



# East Kentucky Science Center & Planetarium



## *Regional Science Fair Project Book*

*Grades 4-12*

*For Breathitt, Elliott, Floyd, Johnson, Knott, Lawrence, Lee, Leslie,  
Letcher, Magoffin, Martin, Menifee, Morgan, Owsley, Perry, Pike,  
and Wolfe Counties*

For additional information,

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## THE SCIENTIFIC METHOD:

- PROBLEM**
- HYPOTHESIS**
- MATERIALS**
- PROCEDURE**
- EXPERIMENT**
- DATA/RESULTS**
- CONCLUSION**



### Getting Started:

- Keep a journal throughout the entire experiment process.
- A journal is a bound notebook that provides a complete and accurate record of all research and work done.
- Each entry should be handwritten, dated, and on a separate page.
- Included should be: research, descriptions of experiment, observations, and data (graphs, tables, diagrams).
- It will be displayed with the completed project at the Science Fair.

A stylized illustration of a clipboard with a journal entry form. The clipboard has a silver clip at the top. The form is white with a light blue background and contains the following text:

Date:

What work did you do today on your project?

Were there any difficulties?  
Any successes?

Details of the results from today's work.

What is the next thing you'll need to do for your project?

An example of a journal entry

**\*This will make writing the report a piece of cake because all you have to do is rewrite the information in an organized manner!**



### Brainstorm:

- Think of a topic that interests you.
- Can it be tested?
- Find a cause and effect relationship within the topic area.

<u>Topic</u>	<u>Topic Relationship</u>	<u>Questions</u>

### Variables:

- The cause is what can be changed or manipulated, so it is the independent variable.
- The effect is the result of the cause, so it is the dependent variable.
- Constant variables are those that stay the same throughout the experiment so that it is a fair test.
- The control is the absence of the independent variable so results can be compared.

### Research:

- Find out as much about your topic as possible.
- Your hypothesis should be backed up with research.

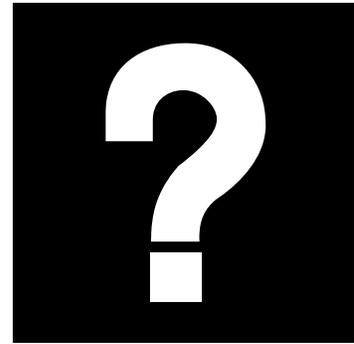


### Sources of Information:

<u>Places</u>	<u>People</u>	<u>Literature</u>
School	Teacher	Science Books
Library	Librarian	Project Books
Home	Family/Friends	Encyclopedia
Businesses	Doctor/Dentist	Magazines
Garden Center	Veterinarian	Newspapers
Zoo	Scientist	Yellow pages

**Problem:**

- What do you want to find out?
- This is a scientific question that you hope to solve with your experiment.
- This is NOT a question that can be answered with a yes or no.



**Hypothesis:**

- What do you think is going to happen?
- This answers your problem from above with an IF/THEN statement.
- This should be an educated guess on what will happen based on your research.

# **NOW YOU ARE READY TO START YOUR EXPERIMENT!**

**Materials:**

- Make a list of everything needed for the experiment, including what, how much, and what kind of materials used.

<u><b>Good Listing</b></u>	<u><b>Poor Listing</b></u>
6 loaves of Kerns white bread	White bread
6-12 x 18 x 11 1/2 inch cardboard boxes	Boxes
1-clear plastic sheet marked with a half inch grid	Grid

**Procedure:**

- This is a list of detailed step-by-step directions, like a recipe.
- You need to tell times, sizes, amounts, and in what order each step is to be done.
- Write each new direction on a new line.
- Anyone who reads it should be able to duplicate the experiment and get the same results.
- To get valid results, you need to conduct the experiment more than once.
- Be sure to make necessary measurements and record your data in your journal.



<u><b>To Measure:</b></u>	<u><b>Use:</b></u>
Width, height, length 	Millimeters (mm) Centimeters (cm) Meters (m) Kilometers (km)
Mass 	Grams (g) Kilograms (kg)
Volume 	Milliliters (ml) Liters (l) Kiloliters (kl)



### Results:

- These are observable or measurable amounts that happen while doing your experiment.
- Keep accurate and organized data WHILE conducting your experiment.
- Using logs and drawings, write down all observations and results in your journal, using one page for each day.

### Data:

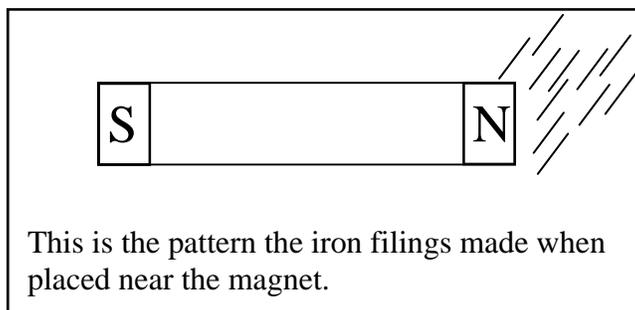
- Your results put in an organized format so the data is presented clearly.
- Be sure to label as much as possible.
- The following are examples of the different types of formats:

