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## **Acknowledgements**

Prince George's County Public Schools wishes to thank Virginia Casbourne who worked on the organization and development of this document. Several pages from the Prince George's County Public Schools Parent Involvement Guide have been incorporated into this Science Fair Journal.

## Steps to the Scientific Method

1. Research\*
2. Topic Selection
3. Question/Purpose/Problem
4. Prediction/Hypothesis
5. Experiment
  - Variables
  - Procedures
  - Materials
6. Data Collection/Results
7. Conclusion



\*Research is an ongoing process. It occurs at the beginning to get ideas for a topic. Then research continues to develop and support the topic. A research paper with a bibliography is mandatory in fourth, fifth and sixth grade.

## Timeline for Science Fair Project

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

Question

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

Prediction

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

Variables

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

Materials

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

Procedures

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

Data Collection Tool

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

Results

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

Conclusion

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

Research paper

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

Science Fair Display Checklist

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

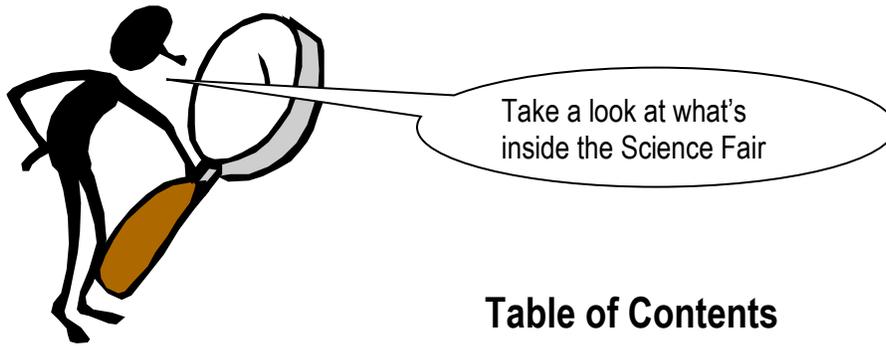
Display board is due at school



### BE A WINNER

- ✓ Meet your due dates so you can finish on time!
- ✓ If you complete something early, start on the next step!

This year the Science Fair will be held on \_\_\_\_\_.



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# TOPIC GUIDELINES

1. Only third graders will be allowed to submit consumer projects. Consumer projects include any kind of product testing such as the strength of paper towels, the best battery, etc...
2. No vertebrate projects will be allowed. A vertebrate is an animal that contains a backbone. PEOPLE are VERTEBRATES. Therefore, no projects involving people will be accepted. This includes memory tests and gender surveys. Other vertebrates include fish, birds, reptiles, amphibians, and all other mammals.
3. Invertebrates are acceptable such as worms, insects and mollusks where no injury to the animal is involved.
4. NO MODELS will be accepted such as solar systems or volcanoes.
5. Projects that involve the growth of bacteria or mold; the use of fire; or potentially dangerous materials will require additional supervision and safety protocols to be signed prior to approval of the project. Any project that falls into this area **MUST** have the approval of the Science Coordinator to ensure county policy and safety protocols are followed.

## SELECTING A TOPIC

A good topic can be found in two basic ways. First, you can research topics using the library and Internet. There are many good books available at the school and public libraries, as well as, websites found on the web. Second, you can brainstorm a topic by asking yourself the following questions:

### 1. What do I already know about the topic?

Example: Vitamin C



Vitamin C is good for you

Some people take Vitamin C when they are sick.

You can buy Vitamin C in a tablet.

Orange juice has Vitamin C.

There are other vitamins besides Vitamin C.

### 2. What do I need to know to better understand the topic?

What is a vitamin?

What is Vitamin C?

How do I test for Vitamin C?

### 3. What possible questions could I explore about the topic?

Which fruit juice has the most Vitamin C?

Does fruit juice from concentrate have more/less Vitamin C?

Do any vegetables have Vitamin C?

Does freezing change the amount of Vitamin C?

Do all citrus fruits have the same amount of Vitamin C?





The **HYPOTHESIS** is another name for a **PREDICTION**. When you are writing the hypothesis you are trying to predict the answer to your question. You should always give a reason for your prediction either from your own experiences or from research you have done.

**For example:**

Question: Does soaking the bean seed before planting it effect how fast it will grow?

Possible Predictions:

I think that bean plants that have their seeds soaked before planting will grow faster because it will make the hard seed covering soft.

I do not think that soaking the beans will make the bean plant grow faster because soaking the seed will just make the seed mushy.

**Rewrite the approved question in pen:**

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**Hypothesis/Prediction:**

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Approved on \_\_\_\_\_

Teacher \_\_\_\_\_

Parent Signature \_\_\_\_\_

# VARIABLES

Take time to identify your variables before you start your experiment. It will help you to write your procedures. Variable is something that can change or be changed. There are three kinds of variables called, independent, dependent and controlled variables.

In a well-designed investigation there should be only one thing changed on purpose, called the independent or manipulated variable.

Remember the example question: Does soaking the bean seed before planting effect how fast it will grow?

In this example the thing I am changing on purpose is soaking the seed before planting it. Therefore, soaking the seed before planting it is the independent variable (manipulated variable).

What I think or hope will change during the experiment is called the dependent variable or responding variable.

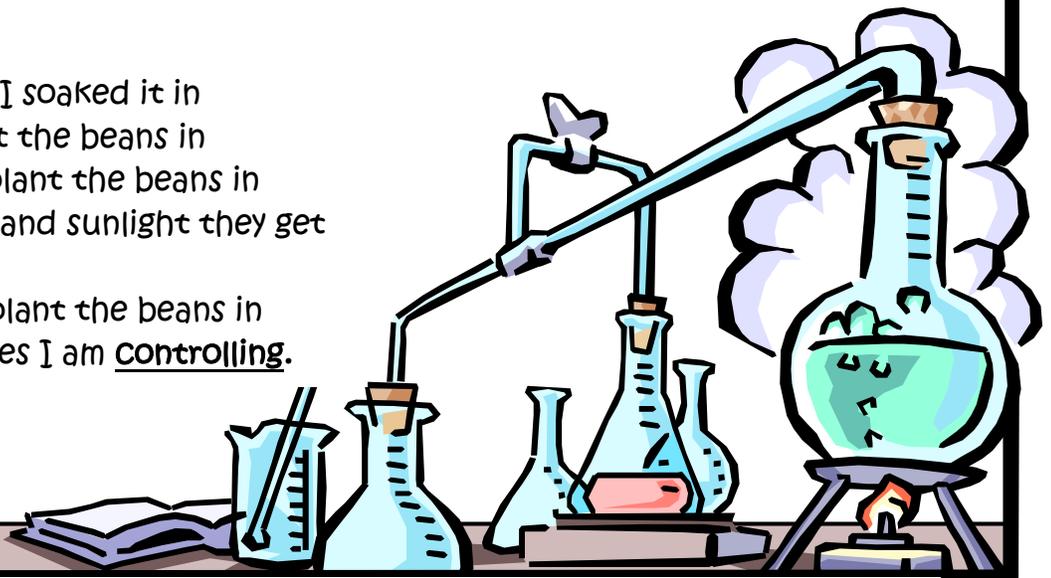
In this example the thing I am hoping or thinking will change during the experiment is how fast the plant grows. Therefore, how fast the plant grows is the dependent variable (responding variable).

