Foothill Family Science Programs 2014-2015

Welcome to Foothill's Family Science Night's Information Packet. Enclosed you will find detailed information about due dates, display sizes, logistical information, as well as grade-appropriate suggestions on topics.

The 2014-15 Science Fair will be on March 10th, 2015. We will have a Science Day in addition to a Science Night. The Science Day, like the Reading Day, is a day dedicated to science, where kids will be able to access to a variety of activities organized for them by PTA volunteers. This will culminate into the Science Night, in which the kids will be able to show their Science Projects. We will also have extra Science activities available on Science Night.

The Science Projects for the Science Fair can be individual, group, or class projects. We strongly encourage all kids to participate in any of the above mentioned forms. Participation at Science Day and at Science Night will be optional for all grades. This year we are encouraging *inventions* in addition to *investigations*. (*Investigations* are the standard science fair experiment, following the scientific method.)

The goal of the Family Science Night in particular is to get your children to choose a simple question or problem about a topic he or she is interested in, and then either:

a.) design a simple experiment to try and answer a question, or
b.) design a solution to the problem.

The emphasis should be on *simple*; the project should be *child driven, child created, and fully understood by your child*. Ideally, the experiment or the solution should involve making observations, and recording results. The younger grades may do a display on a topic they are interested in, rather than an experiment.

Your child should understand what it is they were trying to do, and be able to explain it to others. Do not make an effort to couch the results in scientific language. *Your child and his or her peers should all understand the display.* The information in the display can be done by hand, or computer generated, depending on your child's age and inclinations. The complexity of the topic should be grade level appropriate. Let your child's interests and abilities, as well as his or her teacher, guide you on this.

There are many ways to choose a project. You could start by sitting down with your child and discussing what they have been doing in class for science. You could think back to some of the why and how questions they have asked recently. You could ask the teacher for ideas, or look through the handouts that are attached. Finally, there are hundreds of science fair project books out there, but please only use them as a starting point. Your own child's imagination is a better source of inspiration. ***Remember, that simple is best.***

If you have questions about your projects, please contact: science_fair@saratogafoothillpta.org

FOOTHILL FAMILY SCIENCE NIGHT

March 10, 2015
6:00–8:00pm

INFORMATION PACKET

Attached you will find:

1. A timeline for turning in project proposals
2. Suggestions on how to choose a project
3. A list of rules for the project displays
4. A grade level specific list of project suggestions
5. An example of a science fair experiment proposal
6. An example of a science fair invention proposal

Please plan your project early. Your teacher must okay your project before you start, both for safety and for appropriateness for your grade level.

Nithya Lakshmanan, Mohana Narayan, Misty Davies, Shay Bagherian, and Bhavana Narayanan, are coordinating this year's science fair and are happy to help students in developing ideas for the projects. You can reach them at science_fair@saratogafoothillpta.org**.**

If you need a specific equipment or supply for a project, and you cannot find it, please contact us to see if it is possible to borrow it.

FOOTHILL FAMILY SCIENCE NIGHT TIMELINE
School Year 2014-2015
<u>February 2nd – The proposals are due for review</u>

Teachers will review and return the proposals quickly, so that if there are problems with them, the student has time to revise their project before beginning the experiment.

GRADES K-3 **Students in these grades can do an experiment, create an invention, or make a model or diorama on a topic of their choice. Participation is voluntary and group projects are fine.**

A brief proposal of the topic and the participants list is due. We need this to allot space in the room, and to be sure there are no dangerous or inappropriate activities planned. You may use the form attached to this packet for your proposal. The proposal can be a few lines of text typed or hand-written.

GRADES 4 & 5 **Participation this year is entirely voluntary. Group projects with up to 4 people are fine.**

For an experiment, the project should include the question you are trying to answer, your hypothesis, and how you propose to set up your experiment to test your hypothesis. For an invention, your project should identify a problem, identify any background research you've already done, and suggest a solution. The proposal needs to be detailed enough to make it clear that you understand the procedure, and that it is reasonable to believe it can be accomplished given the time and materials available. This should be around one page long, typed or very neatly hand-written.

