tube at 0 degrees.
16. Make sure the tubing is extended.
17. Use a chair that is 1 meter high to mark the point from which to drop the books.
18. Drop 2 heavy textbooks from the 1 meter mark onto the pump.
19. Measure the distance the rocket traveled in centimeters, measuring from the nose of the rocket.
20. Repeat steps 15-19 four more times at the 0 degree angle for a total of five trials.
21. Repeat steps 15-20 for 30 degrees, 45 degrees, 60 degrees and 90 degrees.
22. Calculate the average.

Appendix D

Research Plan

A. Investigative Question:

How does the angle of take-off affect how far the rocket goes?

B. Hypothesis:

If comparing 0, 30, 45, 60 and 90 degrees, then the rocket will travel the furthest at 45 degrees because gravity will have a larger affect at the higher angles and the lower angle will cause the rocket to hit the ground.

C. Procedure:

1. Insert either end of the launch tube into the wide opening in the elbow joint.
2. Place the open end of the hose (the end without the plastic fitting) over the open end of the elbow joint.
3. Slide the collar up the hose and over the end of the elbow joint to lock it into place.
4. Note: If a collar comes off of the hose, replace it. Notice that one side of the collar is a little wider than the other. Put the collar back on with the wider end first.
5. Insert the free end of the hose (the end with the plastic fitting) into the hole in the pump.
6. Slide the other collar up over the fitting as far as it will go.
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13. Have a parent nail the poster board to the 2 stakes so that the board stands on its own.

14. Use electric tape to mark the corner of the poster board as the starting point.
15. Hold the launch tube at 0 degrees.
16. Make sure the tubing is extended.
17. Use a chair that is 1 meter high to mark the point from which to drop the books.
18. Drop 2 heavy textbooks from the 1 meter mark onto the pump.
19. Measure the distance the rocket traveled in centimeters, measuring from the nose of the rocket.
20. Repeat steps 15-19 four more times at the 0 degree angle for a total of five trials.
21. Repeat steps 15-20 for 30 degrees, 45 degrees, 60 degrees and 90 degrees.
22. Calculate the average.

Data Analysis:

The distance the rocket travels will be measured to the nearest centimeter using a meter stick for each take-off. The averages will be calculated and comparisons will be made.

D. Bibliography:

Petty, Kate. I Didn't Know That You Can Jump Higher on the Moon. Connecticut: Copper Beech Books. 1997

Starr, Dr. Robert M. "What is Force?"
Starr, Dr. Robert M. "What is Gravity?"

Tell Me Who Lives in Space? London: Chrysalis Children's Books, 2003.

Maharajah, Kelly. Personal Assistance: January 4, 2007.

Safety:

Assessment:	Rockets can cause injury if used without caution.
Precautions:	Never point the rocket at any person or animal.
	Always hold the rocket away from yourself when handling it.
	Only use the rocket outside.

Appendix E

Sample Graphs and Data Tables

Results: Data Table

Effect of Different Physical Activities on Heart Rate

Heart Rate (measured in beats per minute)

Type of Activity	Trial 1	Trial 2	Trial 3	Average
Running	162bpm	168bpm	174bpm	168bpm
Weight Lifting	140bpm	158bpm	151bpm	149bpm
Walking	110bpm	115bpm	108bpm	111bpm
Yoga	102bpm	94bpm	98bpm	98bpm
Control (at rest)	68 bpm	72 bpm	70 bpm	70 bpm

