Liberty Elementary's Fifth Grade Science Fair

Why don't arched bridges collapse in the middle? Do all objects fall at the same time? How does the depth affect the pressure of water? Why is salt put on icy sidewalks? How does the design of a paper airplane affect its flight? How do magnets affect tape recordings?

Have you ever stopped to ask yourself any of these questions? If not, we are sure that at some point in your life you have stopped to ask why something was happening. The answers to the questions above and to many other everyday questions you probably stop to ask are related to science. Science occurs all around us.

As your fifth grade teachers, we would like to invite you to embark on an exciting journey. We are asking you to imagine yourself as a scientist. In the upcoming weeks, it will be your job to answer the questions to the unknown. You will need to focus your thoughts on one question in particular and then strive to find an answer to that question. This will involve research, developing a hypothesis, step-by-step planning, testing your hypothesis by conducting an experiment, organization, and the willingness to believe that you can make a successful project. Perhaps we could have our very own Thomas Edison, Albert Einstein, or Sir Isaac Newton among our classes that have yet to be discovered. This is your time to shine!

Everyone in the fifth grade will be creating a Science Fair project that will be due on Tuesday April 12th. You will receive a grade for each of the following areas: Preparation and Planning, Written Report, Tri-Board Display, and Oral Presentation/Demonstration. The question you will attempt to answer must be submitted, in writing, to your teacher by **Wednesday, March 2nd.** Students may not choose the same question as another student in their homeroom, so be sure to turn your Topic Sheet in on time.

Experiment

You must **develop and conduct an experiment** concerning the question you hope to answer. You are responsible for providing all the needed materials for your project, both at home and when you present at school. Attached you will find a Science Experiment Project Plan. It will help you organize your experiment. Be sure to use precise measurements in your experiment. We are looking for you to truly become a scientist.

Written Report

The report must be a minimum of two pages in length. Your report must be on your scientific method for your experiment and must include a reflection of your overall learning experiences. Your report is to be written in paragraph format. You are not to skip lines in this report. You must include graphs, tables, and/or charts in your report. Graphs, tables, and charts should be on paper without lines and should be done using colored pencils. Your report should include a cover. Remember the cover and pages containing any graphs, tables, or charts are not included in your minimum number of pages. If your report is typed, you must use a 14 font. Please refer to the attached Written Report Guide and Science Experiment Project Guide to assist you in setting up an outline of your final report. Also in this packet is a Science Fair Rubric to clearly establish the grading expectations for the written report.

On **Friday, April** 1st, a rough draft of your report is due. Teachers will review your rough draft for content, as well as length requirement and proper page layout. Rough drafts will be returned to you no later than Monday, April 3rd.. You will be given a grade for turning your rough draft in on time.

Tri-Board Display

You will need to purchase a Tri-wall to complete your display. Tri-wall display boards can be purchased at Michael's, Staples, or Office Max. Please refer to the attached guide to aide you in creating this visual. Please refer to the Tri-Board Display Guide and the Science Fair Rubric to clearly establish the grading expectations for the tri-board display.

Demonstration/Oral Presentation

Your oral presentation will be given during the week of April 12th - April 15th. It must be three to five minutes in length. Your experiment and tri-board display must be used in your presentation. You may use one note card for this presentation. **You must perform your experiment in front of your peers and have all needed materials ready for this day.** The grading expectations can be found on the Science Fair Project Rubric.

We would all like to wish you luck on your project. Please do not wait until the last minute to get started. This is a time-consuming assignment and is intended to become a real learning opportunity. Waiting to the very end to begin this project will not only prevent you from learning as much as you possibly can, but it may also affect the outcome of your project and grade.

Attached is a list of possible science fair topic ideas. If you have any questions, please feel free to speak to any of us. If you are having difficulty choosing a topic, please let us know as soon as possible. **Do not wait until the day your topic is due to let us know you are having trouble**. We want you to find a project that you will enjoy and truly be proud of completing.

Mrs. Donnelly, Mrs. Makselan, Mrs. Morrison, and Mrs. Ventimiglia

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I understand that my child,_____, has a project due on Tuesday, April 12th for the Science Fair. I also understand that this will account for a large portion of his/her 3rd Trimester grade in science. **Failure to do this project by April 12th will cause him/her to receive a failing grade in science for the 3rd trimester. All projects must be received on April 12th before 9:00 am to receive credit. No late projects will be accepted for any reason (absence, late to school, etc.)** due to the length of time children are given to complete this project.