Please specify in the proposal if an electrical outlet is needed for the display

<u>March 10th – THE BIG DAY IS HERE!</u>

Bring your project to the MPR in the morning, between 8:00-9:00am. Be sure your name(s), grade level and teacher name are clearly displayed on the back of the display board. Volunteers will help you find the right spot for the project. You must tell the volunteers if you need an electrical outlet.

HOW TO CHOOSE YOUR SCIENCE FAIR PROJECT

1. Brainstorm on all the topics you are interested in. At this stage, do not eliminate anything as being impractical. Make a list.

2. Think about each topic on your list in turn. Are there any questions you have wondered about regarding any of these topics? (You can take an idea from the Science Docent lesson and expand it.) Is there a problem involving your topic that you think you could solve? Decide whether to do an investigation (answer a question) or an invention (solve a problem).

3. Start to narrow down your questions to things you could realistically answer given what you have at hand and what you know is possible. Avoid "why" questions.

4. For either an investigation or an invention:
   a. Keep it relatively **simple.**
   b. If you are working in a group, you all should be involved in the design, and execution of the project.
   c. Run your design by your teacher, a science docent, or your parent and listen to their suggestions. The final design is yours.
   d. If practical, collect data on your investigation or your invention at least two times to ensure that the results are reproducible and consistent.

5. For an *investigation*:
   a. You need to **make observations** and **record them.**
   b. You need to **measure** something.
   c. You need to **compare** at least two things. Most experiments need a **control,** which is the base result to which you compare your results.
   d. For example, if your question is "What is my cat's favorite food?" your control would be her usual food, and then you could try giving her three or four other foods to compare to her usual. You could measure time (how fast does she eat each food?), or quantity (if given the same amount of each kind, how much of each does she eat, by volume or weight?). You could set out all the kinds at once and see which she goes to first, or do a different one each day and see how much is left after an hour.

6. Your experiment could also take the form of an *invention* to solve a problem you are interested in. An example might be designing a way to keep a glass from breaking if you drop it, or a way to float your bowling ball in the swimming pool or something equally challenging.
   a. How can you be sure your invention works? **Collect data** to be sure**.**
   b. Does your invention work better than what is currently out there? Is it stronger? Is it lighter? Does it cost less? Is there a way to **compare** data from your design against a control?
   c. How can you **convince** your classmates that your invention works? Can you take pictures? Can you demonstrate it? Can you present your data in a table or a graph?

RULES FOR PROJECTS:

1. Displays should not take more table space than 30" wide by 14" deep. This is the amount of table space taken up by a standard size ***project board*** sold in all the office supply stores (labeled: 36" X 24" folded, 36" X 48" flat) when it is standing open. Get yours early, because they can run out.

2. There are a very limited number of electrical outlets available. You need to make advance arrangements and provide your own extension cords to use electricity.

3. Photos, graphs, charts and other visual displays always make a project more interesting.

4. Be sure the names of all the students who worked on the display are clearly shown. Participant name, grade, room and teacher must also be written in large characters on the upper part of the back of the project board for retrieving it when folded.

5. Be sure all written parts are clearly displayed, neat and legible.

6. Kids in the lower grades have the option of creating a display on a scientific topic they are interested in without completely following the scientific method. They should still include a summary and a discussion of what they learned.

7. If you did an *investigation*, be sure your investigation includes the following, and that it is clear on your display:

a. Background information that led you to your question
b. The question you are trying to answer by your experiment
c. Your hypothesis – what you predict will happen when you do the experiment.
d. The materials and equipment you used
e. Your method – exactly what you did. Details should include how much of any substance that you used, what you measured, etc
f. Your results
g. A discussion of why you think you got the results that you did, and whether or not your hypothesis was correct.
h. A list of all of the references that you used in planning and doing your project.

8. If you created an *invention*, be sure your invention includes the following, and that it is clear on your display:

a. The problem you are trying to solve with your invention
b. How other people have tried to solve this or a similar problem. How is yours different?
c. Your design — this can be a model or a prototype. If a model, explain why you think this will work if you really build it.
d. The materials and equipment you used,

e. The data you collected to show that your design works (or that it doesn't). Highlight data if it shows your solution works better than what is currently used.
f. A discussion of why you think you got the results that you did, and whether or not your design can be improved.
g. A list of all of the references that you used in planning and doing your project.