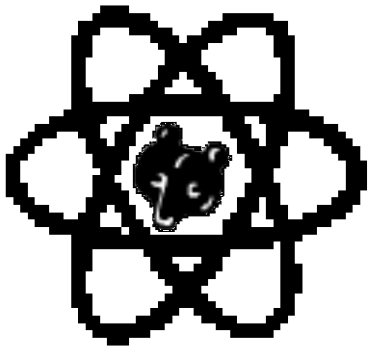
My Science Fair

Rough Draft Journal

Bethel Elementary



Student Name: _____

My Research (I Wonder) Question is:

I Wonder_____

_____**?**

Dear Student,

This rough draft is designed to help guide you through your science fair project. The goal of the science project is to extend your knowledge and understanding of science and to give you a hands-on experience with the scientific method.

This packet is broken done into five main parts to help you through this process:

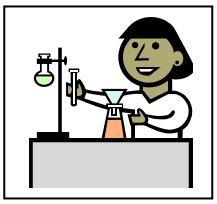
Part 1: A Note to Parents

Part 2: Finding a Problem, Generating your Hypothesis, and Researching

Part 3: Data Collection

Part 4: Analyzing Your Results

Part 5: Creating Your Display



All this information is also posted online on the class webpage at:
http://www.quia.com/pages/sdeane21/page2

Due Dates:

Science Fair Project Idea Sheet sent home:
4th Grade: Thursday, September 29
5th Grade: Monday, September 26

Science Fair Project Ideas Due:
4th Grade: Monday, October 3
5th Grade: Friday, September 30

Science Fair Rough Draft Packet sent home:
4th Grade: Friday, October 7
5th Grade: Monday, October 3

Science Fair Rough Draft Packets due:
4th Grade: Monday, October 24
5th Grade: Monday, October 24

Display boards distributed to students:
4th Grade: Friday, October 28:
5th Grade: Friday, October 28:

Display boards due for final assessment.
4th Grade: Wednesday, November 2
5th Grade: Wednesday, November 2

Thursday, November 10th - Science Fair Celebration 5:30-7:30pm.

Remember to take your time and do your best. If you have any questions let me know.

Mr. Deane

Part 1: A Note to Parents

Dear parents,

As we complete the Scientific Method study unit, it seems fitting to do a project where the children can take some of that knowledge, generate a question about a topic they wish to research, and make a discovery using the Scientific Method.

What is the Scientific Method? It is the process which students will be using to research, predict, test and analyze the results of the topic of their choice. It is composed of following parts:

I. **Purpose**: Students develop a question about something they wish to research.
II. **Hypothesis**: Students make an educated guess about the answer to their question based on some research they conduct.
III. **Experiment**: In order to test their hypothesis, students will list materials, explain steps that need to be taken, state variables, collect data, and make observations of what happened.
IV. **Analysis**: Data is now organized into a charts or graphs where it can be looked at for patterns.
V. **Conclusions**: Students will state whether their hypothesis was supported or not based on their data and results.
VI. **Communicating the Results**: Information is shared with others using their display board.

This can seem overwhelming, but if your child stays on top of their project, takes their time, and paying attention to deadlines, a science fair projects can be a great learning experience!

Of course you can support your child along the way, but I ask that you be their helper and not take over the project. Having students do as much on their own is the best way for them to learn. Ask them questions; have them explain to you their thoughts. This will help them to clarify their thinking.

Gather your needed materials early, watch your timeline. If you have questions, feel free to contact me at: scott.deane@gc.k12.va.us or call the school at 804-693-2360. I wish your child much success.

Mr. Deane

Part 2: Researching and Generating your Hypothesis

Once you have an approved research question, you are now ready to do some research on your topic and make a hypothesis as to what you think the answer to your question is.

A **hypothesis** is an educated guess that is based on some background knowledge of your topic that you have looked up. For example, if you are doing a project on the rate of growth of a plant using a fertilizer, you might want to look up some information on the plants you will be using as well as the fertilizer you will be using. Once you have that information, you can now make a prediction on what you think will happen. It should be written as an if/then statement.

A note about your hypothesis:
Remember your hypothesis is a researched educated guess. Do you have to be right about your hypothesis? The answer is no. Many times scientists are wrong about their hypothesis too. This can cause them to go back and conduct their experiment again, learning from their mistakes.