I must try to keep any other things that might be changed the same throughout the experiment. These things that I keep the same are called the controlled variables.

In this example the things I would keep the same are:

- Type of bean
- Amount of water I soaked it in
- Type of soil I plant the beans in
- Amount of soil I plant the beans in
- Amount of water and sunlight they get everyday
- Size containers I plant the beans in

These are the variables I am controlling.



## VARIABLES

Take time to identify your variables before you start your experiment. It will help you to write your procedures. Variable is something that can change or

**Identifying Variables**

Date \_\_\_\_\_

**Independent Variable** (What I have changed on purpose): \_\_\_\_\_

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**Dependent Variable** (What I think/hope will change during the experiment):

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**Controlled Variables** (What I have kept the same): \_\_\_\_\_

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Approved on \_\_\_\_\_  
Teacher \_\_\_\_\_  
Parent Signature \_\_\_\_\_







Use this space to make any drawings needed to help understand the procedures. Remember to label all parts and provide a title.

# Data Collection

Before you start conducting your experiment, it is important that you have thought out your data collection.

- To begin you should design a chart, table or journal entry system to record your information. Whenever possible you must collect **NUMERICAL DATA** in a chart or table because you are expected to provide both a graph and written results for your project. Your teacher will help you if your experiment requires data that is not in numbers.
- Your chart or table should have room for repeated trials (no less than three - the more trials you complete, the more reliable your data and conclusion) and a place to find the average (mean) of your data.
- The data should be collected using metric units whenever possible because metric is the international system of measurement for scientists. Metric units include centimeters, meters (linear), grams (weight/mass), and liters (liquid volume). Again, consult your teacher if you are not sure which measurement to use.
- Use a ruler to draw straight lines when designing your chart or table. Neatness will help you to keep accurate data.
- Label the different rows and columns of your chart or table. Also include a title.

Remember you will need accurate data to create a graph, write up your results and draw a conclusion.

Checked on \_\_\_\_\_

Teacher \_\_\_\_\_

Parent Signature \_\_\_\_\_

Use this space to design a chart or table to collect your data.





# You are now ready to conduct your Experiment

To conduct the experiment you will need to:

-  Follow the procedures just as you wrote them
-  Keep accurate records by filling in your data chart and making journal entries as you go
-  Have all the materials gathered together before you begin

I will need \_\_\_\_\_ to  
conduct my experiment. (Time Frame)



You are now ready to conduct your  
Experiment

All **RESULTS** should include three parts. First, it should include a data chart. An appropriate graph (line, pie or bar) of the data collected in the chart should also be included. Finally, a written explanation of the chart information and the graph is

## Graphs

When choosing a graph, be sure to use the most appropriate one.

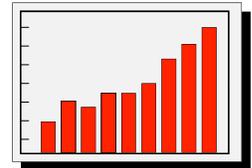


**Line graphs** should be used to display continuous data. Experiments that have dependent variables that involve temperature, time, mass, height or distance will *usually* result in data that can be graphed on a line graph. On a line graph the horizontal (x) axis is always the independent variable and the vertical (y) axis is always the dependent variable. It should also have:

- ❑ Numbers (scale) in even intervals (1's, 2's, 5's, 10's, 100's, etc.)
- ❑ Labels for the horizontal and vertical axes
- ❑ A title that reflects the information that is being graphed

**Bar Graphs** should be used to display data that separate or distinct from other pieces of data. The data in a bar graph can be displayed either vertically or horizontally. A bar graph should include:

- ❑ Numbers (scale) in even intervals (1's, 2's, 5's, 10's, 100's, etc.)
- ❑ Labels for the horizontal and vertical axes
- ❑ A title that reflects the information that is being graphed



Remember to find the **AVERAGE** or **MEAN** of your **DATA** before graphing.

**Pie Graphs** should be used only when the results are best shown as a percentage of a whole. The data of a pie graph should include:

- ❑ A circle that is divided into the necessary number of parts
- ❑ Sections (or slices) of the pie should be sized accurately according to the data
- ❑ Each section of the pie should be labeled or color coded with a key
- ❑ A title that reflects the information being graphed

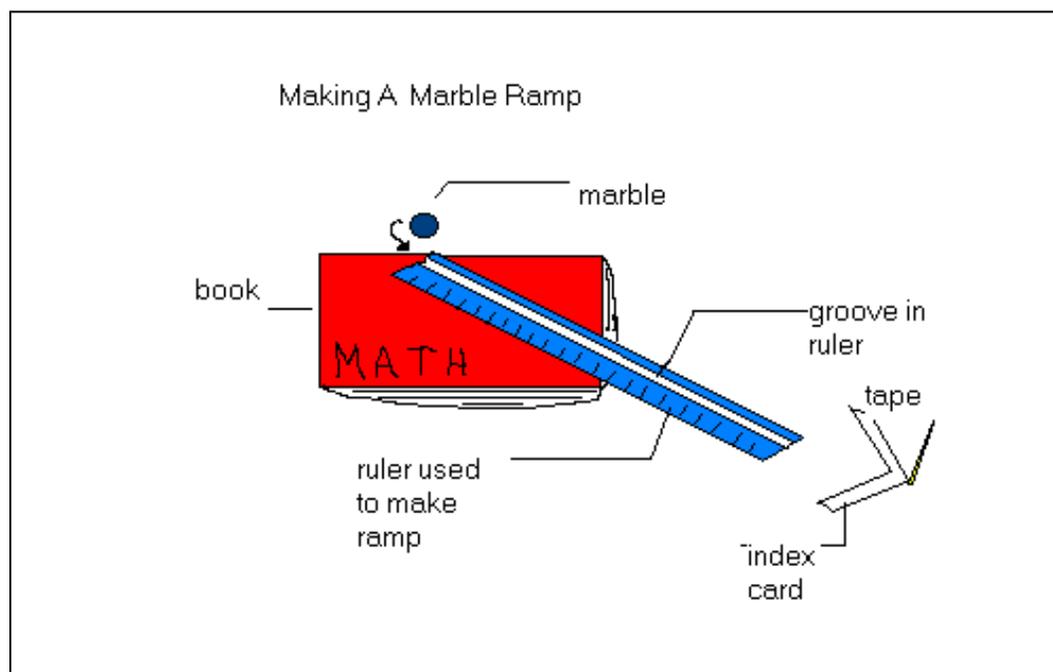
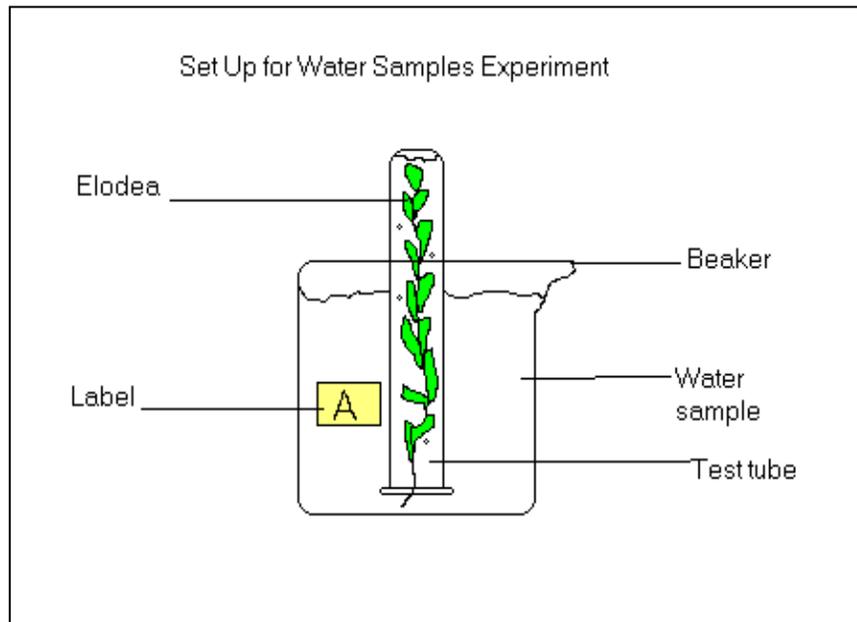


