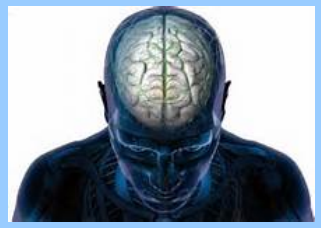

SCIENCE FAIR
Properties of Elasticity
Feed Me
VENUS FLYTRAP
Cats Can Soar
Radio Controls
Day One
FRANKENSPUD
OBJECTIVE: TO ANIMATE A POTATO WITH ELECTRICITY.
Step1:
First TRY
Remarks: needs ketchup
VOLTS
AMPS
©97

GETTING STARTED

- **All parts of the project will count as a project grade**
- **Organize yourself**
- **Stay aware of the timeline**

CHOOSE A CATEGORY

- Animal Sciences
- Earth & Space Science
- Mathematical Sciences
- Behavioral Sciences
- Engineering
- Medicine & Health
- Biochemistry
- Energy & Transportation
- Microbiology
- Chemistry
- Environmental Management
- Physics & Astronomy
- Computer Science
- Environmental Sciences
- Plant Science



Go here for descriptions of the categories:

https://student.societyforscience.org/intel-isef-categories-and-subcategories

SCIENCE FAIR TOPIC

- **After you have chosen a category pick a topic of interest. You may have to do some research.**
- **Put your topic into a question (How, What, When, Who, Which, Why, or Where) For ex, if you are interested in robots, your question might be "How much current does a robot's arm use to lift a weight?"**
- **Make sure your question is not too broad.**

SCIENCE FAIR TOPIC

- **Can you design a fair test to answer your question? It must have a independent, dependent, and control variable. If not then you should change your question.**
- **Your science fair project question should involve factors or traits that you can easily measure.**
- **Record all of your thoughts and ideas in your log book.**

RESEARCHING TOPIC

- **Read books, magazines, journals and search the internet.**
- **Try to use mainly scientific and original research sources.**
- **Watch the dates on your sources – they can get outdated quickly.**

ANNOTATED BIBLIOGRAPHY

An annotated bibliography is an organized list of sources, each of which is followed by a brief note or "annotation."

- References:
- http://writing.wisc.edu/Handbook/AnnotatedBibliography.html

***This is optional for the DCSS Fair but required for the regional and state fair.

ANNOTATED BIBLIOGRAPHY

- **The annotations do one or more of the following:**
- **describe the content and focus of the book or article**
- **suggest the source's usefulness to your research**
- **evaluate its method, conclusions, or reliability**
- **record your reactions to the source.**

ANNOTATED BIBLIOGRAPHY EXAMPLE

- Porush, David. A Short Guide to Writing About Science. NY: HarperCollins, 1995.

- This handbook is directed toward writing in for all the natural sciences rather than being discipline specific. The book is divided up into sections on science and the imagination, science and critical thinking, writing in the lab and field notebooks, moving from the notebook to the report, and chapters on writing, papers, titles, abstracts, introductions, hypotheses, materials and methods, and presentation of results, visual materials, and interpretations. It includes an essay on the relationship between science and writing, illustrations from professional journals, and appendixes on using numbers, formulas and symbols.

FORMATTING CITATIONS

Andel, Jaroslav. Avant-Garde Page Design 1900-1950. Minneapolis: Delano Greenidge Editions, 2002.

Avant-Garde Page Design is an interesting book with beautiful images of various avant-garde artists and designers. I found it very exciting just to thumb through the book before even looking at it in depth. I drew a lot of inspiration from the various title and cover pages such as Herbert Bayer's cover of Staatliches Bauhaus in Weimar 1919-1923.

Blackwell, Lewis. Twentieth-Century Type. New York, New York: national Publications, Inc., 1992.

Twentieth-Century Type was used for project one research. I really learned a lot about my era from this book, and I enjoyed all the designs that it showed. My favorite image was a spread of Neville Brody's "Bounce" ad for Nike.

Cox, Paul. Abstract Alphabet. San Francisco, CA: Chronical Books, 1997.

