December 10, 2009

Dear Foothill Parents and Students,

Foothill Elementary School will be hosting a non-competitive Science Fair on **Wednesday, February 24th**. Participating students will perform an experiment at home using the scientific method, create an exhibit, present their experiment to their class, and present a summary of their experiment to interviewers from the school and community the day of the fair (experiments will not be performed at the fair). All levels of scientific knowledge are encouraged.

Attached is a registration packet for Foothill's Science Fair. If your child is interested in being part of the fair, review the packet together, and help him or her choose an appropriate experiment. If you need ideas for experiments, refer to the included "Links to Science Fair Ideas" page. The last three pages are for 1st and 2nd graders who enter the fair; they may simply fill out these worksheets and paste them to their science board if they wish.

Foothill Elementary School follows BVSD guidelines for Science Fairs. A project must be an experiment (test an idea), not a model, and should be presented in a neat, concise fashion. **Project boards are available for purchase for $3 (see the checklist page for ordering information).**

Please return the project proposal, check list and volunteer sign up sheet by **Thursday, February 4th**. If you order a display board, one will be delivered to your child's classroom the week of February8th. After classroom delivery, you may wish to pick up the board yourself, rather than have your child walk or ride the bus trying to carry the board.

If your child is planning to do a population study using classmates (i.e. boys' hearts beat faster than girls'), please have him/her contact the classroom teacher ASAP to schedule times for testing. Population studies should include at least 10 of each population (10 boys and 10 girls, all the same age), and each population should be tested at least five times on five different days (or 50 boys and 50 girls could be tested one time each, but that is logistically difficult).

If your child needs to have an electrical outlet available at the Science Fair, please note that on the check list. We will provide the outlets. However, you will need to provide a 3-pronged, 10 foot extension cord.

Included in packet are a checklist, a volunteer sign up sheet, and a Science Fair project proposal. **These first three sheets need to be returned to the classroom teacher by February 4th.** Additionally, the types of acceptable projects, a list of websites with science fair ideas, participant roles and responsibilities and safety guidelines for the exhibit, as well as an explanation of the report parts and the scientific method, are included. It is suggested that you print out the entire packet so that you can familiarize yourself with all aspects of Foothill's Science Fair.

If you have questions about project ideas, please contact Kristi Winseck at school or at kristi.winseck@bvsd.org. If you would like to volunteer, please contact Gwen Mossman at 720-406-9603 or gwenmossman@comcast.net .

Sincerely,

Foothill Science Committee

TYPES OF SCIENCE FAIR PROJECTS

1. ***INVESTIGATION:*** Observe nature (plants, animals, people) and report what you observe, following the scientific method. Your purpose is to find out how your specimens behave or function. Example: Watch prairie dogs; record their barks; photograph their movements; compare their movements at various times in the day or how their movement is affected by weather etc; chart or graph findings.

   Comparative Surveys: These surveys, sometimes called natural experiments, identify two or more groups or classes of subjects that are generally alike but which may show a difference in one or more important factors. Express the difference as a hypothesis. EXAMPLE: "Boys' hearts beat faster than girls' hearts do."

   Simple Experiment*:* In this kind of experiment your purpose is to change something. You will be observing what happens as a result of changes. EXAMPLES: Melt an ice cube; incubate an egg; inflate a balloon.

   Controlled Experiment: This kind of experimenting involves more complex investigations. EXAMPLE: You might have a group of plants as an experimental subject and another group of the same type of plants as a control group. The independent variable in this experiment is the amount of chemical fertilizer added to the experimental plant group. The dependent variable is the difference observed in the growth of the plants.

2. STUDIES OR COLLECTIONS: **Provide an answer to a question or hypothesis** you are presenting by constructing a kit or model, or exhibiting a collection. You must be able to explain your model or collection. EXAMPLE: The purpose of a model of a solar home could be to determine the use of solar energy in lowering heating costs. Read; talk to experts; find answers.