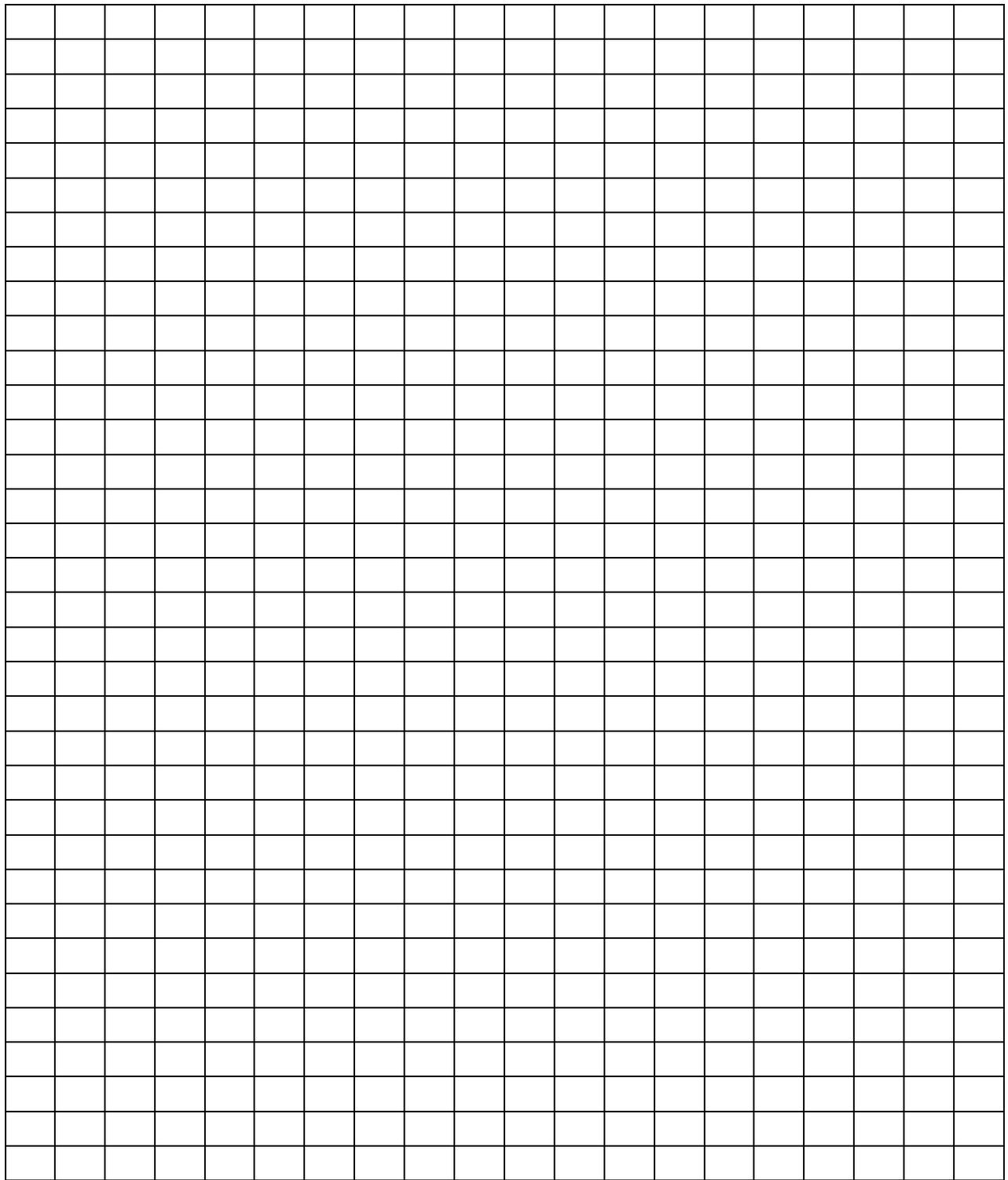
Be extra careful when using a computer to create your graphs for you. The computer will create any graph you want, whether it is the correct graph or not. Also, many computer graphs leave off important titles and labels.