Abstract Alphabet is an adorable children's book where Paul Cox creates his own symbols for each letter of the alphabet. Like many alphabet books, the Abstract Alphabet is a book that utilizes the names of animals for each letter of the alphabet. Using the key, the reader can decipher the name of each animal on the page. This book made me think about how to use and break up white space on a spread.

Duncan, Thomas. "New Art City." Tokion Fall 2008: 72-75.

I studied the Tokion magazine before I started working on my book layout. It's like night and day when I read Tokion compared to magazines like Cosmo or People. The spreads are very minimal and clean. This is unlike magazines like Cosmo and People where I feel like I'm being yelled at by products, cutouts of images, and loud type. In Tokion the use of a grid is obvious and the same grid is used throughout the magazine, which makes it very cohesive.

Lupton, Ellen, and J. Miller. Design Writing Research. New York, NY: Princeton Architectural P, 1996.

Design Writing Research is an engaging book to read. The first half of the book explains the history of various things such as written out numbers and dingbats, the book literally uses the various devices in the way described in the text. Throughout the book, Jacques Derrida and his theory on deconstruction are mentioned, which ties the contents of the book together. The second half of the book shows some artwork, photography, and various commercial designs, with a majority of them from the 1980s. I found this book to be very informative and an enjoyable read.

Rabinowitz, Tova. Exploring Typography. Clifton Park, New York: Thompson/Delmar Learning, 2006.

Exploring Typography served as the foundation for the project one. Although the book did not go into depth about the history of typography it provided the basics and acted as a quick guide

Citation machine

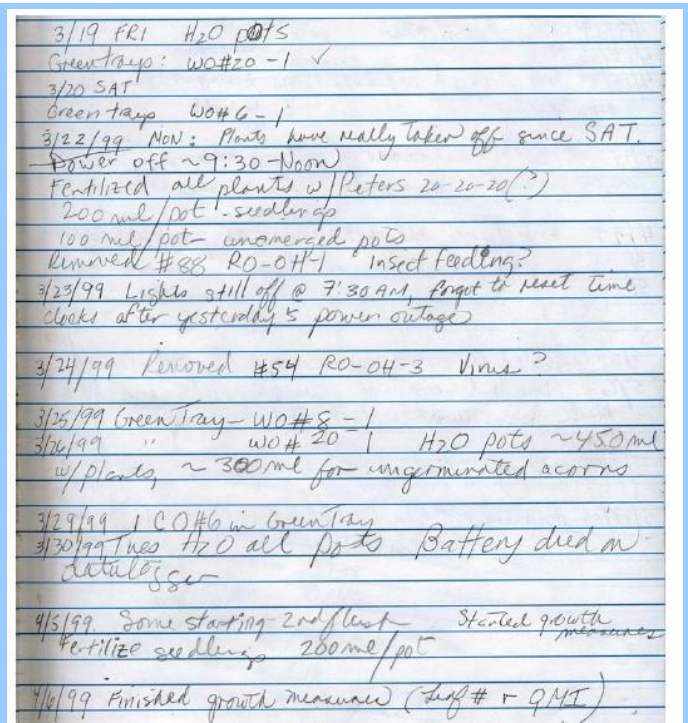
http://citationmachine.net

Easy Bib

http://www.easybib.com/

LOG BOOK BASICS

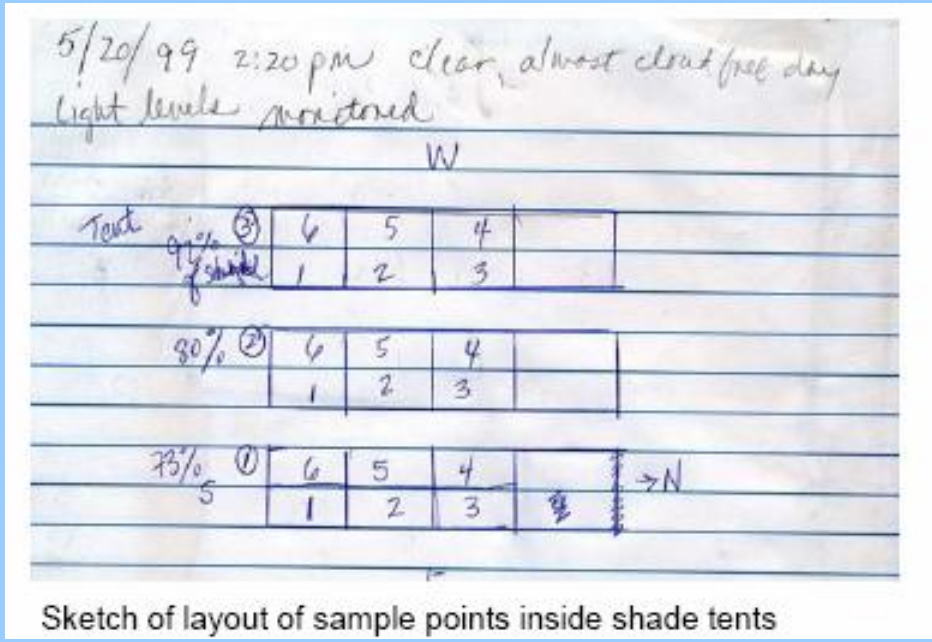
- **Use durable hard-bound notebook**
- **Label front with your name, teacher's name and class period**
- **Write in black or blue pen**
- **Number pages before use**
- **Always date every entry**