3. BEHAVIORAL AND SOCIAL SCIENCE: These projects usually involve surveys[1] and/or human observation.

In the category of behavioral and social sciences:

- All survey questions must have prior approval of the classroom teacher or school science fair committee and must be administered by the student;
- All survey questions must be approved prior to administering them to students;
- Students must notify interviewees of the purpose for the study;
- Students must conduct the surveys;

4. DEMONSTRATION OF A SCIENTIFIC PRINCIPLE: Find a scientific rule or law that interests you. EXAMPLE: Measure lung capacity using several people. The purpose could be to find out if a large lung capacity is an advantage during exercise. Experiment and find the answers.

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[1] For Guidance, refer to the District's policy and form found *at* JFJ/JFJ-R/JFJ-E "Student Submission to Surveys, Analysis, or Evaluations" on the Boulder Valley School District website. See also COLO. REV. STAT. **22-1-123(5).**

LINKS TO SCIENCE FAIR IDEAS

Note that some of the ideas listed at these sites are NOT true experiments. Please choose carefully.

http://school.discovery.com/sciencefaircentral

http://www.all-science-fair-projects.com

http://tryscience.org/experiments/experiments_home.html

http://www.scifair.org

http://www.cdli.ca/sciencefairs

http://kids.yahoo.com/directory/Science-and-Nature/Experiments-and-Activities/Science-Fairs (lots of links to science fair sites)

www.sciencebuddies.org (more advance projects)

http://parentingteens.about.com/cs/homeworkhelp/a/blscproindex.htm (more advanced projects)

Please return this form to your teacher by Thursday, February 4th!

Science Fair Project Proposal

All Science Fairs in Boulder Valley School District must adhere to the official BVSD Science Fair Guidelines

Student Name: _____

Grade Level: _____ Teacher_____

Category of Project: _____

(Botany, Earth and Environmental Science, Engineering, Health, Behavioral and Social Science, Mathematics and Computer Science, Physical Science, or Zoology)

Statement of Purpose and Hypothesis (a brief paragraph about your reason for doing the experiment and your prediction of the experiment's outcome):

_____

_____

_____

_____

Procedure (a list of exactly what you will do in your experiment, in the right order, including quantities and sizes):

_____

_____

_____

_____

_____

_____

_____

Materials to be used in project: _____

_____

_____

_____

Parent Signature: _____

Comments: _____

SCIENCE FAIR VOLUNTEER SIGN UP

(Please return with Project Proposal)

I would like to help with the following items during the Science Fair:

_____	Table Set-up	Tues, Feb 23	1:00-2:30
_____	Project Set-up	Tues, Feb 23	2:00-3:30
_____	Project Set-up	Weds, Feb 24	7:45-8:30 AM
_____	Make/buy refreshments for interviewers	Weds, Feb 24	by 7:45 AM
_____	Interviewing students at the fair	Weds, Feb 24	8:00-12:00
_____	Buy items for the Ice Cream Social	Weds, Feb 24	by 11:00 AM
_____	Ice Cream Social for Participants	Weds, Feb 24	11:30-1:00
_____	Supervise Science Fair Open House	Weds, Feb 24	6:00-7:30 PM
_____	Breakdown of tables/return projects	Weds, Feb 24	7:30-8:00 PM

_____ _____ _____

Name Email address Phone #

CHECKLIST FOR PARENTS AND STUDENTS

(Return with Project Proposal)

_____ This project is an experiment (not a model).

_____ This project is safe for my child to undertake.

_____ I understand that my child is responsible for his/her experiment. My responsibility as a parent is to encourage my child and provide necessary resources. If my child needs help typing his/her project, I may do so (although neatly handwritten is fine). I may also assist my child in learning new skills (such as graphing).

_____ The completed, signed Science Fair Project Proposal is attached.

_____ My child will need an electrical outlet the day of the Science Fair. We will provide a 3-prong, 10 foot extension cord.

_____ I would like to purchase a display board. **$3 (cash or check made out to Foothill Elementary) is attached.**

_____ The volunteer sign up sheet above has been filled out.

_____ _____

Parent signature Phone #

_____ _____

Student Grade/Teacher

FOOTHILL SCIENCE FAIR PARTICIPANTS

We are excited that you will be participating in this year's science fair. This packet contains information that you will need as you begin your scientific journey. The Science Fair will be held on Wednesday, February 24th. Time will be set aside for project set up in the library on Tuesday, February 23rd from 2:00 – 3:30 p.m. and Wednesday, February 24 from 7:45 – 8:15 a.m. Your teacher will provide you with a name /project number sticker for your display board when you bring your project to school. If you have questions about your project, Kristi Winseck will be happy to assist you. Have fun!

