Chatham Park's Ninth Annual…

Science Fair

Project Packet

Friday, March 12, 2010
7:00PM to 9:00 pm
at
Chatham Park Elementary School

Dear 4th and 5th Grade Students (and Families):

You're invited to take part in the **9th Annual Science Fair** at Chatham Park on Friday, March 12, 2010 from 7:00-9:00PM. The Fair is a great way to explore science in a fun and interesting way, and learn how to think like a real scientist!

Participation is completely voluntary. Your project can be about ANY kind of science that interests you. It should not be costly (typically under $10). We will provide free display boards for all participants, and most projects will involve materials found around your home.

Attached are instructions for the steps needed to carry out a project. You may choose to do a project by yourself or with a friend.

Think about ideas and submit your project proposal by **Wed, January 20, 2010.** We will review your project idea with you in late January to firm up your plan BEFORE you implement your final project.

If you or your parents have any questions, or simply want to talk about your project, please contact us.

We hope you'll join in the fun!

Best wishes,

Deb Graff
graffhome@gmail.com

Sharon Sweitzer
Sharon.M.Sweitzer@gsk.com

IMPORTANT DATES:

Winter Break is a good time to start thinking about what kind of Science Fair Project you'd like to do.

Fri, January 8, 2010:
Entry deadline for T-shirt design contest.

Wed, January 20:
Fill out the attached Science Fair Project Proposal (just a sentence or two describing what you'd like to do) and give to your Homeroom Teacher.

January 21-30:
Meet once for 5-10 minutes at school with an adult "Science Fair Coach" to explain how you plan to do your project, and get helpful tips *before* you set to work.

February 12:
Receive your free Science Fair display board to do your final project.

Friday, March 12:
Display your project at the 9TH ANNUAL CHATHAM PARK SCIENCE FAIR!
- 6:30pm: Set up your display
- 7:00-8:45pm: Show your Project to Science Fair visitors
- 8:45-9:00pm: Award ceremony

STEPS TO PREPARE A SCIENCE FAIR PROJECT

1. **Choose a topic**
   A science fair project can be an experiment you do to find an answer to a question, a demonstration, a research effort, or a display of scientific items. Think about something you are interested in. See the "IDEAS LIST" in this packet for examples and Web links to visit. You can also search online for "science fair project ideas" to spark your imagination.

2. **Gather background information**
   Gather information from people, books, magazines, library, or the Internet. Keep notes about what you find.

3. **For experiments, use the "Scientific Method" (see article below)**
   - State the **purpose** of your experiment/demonstration. For experiments, this will be the "question" that you are trying to answer.
   - State your **hypothesis** -- your guess about what the answer will be.
   - Describe and decide how your experiment will test your hypothesis.
   - Decide how you will measure your results.

4. **Obtain the materials you will need.**

5. **Run your experiment and record data.**
   Write down everything that happened.

6. **Analyze the results and draw a conclusion.**
   What happened? Discuss how your experiment helps answer your question.

7. **Construct an Exhibit or Display (see "Sections of a Science Project").**
   Display boards will be given out in February. Your display has to be neat, but it does not need to be typed. Make it fun! Show that you used the scientific method.

8. **Practice your 1-minute presentation for the judges.**
   On the day of the Science Fair, you need to *briefly* explain your project to the judges and Science Fair visitors. Be able to tell them about your experiment/demonstration and what you learned.

9. **Come to the Fair and have fun!**

Sections of a Science Fair Project

1. Title
Ideally this will be an "interest-grabber"

2. Background or Purpose
Include information you know about the subject. Tell why you chose the project.

3. The Question
Clearly record the question you are asking.

4. Your hypothesis or prediction
As soon as you come up with a question, you probably had a prediction about the results. Write it down. Do not change your hypothesis if the results show that you were wrong. It's part of science, too.

5. Materials and Methods
Once you have your question, you need to decide how to test it. Write down and collect the materials that you need. Don't wait until the last minute.

6. Results of Data
Tell the numbers that you got as you did the experiment. You may want to use a graph, but don't tell the answer in this section.

7. Conclusion
Tell what you found. What did you learn?

8. Bibliography
Make a list of the resources you used to learn about your topic. List books, articles, and names of people that helped you, including:

- Author's last name, first name, "Title of article", Name of journal, Publication date, pages used.
- "I was helped in my research by …"

IDEA LIST

Your topic can be about *any* type of science! Here are some examples to see the kinds of projects you can do – then brainstorm ideas of your own!

SAMPLE PROJECTS:

Experiments and Surveys:

- Do more people get the flu in bad weather?
- How do design changes affect the function of a model catapult?
- How does salt melt ice?
- What kind of waste makes the best compost?
- Which uses more water -- a bath or a shower?
- What is the effect of wind on perceived temperature?
- Which makes a better hygrometer, curly hair or straight hair?
- Is most people's dominant eye also the one that sees better?
- What factors affect yeast growth?