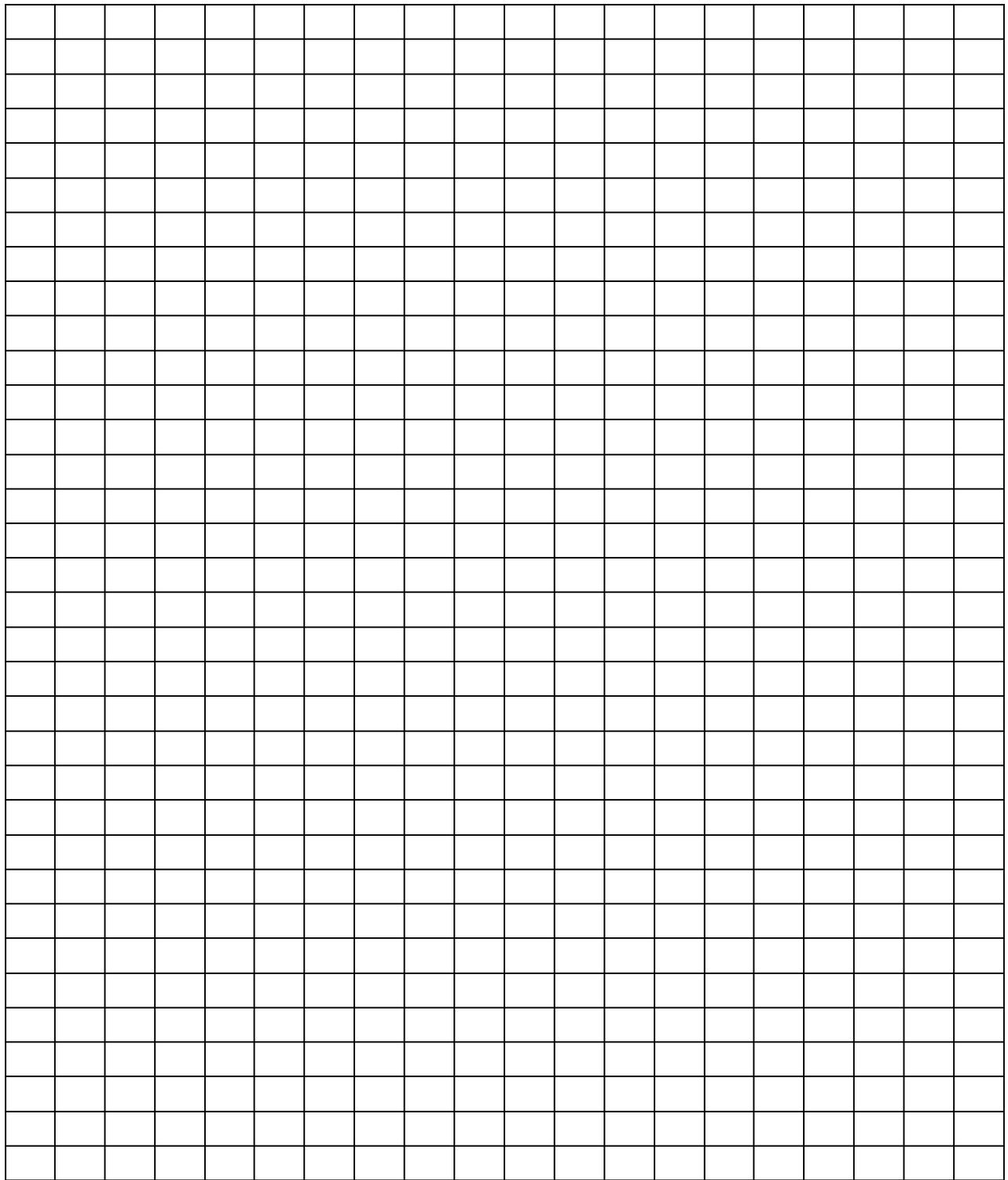


**A Written Explanation** is also required and should be at least a paragraph long. The purpose of the written explanation is to help explain the data displayed in the chart and graph.

RESULTS may also include photographs and diagrams that help to display and understand the data.









Date \_\_\_\_\_

The **CONCLUSION** tells what you learned about the topic by completing the experiment. It contains many parts. Answer each of the questions below then join them together in paragraph form to write your conclusion.

\_\_\_\_\_

Was my hypothesis/prediction correct or incorrect? \_\_\_\_\_

\_\_\_\_\_

What is the answer to my question? Support the answer with data collected.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Were there any problems with the investigation or things I would do differently?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

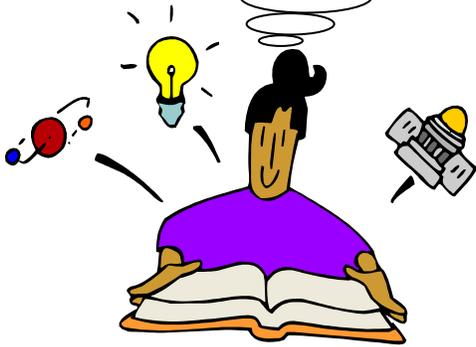
\_\_\_\_\_





# RESEARCH RESEARCH

The more I understand about my topic, the better understanding I will have of my results.



Research is important to a good science fair project. It helps you to choose a topic and then learn more about the topic.

A research report is mandatory for anyone in grades four, five and six. The research report is not complicated and need only include the following five things:

1. **Title Page**- The title page includes the title of your project, your name, school, grade, teacher and the date the project is being turned in.

2. **Acknowledgements**-A personal thank you to anyone who helped you with the project (teacher, parent, sibling, scientist, librarian etc.)

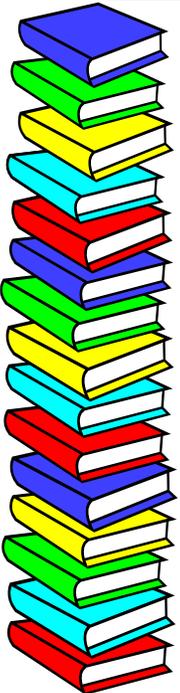
3. **Question**- The specific question you asked for your experiment



4. **Background Research**

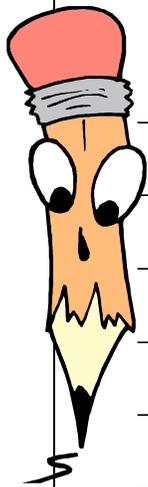
1. If you generated a list of things you wanted to know about your topic in the brainstorming section in the appendix of the journal, the ideas there are a good place to start your research.( If you haven't already done so, take some time to write down questions that could be found through research about your topic.)
2. Use the books in the library and the Internet to find out interesting and relevant information about your topic.
3. Rewrite the information you find in your own words. Do not just copy from the book or print out pages from the Internet. This is considered **PLAGIARISM** and it is illegal. If you are having difficulty putting ideas in your own words, try saying aloud a small section that you have just read without looking, chances are you will put it in your own words or ask an adult to help you.
4. Keep track of what books or websites you used to get your information so you can list your sources in a bibliography.

5. **Sources/Bibliography**- An alphabetical listing of books, articles or other sources including websites that you used when researching your topic. Look in the appendix for specific rules for writing a bibliography.





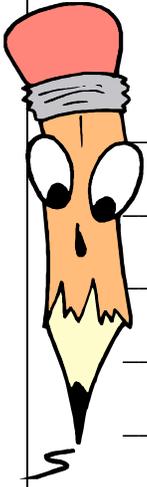
Date \_\_\_\_\_



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Lined writing area for research notes.