Table-

PLANT GROWTH

	<u>Fertilizer A</u>	<u>Fertilizer B</u>	<u>No Fertilizer</u>
<b>Week 1</b>	3 cm	2 cm	2 cm
<b>Week 2</b>	6 cm	5 cm	5 cm
<b>Week 3</b>	10 cm	9 cm	7 cm
<b>Week 4</b>	13 cm	12 cm	10 cm
<b>Totals</b>	32 cm	28 cm	24 cm
<b>Average</b>	8 cm	7 cm	6 cm

Chart-

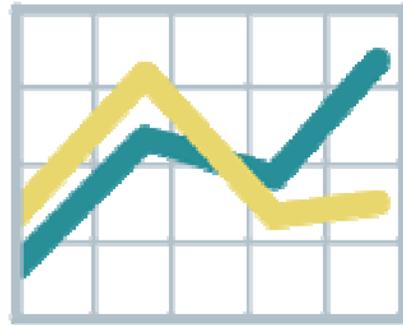


Log-

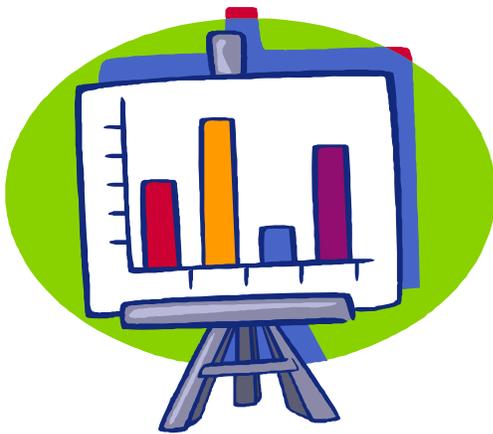
Date:  
Item Tested (IV)  
Purpose:

Time	Observation

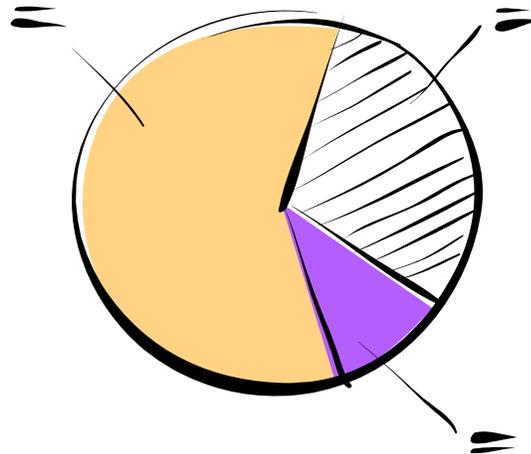
Line Graph-



Bar Graph-



Pie Graph-  
Compares parts to a whole.



## Conclusion:

- Summarize the results of the experiment.
- Tell in words exactly what happened during the experiment.
- Tell whether your results supported your hypothesis and give possible reasons if there was a difference between your hypothesis and the results.
- Answer all questions that came up during the experiment.
- State any information that was discovered in the process.



## Report:

- Organize all of your written information, charts, and graphs into a complete written report.
- It is a written record of your entire project from start to finish.
- By recording everything in your journal as the project progresses, all you have to do is organize and neatly copy it's contents.
- It should be typed or rewritten neatly in ink and bound in a folder or notebook.

The pages should be in this order:

1. Title (name of project and your name)
2. Acknowledgments (thanking anyone who helped you)
3. Table of contents (complete with page numbers)
4. Problem (question you are answering with your project)
5. Hypothesis (answer to your questions)
6. Background information (research)
7. Procedure (Step by step)
8. Variables (Identify dependent, independent, constant, and control)
9. Materials (list)
10. Results (written explanation)
11. Data (tables, charts, graphs, etc.)
12. Conclusion (written summary)
13. Bibliography (list any books, internet cites, or people utilized to get information for your project)

## Display:

- It tells the story of the project in such a way that it attracts and holds the attention of the viewer.
- Use neat lettering and arrange your work in an organized and clear, but simple way.
- It must fit within a space of 48 inches wide, 30 inches deep, and 108 inches high.



## Be sure to include:

- Title
- Problem
- Hypothesis
- Materials
- Procedure
- Data-pictures, graphs, tables, etc.
- Results
- Conclusion

## Do not include:

- Live animals
- Plants
- Open flames
- Preserved vertebrate or parts
- Dangerous chemicals
- Fungi
- Live pathogens
- Microbial cultures
- Any other hazardous material



### Oral Presentation:

- You may be required to explain your project in an interview with the judges.
- Make it short, but complete.
- Clearly discuss the project and explain its purpose, procedure, results, and conclusion.
- Answer the judges' questions in a way that convinces them that you did the work and understand what you have done.



**CONGRATS! YOU DID IT!**



### **Dates to Remember:**

School Science Fair: \_\_\_\_\_

School Registration Deadline: October 12, 2012

Student Registration Deadline: October 26, 2012

Regional Science Fair at the East Kentucky Science Center and

Planetarium: November 3, 2012