Mount Sinai Elementary School
Mount Sinai, New York 11766

January 2017

Dear Parents and Guardians of Elementary School Students:

It is "Science Fair time!" As in the past, Elementary students will have an opportunity to display their talents at the 2017 Mount Sinai Elementary School Science Fair on Tuesday May 16th at 7:30 p.m. in the Elementary School cafetorium.

We have just received word that Brookhaven National Lab (BNL) will also be hosting an Elementary School Science Fair on Saturday May 6th This would be an excellent opportunity to showcase some of Mount Sinai's best science minds and they have allowed Mount Sinai Elementary School to enter one project per grade level.

Attached you will find information sheets which will help the children prepare for one or both of the science fairs. Due to the fact that the BNL Science Fair is Suffolk County wide event, requirements are slightly different than those for the Mount Sinai Science Fair Please note due dates for each Fair. Please return the bottom portion of this letter no later than **February 15, 2017**

Note: For those students who would like to participate in the Brookhaven National Lab Science Fair will receive additional information that will be sent home with that child.

Students participating in either science fair will be entered in a raffle to win science prizes, including a family membership to the new Long Island Science Center opening in Rocky Point!

Happy Experimenting!

Sincerely,

Mr A. Matthews, Director of Math, Science and Technology
Ms. K. Conard, Elementary School Fourth Grade Teacher
Mr J. Costa, Elementary School AIS Mathematics Teacher

Mount Sinai Elementary School, Mount Sinai, New York 11766

Please check the appropriate box (below) to indicate which fair(s) you are interested in participating in.

Print Student Name:_____ **Teacher** _____ **Grade:**_____

_____ BNL Elementary Science Fair **(project due date April 3, 2017)**

_____ Mount Sinai Elementary Science Fair **(project due date May 9, 2017)**

_____ Both BNL and Mount Sinai Elementary Science Fairs **(project due date April 3, 2017)**

General Outline for Participation in the

2017 BROOKHAVEN NATIONAL LABORATORY ELEMENTARY SCHOOL SCIENCE FAIR (MAY 6th)

1. The Brookhaven National Lab School Science Fair is open to all students in grades K-4.

2. All projects must be durable and safe. Moveable parts must be firmly attached. BNL will **NOT** provide electrical outlets for electricity, running water, drainage, gas or compressed air. Live animals, dangerous chemicals, open flames and explosives may not be exhibited. Any project that is deemed to be unsafe or inhumane will **NOT** be displayed at the science fair.

3. Projects should demonstrate scientific investigation of a question/hypothesis. Please note it would be preferable if the investigation focused on an avenue of inquiry pertinent to the child. That is, demonstrations or models are not considered appropriate activities.

4. Please encourage your child to investigate the physical surroundings. Encourage them to keep journals detailing the discoveries they are making. The use of scientific tools such as hand lens, rulers, balance, gram weights thermometer, measuring cups and timepieces is encouraged. Children are encouraged to work in cooperative groups and with parental guidance.

   NOTE: Individual or group projects are acceptable for grade K-3. Participants in group projects must be of the same grade level.

   NOTE: Grade 4 students must submit individual projects.

5. In order to assure anonymity, there should be no photographs or names on the projects that could be used to identify the student, student's gender or school.

6. **Summary of project** must be signed and submitted to certify that the project clearly reflects the student's work. This form must be attached to the student's project. This form, as well as, the Judges' scoring rubric for the BNL fair will be sent home with those students who would like to participate.

7. **DUE date for the BNL Fair is APRIL 3, 2017**

Note: Since the BNL fair allows only one entrant per grade level. All the submitted experiments in a grade level will be judged and one winner per grade level will be chosen to represent Mount Sinai Elementary School at the BNL Fair.