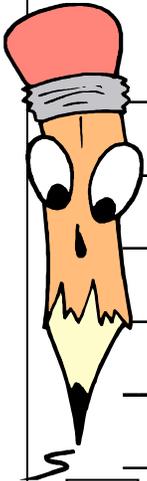
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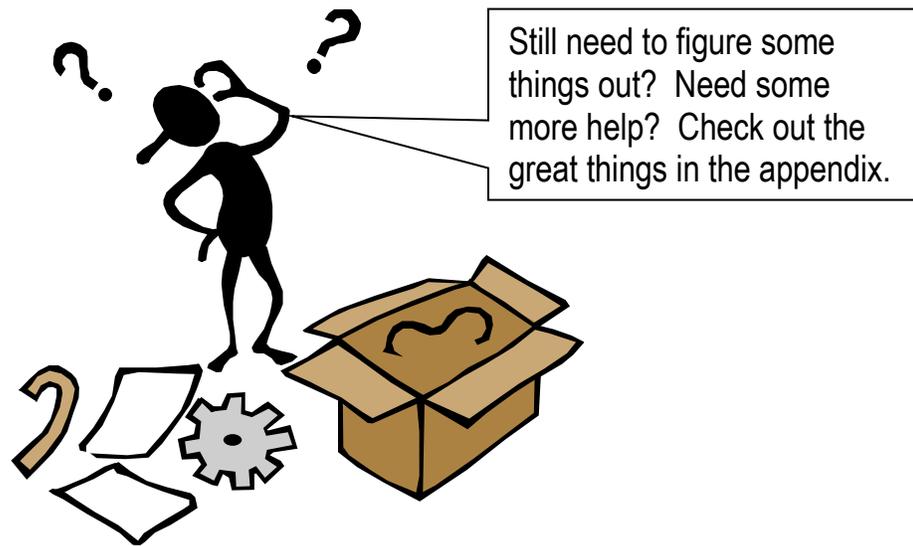
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## Appendix

This appendix is designed to provide additional information to help the student with the science fair project. Included in this appendix are additional items that may be helpful in finding a topic, writing a research paper or creating the display. There is information about how the science fair project will be judged, along with scoring sheets for the teachers.

Also included in this appendix are sample research papers written by William Beanes students. These samples are meant to help illustrate the 5 parts to be included in the research paper. Notes inside of balloons are added to the papers to highlight special parts of the paper. These notes and highlighted areas should not be duplicated into your own papers. The contributions of Schntae Graham (4<sup>th</sup> grade) and Venetta Bronson (6<sup>th</sup> grade) are greatly appreciated. They generously donated their research papers to be used in this journal.







## Writing a Bibliography

When you write a bibliography you are listing all of the sources of information you used to write your paper in alphabetical order. For the different types of sources follow the examples listed below.

### BOOKS

Author (last name, first name). Title of the book. City where book is published: Publisher, Copyright date.

**Tillerman, Jon. The Way the Earth Moves. Chicago: McMillian, 1998.**

### MAGAZINES

Author (last name, first name). "Title of the article." Title of Magazine Date (day month year): page numbers of article.

**Smith, Sarah J. "Why Don't We Fall from Rollercoasters?" Science News 8 July 2000: 77-79.**

### ENCYCLOPEDIA

"Article Title." Title of Reference book. Edition (if available). Year published.

**"Microscopes". Encyclopedia Britannica. 1996.**

### FILMS, SLIDES, or VIDEO TAPES

Title. Medium (state if it is a film, slide, video tape, laser disc etc). Production company, date. Time length

**Under the Microscope- Amoebas. Videocassette. Science and Kids Productions, 1994. 15 minutes.**

### INTERVIEWS

Person you interviewed (last name, first name). Type of interview. Date.

**Aberwitz, Shelly. Personal interview. 20 Sept. 2002.**

### ON LINE SOURCES (Websites)

Author (last name, first name – if there is one) "Title of Article". Title of Website or Publication. Date of Publication (or last update). On-line. Date of access (when you went to website). Available website address.

**"Deserts". BrainPop. 2002. Online. 13 May 2002. Available:  
<http://www.brainpop.com/science/ecology/desert/index.weml>**

# Sample Research Paper 1

This is the title page. It is the first requirement of the research paper.

Title of Project

# TRUTH DECAY

Subtitle gives additional understanding of topic

## THE TRUTH ABOUT TOOTH DECAY

Student Name

Schntae Graham

School

William Beanes Elementary School

Fourth (4<sup>th</sup>) Grade

Grade level

Teacher Name

Teacher: Ms.Ward

Date due

February 19, 2002

Notice the student was specific with type of help received.

## Acknowledgements

This page acknowledges the help that the student received in doing the project. It is the second requirement of the research paper.

I would like to thank my Mom for helping me with this project and typing the information, because it was taking me forever. Special thanks to Ms. Ward and Ms. Casbourne for encouraging me to do the project. I wanted to change projects because things weren't working the way I thought.

Both the question and research are on the same page of this research paper.

## QUESTION

The Science Fair question is the third requirement of the research paper.

To find out, if you let an egg sit in lemonade, Coca-Cola, Diet Coke, orange juice or water for seven days, what effect will it have on the egg?

The first two paragraphs are the introduction to the topic.

## RESEARCH

Background research about the topic is the fourth requirement of the research paper.

This research paper and science project taught me a lot about why my Mom always asks, "Did you brush your teeth?" I hear it every day. I see that it is important to brush your teeth, eat well and visit the dentist. That's why this project is titled, TRUTH DECAY. This paper will give you a better understanding about why our teeth are important, how tooth decay begins, and how to prevent tooth decay.

This sentence tells the specific ideas that will be covered in this research paper.

Tooth decay can start at any age. While we are young, we should take good care of our teeth. I do not like to go to the dentist but my mom makes me go at least two (2) times a year. My mom says it is important to go to the dentist, so when you get older you won't have a lot of problems with your teeth and spend a lot of money.

### What Are Teeth Made Of?

The student organized the research information by writing important questions as headings and then answering the questions from research.

The white covering on teeth is called enamel. The function of the enamel is to protect the tooth from damage and pain. Under the outer covering of enamel is a hard, yellow substance called dentin. Most of the tooth is made up of dentin.

## What Is Tooth Decay?

Tooth decay is a bacterial disease of the teeth. This decay is the primary source of tooth loss in people no matter what their age is of a person.

Important,  
interesting fact

## Why Do You Get Tooth Decay?

Tooth decay happens when bacteria, sugary foods, and a target tooth surface work together or react against each other. Our mouths contain lots of bacteria. We eat a lot of different foods at different times of the day; therefore, the bacteria convert some of the sugary foods to acid. The bacterium that grows on our teeth is called plaque. Plaque is the sticky coat that forms on the outside of our teeth. When you don't clean or brush your teeth regularly, plaque will build. Bacteria eat through the outside of the teeth or what is called tooth enamel; this makes the tooth surface soft. Once the bacteria get through the enamel of a tooth, tooth decay can make a tiny cavity or little hole in the tooth. You can tell when you have a cavity because something cold (ice cream), hot (soup) or sugary (candy) may cause you to get a toothache or your teeth may feel tender. When this happens tell a parent so you can go to the dentist.

