Ruskin 2012 Science-O-Rama
Science Fair

April 2 - 3	Science Fair School Assemblies
April 2 - 3	Science Fair permission slip distributed to students
May 17	Last day to pick up display board from the Science Lab
May 22	Bring projects to the Ruskin Multipurpose Room during the hours of 7:30 a.m. to 3:30 p.m.
May 23	Take late projects to the Science Lab for sign in – **do not** take the project directly to the multipurpose room.
May 24	Ruskin Science Fair opens to viewing by the students, parents and community during the Ruskin Open House from 6:30 – 8pm
May 24	Before leaving Open House, take science project home.
May 25	All science projects taken home.

Acknowledgement

Ruskin Elementary School would like to acknowledge the Synopsys Silicon Valley Science and Technology Outreach Foundation for their generous support of the Ruskin Science Fair. The Foundation, headquartered in Mt. View, champions activities and programs that enhance science and math education. The Foundation's **Science-O-Rama** program provides support for high school and middle school science fairs. The Foundation is also a sponsor of the regional science fair, "The Synopsys Silicon Valley Science and Technology Championship. "
The Synopsys Outreach Foundation supports the Ruskin Science Fair at the elementary school level. They are providing Ruskin Elementary School with display boards, ribbons, certificates, Kudos bars and a grant for science project related costs. Thank you Synopsys Silicon Valley Science and Technology Outreach Foundation!

Steps to Participating in the Science Fair

To participate in the Science Fair, you will need to follow these steps:

- **Choose a science project**.
  Page 3 - Science Fair Rules.
  Page 4 - a list of the different types of science projects.
  Page 5 - ideas for a science project.

- **Carry out a science project**, at home.

- **Create a three-sided display board**, at home. This display board will describe your project, including facts you learned about your subject from books and a discussion of how you carried out your project. The display board is available when you bring the signed Science Board Ticket (page 10) to your teacher. The Science Lab will distribute boards to the classroom daily. If you did not turn in your board ticket**, you may pick up your free display board from the Science Lab after school Thursday May 17th. This is the last day to get a display board.**

- **Bring your display board and other parts of your project to the Ruskin Multipurpose Room on Tuesday May 22nd.** The projects will be brought into the Ruskin Multipurpose Room between the hours of 7:30am to 3:30 pm. More information about dropping off you project will be provided later.

Science Fair Rules

1. Each student may enter only one project.

2. The three-sided display board should be free standing and not more than approximately 24 inches high and 36 inches wide when fully extended. When displayed, the board and project should not occupy more than 48 inches of table length and 16 inches of depth. **Display boards are provided for each participating student.** Make sure you turn your board ticket in – first thing in the morning - to your teacher. The Science Lab will distribute boards to the classroom daily.

3. The following are prohibited: dangerous chemicals, open flames, explosives, illegal drugs, or animal experiments that involve starvation or any other form of cruelty.

4. Electrical switches and cords needed for exhibits must be in good working condition and must be approved by the teacher.

5. Expensive or fragile items should not be displayed. Valuable items essential to the project should be simulated or photographed.

6. The school and teacher assume no liability for loss or damage to the exhibit.

7. Teachers and parents may advise. Parents should let students do the actual work.

Suggested ways for parents to help:

- Give lots of encouragement. Let the students enjoy the process and experience the excitement of experimenting with their own ideas.

- Help the student find information on their experiment and encourage discussion of their ideas. Help refine their hypothesis – the choosing of a question that can be tested.

- Reinforce the concept that experiment results which do not match the hypothetical results does not mean “failure”, but is part of doing science.

- Provide working space and materials.

What is a Science Fair Project?

A science fair project should be selected from one of the following types of projects:

- **Experiment**
  In this type of project, a hypothesis (an educated guess) is made to answer a question. Then, experiments are carried out to test this hypothesis. **Example**: you might be interested in the question, "What design of paper airplane will fly the farthest?" You would research different designs of paper airplanes by going to the library and looking at books on paper airplanes. You might then develop the following hypothesis for this question, "Paper airplane design #1 will fly farther than design #2 or design #3." You would then make the paper airplanes, fly them, and take notes on which design of airplane flew the farthest.

- **Model**
  A model is a small object usually built to scale that represents some already existing object. **Example**: you might decide to construct a model of the planet Saturn from Styrofoam and cardboard. Your poster should include facts about Saturn, a description of how you constructed the model, and a discussion about the features of your model and how these features represent the actual planet.

- **Demonstration**
  A demonstration is an illustration or explanation of a scientific principle. This type of experiment shows how and why something works. **Example**: you might demonstrate the principle of sound using a rubber band stretched around a box. You could show that the more tightly stretched the rubber band, the more rapidly the rubber band vibrates, and the higher the sound that is produced.

- **Collection**
  A collection is a group of objects. This group of objects must be scientifically oriented and show that you have learned something through the process of collecting and categorizing. The items should be categorized and labeled correctly. **Example**: you might have a collection of leaves separated into categories based on the type of tree on which they grew.

- **Invention**
  An invention is a new device or process used to improve conditions, solve problems, or to fill needs. Inventions can be completely new ideas or improvements on something that already exists today.

How to Start your Science Fair Project

Choose an Area of Science

Choose an area of life, earth or physical science that interests you. Do a little research to be sure that this topic really interests you. Then, from that area of science, such as life science, select a general topic such as “plants”. Finally, narrow your general topic to a specific subtopic such as “plant growth”. Below is a list of general topics you can consider for your science project:

acids and bases	airplanes	amphibians	anatomy	animal behavior	astronomy
atoms	birds	bones	cells	circulatory systems	colors
computers	crystals	digestion	dinosaurs	diseases	electricity
energy	engines	flowers	food chains	fossils	geology
gravity	heart	heat	insects	invertebrates	jet propulsion
learning	light	liquids	machines	magnetism	mammals
muscles	medicine(s)	migration	molds	nutrition	ocean life
parasites	planets	plants	pollution	reptiles	robots
rockets	rocks	seeds	senses	shells	sound
tides	trees	vertebrates	water	weather	yeast

Help choosing a topic

Books. Books on science experiments and science projects are available in libraries (including the Ruskin School Library) and bookstores.

Web Sites. Science web sites for kids are available:

www.sciencefairproject.virtualave.net www.exploratorium.edu http://kids.yahoo.com/

http://www.lhs.berkeley.edu/kids (Lawrence Hall of Science at Berkeley);

http://school.discoveryeducation.com/sciencefaircentral/ www.kidsgardening.com

http://www.ipl.org/div/projectguide/ www.madsci.org/ (Mad Science Network)

www.nationalgeographic.com (National Geographic); http://quest.arc.nasa.gov/ (Nasa Quest)

http://www.hhmi.org/coolscience/index.html (Hughes Medical Center site of science for kids)

http://www.kidsclick.org/ (web search for kids by librarians)

www.howstuffworks.com (background information on a variety of things)

Choose a Question

Choose one question that will narrow the focus of your investigation. For example, using the subtopic "plant growth", one question could be "How does sunlight affect plant growth?" Another question could be "Which plant food works the best?" Below is a small sample of science questions to be investigated.

Astronomy
Why does the earth have seasons?
How are tides created?

Chemistry
How can you tell if a substance is an acid or a base?
What is a chemical reaction?

Consumer Science
Which laundry detergent is best?
How does a radio work?

Earth Science
How do crystals grow?
What is the water cycle?

Electricity
What is the best conductor?
How does a switch operate?

Physical Science
How does an airplane fly?
How does an electromagnet work?

Botany
Do large seeds grow large plants?
Can plants grow in water alone?

Anatomy
How does blood get from the heart to the toes?
How do muscles and bones work together in movement?

Choose the Project Form

Decide which type of project would best show your audience the answer to your question. You can do an ***experiment***, a ***demonstration***, or make a ***model***, a ***collection*** or an ***invention***.

Research

You are now ready to begin planning your project by researching your question. You can get information from books, encyclopedias, pamphlets, television, field trips, interviews or the Internet. Look for information from several different sources. Become an expert on your topic!

Plan Ahead

Sometimes science experiments don't work. If you plan and conduct your experiment well in advance of the science fair and your experiment does not work, you will have an opportunity to retry or change your experiment.

What if my Experiment Fails?

This happens sometimes but ***don't worry,*** you should still present your work. Present what you did in your poster. In the conclusion section of your presentation, suggest ways to investigate *why* your experiment did not work. Experimental failure is common for scientists. They usually repeat the experiment, and if the experiment still does not work, they ask their question in a different way or redesign the way the experiment was conducted.

The Scientific Method

For Projects which Involve Experiments

Use the following five steps of the scientific method when conducting an experiment.

1. Identify the problem

Think about what area of science interests you. Narrow your focus down to a specific question.

2. Collect information

Research your topic. Take notes on information that you think will be important for your experiment.

3. Develop a hypothesis

A hypothesis is an *educated* guess. It takes into account the research you have done and also your opinion of what you think will happen. What do you think will happen when you perform your experiment? The hypothesis answers your question.

Example: Plant food "B" will cause the lawn to grow faster.

4. Plan and Conduct an Experiment

First, make a plan for how you will do your experiment and a list of all the materials you will need. Conduct your experiment and observe what happens. In your experiment, make sure that you are only changing one variable at a time. This means that everything should be the same among the tested items (conditions remain constant). The only difference (variable) would be the procedure or item being tested in that part of the experiment. Keep a journal to record what you did and your observations - changes, growth or other results of your experiment. Photos or illustrations of the progress of your experiment are good ways to display what you did and what your results were.

Example: All lawns being tested should be treated the same (conditions remain constant): same type of grass soil, temperature, sunlight water feeding times, etc. The only difference (variable) would be the plant food fed to the lawns. Make a chart of the weekly lawn growth.

5. Draw a conclusion

Analyze the results of your experiment. Draw a conclusion based on your results. Was your hypothesis correct? Why or why not? Your conclusion should tell what you learned by conducting the experiment. Remember, an experiment is *not* a failure if the hypothesis is proven wrong!

Example: The lawn fed with plant food "A" grew faster than any of the other plant foods tested. My hypothesis was not correct, even though plant food "B" cost more and promised better growth. I learned that not all plant foods are the same and that advertising is not always true.

Displaying Your Project

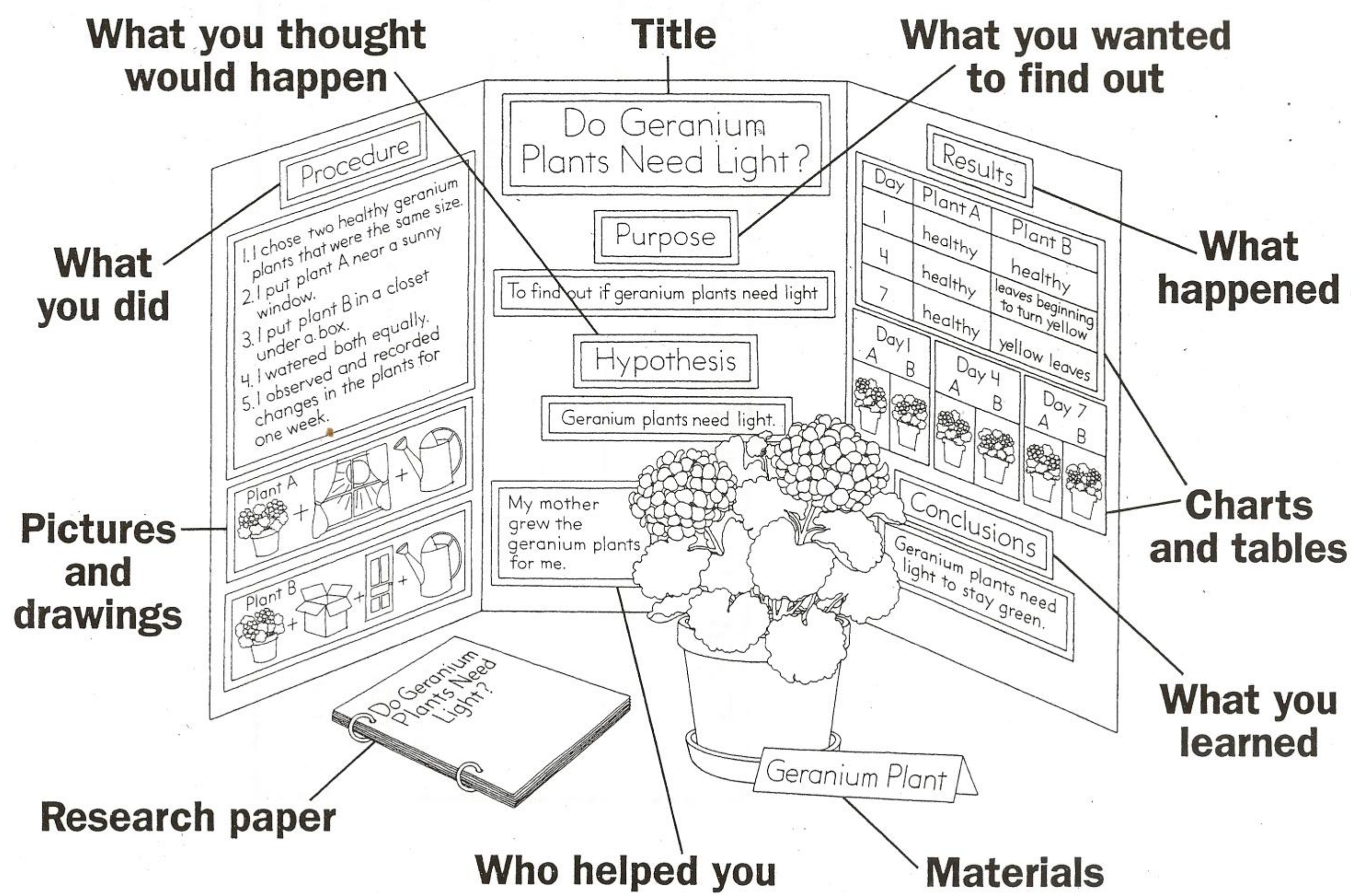
A very important part of your Science Fair project is your display, since it is a way of teaching others what your project is about and what you have learned.

The display board should be of sturdy material which can stand by itself. Ruskin School will provide a display board free of charge. When you are ready to display your project, please return the Science Fair Display Board Ticket, page 9 of this packet, to your teacher.

Your display should include the following sections:

1. **Project Title**-Your title should include the word that describes your project's category: experiment, collection, model, display, or invention. Also, include your name, grade, teacher's name, and room # below the title. This information should be at the top and center of the center panel.
2. **Scientific Question or Hypothesis**- if your project is an experiment
3. **Procedure and Materials** – text and photos, if needed
4. **Results/Data** – text, graphs, tables, photos, drawings
5. **Conclusion**- for experiments
6. **Completed Science Fair Entry Form-** taped to the back of the poster board.
7. **Acknowledgments** – please thank the people who helped you
8. **Model, Invention, Demonstration, Experiment, Collection, or Materials Used in an Experiment** should be displayed in front of your poster. If it will not fit in front of the poster board, please let your teacher know in advance that you will be bringing an oversized project and we will arrange for an area in which those projects can be displayed.

Displaying a Science Fair Project



Teacher: Reproduce this page and the "Science Fair Time Line" page. Send them home with students to inform parents about the science fair and to help students prepare their projects. You may wish to use this chart with Frank Schaffer's *The Scientific Method* bulletin board set (FS-9492) and *Work Like a Scientist* chart (FS-2427).

SCIENCE FAIR DISPLAY BOARD TICKET

Student Name_____

Teacher _____ Grade _____

Project description _____

When you are ready to mount your project information onto the display board, please return this ticket to your teacher.

Teachers: forward tickets to the box in the office – thank you.