LOG BOOK BASICS

- **Glue or write schedule in the front of your log book (leave next page blank for table of contents – write in after experiment is done)**
- **Organize log book: table of contents but also index, tabs (sections), etc.**
- **Do not white-out or completely mark out mistakes. Simply place a line through incorrect/unusable data.**

INCLUDE IN LOG BOOKS:


5/20/99 2:20 PM clear, almost cloud free day
Light levels monitored
W
Tent
90% ③ 6 5 4
1 2 3
80% ② 6 5 4
1 2 3
75% ① 6 5 4
1 2 3
→N

Sketch of layout of sample points inside shade tents

- **Brainstorming, sources, research and references, supplies, phone calls, interview, meetings with advisors, calculations, graphs, diagrams, sketches, etc.**
- **Also, include any changes to procedures, mishaps, failures or mistakes**
- **Glue, staple or tape loose papers**

EXPERIMENTATION

- **Dependent variable:**

A dependent variable is the variable being tested in a scientific experiment

- **Independent variable:**

An independent variable is the variable that is changed or controlled in a scientific experiment.

- **Controlled variables:**

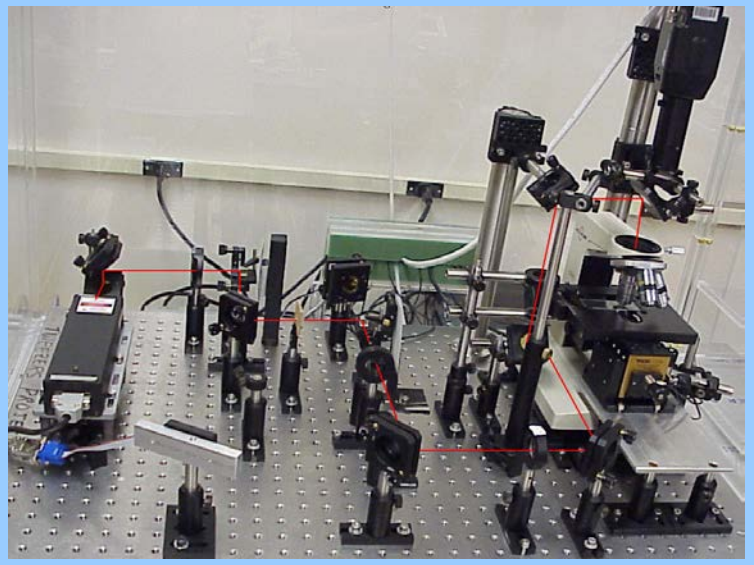
A controlled variable stays the same throughout the experiment.