Important  
Definition

Detailed  
explanation

Gives real  
examples

## Why Was An Egg Used In The Experiment?

This question and answer make the connection between the research and the science experiment.

A hard-boiled egg was used because this is the closest model of your teeth. The damage to the egg during the experiment is in relation to the damage that can be done to your teeth.

## How Do You Prevent Tooth Decay?

This paragraph gives three very important ways to prevent tooth decay with supporting details.

To prevent tooth decay, it is important to brush your teeth regularly. Brushing is not just to make sure that your teeth are clean, but to remove plaque that builds on your teeth and causes tooth decay. You should brush more than just once a day. Books and articles suggest that your brush after every meal. Use fluoride toothpaste. Fluoride helps protect your teeth from tooth decay. Visit the dentist at least twice a year. The dentist checks for problems. The dentist may prevent small problems from getting out of control. Tooth decay may take several months to happen, but modern technology, like an x-ray, will show small problems.

Our teeth must last a lifetime. One or two cavities may not seem like a big deal, but your teeth tell a lot about you. If you have rotten teeth, you may not smile a lot or it may cause you embarrassment. Now that you know what “TRUTH DECAY” is, let’s get busy and brush “TOOTH DECAY” away.

This paragraph is the conclusion. It ends the paper with an appeal to readers to make good use of the information provided. This is one good strategy for writing a conclusion.

## BIBLIOGRAPHY

Listing website resources can be tricky because all the same information is not always available. Always give as much information about the website as you can.

This is the bibliography page and it is the fifth and final requirement of the research paper. Notice that the sources are listed in alphabetical order by author's last name.

Dr. Green website. 2000-2002. Online. 20 Jan. 2002. Available:

[http:// www.drgreene.com](http://www.drgreene.com).

Name of website

Website address

Day you went to the website. This is important because the Internet information is always changing.

Silverstein, Alvin and Silverstein, Virginia. Tooth Decay and Cavities.  
Danbury: Grolier Publishing, 1999.

Stay, Flora Parsa. DDS. The Complete Book of Dental Remedies.  
Garden City Park: Avery Publishing Group, 1996.

Ward, Brian R. Dental Care. New York: Franklin Watt, 1986.

Copyright date

Author name is written with the last name first

Title of book is underlined

City in which book was published

Name of publisher

This student used three books and one website as resources for the research found in this paper.

# Sample Research Paper 2

This is the title page. It is the first requirement of the research paper.

## What is the Effect of Thermal Inversion on Air Pollution?

Student Name: Venetta L. Bronson  
Teacher Name: Mr. Fishkin  
School: William Beanes Elementary School  
Grade: Grade 6  
February 19, 2002

## ACKNOWLEDGEMENTS

Thanks Mom for all of your help.

Thanks Ms. Casbourne for the Science Fair “make and take.”

Thanks Mr. Fishkin for helping me with my corrections.

This page acknowledges the help that the student received in doing the project. It is the second requirement of the research paper.

Notice that the student was specific with the type of help given here.

The Science Fair question is the third requirement of the research paper.

Question: What is the Effect of a Thermal Inversion on Air Pollution?

The student decided to place the Science Fair question on a separate page.

## Background Information

Background research about the topic is the fourth requirement of the research paper.

Air and water are essential to life. Air pollution is caused when chemical substances are released into the atmosphere that are not normally found there. Polluted air can cause or lead to lots of health problems in people. It can also harm plants and animals.

This paragraph introduces the topic of pollution and tells why it is important.

Smog, the dark haze in the air (smoke and fog) is the most common form of air pollution. It is a major problem for many cities in the world. Polluted air is dirty air. It can make the air smell bad and can make things dirty. It can rise up into the atmosphere and be carried away for many miles by the winds. The atmosphere can be damaged by polluted air.

This paragraph gets more specific and focuses on one type of pollution.

Many activities of human beings pollute the air. People pollute the air by allowing chemicals, poisonous gases, and tiny particles of dirt to get into the air.

This paragraph tells what causes this type of pollution.

## My Science Project

Student decided to add a separate heading for more background research as it is related to the project.

My science project is about the effect of a thermal inversion on air pollution. A thermal inversion occurs when hot air is above colder air. Hot air rises and cold air falls. If the cold air is nearer to the ground, there will be no mixing of air. This still air has no wind to carry away the pollution particles.

This paragraph makes a connection between the research and the experiment.

Important definition

A thermal inversion traps air near the ground. Pollution molecules build up in the air if there is no wind to carry them away from the city or rain to wash them out of the air. An example of how pollution and smog can be deadly is in Donora, a small town in Pennsylvania. In October 1948, 6,000 people in a town of 14,000 got sick, and 20 died from pollution and smog that was so thick people couldn't see across the street.

Important definition

Uses important, real fact to provide an example.

Smog is a combination of smoke and fog. A lot of the pollution molecules you cannot see. However, sometimes you may see smoke combine with fog to produce smog. Estimates of deaths from pollution caused by still air, a build-up of smog, and pollution include 650 people in London in 1873, 400 people in New York City in 1963 and 4,000 people in London 1952 during five days of smog!

More examples using real facts and data that are important to understanding the topic.

We cannot control the weather or prevent thermal inversions from occurring, but we can reduce the pollution that causes smog. We can drive more fuel-efficient cars. We can use devices to help stop pollution molecules from being released from cars, factories and power plants.

Final paragraph is a conclusion that offers ways to deal with problem presented in topic.

This paragraph gives a quick summary of the background research.

## Conclusion

Student decided to include the conclusion of the actual experiment with the research paper. This is an excellent idea but it is not a requirement of the research paper.

This process of warm air rising and cold air falling keeps the air moving and helps carry pollution away from its source. A thermal inversion occurs when hot air is above colder air. Hot air rises and cold air falls. If the cold air is nearer to the ground, there will be no mixing of air. This "still" air has no wind to carry away the pollution particles. A thermal inversion traps air near the ground.

My hypothesis proved incorrect. I predicted that the hot air smoke would not rise out of the bottle.

Instead, it would be trapped near the ground (stay in the bottom of the bottle) and the cold air would rise.

also predicted that a thermal inversion would have no effect on the air pollution at all.

Includes the actual data from the experiment to tell what was learned.

Restates hypothesis and tells whether it is correct or not.