_____ _____

Parent Signature Date

SCIENCE EXPERIMENT PROJECT PLAN

State the "BIG" **Question:** _____

_____

Research (read and gather information that will help you with your experiment): _____

_____

_____

_____

(Continue on another sheet of paper if necessary.)

Hypothesis(Educated Guess)

What I think will happen(If...then...): _____

_____

_____

Materials:

_____ _____ _____

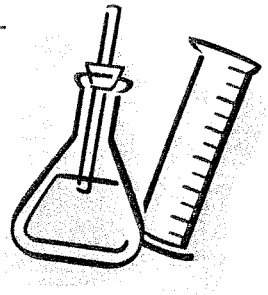
_____ _____ _____

_____ _____ _____

Procedures:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

(Continue on another sheet if necessary.)



Data/Results:

What happened when you tested your hypothesis? Explain.

Conclusion:

Was your big questions answered? Was your hypothesis correct? Explain.

Written Report Guide

The information on this sheet is only to serve as a guide. Your report should be written in paragraph form, not question and answer format.

Scientific Method

1. **Choose a problem:**
   (State your BIG Question)

2. **Research your problem:** (2 Resources; at least 1 being a book)
   (What information did you learn and read about in the resources that will help you with this experiment?)

3. **Develop a hypothesis:**
   (Using the words *if* and *then*, develop a hypothesis for this experiment.)

4. **Write your procedures:**
   (Write in order each step you took and the materials you used.)

5. **Test your hypothesis:**
   (Record and Describe what observations you made during the testing of this experiment.)

6. **Organize your data:**
   (Draw pictures, make tables, charts, and graphs.)

7. **State your conclusions:**
   (Was your hypothesis true? Was your BIG Question answered?)

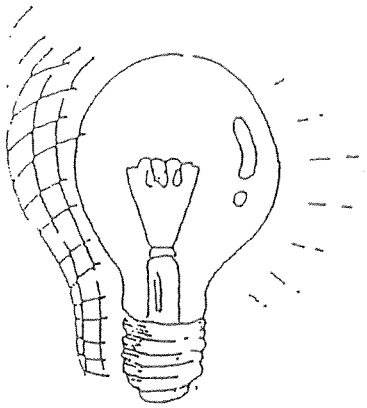
Reflection

Why did you choose the topic that you did? Has the "BIG Question" you worked to answer been a question that you have pondered for a long time?

Did your experiment result in the conclusion that you had predicted? Did you encounter any problems/difficulties with your experiment? If your experiment did not work the way you had planned, what might have caused this? What steps did you/could you take to adjust the outcome if you were to do this project again?

If you were to grade yourself on this report, what grade would you have earned and why? Do you think you worked as a true scientist towards learning the answer to your "BIG Question"?

"BIG Question" Ideas



- Does the color of a material affect its absorption of heat?
- How does a cooler or ice chest work?
- Can you change an object's center of gravity?
- Can the design of a paper airplane make it fly farther?
- What materials provide the best insulation?
- Can flies grow from decaying bananas?
- What is stroop?
- Do sugar crystals grow faster in tap water of distilled water?
- How do bacteria help clover live?
- How does dishwashing liquid clean away oil?
- How does a magnet produce movement in a current-carrying wire?
- Can same-type balloons withstand the same amount of pressure?
- What type of soil filters water best?
- Does the color of light affect plant growth?
- Which brand of popcorn pops the most kernels?
- Which kind of glue holds two boards together better?
- Which paper towel is the strongest?
- How does gravity affect the shape of soap bubbles?
- How do gears affect each other's speed and direction of motion?
- Does hitting a magnet weaken its magnetic strength?
- What is radial symmetry?
- Is a paper of plastic bag stronger?
- Do different liquids evaporate at different rates?
- Does the type of water affect the growth of plants?
- Can electricity produce a magnet?
- Does the fatty layer under the skin keep an animal warm?
- How does heat affect the movement of molecules in a rubber band?
- What product removes stains the best?

If you have difficulty finding a topic, there are many books about science fair ideas at your local library.

All topic ideas <u>MUST</u> have a scientific experiment/demonstration to help prove your theory.

Tri-Board Display Guide

Your tri-board display is the visible proof of your hard work. **Neatness and organization are keys to a terrific exhibit.** You need to include all of the following in your display*. There is a picture of an sample display board in this packet, however as long as you have what is expected you may be as creative as you desire.