Results: Graph

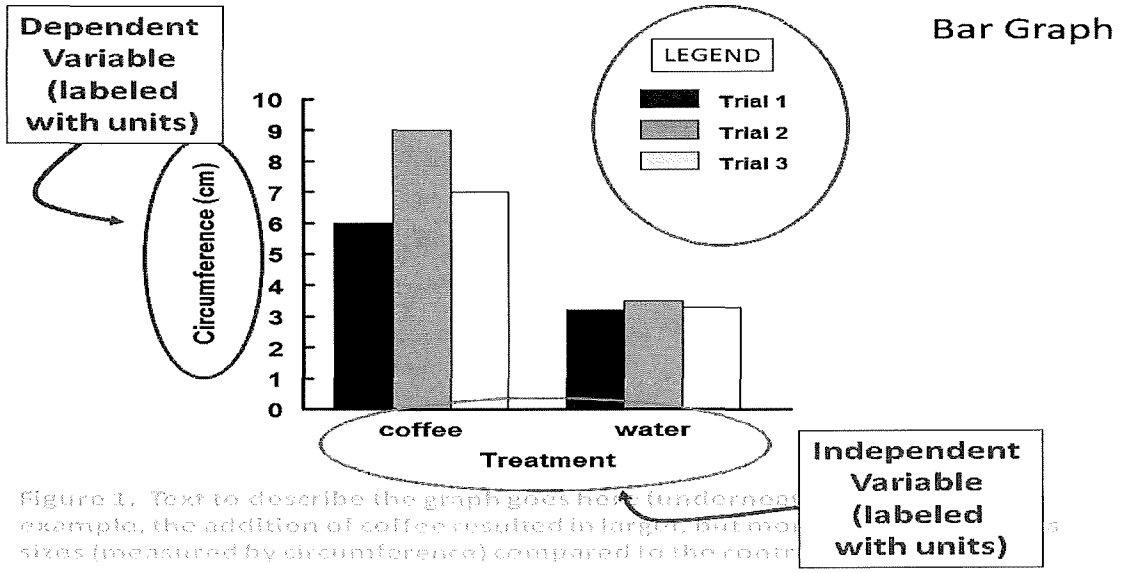


Figure 1. Text to describe the graph goes here (underneath). For example, the addition of coffee resulted in larger, but many sizes (measured by circumference) compared to the contr

Appendix F

Conclusion

In this experiment different types of organic fertilizers were added to pond water to determine the effect on water quality. Water quality was tested by measuring pH, Dissolved Oxygen, Ammonia, and Nitrates. Water was collected from a pond and 5 grams of fertilizer was added to each sample. The different types of fertilizer tested were: bone meal, blood meal, manure, and cottonseed meal. After 5 days the water quality was tested by performing water quality tests for pH, DO, Ammonia, and Nitrate. The hypothesis for this investigation, "if manure is used as an organic fertilizer then the pond water will have better quality as measured by pH, DO, Ammonia, and Nitrates because manure contains less nitrogen and is less acidic therefore having less impact on the natural water," was proven to be correct.

The data supported the hypothesis because the water quality tests from the manure were the closest to the control (no fertilizer added). Both the manure and the control had a pH of 8.5 and manure did not have any effect on DO, Ammonia, or Nitrates. All of those tests resulted in an average of a 0. The cottonseed meal the bone meal had the most significant effect on water quality. Cottonseed meal and bone meal both lowered the pH of the water making it more acidic which can kill fish and plants. The cottonseed meal had an average pH of 6.5 while the bone meal had an average pH of 6. The Blood meal raised the ammonia levels a lot with an average of 3. This means there is too many nutrients in the water which can make algae grow and cause water quality issues. The cottonseed meal also resulted in an increase in ammonia, raising it to an average of 1.5. The Dissolved oxygen decreased in all the samples which means that all fertilizers can decrease oxygen available to fish. The Cottonseed meal and the Blood meal were the worst of the organic fertilizers in terms of overall water quality.

The nitrate tests did not show any results. This could be because the tabs used were not effective or sensitive enough. It could also be that there were no nitrates in any of the samples. However, since cottonseed meal had a nitrates as an ingredient, it is more likely that the test tabs used were not accurate. Further investigation into testing nitrates could be done in the future using a different measuring technique.

This information is useful to anyone wanting to choose a fertilizer for their yard or for farmers needing to fertilize their plants. It is known that organic fertilizers are better than ones which are not organic and made of chemicals, but now the best organic choice is known. Manure is the best and least expensive choice for anyone using fertilizer. It has the least effect on water quality and since so much of water pollution comes from runoff from yards and farms this information is very important when wanting to protect the water sources around the world.

In the future, it would be useful to know how the temperature affects water quality. Increasing temperatures around the world are changing our environment and since more algae grows when temperature increase, water quality may be affected by this increase in temperature.