In doing my experiment, I observed that the cold air smoke stayed in the bottom of the bottle for a long time before it disappeared. At no time did it rise to the top. I was so sure that the hot air smoke would not rise; instead it would stay in the bottom of the bottle. However, it seemed like once I dropped the match into the bottle with the hot air smoke, I saw the smoke rise up to the top of the bottle and then it quickly disappeared. I did this experiment six times. Each time I got the same results. The only problem I remember was that sometimes the match would go out before I could get it to the bottle. I think this happened because I was scared of the fire. I was afraid I might get burned, but my mom said she wouldn't let that happen.

Repeated trials

Mentions problems that occurred during the experiment.

I'd like to try this experiment with a watch instead of a timer. I could check the amount of smoke in the bottles every minute to see if there was smoke in them or not.

Discusses changes that could be made if the experiment was done again.

All of the resources used for this paper were books.

## Bibliography

Bender, David and Leone, Bruno. The Environment Opposing View Points. San Diego: Greenhaven Press Inc., 1996.

This is the bibliography page and it is the fifth and final requirement of the research paper. Notice that the sources are listed in alphabetical order by author's last name.

Brower, Michael and Leon, Warren. The Consumer's Guide to Effective Environmental Choices. New York: Three Rivers Press, 1999.

Chandler, Gary and Graham, Kevin. Protecting Our Air, Land and Water. New York: Henry Holt and Company Inc., 1996.

There is no author name, so it is listed alphabetically by the title.

Current Controversies: Pollution. San Diego: Greenhaven Press Inc., 1994.

Ehrlich, Anne H. Betrayal of Science and Reason. Washington, D.C.: Island Press, 1996.

McCormick, John. Acid Rain. New York: Gloucester Press: 1991.

Morgan, Sally. The Ozone Hole. Danbury: Franklin Watts, 1996.

This is the source where the project idea came from.

Redalia, Debra Dadd. Sustaining the Earth. New York: Hearst Books, 1994.

Rybolt, Thomas R. and Mebane, Robert C. Environmental Experiments About Air. New Jersey: Enslow Publishers Inc., 1993.

Copyright date

Stille, Darlene R. Air Pollution. Chicago: Children's Press, 1990.

Author's name listed with last name first.

Book title is underlined.

City where book was published.

Name of publishing company

## Science Fair Display Checklist

After you have completed your backboard take time to complete this checklist yourself to be sure you have everything included on your display board. Then add or revise any areas that you did not check off as being complete. After you have made any changes to your board, have your parent complete the checklist as a final review of your work before turning it in at school.

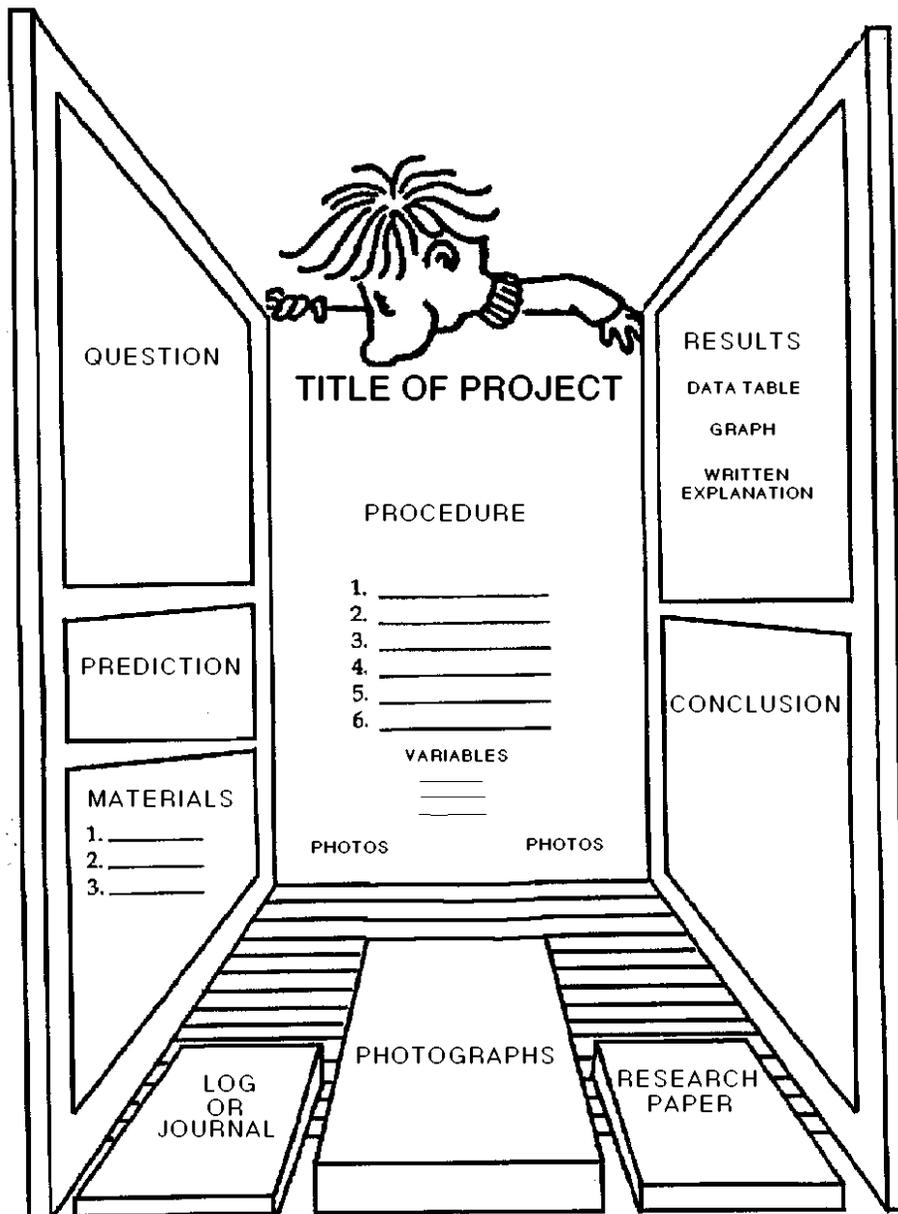
	Assessment	
	Self	Parent
1. Overall appearance is neat and attractive.	_____	_____
2. All necessary parts are included and labeled ( <b>Question, Prediction, Materials, Procedure, Results, and Conclusion.</b> )	_____	_____
3. I used no more than three colors when doing my backboard.	_____	_____
4. My backboard has a short and catchy title.	_____	_____
5. All of the words on my backboard are spelled correctly.	_____	_____
6. I have used proper grammar and punctuation.	_____	_____
7. My procedures are written in clear sequential order.	_____	_____
8. My procedure shows that I conducted repeated trials ( <b>at least 3</b> ) and used an adequate sample size, if necessary.	_____	_____
9. I have identified my independent, dependent and control variables.	_____	_____
10. All necessary parts are included on my chart ( <b>title, labels, and units</b> ) and it is neatly drawn and filled in with appropriate data.	_____	_____
11. I have the correct type of graph that displays my data from my chart and the graph includes all the necessary parts ( <b>title, axes, increments, labels, and scale</b> ). A key is present if necessary.	_____	_____
12. I included a written explanation of my chart, graph and any other observations I made.	_____	_____
13. My conclusion includes the answer to the original question, accuracy of my prediction, what I learned <b>supported with data</b> , any problems and real world applications.	_____	_____
14. My research paper follows the guidelines listed in the journal.	_____	_____