EXPERIMENT EXAMPLE

- **Controlled variables: Take a package of sunflower seeds. Use two containers that are the same size with the same kind of potting soil. Have them exposed to the same amount of light and air. Plant half the package of seeds in one pot. Space them equal distance as you did with the seeds in the other container. Water with equal amounts of water.**
- **Independent Variable: Feed one set of seeds with fertilizer. Do not feed the seeds in the second container. Which seeds germinate the fastest?**
- **Dependent Variable: the speed of the germination.**

EXPERIMENTATION TIPS

- **The experiment should be able to be repeated**
- **Complete multiple trials**
- **Avoid human/animal subjects and live cultures (bacteria, viruses, etc.) – LOTS of Extra Paper work and prohibited by DCSS.**
- **Know your limitations**



DATA COLLECTION

- **Record the data obtained from the science fair experiment. Organize the results of your experiment on easy-to-read tables and / or graphs to express the results of your data. These can be drawn on graph paper or on your computer.**
- **Remember to record and keep everything in your Science Log.**

CONCLUSIONS

- In your **Science Log** , using your notes, charts and graphs, analyze what happened in the science fair experiment.
- Did your **hypothesis** hold up? Do your results agree with your hypothesis? What happened? State what the investigation showed. Accept or reject your hypothesis. You may also include other explanations, such as conditions that you were not able to control that may have affected the results.
- **It's OK if your hypothesis does not agree with the results. This is part of the scientific process.**
- Write your conclusion in your **science fair experiment log.**

INCLUDE IN PROJECT REPORT

- **1) Title Page**
- **2) Table of Contents**
- **3) Abstract** - brief overview of the project - one or two paragraphs. No more then one page. **(optional for DCSS Fair)**
- **4) Introduction** - hypothesis, explanation of what prompted your research and what you hoped to achieve.
- **5) Experiment** - describe in detail the method used to collect your data or make your observations. Be sure to explain every detail so that someone could repeat the experiment step by step. Include data, drawings, charts and graphs. Also, you may want to include photos.

PROJECT REPORT

- **Data** - include all data and measurements from your experiment along with drawings, charts and graphs. If you have extensive data that is several pages, put it in an appendix at the back of your log book. If it is very long, and you put it in another binder, write a summary statement along with the data.
- **Discussion** - results and conclusions obtained from your experiment; compare your results with published data you found in your research, what you would do differently if repeating the experiment; possible ways in which the project could be expanded in the future.
- **Conclusion** - summarize your results. Only include what was stated earlier in the paper.
- **Acknowledgements** - brief statement stating the names of people and how they helped you.
- **References** - Books, magazines, journal, articles, interviews that you used to do your research. Ask each person's permission that you interviewed to print their name, title, work address and work phone number.

ABSTRACT

- (Write Last) While most abstracts should include all of the elements listed here, all elements may not be appropriate for all categories.
- **Objective or Goal:**
  - State the objective, goal, or hypothesis upon which the project is based. Example: My objective was to learn if the feeding habits of hummingbirds are affected by color.

- **Materials and Methods:**
  - Indicate the materials, methods, and experimental design used in your project. Briefly describe your experiment or engineering methods.

- **Results:**
  - Summarize the results of your experiment and indicate how they pertain to your objective.

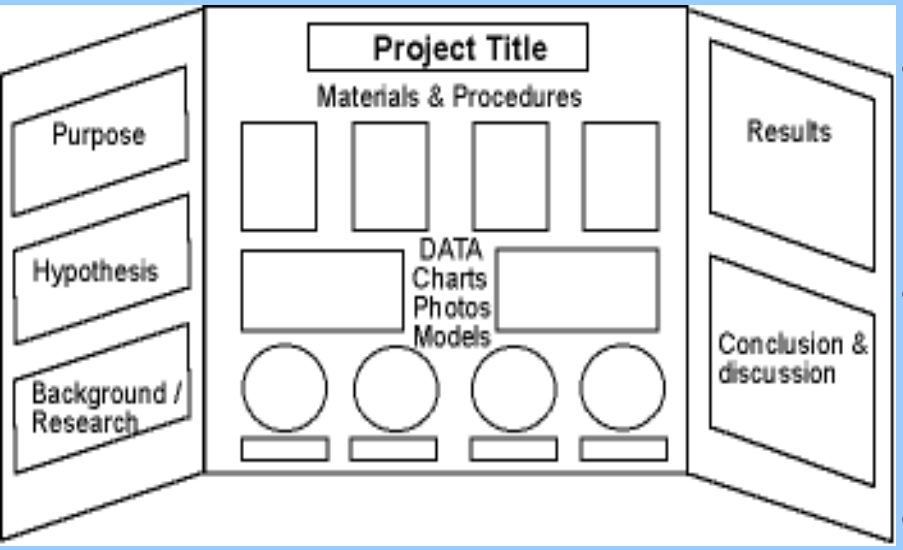
- **Conclusion/Discussion:**
  - Indicate if your results supported your hypothesis or enabled you to attain your objective. Discuss briefly how information from this project expands our knowledge about the category subject.

