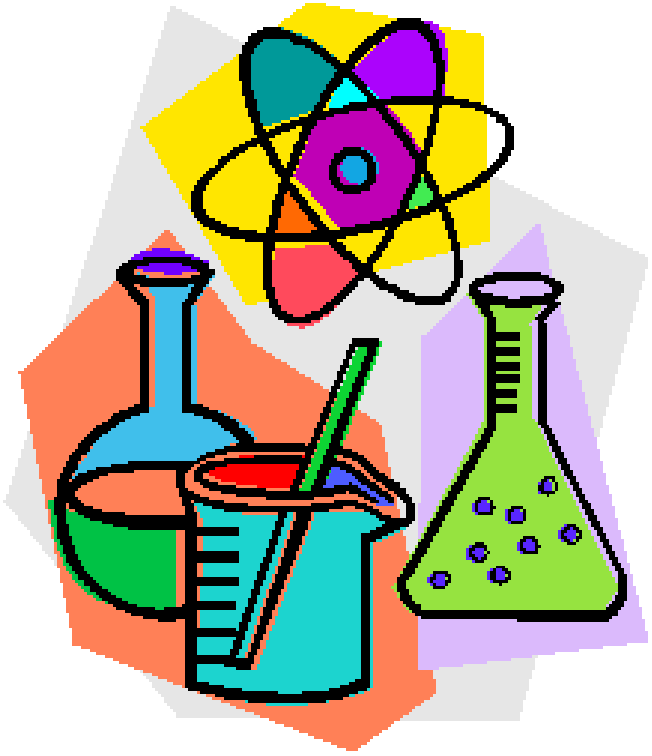
St. Nicholas Catholic School

Science Fair

March 19th, 2013



Student Packet

Investigator _____

Teacher _____

Title of Project _____

Scientific Methods

1. **Begin by choosing a topic/testable question.** Be sure you select a topic that is of interest to you. Note: Searching the internet for experiments to replicate for your project will not be accepted as an original idea produced by you. ***You should not know the results.*** You should only be able to guess what they might be.

Your question should be based on

- Observations about the world around you
- Questions you have that you would like answered
- Relating to a topic that interests you

Sample Question Format

- How would (a manipulated variable) affect (a responding variable)?

In other words, how would what is being changed affect a measurable variable?

Final Testable Question, "Your Best Science Question" DUE: Monday, February 4th

2. **Write a research report.** Write 3 full paragraphs explaining a scientific concept related to your topic and linking it to your testable question. Full directions and rubric are attached on a separate page.

DUE: Monday, February 11th

3. Create a Works Cited page to go along with your report. You may use citationmachine.net to create citations of text you used to research a science concept for the report. Remember to reformat each citation when you copy/paste so that the first line is not indent, but all following lines are. **All sources should be accurate and legitimate. If you have questions about a source please ask your teacher.

DUE: Monday, February 11th

4. Develop a hypothesis.

A prediction is a guess based on what you already know about a subject. A hypothesis is based on research (an educated guess). The formal way to write a hypothesis is:

If _____*(this is done)*_____

then _____*(this will happen)*_____

because _____*(scientific support)*_____**.**

DUE: Monday, February 11th

5. Plan an experiment that will prove or disprove your prediction.

<u>Materials</u>: Make a list of the materials you will need for your experiment. Use bullet points for each step.

<u>Procedure</u>: Create the plan, "The Recipe," for your experiments.

Write out your experimental procedure to display on your board.

Things to think about:

- How much time will you need?
- Will you do repeated trials (you must do 3 minimum) or use duplicate test subjects?
- What will you be observing and recording?
- What materials will you need?
- What are the exact steps to follow in running a test or trial?

<u>Variables</u>:

- **Identify the variable that will be changed (manipulated).**
- **Identify the variable that will be measured (responding).**
- **Identify all other variables that will be kept the same (controlled).**

Hint: Make your step-by-step procedures for your science experiment clear and specific. Your "recipe" or procedure should allow someone to duplicate your experiment and replicate your results. Be sure your experiment answers your question.

<u>You should have a plan for an experiment to test your hypothesis by Wednesday, February 13th, 2013</u>. Show this plan to your teacher. Be sure it is neat and well organized. It may include words and/or pictures.

6. Do the experiment and record your data. Be sure you do your experiment more than once (3 trials) to ensure that your data is accurate.