BROOKHAVEN
NATIONAL LABORATORY

Brookhaven National Laboratory
Elementary Science Fair Overview

1. **BNL Elementary Science Fair**
   a. **Rules**
      - One project per 200 students in a grade level
      - Grades 4,5,6, must be individual project
      - Only school contact person may submit names
      - No electricity provided
      - No live animals allowed at fair – no harm to animals in experiment
      - Not a demonstration, must have data
      - Nothing to identify child's gender of school – check photos, front and back of project, journals etc to make sure no identifiable information
      - Summary of project form attached somehow

   b. **Judging**
      i. You can be a judge at the BNL Science Fair, working closely with world-renowned scientists/engineers. Great opportunity to network with other teachers, school districts, BNL's scientific staff, and learn how BNL's Office of Educational Programming can enhance your students' science and math curriculum

2. **On-line registration**
      i. Please do not register for our contest until after your school's contest. The Science Fair Coordinator should submit information for all grade levels on the same form.
      ii. Go to the online registration page.
      iii. Select your school district. Private and parochial schools, please select "Private".
      iv. Select your school. If your school is not listed, please select "School Not Listed" and add the name and address in the comments section at the bottom of the form.
      v. Enter the contact person's name, e-mail address, principal's name, and school phone number. **Please be very careful regarding the e-mail address, as all registration numbers and information will be sent by e-mail.**
      vi. Enter the total number of students registered at your school for each grade that you wish to enter into the contest. Do not enter a number for the grades that you are not entering the contest.
      vii. Project information: Enter information as you would like it printed on the certificate. **Please check spelling and grammar.** This information will be used for the student's certificate.

BROOKHAVEN
NATIONAL LABORATORY

Brookhaven National Laboratory
Elementary Science Fair Overview

viii. If you have more than 200 students in one grade level, you may enter 2 students into the contest. Add this information to the comments box.
ix. Please check all information you have entered before continuing then click the Submit button
x. Once you have submitted the form, you will either get a thank you page or the registration page with errors messages for incorrect or missing entries.
xi. Make any corrections as indicated, then click the "Submit" button.
xii. You will receive an e-mail confirming your submission. If you do not receive the confirmation, or there are errors in your submission, please e-mail Aleida Perez at pereza@bnl.gov, Science Fair coordinator, or Jessica McKenna jmckenna@bnl.gov, they will make any necessary corrections.

3. **Day of Fair**

i. **9:00-11:00 am Registration and Project Set-Up**
Can I have someone else drop off my science project for me?
Yes. The student does not need to personally bring the project. Someone else can set up the project for them. All projects must be set up and ready for judging by 11:00 a.m. One person from the school could be designated to drop off all the projects for the school.

What if the student can't attend the fair, or can't drop off/pick up their exhibit during the scheduled time?
The student does not need to attend the fair to participate: only the project NEEDS to be at the fair. Someone else can drop off and pick up the project. If other commitments prevent you from dropping off or picking up the project at the specified time, please try to make arrangements with someone else from your school to be responsible for your project. Projects not picked at the close of the fair will be held for a few days, but BNL cannot be held responsible for projects left behind after the fair.

ii. **11:00-1:30 pm Judging- Fair Closed to Public**
Do students need to be present during the judging?
With over 500 projects entered in the fair, there simply is not enough time available for the judges to speak to every student. To be fair to all, we decided to have no students present during the judging period, which runs from 11:00 a.m. to 1:30 p.m. The fair is closed to the public during this interval.

BROOKHAVEN
NATIONAL LABORATORY

Brookhaven National Laboratory
Elementary Science Fair Overview

Is there anything for us to do at BNL during the time the fair is closed for judging?
Sorry, but no BNL facilities are open to the public on the day of the fair. A list of places to eat and visit will be available at the fair.

iii. **1:30-5:00 pm** **Open House in Berkner Hall**

How many guests may accompany me to the fair?
There is no limit on the number of guests you may bring. The event is very crowded (especially during the drop off period), so please limit guests to a reasonable number.