ROLES AND RESPONSIBILITIES

In order to maximize each student's experience please follow these guidelines and responsibilities.

Student's role is to:

- Select a topic for the project following school district science fair guidelines and gain approval for the project;
- Complete an investigation, study, collection or demonstration of a scientific principle;
- To construct an exhibit and, when the grade level is appropriate, write a report which illustrates and explains the project;
- Use scientific terms in the display and explanation of the project to other students and community members; and
- Follow district science fair, safety guidelines.

Teacher's role is to:

- Motivate students;
- Serve as an advisor;
- Support student ideas and promote creativity;
- Be generous with praise and enthusiasm;
- Contact resource people to serve as mentors;
- Arrange for special equipment if needed;
- Determine appropriateness of projects submitted; and
- Maintain a safe environment.

Parent's role is to:

- Provide information on the topic as a resource person;
- Furnish supplies and help locate needed equipment;
- Transport students to library or resource people;
- Provide space such as a garage or room in the home for student to work on the project;
- Provide encouragement to the student who is the primary scientist completing the project; and
- Ensure student safety and follow district safety guidelines.

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ELEMENTARY SCIENCE FAIR DISPLAY
SAFETY GUIDELINES

Anything which could be hazardous to the public, the exhibitor, or other exhibitors is PROHIBITED.

Organisms: No organisms may be displayed.

For example:

Vertebrates-	No owl pellets	No fish, live or dead
	No mice, live or dead	No skeletons
Microbial cultures-	No fungi, live or dead	
	No bread molds, bacteria, viruses, viroids, prions, rickettsia, live or dead	
	No parasites, human or other, live or dead	
Invertebrates-	No worms, live or dead	No insects, live or dead
Plants-	No plants in soil	

Chemicals: No chemicals may be displayed.

For example:

No acids, dilute or strong	No bases, dilute or strong
No salt solutions	No insecticides
No repellents	No mercury

No Water or Ice

Flammable substances: No flammable substances may be displayed.

No gases No solid rocket fuel No flammable liquids No fumes

Glassware: No glassware may be placed on the display tables.

As an alternative to displaying the above items, you may take photographs of the substances that were used for display on your project board.

Electricity: Projects in the electricity category require the following:

Electrical connections using voltage over 12 **volts** must be soldered or fixed with approved connectors, and all connecting wires must **be** properly insulated. Nails, tacks, or un-insulated staples must not be used to fasten **wire.** All switches and metal parts must be located out of reach of observers and be designed with adequate overload protection. Bare wiring and exposed knife switches may be used on circuits **of** 12 volts or **less only-**
If the project requires an electrical outlet: Only one 110 volt, 60 cycle, single phase AC connection will be provided for exhibits (if ordered in advance). Exhibitors who require electricity must furnish a 25 foot, three-pronged (grounded) extension cord, maximum amperage = 5 amps, maximum wattage = 500 watts.

All projects will be inspected for adherence to science fair safety guidelines by the classroom teacher or the school science fair committee.

THE SCIENTIFIC METHOD

When doing an investigation you will want to follow a research method used by scientists when they do experiments.

PURPOSE: A question or statement stating what you will try to find out with your experiment