Make a plan to record your data (the information you learn by doing your experiment). There are three ways to observe and record your data:

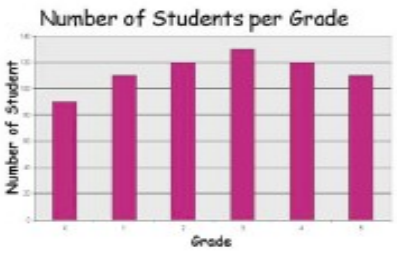
- Measuring (data chart)
- Counting (tally sheet)
- Describing (journal with dated entries)

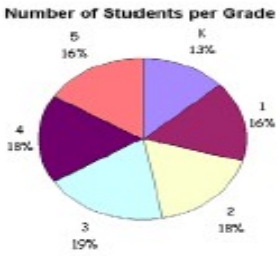
Must be done by: Friday, March 6th

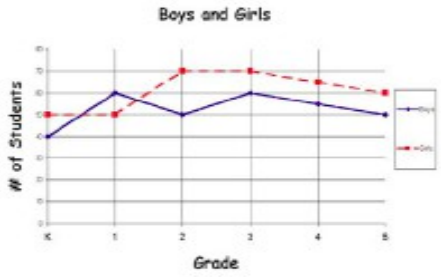
7. Analyze your results.

Look at your data. Is it complete? Are the entries dated and in order? Is everything labeled with titles and units? Is your log easy to understand?

Demonstrate your results in a graph. A graph is like a picture of your results. Below are 3 kinds of graphs:







You must include all "raw data" (exact results) along with a summary of results, or averages.

DUE: Friday, March 8th

8. Write your conclusion.

The conclusion is your chance to share your results. It is where you let everyone know if your original prediction is correct or incorrect. Be honest in reporting your results.

Conclusion Guidelines

1. **The conclusion should be in paragraph form and displayed on your science fair display board near your results.**

2. **Your conclusion should be based ONLY on your actual data.**

3. **Your conclusion should include:**

- Your question.
- Hypothesis.
- Actual results (data).
- Explanation of results. Connected to the research report.
- Whether or not your results agree or disagree with your prediction.
- Any question that come out of your results.

DUE: Wednesday, March 13th

9. Plan and create your Science Fair display.

Your display should include:

Title Your name Question (Problem)
Prediction Materials list Procedure
Results Graph Conclusion

Your display may also include:

Journal Pictures Models or samples
Diagrams Experimental equipment

A copy of your bibliography should be placed on the back of your display board.

Congratulations! You did it!

Bring your completed project to school on Monday, *March 18th, 2013*.

ATTACH THIS LABEL TO THE BACK OF YOUR DISPLAY BOARD.

Cut along line.

Science Fair 2013

Display Board Label

Tuesday, March 19th 2013

Investigator _____

Grade _____

Teacher _____

Project Title _____

Science Question Investigated _____

_____

Comments:

Your Best Science Question

Due: Monday, February 4th, 2013

Double check that you have considered all the things below before you write your question.

- ***Do I have high interest in learning more about this topic?***
- ***Can I find research material on the question/topic?***
- ***Does the question require experimentation and testing in order to answer it?***
- ***Can I get all the necessary materials to do the experiment?***
- ***Can I conduct the experiment on my own?***
- ***Will I be able to run repeated tests or test many subjects?***
- ***Will I be able to test results in some numerical way?***
- ***Does my question and experiment reflect real science?***
- ***Do my parents or guardian approve of my project plans?***

<u>Examples</u> for final wording of the question: (Use one of the models below or your own wording if these do not fit your question.)

How does _____ affect _____?

What is the effect of _____ on _____?

Which _____ is the _____?

<u>My Best Science Question</u>

_____

_____

_____

Student Signature _____ Date _____

Parent Approval _____ Date _____

Teacher Approval _____ ____ Date _____

Important Dates to Remember

Thursday, February 7th, 2013– Science Fair Question Due

Thursday, February 14th, 2013 – Hypothesis Due

Thursday, February 21st, 2013 – Preliminary Plan Due

Thursday, March 7th, 2013 – Bring to School for Questions

Thursday, March 14th, 2013 – Trifold Due at School

Thursday, March 14th, 2013 – Monday, March 18th, 2013 – Present Project to Mrs. Lockwood and classmates

Tuesday, March 19th, 2013 – Science Fair