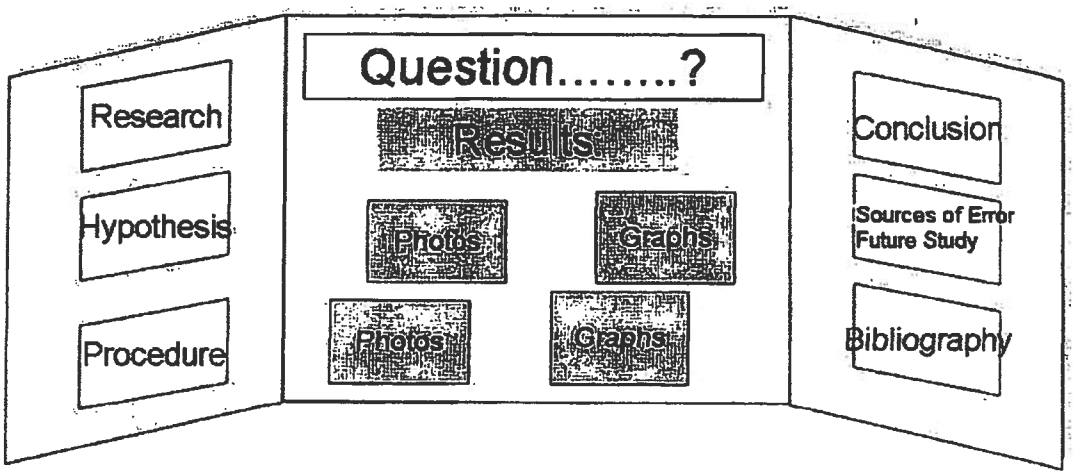
2:15-5:00 pm Please return for the appropriate Award Presentation:

Awards Presentations by grade level

2:15 – 2:30 pm Kindergarten
2:40 – 2:55pm First Grade
3:05 - 3:20 pm Second Grade
3:30 – 3:45 pm Third Grade
3:55 – 4:10 pm Fourth Grade
4:20 – 4:35 pm Fifth Grade
4:45 – 5:00 pm Sixth Grade

SCIENCE FAIR SCORE SHEET

PowerPoint Slides for Poster Board



OR

Option 2:

You may use any title you want and then put the problem on the left side of the poster board.

Updated: April 2013

BROOKHAVEN
NATIONAL LABORATORY

Science Fair Checklist

Start thinking!

1. Find a topic that interests you. Ideas should come from things in your area of interest. A hobby might lead to a good topic. What is going on in the world that you would like to know more about?
2. Start a journal or folder to keep all your notes and research along the way.
3. Find out more about the subject. Go to the library, search the internet, and talk to scientists. Remember to record all your findings and sources.

Get going

4. Ask a question about your subject that can be answered by doing an experiment.
5. Make sure you have enough time to finish the project.
6. List all the materials you need, where to obtain them and how much they cost.
7. Discuss the project with your parents and teacher and review with them the rules that might apply to your project.
8. Develop a hypothesis - what you think the answer might be to your question and give a reason why.
9. Decide what changes you will measure and how you will measure it. Keep everything else the same.
10. Develop a procedure. Make sure you will be repeating the experiment more than once.

Testing and results

11. Make observations and collect data.
12. Examine and organize the data and observations, make charts and graphs so that it is easy to see what the results are. What patterns do you see in your data?
13. Draw conclusions. Did your experiment give you the expected results? Why or why not. Were there any errors in your method or data collection? What were the problems and how could you solve them?
14. What new questions can you ask about the subject now?
15. Is there any practical use for your research?

Finish Up

16. Create the project exhibit board, make it clear and colorful.
17. List your sources of information on your project.
18. Fill in the project summary form; attach it to your project.
19. Check that the project display follows the rules.

BROOKHAVEN
NATIONAL LABORATORY

Helpful Tips to Inspire Science Fair Project Ideas

1. Keep a notebook of all questions students ask.
2. Have a shelf of interesting objects to spark discussion/investigation.
3. Provide students with measuring tools – ask what they can use them for.
4. Take project idea, put in middle of paper – draw off frequently asked questions – how do you answer each question – leads to investigation.
5. Take general science category, list relevant subjects, choose one that interests students, list subcategories in that subject, and so on until a specific subject matter is reached.
6. Current events – research periodicals (newspapers, National Geographic, Scientific American, Ranger Rick, Prevention Health Magazine, etc.).
7. Test claim of a product (advertisements, commercials, Consumer Reports magazine).
8. Test superstitions/ancient lore.
9. Personal experiences – sports, travel, observations in backyard, illness in family.
10. Look at past projects to see if there is something that sparks an interest, maybe an experiment that ended by asking another question, or didn't turn out as expected.