## TIPS FOR CREATING OUTSTANDING DISPLAYS

- ❑ **BE NEAT-** Avoid frayed or ripped edges of paper, glue globs, lots of cross outs or white outs etc.
- ❑ **USE COLORS TO ATTRACT ATTENTION BUT DON'T OVER DO IT--** No more than (3) three colors should be used on a project except for special situations. Too much color can be distracting. Instead develop a color pattern that is pleasing to the eye.
- ❑ **FRAME OR MATTE YOUR WORK-**Use construction paper or other colored materials to provide a background for your written work and labels (construction paper, newspaper, wrapping paper, old wall paper, contact paper etc...)
- ❑ **TITLES SHOULD BE SHORT, CATCHY AND RELATED TO THE PROJECT IDEA**  
For example:  
Color of Cool Cubes is better than The Melting Rate of the Different Colors of Ice Cubes  
Sizing Up Seeds is better than The Relationship between the Size of the Seed and the Size of the Plant
- ❑ **WRITING SHOULD BE NEAT AND LEGIBLE-** If you choose to use a computer or typewriter, stick to one or two fonts to type your work. Too many fonts can be distracting and difficult to read. If you hand write your work, print or use cursive, don't mix the two. Also, if you are handwriting the information, be extra careful to write so it can easily be read by others. Pen is easier to read than pencil. Messy or illegible writing can really lower your score.
- ❑ **SPELLING DOES COUNT-**Take time to check over your work before you put it on your display board. Don't overuse white out. Scratching out mistakes is not acceptable. If you do recognize an error after finishing, place a single line through it and write the correct word above. However, too many of these types of marks will effect the overall appeal of your project.
- ❑ **PRACTICE YOUR LAYOUT-** Before you begin gluing things down, practice moving the parts of the display around until they are evenly spaced and centered. Crowding together or large gaps can take away from your project's appeal. Trying to rip off or move things once they are glued down can be messy and often ruins the paper or display board.
- ❑ **DON'T GLUE ON MATERIALS FROM YOUR PROJECT-** Don't glue on food items such as M & M's, popcorn or moldy bread to the board. Food products attract bugs, so do their wrappers. Don't place samples of chemicals or their containers on the board. This includes household items such as vinegar, dish soap, oil etc.
- ❑ **TAKE PHOTOS OR DRAW PICTURES/DIAGRAMS OF THE ITEMS FOR DISPLAY-** This will help you to avoid attaching materials from your experiment to your display. Inappropriate materials will be removed from the board before allowing it to be displayed in the fair.
- ❑ **RESEARCH REPORTS ARE PLACED IN FRONT OF THE DISPLAY-** Don't attach the report to the display board. It is placed in front of the display.

**SCIENCE FAIR PROJECT DISPLAY INFORMATION**

- Title:** short, catchy, related to the topic and results of the experiment
- Question** the question to be tested
- Prediction:** the predicted answer to the question/problem asked with a reason
- Materials:** a list of the supplies, equipment to be used
- Procedure:** a list of the steps followed to perform the experiment
- Results:** data displayed in table and graph form to include data analysis (mean, medium, mode, range) and accompanied by a written explanation
- Conclusion:** briefly answers the question asked in the beginning; states the prediction to be supported or not supported, and makes suggestions for further research



## Science Fair Project- Oral Report Scoring Guide

Name \_\_\_\_\_

Total Points \_\_\_\_ /25

Teacher Signature \_\_\_\_\_

Grade \_\_\_\_\_

### Communication

- Eye Contact: 2 -1- 0
- Loudness of Voice: 2 - 1- 0
- Preparation: 2 -1- 0

### Content

- Title: 1- 0
- Purpose: 1- 0
- Hypothesis: 1- 0
- Materials: 1- 0
- Procedures: 1- 0
- Results: 1- 0
- Conclusion: 1- 0



### Questions

- Why did you choose your topic? 2 – 1- 0
- How many times did you repeat your experiment? 2 – 1- 0
- If you were to do this experiment again, what would you do differently? 2 – 1- 0
- (4<sup>th</sup>-6<sup>th</sup> only) Tell one interesting fact or idea you learned when completing your research paper. 2 – 1- 0

OR

- (3<sup>rd</sup> grade only) Tell one thing you learned by doing this experiment. 2 – 1- 0

### Overall Score

**Excellent – 3**

**Satisfactory – 2**

**Fair – 1**

**Unsatisfactory - 0**

Score Range  
**25-20**

Score Range  
**19-15**

Score Range  
**14-10**

Score Range  
**9-0**

## Score Sheet for Science Fair Project

Checked boxes indicate something is incomplete, inaccurate or missing.

### Overall Appearance and Organization of Backboard

10 points \_\_\_\_\_

- All parts of project are included and clearly labeled
- All parts are in the correct sequential order
- Backboard is neat and attractive
- There are very few or no spelling errors
- Good grammar was used throughout the writing
- Any photographs used have captions
- Any drawings included have labels and titles

### Question

5 points \_\_\_\_\_

- Question led to an investigation, not a report, demonstration or model
- Question is clearly written in the form of a question
- A creative approach to problem-solving was used to formulate the question

### Prediction

5 points \_\_\_\_\_

- Prediction must state a possible outcome of the experiment
- Prediction must include an explanation or reason for the prediction
- Background information is present showing research was done

### Materials

5 points \_\_\_\_\_

- All materials used in the experiment are listed
- All materials list the quantity needed
- All measurements are done in metric

### Procedures

5 points \_\_\_\_\_

- All steps for the procedure are accurately stated and in sequential order
- Procedures indicate that repeated trials (at least 3) were conducted
- The independent, dependent and control variables are accurately identified

### Results- Graphic representation

5 points \_\_\_\_\_

- Data is present in the form of a table or chart
- An appropriate type of graph is accurately constructed
- If a graph is not possible- journal entries or other visual display of results is present

### Results- Written Explanation

5 points \_\_\_\_\_

- Explanation analyzes and summarizes the data to note patterns and trends
- Explanation interprets the graph

### Conclusion

5 points \_\_\_\_\_

- Conclusion answers original question asked
- A statement reflecting whether or not the prediction was supported is included
- Supporting data is used
- Any problems with the experiment, changes for the future or addition research questions are mentioned as life application connections are made

Teacher Signature \_\_\_\_\_

Total Score \_\_\_\_\_

Grade \_\_\_\_\_