

Riverside's "Giants in Science" Science Fair



Primary Grades K-4 Participant's Project Guide

Welcome and Overview

So you've decided to do a project and enter Riverside's science fair. Good for you! With preplanning and some hard work on your part, the days ahead will be very fun and rewarding. Your teachers and parents will probably be of help and support to you, but most of the responsibility for the project rests on your shoulders. Realizing this, you need to carefully organize and use your time and resources wisely. This project guide was designed to help you do just that. Hopefully, by the time you get done looking through this guide, you will feel more comfortable and confident about your project.

Objectives

Riverside's science fair will emphasize fun through learning by:

- Stimulating imagination and independent thinking
- Increasing knowledge in many scientific areas
- Teaching the use of the processes of science
- Training in the organization and completion of major tasks
- Providing the opportunity to enjoy science
- Learning the process of effective problem solving
- Providing the students with the opportunity to share what they have learned with other students and community members.

Project Options (choose one)

Choose one of the following three areas to complete your project in.

1. **Scientific Inquiry**- Focusing on a question about science and then using the scientific method to help answer the question.
2. **Original Invention**- Create an invention that will solve a special problem or need that we have.
3. **Research a Scientist**- Choose a scientist that has changed the way we live. Students will learn about a scientist's life and what they contributed to science.

Presentation Displays

Students have the option of buying a tri-fold display board from school or getting one on their own. They are available in our office for the low price of \$4.00. The price includes a 36" X 48" board (color of your choice while supplies last) and a 10" X 36" title board.

Stop by the office and pick one up anytime before the science fair.

Displays need to be:

- NEAT (word processed, easy to read at a distance)
- INFORMATIVE (shared through your own words and thoughts)
- ATTRACTIVE AND EYE-CATCHING (Bold words and colorful)
- ORIGINAL
- EASY TO UNDERSTAND (provide observation tables, graphs, and photos)

SCIENTIFIC INQUIRY PROJECT:

Are you a curious person? Maybe you are always asking questions about why things happen. Or maybe you ask questions about what would happen if... If you find yourself curious or interested in the world around you, maybe this is the type of project you should select for the science fair.

STEPS: The steps you will follow are used by scientists to explain problems and their solutions. This process is the scientific method. The scientific method consists of **FIVE STEPS:**

1. **Stating the research question to be solved (Purpose)**
2. **Forming the hypothesis**
3. **Experimenting and observing**
4. **Explaining the results**
5. **Drawing conclusions**

BEGINNING:

1. SELECT A TOPIC (ONE YOU ENJOY)
2. START YOUR RESEARCH WITH A PURPOSE IN THE FORM OF A QUESTION.

For example, if you want to enter a rock collection, you might ask questions such as these: Are all rocks equally hard? Is the hardness of a rock correlated to the density of a rock? Then you can pose a hypothesis and test it, as well as display an interesting collection of rocks.

The following are sample research questions that may help you think of your own research question.

How does electricity travel through wire?	How do batteries work?
What objects are attracted by magnets?	How is electricity generated from solar energy?
How can rusting be prevented?	How do integrated circuits work?
What is the shape of the magnetic field?	How does a robot work?
How can gasoline make a car move?	How can a tomato plant be grafted to a potato plant?
How does overcrowding affect life in a terrarium?	Do plants grow better in sunlight or artificial light?
How does gravity affect the growth of a plant?	How does mold grow?
How is a bridge built so it does not collapse?	How fast do different fibers burn?
How is sound obtained from a phonograph record?	What does a dam do?
How do soft drinks affect teeth?	How does a canal lock work?
How does exercise affect the heart?	Does the moon rise at the same time every night?
How do spiders spin webs?	How accurately are weather and natural disasters forecasted?

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FORMING THE HYPOTHESIS: After you have selected a research question, you have performed the first step of the scientific method. The second step is forming the hypothesis. The hypothesis (hi-poth-i-sis) is an educated guess or a possible explanation of the research question.

Kim and Carlo wanted to solve the question,
"Do plants grow taller in sunlight or in artificial light?"
They each wrote a possible explanation of the question,
And these are the hypotheses they came up with:

Kim's hypothesis: Plants will grow the same,
whether in the sun or under artificial light.

Carlo's hypothesis: Plants will grow taller in artificial light,
because they will get light for a longer period of time.