BROOKHAVEN
NATIONAL LABORATORY

Designing a Controlled Experiment

Ask an Investigable Question – ask a question that can be answered through an investigation, such as, How, What, When, Who, Which, Why, or Where?

Controlled Experiment (fair test) - only one variable is changed (has only one independent variable), a repeatable investigation where the researcher tests a hypothesis by changing the independent variable and noting the effect on the dependent variable(s).

Construct a Hypothesis – a hypothesis is an educated guess, or explanation, based on experience, of a phenomenon, event or the nature of an object. A hypothesis is testable.
"If _____ *[I do this]* _____, then _____ *[this]* _____ will happen."
I think [this] because _____

Planning and Investigating – design an investigation that devises a way to test your hypothesis, which includes, identifying and controlling variables, collecting data using measurement tools, and means to interpret and communicate your results

Independent (Manipulated) Variable - variable that the experimenter purposely changes or manipulates; what is being tested; the cause; typically graphed on the horizontal or X axis.

Constants (Controlled) - all other factors that could change, but are deliberately kept the same.

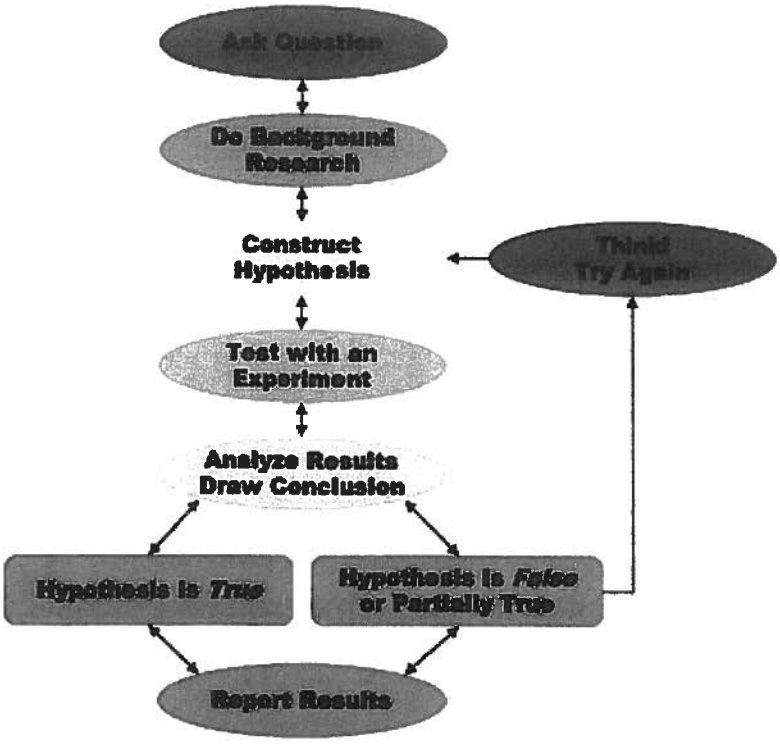
Dependent (Responding) Variable - variable that changes in response to the independent variable; what you observe; what is being measured; the effect; typically graphed on the vertical or Y axis.

Test Your Hypothesis by Conducting the Experiment – your experiment tests whether your hypothesis is true or false. Completing an investigation several times and using collected data for comparing results will create reliability in your test. 3-5 trials are recommended.

Analyze your Data and Draw a Conclusion – once your experiment is complete, collect your measurements and analyze your data to see if your hypothesis was true or false. Data should be converted from table/journal format and depicted as easily read graphs.

Scientists often find their hypothesis false, and in such cases they will construct a new hypothesis, thus restarting the scientific process. Even if they find their hypothesis to be true, they may want to test it in another way.

Communicate your Results – to complete your science fair project, you will need to communicate your results to others via final report and/or display board. Professional scientists do a similar task by publishing in scientific journals or by presenting their work through a poster at scientific conferences.



How to Formulate a Good Question

Question:

When I change manipulated variable, what will happen to responding variable?

Hypothesis:

When I change manipulated variable, I predict that _____ will happen to responding variable because _____ .