Appendix G

Abstracts

Sample #1

The purpose of this project was to find out whether the angle of the Sun's rays at noon affects seasonal temperatures. The experiments involved measuring the air temperature and the angle of the Sun's rays at noon during different seasons. This was done by recording air temperature and measuring the angle of shadows at noon on the first day of the month from October through April.

The measurements confirmed my hypothesis that as the angle of the Sun's rays decreases during the year, the outdoor temperature increases. These findings led me to believe that seasonal temperatures are the result of the difference in the angle of the Sun's rays. As the ray angle decreases, sunlight is more concentrated on an area, resulting in a higher temperature.

I discovered that during seasons with high temperatures, the angle of the Sun's rays is lower than during seasons with low temperatures.

Sample #2

The purpose of my project is to answer the question, "Do bean plants grow taller with ACME or Generic brand fertilizer?" I predicted that bean plants given ACME fertilizer would grow taller than bean plants given Generic brand fertilizer. I tested each brand of fertilizer on a group of 5 bean plants. I also tested a control group of 5 bean plants that received no fertilizer. The amount of fertilizer, amount of sunlight, amount of water, type of soil, temperature, type of plant, and starting size of plants were all kept the same for all 15 bean plants. The only growing factor that was changed on purpose was the type of fertilizer.

The height of each plant was measured in centimeters every other day for 14 days. My results showed that on average the ACME group grew the tallest at 26 cm, while the Generic group grew 23 cm and the control group grew only 20 cm.

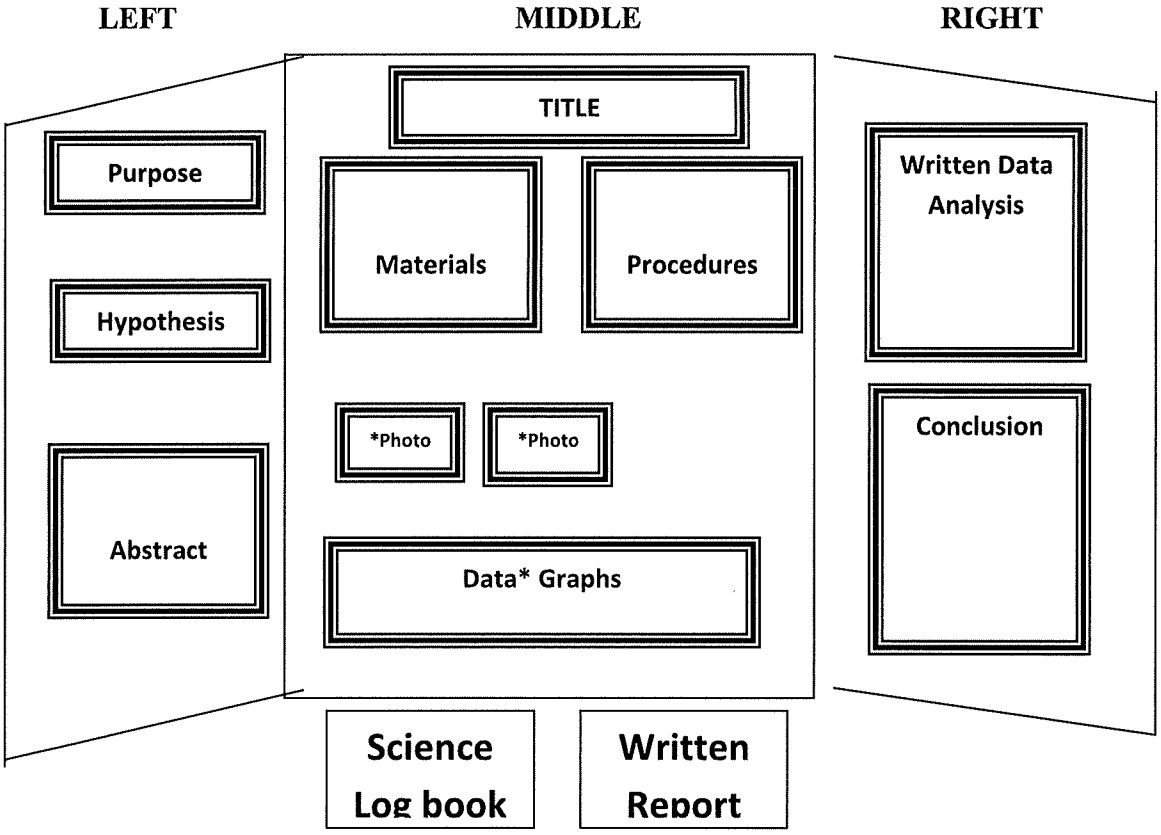
My conclusion was that I had correctly predicted that ACME fertilizer would make the plants grow the tallest. The ACME group grew an average of 3 cm taller than the Generic and an average of 6 cm taller than the control group.