Sample Question 1:
Does liquid fertilizer help my vegetable plants grow faster?
Sample Hypothesis 1:
If I add liquid fertilizer to some vegetable plants and no fertilizer to other plants, then the vegetable plants with liquid fertilizer will grow at a faster rate.

Sample Question 2:
Does salt water freeze faster than fresh water?
Sample Hypothesis 2:
If I fill some cups with salt water and some cups fresh water, then the cups with salt water will freeze faster.

Now write the hypothesis for your experiment below:

If _____

then _____ .

Part 3: Data Collection

This is the best part of the scientific method because this is where you get to run your experiment! It is very important that your experiment is accurate and safe. Make sure you have adult supervision when you conduct your experiment. You need to run your experiment with <u>at least</u> 3 trials. Results should be recorded immediately afterwards. This is the part of your experiment where you:

<u>List your materials</u>: Make a list of all needed materials that are important for you to run this experiment. If you are measuring certain amounts, it should be listed with the units you are measuring in.

<u>Example of a materials list:</u>
3 flashlights
6 Duracell AAA batteries
6 Energizer AAA batteries
6 Walgreens AAA batteries
3 stopwatches

Write your <u>materials for your experiment</u> below:

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

Part 3: Data Collection

Write a <u>procedure</u>: This is where you need to state what must to do to conduct your experiment. Each time you do your experiment it is called a trial. In a good experiment there are **<u>at least 3 trials</u>** run. Remember to include times, sizes, amounts and the order each step must be done.

<u>Example of a procedure</u>:

1. Take a 6 inch board and make a ramp by placing one text book underneath it.
2. Place a toy car at the edge of the top of the ramp.
3. Let your car go down the ramp.
4. Measure the distance in centimeters the car traveled from the beginning to the bottom of the ramp.
5. Record distance on your data sheet
6. Repeat steps 1-5 two more times for three trials.

Write the <u>procedure for your experiment</u> below:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____

(continue on other paper if necessary)

Part 3: Data Collection

Variables:

Independent or Manipulated Variable: What is changed in the experiment.
(I.E. – How much sunlight given to different plants)

Dependent or Responding Variable: What is changed as a result of the Independent Variable.
(I.E. – - The rate of growth of each plant)

Constants: What you need to keep the same in an experiment.
(I.E. – - The amount of soil, the amount of water given, the size of the cup, the type of seed)

Write down the variables in your experiment below:

Independent or Manipulated Variable:

_____

_____

_____

Dependent or Responding Variable:

_____

_____

_____

Constants:

_____

_____

_____

Part 4: Analysis

Results:

Now that you have completed your research, you need to record your results from your trials in an organized way. You can display your data in a table and make a graph. Make sure you choose the right kind of graph. Here are some examples:

A table:

Tables are used to show your results in an organized way. Data is labeled with the units you are measuring in.

Height of Ramp	Trial 1	Trial 2	Trial 3	Average
6 inches	12 inches	11 inches	13 inches	12 inches
12 inches	26 inches	25 inches	25 inches	25 inches
18 inches	30 inches	36 inches	34 inches	34 inches

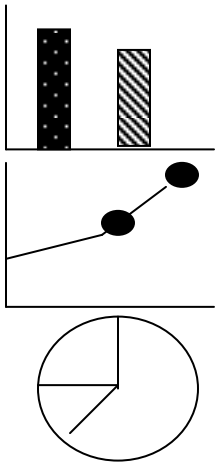
Graphs:

Graphs can be drawn or made on a computer. Common graphs include:

Bar Graphs: Used to show a comparison between different trails.

Line Graphs: show a change over time. Plant growth can be shown on a line graph.

Pie Graphs: show a how much each item has compared to the total.



By putting your data in a table or a graph you can better analyze the results. You also can include photographs or bring in a sample to show your results.