Big Question

This should be your title and it should stand out from the rest of your display.

Hypothesis

After reading your research what did you think the answer to your question would be? Make an educated guess and display it as an if... then... statement.

Materials

Display a complete LIST of materials.

Procedures

In a step-by-step format describe the entire investigation/experiment.

Data

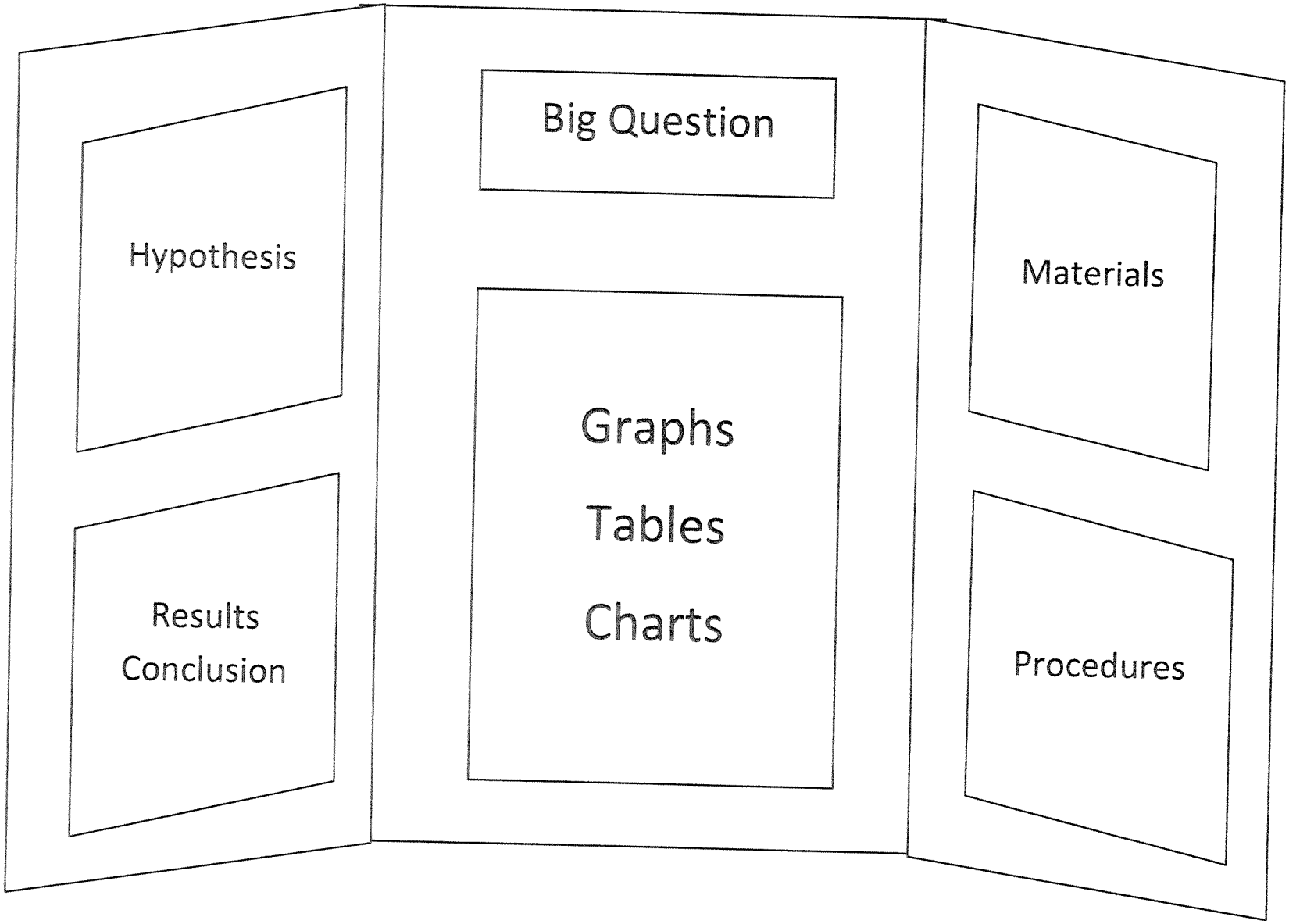
Organize your data from you observations. Display it in graphs, tables, and charts.