Step 4: Create your Science Fair Project Board

Science Fair Display Board: Creativity, Scientific Thought, Thoroughness, and Neatness

Project Display Board: Size: Standard– After all the research, experimentation, time & effort spent on the preparation of the science fair project, the student's presentation should show off his/her hard work. First impressions can make a difference. . All items must be typed and placed in the correct location and order.

All students will need to follow the project guideline below when assembling the display board. These display boards can be purchased in local stores, school and office supply stores. Board must be free standing and sturdy.



Data Notebook & Written Report are separate from the board and will be displayed in front of the board

*photos are optional but must be cited. Example: Photos Taken by Student researcher. Remember that photos should be of your project not of yourself!

Display Board Checklist: All items must be typed and placed in the correct order.

___Purpose
___Hypothesis
___Abstract Summary
___Title
___Materials
___Procedure
___Variables
___*Photos (optional)
___Data (*overflow area)
___ Written Data Analysis
____ Conclusion

Science Project Log Book

Each project must contain a Science Project Log Book. It is recommended that students use a hard cover composition notebook for this purpose. This log book is documentation that the students work is their own. The log book can be done in pen or pencil but must not show signs of work being erased or pages torn out. Thoughts or writing not relevant can be crossed out with an X over it, mistakes are part of the scientific process and reevaluating work is encouraged.

The following should be in your Science Fair Log Book and be available for judges or SRC to review.

- The student chosen topic written in your own handwriting
- Five research summaries with information and the sources in MLA format. Written student approved hypothesis sheet
- List of independent, dependent, constant, control-variables
- All safety precautions (can be typed and pasted in)
- Procedures (handwritten or typed and pasted in)
- All data recorded, then placed in the data table, data should be hand written in Hand written data analysis
- Hand written conclusion

For more detail information and an example please go on line to science buddies and look under Laboratory Notebooks, then click on the "How to Use" link. Great pictures and examples.

Helpful Websites for Completing a Science Fair Project

For overall help with completing a project, science buddies offers step by step directions and examples: www.sciencebuddies.com

Rules and Guidelines

For information on Science Fair Rules and Guidelines, including Humans, Vertebrates and Microbiology projects, see International Science Fair (ISEF) guidelines:

www.societyforscience.org/isef/ruleandguidelines

Forms

Florida Foundation of Future Scientist- For all State forms and information on the State Fair dates go to www.floridassef.net and to go directly to all State forms, including Official State Abstract form and State Entry Form www.floridassef.net/studentforms.htm

MSDS Forms: http://www.msdssearch.com/

http://www.flinnsci.com

http://www.ilpi.com/msds/index.html

Other Helpful Sites

Guide to Science Project Journal: http://www.sciencebuddies.com/science-fair-projects/project-laboratory-notebook.pdf

A Student's Guide to Recognizing Plagiarism and Avoiding It:
http://www.valdosta.edu/~cbarnbau/personal/teaching_MISC/plagiarism.htm

Metric conversion charts: http://curezone.com/conversions.asp

http://www.fitnessandfreebies.com/conversions.html

Bibliography help: http://www.citationmachine.net/

http://www.citationmachine.com/

Material and Data Safety information: www.msdasearch.com

Graphing Tools: http://nces.ed.gov/nceskids/createagraph/default.aspx