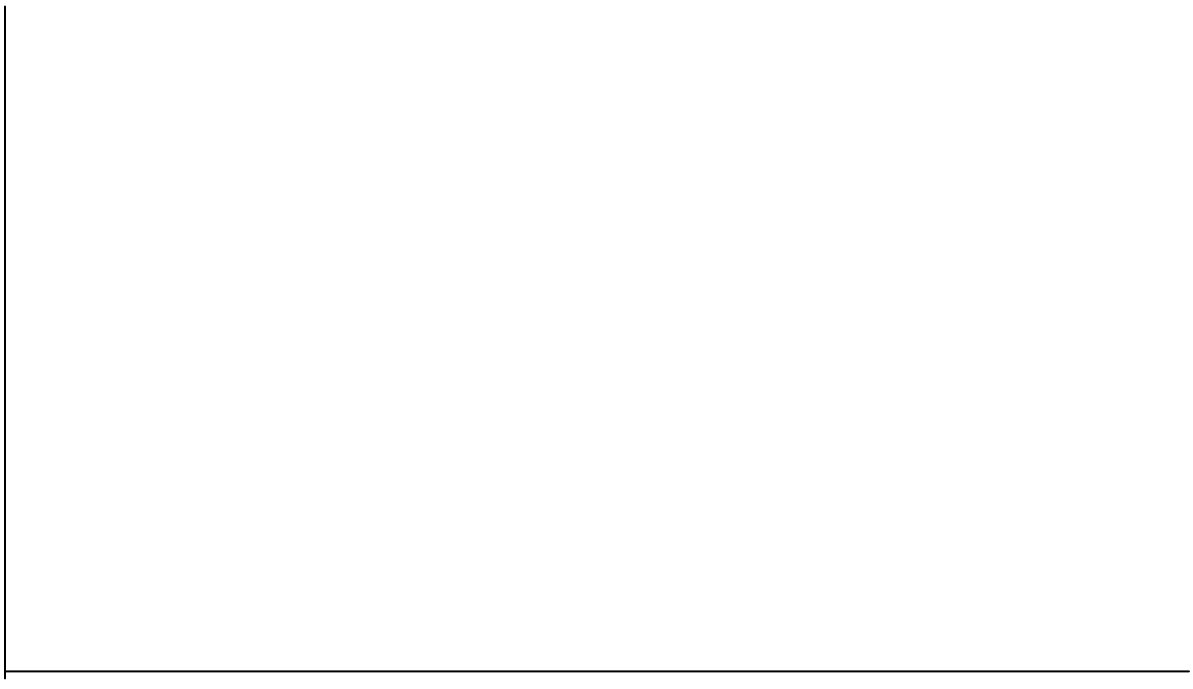
Part 4: Analysis

You can use this page to record your results below. You can also make your own if these do not fit your needs:

Table Title: _____

	Trial 1:	Trial 2:	Trial 3:	Average:

Graph Title: _____



Part 4: Analysis

Conclusion:

You now are ready to make a statement based on the analysis of your results. First you need to state whether your hypothesis was correct or not and then state why by referring to the data in your charts.

Sample Conclusion:

My hypothesis was correct because my cat preferred canned food to dry cat food. I noticed as shown in my data table that my cat chose the canned food 9 out of 12 days when given the choice.

Write the conclusion from your experiment below (remember to refer to your data table to back up your statement:

My hypothesis was RIGHT WRONG (circle one) because

_____

_____

_____

_____

_____

_____

_____

_____

Part 5: Creating Your Display

Now that you have filled out your rough draft journal you will be asked to turn this in to Mr. Deane to be graded. Your journal should be completed with the following parts:

- ✔ Research Question
- ✔ Hypothesis
- ✔ Materials
- ✔ Procedure
- ✔ Independent or Manipulated Variable
- ✔ Dependent or Responding Variable
- ✔ Constants
- ✔ Results (Graphs/Tables)
- ✔ Conclusion

After your draft is handed back, you will need to publish your results on a display board. Mr. Deane will purchase your display board. A display board is a white tri-fold piece of cardboard. Boards will be distributed when your rough draft is given back on June 11th. Information on how to organize and present your board will be given out at that time.

Judging:
In addition to receiving a grade for your project, there will be a team of adults who will be coming to Bethel to judge the projects on how well the project was conducted and used the scientific method. Recognition will be given to the top 1st, 2nd and 3rd place projects in 4th grade and the top 3 projects in 5th grade. All students will receive a participation ribbon for their efforts.

I know you will give your best effort and I look forward to seeing your projects at the science fair.

Mr. Deane