Results/Conclusion

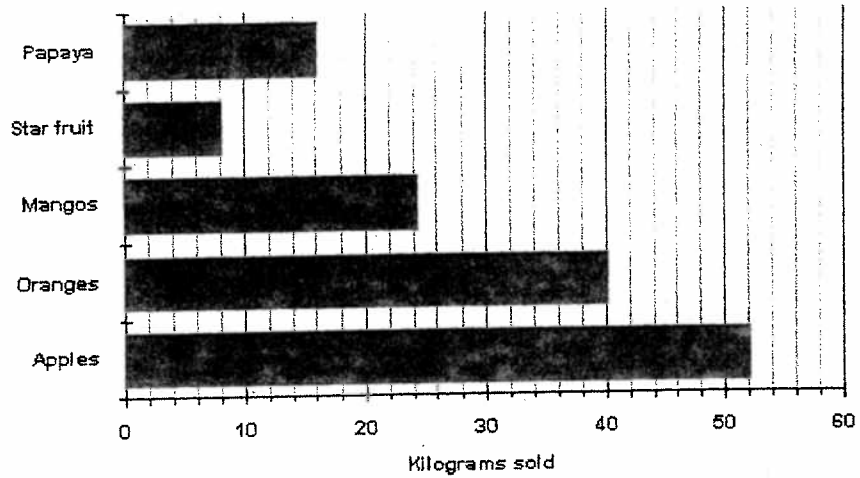
What was the answer to your question? Was your hypothesis proven true or false and why?

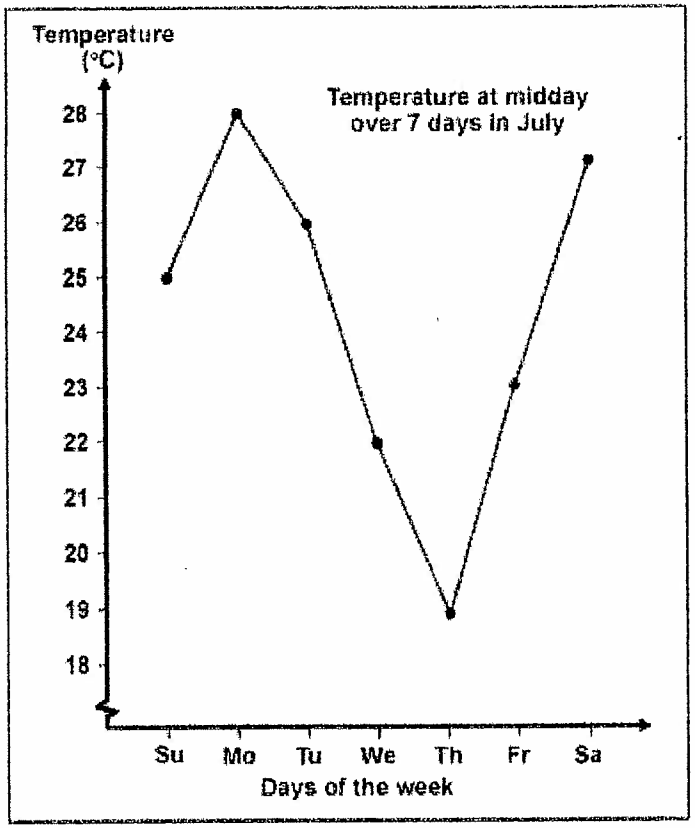
*Pictures are not required but do help in the overall appearance of your display.