EXPERIMENTING AND RESEARCH: The key to a successful science fair project is planning. Now you are ready to begin researching your topic and planning for the experiment you wish to perform. Safety comes first. Remember to have adult guidance when experimenting with electricity, batteries, harmful chemicals, or fire. Always have the necessary emergency supplies ready should an accident occur.

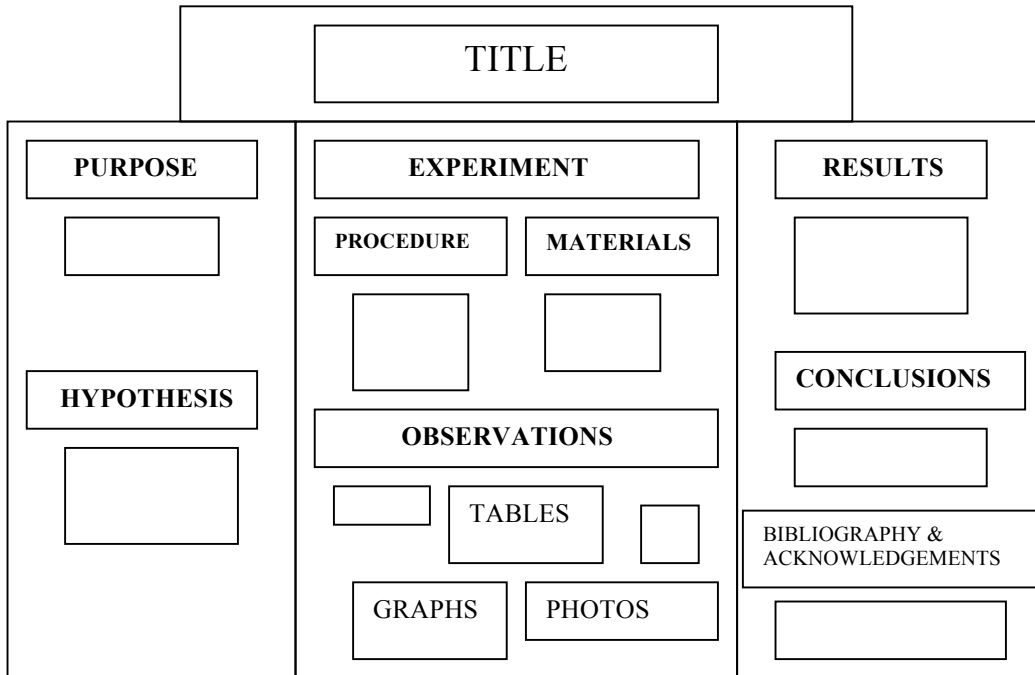
YOUR RESEARCH: Take careful notes as you research your topic and always give credit where credit is due! Take the time to write the bibliography of the resource you are using. You may need to use more than one resource. You need to provide this information on your display, as well as acknowledge the people who have helped you with this project.

PLANNING: Plan carefully before you start experimenting or making your model. Make a list of the materials you need.

Make a list of the steps you need to perform.