BROOKHAVEN
NATIONAL LABORATORY

Science Fair Resources

Fiction Books

Cole, Joanna and Bruce Degen, *The Magic School Bus and the Science Fair Expedition*, 2006
Greene, Stephanie, *Owen Foote, Mighty Scientist*, 2004
Finchler, Judy and Kevin O'Malley, *Miss Malarkey's Field Trip*, 2006
Grossnickle Hines, Anna, *What Joe Saw*, 1994
Knudsen Michelle, *Science Solves It* series:
A Moldy Mystery, 2006
A Slimy Story, 2004
The Case of Vampire Vivian, 2003

Non-Fiction Books

Henderson, Joyce and Heather Tomasello, *Strategies for Winning Science Fair Project*, 2001
Markle, Sandra, *The Young Scientists Guide to Successful Science Projects*, 2000
Smith, Norman, *How to do Successful Science Projects*, 1990
Voth, Danna and Michael Moran, *Kidsource: Science Fair Handbook*, 1998

Web Sites

Discovery Education site, Science Fair Central
All you need to know about creating a science fair project
http://school.discovery.com/sciencefaircentral/

Science Buddies
Project ideas and step-by-step project guide
http://www.sciencebuddies.org

Neuroscience for Kids
Successful science fair projects
http://faculty.washington.edu/chudler/fair.html

Science Fair Preparation
Helpful tips
http://www.cyberbee.com/science/prep_sites.html

Teacher Resources

Articles

NSTA Science and Children. *A Standards-Based Science Fair*. April 2011.

Students compete against standards rather than other students.

NSTA Science and Children. *A Kinder-Science Fair, Science 101: What Makes for a Good Science Fair Project?, Take the Science Fair Online!, Four Tools for Science Fair Success.* December 2007.

This entire edition is dedicated to science fair.

NSTA Science and Children. *First Graders Can Do Science.* December 2006.

Young students investigate their own questions and present their projects at a science inquiry conference.

NSTA Science and Children. *The Confidence Game, The Road to Stress-Free Science Fairs.* September 2006.

A simple activity with dice teaches students the importance of replication and sample size in data collection.

A long-term approach to learning inquiry takes the stress out of science fairs.

Websites

Brookhaven National Laboratory Elementary Science Fair Website
Visit site for contest and registration information and to see previous year's winners.
www.bnl.gov/education/program.asp?q=175

BROOKHAVEN NATIONAL LABORATORY

JUDGES' RUBRIC
BNL Elementary School Science Fair

Criteria	4	3	2	1
Originality of Question	Original research.	Unique perspective on a traditional project.	Embellish an existing idea.	No originality.
Hypothesis	Thoroughly developed with "I think...because...."	Sufficiently developed.	Partially developed.	Major flaws.
Procedures/ Organization	Easy to follow sequence of the Scientific Method. Dated sequence of entire process captured by the student in a log or journal. This includes all observations, data collection, and changes to project.	Easy to follow sequence of the Scientific Method. Dated sequence of entire process captured by the student in a log or journal with moderate detail.	Somewhat difficult to follow because of lapses of the sequence of the Scientific Method. Minimal documentation included in a log or journal.	Difficult to follow; no sequence of the Scientific Method. No data collection shown.
Investigation Trials	Experiment was performed more than 2 times and/or sample size was exceptional.	Experiment was performed 2 times and/or sample size was adequate.	Experiment was performed 1 time and/or sample size was minimal.	Experiment was performed incompletely.
Analysis	Data is clearly presented and directly relates to hypothesis/ question.	Data is reasonably presented and shows good relationship to hypothesis/ question.	Data is minimally presented and shows some relationship to hypothesis/ question.	Data is not presented and no relationship to hypothesis/question is evident.
Evaluation/ Conclusion	A logical conclusion has been drawn from the data collected, and answers the hypothesis/question and/or raises a new hypothesis/ question. Has real world application.	A logical conclusion has been drawn from the data collected.	A fairly reasonable conclusion has been drawn from the data collected.	The conclusion drawn is not shown to relate to the data collected.
Presentation *(Overall Impression)*				

*Scientific Method: question, hypothesis, investigation/testing, analysis, and evaluation/conclusion.