HYPOTHESIS: Your prediction of the experiment outcome

PROCEDURE: Experimenting and observing

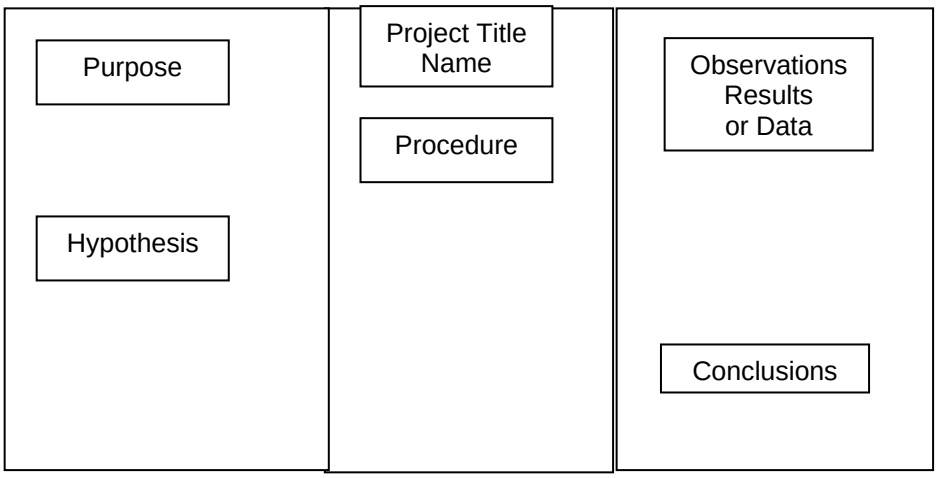
DATA GATHERING: Collecting information and results

RESULTS: Finding out what the experiment proves

CONCLUSION: A summary of what your experiment shows and how your work can be used for more research.

Exhibit Guidelines

- Keep the exhibit neat, uncluttered and to the point.
- All posters, charts, etc. must be attached to the exhibit, or able to fit on the table in front of the display board.
- No part of an exhibit may be attached to walls.
- Build your exhibit compactly. It must be self-supporting (FREE STANDING).
- Be sure to make everything sturdy so it can be safely transported.
- Fasten everything well.
- The exhibit displays your project. Use one-color printing to avoid confusion.
- Spell correctly.
- Main points should be large and simple. Details must be clear and legible from three feet away.



Title: _The title describes the experiment without giving too much information

By_____

Purpose:

This explains the reason you are doing the experiment. What do you want to find out with your experiment? The question should be about "cause" and "effect". For example if you give a plant twice as much water as another (the cause), will it grow twice as fast (the effect).

Always use specific, measurable words in your purpose. Words like "best", "it", "good" should not be used. For example, instead of asking which potato chip tastes "best", you want to ask which potato chip 5th graders prefer.

Hypothesis:

This is what you THINK will happen with your experiment, based upon what you already know and research you've done. It is very important to make sure that you use specific, measurable words in your hypothesis (see examples in Purpose).

Procedure:

This lists EXACTLY what you do, in the right order, including quantities and sizes.

1.

2.

3.

Observations/Data:

Observations include pictures, charts, graphs, logs, data tables and words. Record EXACTLY what you are testing, in a neat, organized way.

A data table for finding the preferred potato chip would look like this:

5th graders' preferred chip

	Chip Brand A	Chip Brand B	Chip Brand C
Student 1	1	2	3
Student 2	1	3	2
Student 3	2	1	3
Student 4	1	3	1
Student 5	3	2	1
Student 6	1	2	3

(remember that you need at least 20 students voting – the more you have, the better your results will be)

Conclusion:

A good conclusion explains how and why your data supported (or didn't support) your

Hypothesis. If something went wrong or if your project needed more data, explain why

in the conclusion.

The following page can be used by 1st and 2nd graders to plan their projects. If they wish, they can paste the completed forms to their science boards.

SCIENCE PROJECT OUTLINE

First and Second graders may use the following science project outline as their display. Mount each completed section on the display board and supplement with pictures that document the experiment.

1. Can I test my question?

THE QUESTION:

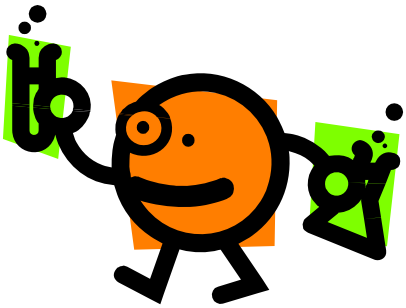
2. Did I write my hypotheses (guess) before I started?

MY HYPOTHESIS:

3. Did I carefully think HOW I was going to test my hypothesis and write down the steps I need to take (procedures)?

MY PROCEDURES:

4. Did I test accurately?



THE TEST:

5. Did I write down everything I observed?

MY OBSERVATIONS:

6. Did I tell whether my hypothesis was correct or incorrect? Did I explain why things happened in my conclusion? Is my project neat? Colorful? Easy to read?

MY CONCLUSION: