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RIMS INLAND SCIENCE AND ENGINEERING FAIR

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STUDENT'S PARTICIPATION GUIDE 2013-2014

Student's Online Registration: February 11-27, 2014

April 1-2, 2014

STUDENT'S GUIDE TO PARTICIPATION

Congratulations!

You have just made an important decision. You are about to take part in one of the most rewarding and exciting learning experiences available to students—the Science and Engineering Fair.

What is a Science and Engineering Fair?

A Science and Engineering Fair is a competition of student science projects held each year at your school or district, in your county, and in the state of California.

What will taking part in the Fair mean to you?

Participating in a science fair means that you will have the opportunity to:

- Develop and display a science project of your choice
- Share your creative abilities, knowledge, and interests with other students
- Meet and talk with scientists in your field of interest
- Be recognized and feel satisfaction for a job well done
- Compete for awards which range from certificates, ribbons, trophies, and medals to industry tours, cash prizes, and scholarships

What is a science project?

A science project is an active "fun" approach to science, something you do rather than something you only read about or watch someone else do.

A science project is an investigation of a question about a science topic that interests you. The difference between this kind of project and other ways of working on a problem is the use of a systematic plan called the Scientific Method.

What is the Scientific Method?

The Scientific Method is a way of working on a problem using a series of related steps. In brief, these steps are as follows:

Step 1: Identify and state the problem (usually as a **question)** and purpose of the investigation.

Step 2: **Research** the question—find out what is known about the problem from reading and by talking with experts.

Step 3: Form a **hypothesis**—write a statement expressing your opinion about the question.

Step 4: Plan an **experiment** that will test your hypothesis. Your experiment should contrast a control group or situation with a test group or situation. Describe how you will do the experiment (your procedure or **method**). List your materials. The order in which you do the experiment is termed your protocol.

Step 5: Do the experiment—record all your information, observations, measurements, charts, and graphs in a notebook or journal. Display your **data** as graphs, histograms, or charts.

Step 6: State your **conclusions**—tell what happened in the experiment, whether your experiment proved or disproved the hypothesis. (Your experiment does not have to prove it correct or true!) Did your experiment suggest some other experiment to be tried?

Words underlined above may be topic headings on your display. Example of how to apply the Scientific Method:

1. I am interested in how the Mendelian ratio determines the color of flowers of pea plants. My reading suggests that hydrocarbons (gasoline) in the environment alter normal genetic behavior.

2. My question develops: Does the presence of gasoline in the environment alter the Mendelian ratio? I can not answer this question directly but I can do an experiment which will test my opinion about this question. My opinion (or hypothesis) is: hydrocarbons in a plant's environment will change the expression of the Mendelian ratio. I can design an experiment to test this hypothesis.

3. My experiment will be to grow pea plants in an atmosphere that is rich in gasoline fumes (test group). I will grow other pea plants in a similar situation with no fumes (control group). In both control and test groups, all other facts or variables will be the same.

4. I do the experiment (often several times), making observations (measurements, written descriptions) at frequent and regular intervals. These data are recorded in a notebook or journal. Graphs are prepared from the data tables and both are used to form a conclusion about my hypothesis. Is another question or experiment suggested by what I have done?

5. Finally, I prepare a Summary Statement or Abstract (in perhaps 200 words) about my experiment, conclusion, and the importance of my work.

Will you have to do an experiment to qualify for the RIMS Inland Science and Engineering Fair?

There are many ways to participate in the Science Fair. Ask your teacher for suggestions to get you started. If you would like to compete in the regional or the state fair, your project must show that you can use the Scientific Method.

Generally, this means you must do an experiment. The Mathematics & Software category does seek to provide additional rewards for other creative abilities. Even here a project is stronger if the Scientific Method has been used to organize or communicate the content of your project.

How do you communicate your project to others?

A Science Fair project is really made of three parts:

1. **The Problem, your Research Plan, and Experiment.** This is all the work that you do to investigate your question. This is a measure of your thinking. This is what the judges want to find out about. This is what you want to communicate about.

2. **The Written Record**. You must include a journal containing an explanation of the problem and all records of your experiment. Careful record keeping is considered a mark of a good scientist. The judges will carefully examine your notebook.

3. **The Display**. Your display should show your understanding and application of the Scientific Method. If you use a three panel display, the steps of the method may be read on the panels, from top to bottom, from left to right, with a statement of the problem at the top left, and the conclusion at the bottom of the right panel.

Good Luck!!!