Demonstrations, Models, and Reports:

- Make a model of the rings of Saturn.
- How do gears work?
- Give a report on bee behavior.
- Build a robot.
- How do fiber optic cables work?
- Do a report on big bang theory.
- Give a report on ape or parrot language ability.

Resources:

- LIBRARIES have great books and information.
  The Internet does, too:
- www.sciencebuddies.org
- www.discoveryeducation.com
- http://faculty.washington.edu/chudler/neurok.html (about Neuroscience for kids)
- www.ipl.org/div/projectguide

THE SCIENTIFIC METHOD

from www.biology4kids.com

REASONING IN SCIENCE

Learning about the scientific method is almost like saying that you are learning how to learn. You see, the **scientific method** is the way scientists learn and study the world around them. It can be used to study anything from a leaf to a dog to the entire Universe.

The basis of the scientific method is asking questions and then trying to come up with the answers. You could ask, "Why do dogs and cats have hair?" One answer might be that it keeps them warm. BOOM! It's the scientific method in action. (OK, settle down.)

START WITH A SIMPLE QUESTION.
WHY DO SPIDERS SPIN WEBS?

QUESTIONS AND ANSWERS

Just about everything starts with a question. Usually, scientists come up with questions by looking at the world around them. "Hey look! What's that?" See that squiggly thing at the end of the sentence? A question has been born.

So you've got a scientist. When scientists see something they don't understand they have some huge urge to answer questions and discover new things. It's just one of those scientist personality traits. The trick is that you have to be able to offer some evidence that confirms every answer you give. If you can't test your answer, other scientists can't test it to see if you were right or not.

YOU MUST ALWAYS OFFER EVIDENCE TO SUPPORT YOUR STATEMENTS.

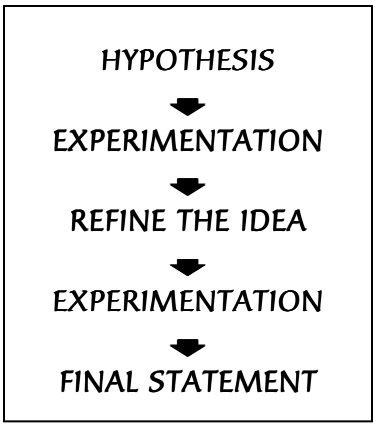
As more questions are asked, scientists work hard and come up with a bunch of answers. Then it is time to organize. One of the cool things about science is that other scientists can learn things from what has already been established. They don't have to go out and test everything again and again. That's what makes science special: it builds on what has been learned before.

This process allows the world to advance, evolve, and grow. All of today's advancements are based on the achievements of scientists who already did great work. Think about it this way: you will never have to show that water (H_2O) is made up of one oxygen (O) and two hydrogen (H) atoms. Many scientists before you have confirmed that fact. It will be your job as a new scientist to take that knowledge and use it in your new experiments.

EXPERIMENTAL EVIDENCE

Experimental evidence is what makes all of the **observations** and answers in science **valid** (truthful or confirmed). The history of evidence and validations show that the original statements were correct and accurate. It sounds like a simple idea, but it is the basis of all science. Statements must be confirmed with loads of evidence. Enough said.

Scientists start with observations and then make a **hypothesis** (a guess), and then the fun begins. They must then prove their hypothesis with trials and tests that show why their data and results are correct. They must use controls, which are **quantitative** (based on values and figures, not emotions). Science needs both ideas (the hypothesis) and facts (the quantitative results) to move forward. Scientists can then examine their **data** and develop newer ideas. This process will lead to more observation and refinement of hypotheses.



THE WHOLE PROCESS

There are different terms used to describe scientific ideas based on the amount of confirmed experimental evidence.

Hypothesis
- a statement that uses a few observations
- an idea based on observations without experimental evidence

Theory
- uses many observations and has loads of experimental evidence
- can be applied to unrelated facts and new relationships
- flexible enough to be modified if new data/evidence introduced

Law
- stands the test of time, often without change
- experimentally confirmed over and over
- can create true predictions for different situations
- has uniformity and is universal

You may also hear about the term "model." A **model** is a scientific statement that has some experimental validity or is a scientific concept that is only accurate under **limited situations**. Models do not work or apply under all situations in all environments. They are not universal ideas like a law or theory.

Chatham Park Science Fair: Project Proposal

SUBMIT TO YOUR HOMEROOM TEACHER BY JANUARY 20, 2010

Name: _____

(Partner's name -- for joint projects):

_____

_____

Title of Project:

_____

_____

Brief Description:

_____

_____

_____

_____

Parent or Guardian's Signature:_____

Parent or Guardian's e-mail:_____

Any questions? Contact:
Deb Graff: graffhome@gmail.com or
Sharon Sweitzer: Sharon.M.Sweitzer@gsk.com

RETURN TO YOUR HOMEROOM TEACHER BY JAN. 20, 2010