Sample Tri-Board Display



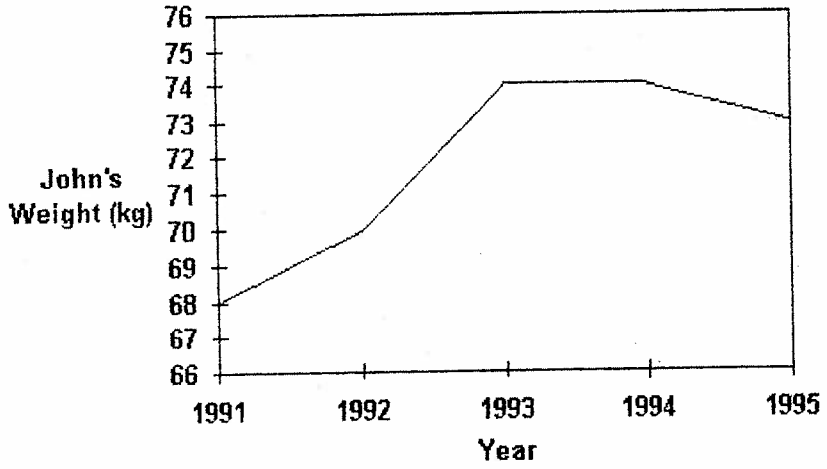
Sample Graphs

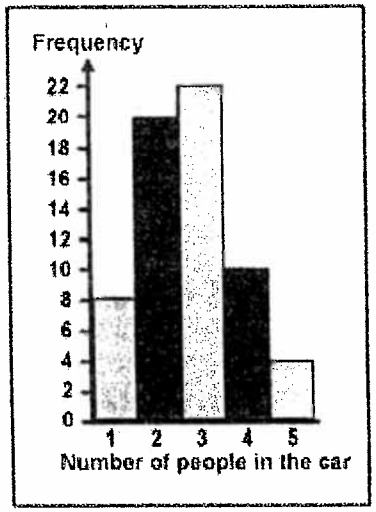




Website for creating a graph

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





Name_____Date_____

Topic Sheets

This sheet is due by Thursday, March 2nd.
Be sure your answers are in complete sentences.

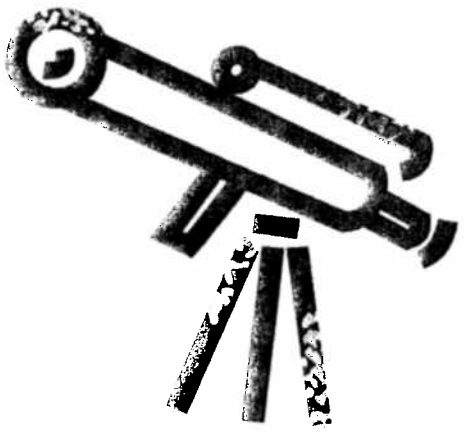
1. What is the big question to be researched for the science fair?

2. **Describe** the experiment you will perform in order to answer your big question.

Name_____

Science Fair
Preparation/Planning Rubric

	Points Possible	Points Earned
1. Topic Sheet (March 2nd) Question One (3 points) Question Two (4 points) Turned in on Time (1 point)	8	_____
2. Two Resources (include at least 1 book) Shown to Teacher on Time (March 9th)	3	_____
3. Rough Draft (April 1st) Completed (10 points) Turned in on Time (2 points)	12	_____
Total	23	_____



Science Fair Project
Rubric

Written Report	Points Possible	Points Earned
Included Scientific Method		
State Your Big Question	1	_____
Research	5	_____
Hypothesis (If.... then....)	3	_____
Materials/Procedures	10	_____
Activity/Experiment	5	_____
Data (Graphs/Tables/Charts)	5	_____
Conclusions	5	_____
Reflection		
Why did you choose the topic you did?	3	_____
Problems/Difficulties/Changes	3	_____
If you were to grade yourself, what grade would you have earned and why?	3	_____
Page Requirement (2 page minimum)	2	_____
Cover (Name, Date, Big Question)	3	_____
Spelling/Grammar	2	_____
Neatness	2	_____
Total	52	_____

Tri-Board Display

Big question displayed	3	_____
Steps listed for scientific process		
Hypothesis (If…then…)	3	_____
List Materials	3	
Procedures (List the steps)	5	_____
Data (Graphs/Tables/Charts)	5	_____
Results/Conclusions	3	_____
Overall Presentation	3	_____
Total	25	_____

Presentation/Demonstration

Explain reason for choosing topic	1	_____
Research Knowledge	3	_____
Hypothesis Stated (If…then…)	1	_____
Explain Materials/Perform your steps	10	_____
Explanation of Data	3	_____
Results/Conclusions	3	_____
Spoke Clearly	2	_____
Eye Contact	2	_____
Total	25	_____
Bonus: Audience Participation		_____
Grade		_____

Science Fair Timeline

THE RESEARCH AND WORK ON THIS PROJECT IS TO BE COMPLETED AT HOME.

March 2nd	Topics are due
March 9th	At least two resources about your topic are to be brought to school
March 2nd-March 31st	Research/Experiment Work on completing rough draft of paper
April 1st	Rough drafts are due
April 4th-April 11th	Work on Tri-Board and Final Copy of Report
April 12th	Science Fair project is Due
April 12th-April 15th	Oral Presentations
April 19th	Science Fair from 6:00-7:00 at Liberty Elementary. **All students are expected to be present this evening.**