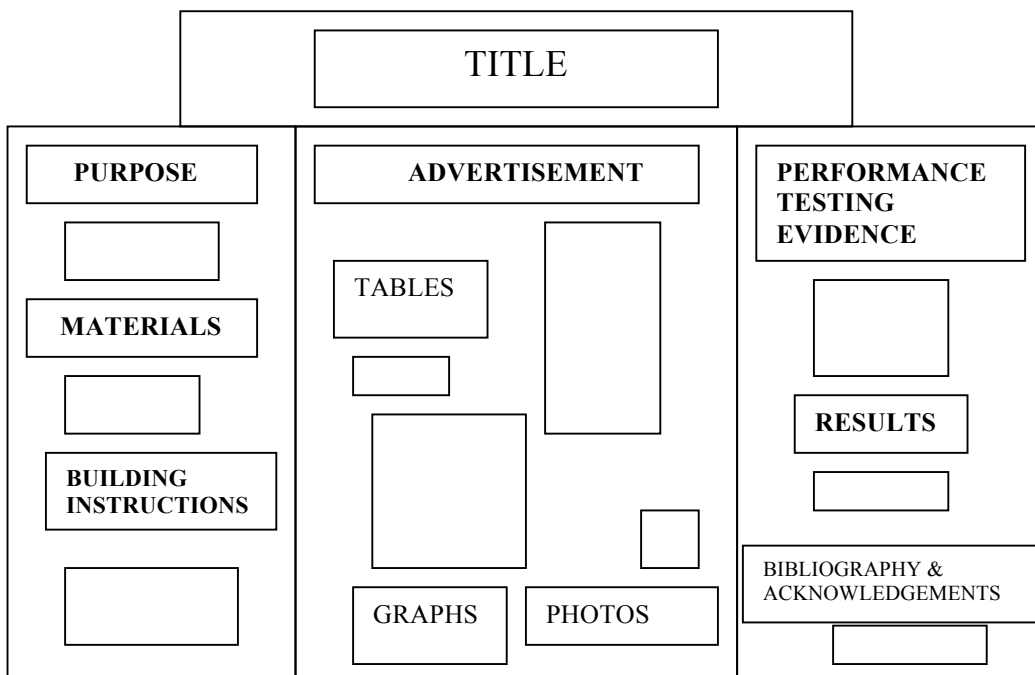
YOUR SCIENTIFIC INQUIRY DISPLAY

Here is a sample of the correct layout of information on your display for a SCIENTIFIC INQUIRY.



ORIGINAL INVENTION PROJECT

If you are creative and full of ideas, then this topic may be perfect for you. Think about it, you get to invent something that you think may benefit others. You will create an invention, test it, and market it. That's right, you even get to create an advertisement for it to persuade others why they should use your invention. Most importantly, don't forget that you must have a working model of your invention on display for everybody to be "Wowed" by.



RESEARCH A SCIENTIST PROJECT

If you love researching and learning about people that have made a real impact in science, maybe this will be the topic you should choose. Here is a list of just a few of the famous scientists that have overcome obstacles and have shown courage in their time to change the way we think about our world:

Archimedes
Aristotle
Niels Bohr

Isaac Newton
Galilei Galileo
Albert Einstein

Nicholas Copernicus
Thomas Edison

Marie Curie
Benjamin Franklin

After you choose a scientist, you will research their life. You will learn about their childhood, schooling, and hobbies. You will also discover how he or she contributed to science. After you have explored the life of your scientist, you will highlight one of their most important accomplishments. Make sure you back this up with evidence of why you feel it was so important. Lastly, you will create a hands-on project to accompany your display board. This project should tie into a contribution or theory that your scientist was instrumental in discovering.

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<div style="border: 1px solid black; padding: 5px; text-align: center;">BIOGRAPHY</div> <div style="border: 1px solid black; padding: 5px; text-align: center; margin-top: 10px;">LIFE</div> <div style="border: 1px solid black; padding: 5px; text-align: center; margin-top: 10px;">EDUCATION</div> <div style="border: 1px solid black; padding: 5px; text-align: center; margin-top: 10px;">FAMILY</div> <div style="border: 1px solid black; padding: 5px; text-align: center; margin-top: 10px; height: 40px;">PORTRAIT</div>	<div style="border: 1px solid black; padding: 5px; text-align: center;">CONTRIBUTIONS TO SCIENCE</div> <div style="border: 1px solid black; padding: 5px; text-align: center; margin-top: 10px;">INVENTIONS</div> <div style="border: 1px solid black; padding: 5px; text-align: center; margin-top: 10px;">THEORIES</div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"><div style="border: 1px solid black; width: 30px; height: 15px;"></div><div style="border: 1px solid black; width: 60px; height: 25px;"></div><div style="border: 1px solid black; width: 20px; height: 15px;"></div></div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"><div style="border: 1px solid black; width: 60px; height: 25px;"></div><div style="border: 1px solid black; width: 80px; height: 25px;"></div></div>	<div style="border: 1px solid black; padding: 5px; text-align: center;">HIGHLIGHTED ACCOMPLISHMENT</div> <div style="border: 1px solid black; padding: 5px; text-align: center; margin-top: 10px;">DESCRIPTION</div> <div style="border: 1px solid black; padding: 5px; text-align: center; margin-top: 10px;">PURPOSE</div> <div style="border: 1px solid black; padding: 5px; text-align: center; margin-top: 10px;">VISUAL</div> <div style="border: 1px solid black; padding: 5px; text-align: center; margin-top: 10px;">BIBLIOGRAPHY & ACKNOWLEDGEMENTS</div> <div style="border: 1px solid black; width: 100%; height: 25px; margin-top: 10px;"></div>

SCIENCE FAIR WORKSHEET

Name: _____

Topic:

Title:

Please check one:

Scientific Inquiry

Research a Scientist

Original Invention

Purpose:

Equipment, Materials:

(Resources)

Procedure:

(Findings and Highlighted Accomplishment)

Results:

Conclusion:
