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# Why Do a Science Fair Project?

By [Anne Marie Helmenstine, Ph.D.](#)

You may be doing a science fair project because it's an assignment. You may get the opportunity to do a project by choice. Either way, it may motivate you to know how doing a project can benefit you.

## **Answer:**

- **Discovering Something Amazing** You'll learn something from doing a project, plus it's usually a lot of fun. You may find something new doing your own project, plus you'll learn from other people. Real research is done for science fairs, sometimes resulting in important inventions and discoveries. Even if your project isn't earth-shattering, you'll almost certainly learn something you didn't know before you started.
- **Developing Skills** You'll become better at science, plus you'll gain or practice several other skills. You may become more familiar with the library, learn to use a camera or word processing program, master a mathematical analysis, get public speaking practice, etc. Some of these skills may be intimidating to learn. When you're working on a science fair project, it's easy to get help, plus no one expects perfection. The benefits of the project go way beyond learning science. You'll become more confident, more mature, more disciplined, and more skilled.

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## 6 – Week Timetable

**Date of Science Fair:** February 18<sup>th</sup> & 19<sup>th</sup>, 2014

**Date to begin** working on the project: **NOW**

**Week 1** January 6-12

- Choose a topic or problem to investigate
- Check resources in school or community library
- Contact experts in the field
- Gather all the written material you can find on the topic

**Week 2** January 13-19

- Begin putting your project notebook together
- Start collections or experiment
- Begin designing display unit

**Week 3** January 20-26

- Begin building display unit
- Design all visual aids
- Take the photographs you need
- Complete your research
- Consult with experts (scientist, college professors, teachers, parents..)

**Week 4** January 27-February 2

- Continue collecting items for display
- Continue your experiments
- Set up your apparatus and test it
- Purchase a board from Mrs. Luloff

**Week 5** February 3-9

- Construct background for display
- Design and assemble graphs or charts
- Complete lettering for display unit and mount it
- Double check your written data
- Complete experiment and record data

**Week 6** February 10-16

- Grades 4-6** ....write & type an abstract
- Grades 5-6** ... write & type both an abstract and a report
- Set up display unit at home and practice project orally

**Hand in entry form to your teacher on – Feb. 14th by 2:45p.m.**

**Feb. 18th** – Bring project to school and set up in gym from 7:30-8am.

Judging will take place sometime today

**Feb. 19th** – Public Viewing from 8am – 2:00pm, Awards 2:00 p.m. , Take your project



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# 2014 Malta Elementary Science Fair

## February 18<sup>th</sup> & 19<sup>th</sup>

Partners in Education (P.I.E.) and the Malta Elementary School Staff invite you to participate in the Annual Science Fair open to all elementary students. Please take the time to review this packet and encourage your children to participate!

Students (except kindergarten) will explain their project to 3 judges. They will be judged on their knowledge of their project and the appearance of their boards. Students are encouraged to use computers. It is a good idea, to have the student practice their presentation to an adult or older student. Remember to ask a few questions about the project, as that is what our judges will do. Students are encouraged, but not required, to use a standard science fair board. These will be available starting Feb. 1<sup>st</sup> from Mrs. Luloff in her 1st grade classroom. The cost is as follows: Regular corrugated board \$3.50 / corrugated header \$1.00, Foam board \$6.00 / Foam header \$2.00. These boards can often be reused and make nice displays.

**KINDERGARTEN** students are encouraged to bring a collection or other science project of interest (with or without a board). They will not be judged, but can show and tell their project to one person. They will receive a participation ribbon.

**GRADES 1-3** need to make a neat display that has the below headings and your project information on the display board. Look at the example science fair board for grades 1-3 at the bottom of the Science Fair Rules page for how to set your board up. Science fair boards should contain the following: **Title, Question or Idea, Steps I Did, What Happened, What I Learned**

**GRADES 4-6** must have the following headings and information neatly displayed on their boards. **Grades 5-6** MUST have report lying at the table by their boards. Projects that have graphs, charts and pictures do better at the next level of competition if so desired. Look at the bottom of the Science Fair Rules page for an example of how to set up grades 4-6 science fair boards. Science Fair boards need to contain the following:

**Title, Purpose, Hypothesis, Procedure, Results, Conclusion**

The following need to be included in the report:

**Abstract (grades 5 & 6 only), Purpose, Hypothesis, Procedure, Results, & Conclusion.**

An abstract is a 250 word (maximum) brief paragraph or two highlighting and/or summarizing the major points or most important ideas about your project and is a great summary for the students to share about their project with the judge. The abstract should include the purpose of the experiment, procedure, data and conclusion, it should **NOT** include acknowledgments or self-promotion and external endorsements, work or procedures done by the mentor.

### Sample abstract

The problem is, "Will the number of paper clips on the nose of a paper airplane affect the distance that it can fly?"

It is hypothesized that five paper clips on the nose of a paper airplane will make the plane fly farther than with non, one, or three paper clips on the plane nose.

A brief procedure of the experiment is as follows: One plane was made according to the directions given in the Procedure of Investigation. The same plane was flight tested in the same breezeless hallway; using the same amount of thrust and the same angle of release to fly the plane. The flight distances for each test was measured in meters. All tests were repeated for a total of three trials. That is, three tests for each of the following: non paper clip, one paper clip, three paper clips and five paper clips. Data were taken and recorded. The results do support the hypothesis.

**Tips on writing an abstract:**

Emphasize these aspects: purpose (hypothesis), method (procedure used) data summary or analysis, and conclusions.

Focus only on the current year's research

Omit details and discussions

Use the past tense when describing what was done. However, where appropriate use active verbs rather than passive verbs.

Use short sentences, but vary sentence structure

Use complete sentences. Don't abbreviate by omitting articles or other small words in order to save space.

Avoid jargon and use appropriate scientific language

Use concise syntax, correct spelling, grammar and punctuation.

Focus on what you did

Be sure to emphasize the current year's research. A continuation project should only make a brief mention of previous year's research( no more than a sentence or two).

**All students** are encouraged to check out a Montana Power Company booklet from the school library. It explains the process of completing a science fair project in more detail and it explains how to properly prepare a report. There are also books in the library with project ideas and some teachers may have books for you to browse through. If you have access to the internet try looking for Science Fair Project ideas there too. If you have pictures on your board please include the following statements and place on the display board:

I, \_\_\_\_\_ give permission to \_\_\_\_\_ to use my picture on their science fair board.  
Signature \_\_\_\_\_  
Date \_\_\_\_\_ (You Need one of these for each different person in a picture)

Pictures on this display board were taken by: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Have fun!!**

If you have any Q's - Mrs. Demarais can help or call Rachel Mortenson at 658-2104



## SCIENCE FAIR RULES

A team project is to consist of no more than two (2) participants.

STUDENTS ARE ASKED NOT TO PUT NAMES ON THEIR PROJECTS, THEY WILL BE IDENTIFIED BY A NUMBER GIVEN AT THE TIME THEY LEAVE THEIR BOARDS FOR JUDGING.

Because of the **fire and burn hazard**, there must be no open flame, torch or burner in the display area.

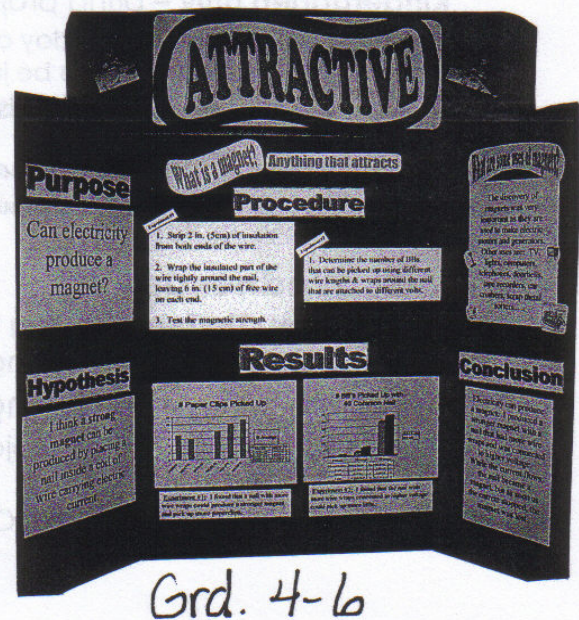
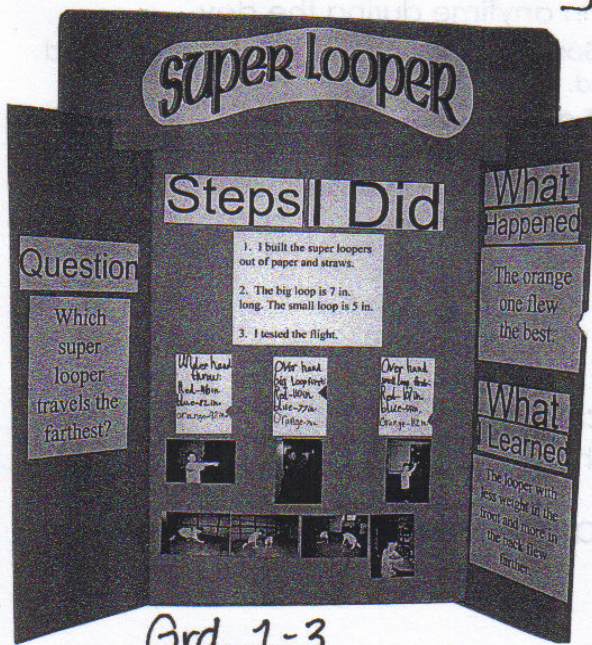
All exhibits that require an external source of electricity for operation must be designed for a standard 110-125 volt AC supply. **The need for electricity must be noted on the entry form.**

Anything that could be hazardous is prohibited, including but not limited to the following:

- poisonous plants;
- pathogenic microbial agents, e.g. viruses, bacteria, fungi;
- hypodermic needles, syringes, razor blades, and other sharp items;
- display of all chemical substances except water and saline.
- instruments containing mercury, e.g. thermometers;
- glass bottles and lab ware, either empty or containing any substance, are prohibited and must be replaced by break-resistant containers or placed in secondary containers;
- drugs, over-the-counter medications, antibiotics, and vitamins may not be displayed.

**Live animals** must be in secure cages with proper ventilation and food and water. They must be removed after the first day and returned the next day for student and public viewing, unless adequate care is provided at all times.

*Visual idea of what boards may look like from past fairs*



## **REPORT** (research paper)

**(only applicable to 5<sup>th</sup> & 6<sup>th</sup> grade science projects)**

The written report is a capsule summary of everything the student did to investigate the selected topic. It contains all the information the student collected or learned during the weeks leading up to the actual science fair. It will be necessary to record observations and information in written form. This research paper provides observers with vital data on the scope of the project as well as its effect on a student's understanding of the topic.

Usually 5 to 30 pages in length, the paper provides observers with a blow-by-blow account of everything the student did throughout the length and breadth of the project. It is meant to provide readers with a succinct, detailed accounting of the chosen project – including its impact on the student. Above all, it provides students with an opportunity to think about all the dimensions of their projects and to share their ideas with others.

Research papers should be neatly bound in an attractive folder or binder. Any research paper for a science fair project should include:

### **Title Page and Table of Contents:**

The title page and table of contents allows a reader to follow the organization of the paper quickly. The title page should include the title of the project as well as the name and grade of the student. The table of contents should list the different parts of the project and the page number on which each section can be found.

### **Introduction:**

The introduction sets the scene for your report. The introduction includes your hypothesis or engineering goals, and explanation of what prompted your research, and what you hoped to achieve. Remember a hypothesis is only an educated guess about what the student thinks will occur as a result from conducting the selected experiment.

### **Procedure (method):**

Describe in detail the methodology you used to collect data, make observations, design apparatus, etc. Your report should be detailed enough so that someone would be able to repeat the experiment from the information in your paper. Include detailed photographs or drawings of self-designed equipment.

### **Results (discussion):**

The discussion is the essence of your paper. The results and conclusions should flow smoothly and logically from your data. Be thorough. Allow your readers to see your train of thought, letting them know exactly what you did. Compare your results with theoretical values, published data, commonly held beliefs, and/or expected results. Include a discussion of possible errors. How did the data vary between repeated observations of similar events? How were your results affected by uncontrolled events? What would you do differently if you repeated this project? What other experiments should be conducted?

### **Conclusion:**

Briefly summarize your results. Be specific, do not generalize. Never introduce anything in the conclusion that has not already been discussed.

### **Acknowledgments:**

You should always credit those who assisted you, including individuals, businesses, and educational or research institutions.

### **References/Bibliography:**

Your reference list should include any documentation that is not your own (i.e. books, journal articles). Remember to alphabetize.





**Science Fair Project Ideas:** This list is divided into three levels by difficulty: level 1, level 2, & level 3

**Animal Studies**

**Level 1**

Do ants like cheese or sugar better?  
What food do mealworms prefer?  
What color of birdseed do birds like the best?  
Do suction cups stick equally to different surfaces?  
Do mint leaves repel ants?  
Which travels faster- a snail or worm?  
On which surface can a snail move faster- dirt or cement?  
Does holding a mirror in front of a fish change what a fish does?  
How far does a snail travel in one minute?  
How much can a caterpillar eat in one day?

**Consumer Testing**

Which brand of raisin cereal has the most raisins?  
Which dish soap makes the most bubbles?  
Which paper towel is the strongest?  
Which type of battery do toys run the longest?  
Which laundry detergent works the best?

**Plant Studies**

Do roots of plants always grow downward?  
Can plants grow without soil?  
Will bananas brown faster on the counter or the refrigerator?  
Does temperature affect the growth of plants?  
Can plants grow from the leaves?  
Do bigger seeds produce bigger plants?  
What is the soil in my schoolyard made of?  
Does a plant grow bigger if watered with milk or water?

**Water**

Does a bath take less water than a shower?  
Does warm water freeze faster than cool water?  
Which materials absorb in water- salt or baking soda?  
How long will it take a drop of food dye to color a glass of still water?

**Animal Studies**

**Level 2**

Does an earthworm react to light and darkness?  
Does surrounding color affect an insect's eating habits?  
Do different kinds of caterpillars eat different amounts of food?  
How long does an animal remember?  
Can birds distinguish color?  
Are cats right or left pawed?  
Do animals have color preferences?  
Which dog food does my dog like best?  
Do dogs have blood types?  
How strong is an animal's sense of smell?  
Can insects learn?  
How well do animals see?

**Comparative Studies**

What kind of juice cleans pennies best?  
Do watches keep the same time?  
How does omitting an ingredient affect the taste of cookies?  
Which cheese grows mold faster?

**These are just ideas, projects are not limited to the following!!**

**\*\*Internet is a good source for other ideas!!!!**

**Human Studies**

In my class, who is taller- boys or girls?  
Does anyone in my class have the same fingerprints?  
Which student in my class has the greatest lung capacity?  
How far can a person lean without falling?  
In my class, who has bigger feet- girls or boys?  
In my class, who has the smallest hands- girls or boys?

**Physical Science**

Can the design of a paper airplane make it fly farther?  
Do wheels reduce friction?  
Does a ball roll farther on grass or dirt?  
What holds two boards together- a nail or a screw?  
Do all objects fall to the ground at the same speed?  
What kind of things do magnets attract?  
How can you measure the strength of a magnet?  
How much salt does it take to float an egg?  
Does the water with salt boil faster than plain water?  
Does an ice cube melt faster in air or water?  
Can you tell what something is just by touching it?  
Can you tell where sound comes from when you are blindfolded?  
Does the length of a vibrating object affect sound?

**Comparative Studies**

Do people learn better through praise or fear?  
What factors affect the growth of yeast?  
What firewood burns the longest & gives out the most heat?  
What is the favorite toothpaste of kids?

**Consumer Testing**

Which brand of popcorn pops the kernels?  
Which brand of popcorn pops faster?  
Which brand of diaper holds the most water?  
Which type of cleaner sink stains best?  
Which brand of soap makes the most suds?  
Which plastic trash bag is the strongest?  
Which houseplant fertilizer works best?



### Human Studies

- Can you tell time without a watch or clock?
- Is using eyes to judge distance more accurate than using one eye?
- Do boys or girls have a higher resting point?
- Do taller people run faster than shorter people?
- Who can balance better on the balls of their feet- girls or boys?

- Does exercise affect heart rate?
- Is the world fair to left handed people?
- How does sugar affect children?
- How fast do fingernails grow?

### Physical Science

- Which liquid has the highest viscosity?
- Will more air inside a basketball make it bounce higher?
- Do all colors fade at the same rate?
- Does a baseball go farther when hit by a wood or metal bat?
- What kind of glue holds wood better?
- Does the width of a rubber band affect how far it will stretch?
- In which way does the wind blow most frequently?
- What common liquids are acid, base or neutral?
- Do sugar crystals grow faster in tap water or distilled water?
- What determines how fast a piece of candy dissolves?
- What is the best soap for washing dishes?
- In a coin toss, should you call heads or tails?
- What causes a ring in your bathtub?

### Animal Studies

- How do day old domestic chicks behave?
- What are the humidity preferences of a flour beetle?
- How does earthworm population relate with soil type?
- What are the habits of birds in your area?
- Are fish affected by magnetism?
- Environmental effects the growth of bread mold?
- What type of oil has the greatest density?
- How is the rate of melting snow affected by color?
- Which type of sunglass lens blocks the most light?
- Which materials keep ice cubes from melting for the longest time?
- Which amount of air space is the best insulator for storm windows?

### Plant Studies

- Does green plant add oxygen to its environment?
- What percentage of corn seeds in a package will germinate?
- How do flowers produce seeds?
- What are the effects of chlorine on plant growth?
- How does centrifugal force affect the germination of corn seeds?
- How does the light direction affect plant growth?
- What is the effect of acid rain on plants?

### Plant Studies

- Do different types of soil hold different amounts of water?
- Does sugar prolong the life of cut flowers?
- Will adding bleach to the water of a plant reduce fungus growth?
- How much of an orange is water?
- Does the color of light effect plant growth?

### Water

- Do plants grow bigger in soil or water?
- How much weight can a growing plant lift?
- Does it matter in which direction seeds are planted?
- Do living plants give off moisture?
- What plant food contains starch?
- Does baking soda lower the temperature of water?
- Does the color of water affect its evaporation?
- Can you separate salt from water by freezing?
- Will water with salt evaporate faster than water without salt?
- What type of soil filters water best?
- Can dirty water pass through gravel & sand and become cleaner?
- Which freezes faster- hot or cold water?

### Level 3

### Consumer Testing

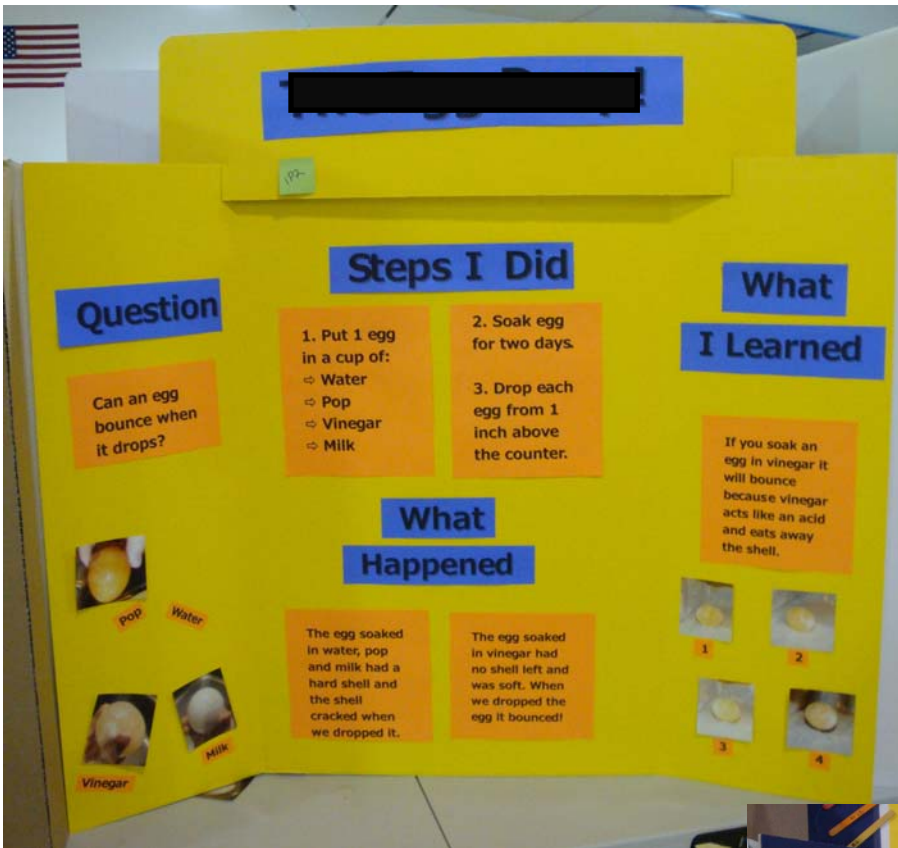
- Which videotape maintains the best picture for the greatest amount of time?
- Which home smoke detector is most sensitive?
- Which engine oil reduces friction the most?
- Does home insulation work best?
- Which self-adhesive floor tile resists wear the most?
- Research a science career that interests you.

### Human Studies

- Does the human tongue have definite areas for certain taste?
- Do children's heart rates increase as they get older?
- Does heart rate increase with increasing sound volume?
- Can you see better if you limit the light that gets to your eye?
- How accurate do people judge temperature?
- How does coffee affect blood pressure?

### Physical Science

- Which type of line carries sound waves best?
- Which metal conducts heat best?
- Does the viscosity of a liquid affect its boiling point?
- What materials provide the best insulation?
- Does the slope of land effect its absorption of heat?
- What factors affect the rate at which a pendulum swings?



# EXAMPLES OF SCIENCE FAIR BOARDS