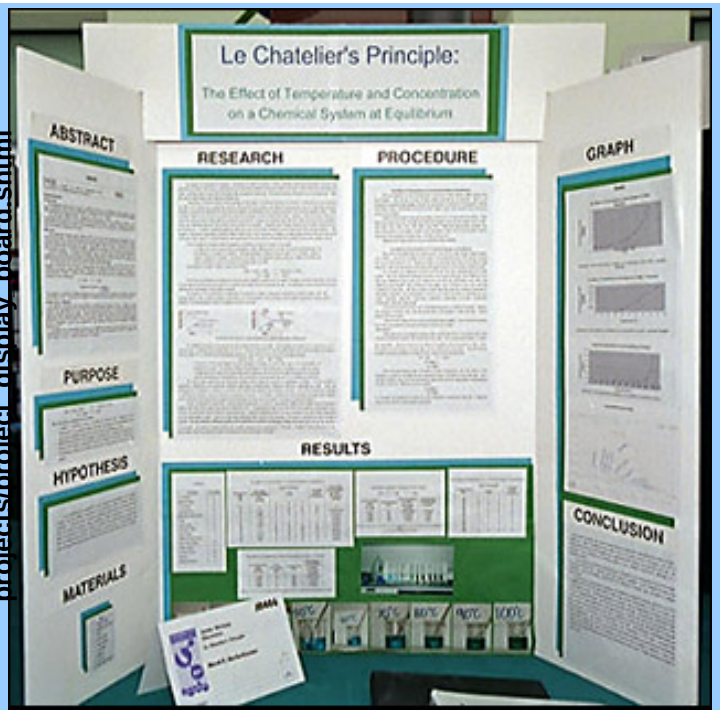
ABSTRACT EXAMPLE

The Effect of Surface Finish on Rocket Drag

- **Objective:** My project was to determine if surface finish has an effect on the drag of a model rocket. I believe that a model with a smooth surface will have lower drag and will reach higher altitudes. **Materials and Methods:** Five model rockets with identical size and shape, but different surface preparations, were constructed. One rocket was left with an unfinished surface, three had surfaces finished to various degrees of smoothness, and the fifth rocket had its surface sealed, primed, sanded to 600 grit, painted, and covered with clear gloss. The rockets were ballasted to weigh the same and flown 10 times each with B5-4 motors.
- **Results:** The rocket with the clear gloss finish consistently reached the highest altitudes of all 5 rockets, while the unfinished rocket consistently reached the lowest altitude.
- **Conclusions:** My conclusion is that surface finish has an important role in model rocket drag and rockets with carefully prepared surfaces will reach higher altitudes.

PROJECT BACKBOARD



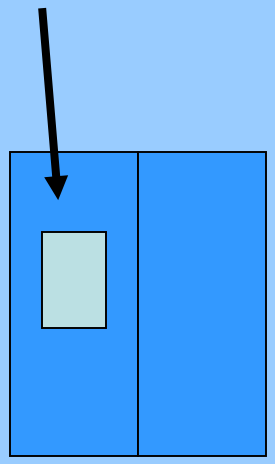


All images:
http://www.sciencebuddies.org/science-fair-projects/project_display_board.shtml

- Make it neat and organized
- Use at least 16 pt font (except for captions)
- Make title large enough to read across the room
- Use relevant photos and diagrams
- Don’t put text over pictures

SCIENCE FAIR SET-UP

Your names,
Teacher name
Abstract



1) **Write your name(s) and my name on the <u>back</u> of your backboard. Your name(s) should also be on the front.**

2) **Place your board in the appropriate category.**

3) **Your display needs to include your backboard, log book, report, and judges rubric.**

Abstract

http://www.societyforscience.org/Document.Doc?id=24

ISEF GUIDELINES AND PAPER WORK

- **All information and paper work can be found on the following site:**
- http://www.intel.com/education/isef/