Science Fair Projects

HOW TO COMPLETE A PROJECT!
What’s in your Research Paper?

- Title page (Sci) (SS) (LA)
- Question
- Hypothesis
- Research (paragraphs) (LA) (Sci) (SS)
- Materials (list) (Sci) (Math)
- Procedures (pictures and paragraph) (Sci) (SS)
- Results (data and paragraphs) (Sci)
- Conclusions (paragraphs) (Sci) (SS)
- Acknowledgments (as needed)
- Abstract (Sci) (LA)
- References (alphabetical list) (LA) (Sci) (SS)
**Project Experimentation**

(Conduct an experiment and find out if your hypothesis was right or wrong.)

- Project experimentation is the process of testing a hypothesis. The things that have an effect on the experiment are called variables. There are three kinds of variables that you need to identify in your experiments: independent, dependent, and controlled.

- The independent variable is the variable you purposely manipulate (change). (light changed to dark)

- The dependent variable is the variable that is being observed (the mold), which changes (or may change) in response to the independent variable. (the light)

- The variables that are not changed are called controlled variables. (white bread)
Hypothesis

(What do you think will happen during your experimentation?)

- A hypothesis is an idea about the solution to a problem, based on knowledge and research.

- It is a single statement that is the key to a successful project.
Hypothesizing

- Do state facts from past experiences or observations on which you base your hypothesis.
- Do write down your hypothesis before beginning the project experimentation.
- Don't change your hypothesis even if experimentation does not support it. If time permits, repeat or redesign the experiment to confirm your results.
When you conduct research to better understand your topic:

- Do use many references from printed sources—books, journals, magazines, and newspapers—as well as electronic sources—computer software and online services.

- Do gather information from professionals—instructors, librarians, and scientists, such as physicians and veterinarians (interviews).

- Do perform other exploratory experiments related to your topic.
References

- Use APA style to cite your resources
  Go to [www.citationmachine.net](http://www.citationmachine.net) and type in the name of your resource to get the proper format.
- Give credit for ALL resources used


Experimenting to test the Hypothesis

All of your project experimenting will be performed to test the hypothesis. The hypothesis should make a claim about how two factors relate. For example, in the following sample hypothesis, the two relating factors are light and bread mold growth. Here is one example of a hypothesis for the earlier problem question:

"If bread mold does not need light for reproduction on white bread, then mold will grow in a dark environment."

I base my hypothesis on these facts (gathered through research):

- Organisms with chlorophyll need light to survive. Molds do not have chlorophyll.
- In my exploratory experiment, bread mold grew on white bread kept in a dark bread box.
Materials List

★ Create a list of all your materials
★ Things you used to complete your project
  Project board  cut-out letters
  Paper, pencil, markers  6 loaves of bread
  Sealed box  Thermometer
  Timer  Lamp
  Refrigerator  Camera

★ Make sure that you list the amount of each item.
★ Include the measuring scale used for the items (Metric/Standard English).
Procedures

Methods (paragraph)

Steps you did to complete your project (example)

- To complete my project, I bought 3 loaves of bread and placed the control in the refrigerator to keep it from molding. I placed one loaf in a dark, sealed box and I left one loaf out on the counter in the light. I took pictures of the 3 loaves.

- I wrote down the beginning time for the 3 loaves and then observed them each day – once in the morning and once in the evening – to check for mold. I wrote down my observations in my log book.

- No mold was observed until the 5th day. It was on both loaves in the same place – on the bottom.
Results

- **Data** (information you collected as you did your experiments)
  - Time it took for mold to start growing
  - Amount of mold each day on each loaf
  - Temperatures of bread loaves
- **Analysis** (what you decided that your data showed you)
  - Mold grew first on both, but faster on the loaf in the dark, possibly due to higher temperature and ...
- **Include statistics, graphs, charts, etc.**
Results

- Include charts, graphs, or other visual displays that help explain your project results.
Project Conclusion
(What did you learn? Explain thoroughly. What really happened during your experiment – were you right? Be honest!)

- The project conclusion is a summary of the results of the project experimentation and a statement of how the results relate to the hypothesis.
- Reasons for experimental results that are contrary to the hypothesis are included. If applicable, the conclusion can end by giving ideas for further testing.

If your results do not support your hypothesis:
- Don’t change your hypothesis.
- Don’t leave out experimental results that do not support your hypothesis.
- Do give possible reasons for the difference between your hypothesis and the experimental results.
- Do give ways that you can experiment further to find a solution.
The hypothesis is incorrect.

The type of ball made little difference. The X-Cat ball went the farthest but it was barely farther than the other balls. The different types of balls traveled very close to the same distance. The difference between the longest average and the shortest average was only 0.6 of a yard or 21.6 inches.
Acknowledgments

* In this paragraph, you will give credit for help given by teachers, parents, or people you have interviewed.

* I would like to thank my mom for typing the final draft of my project.

* I would like to thank my science teacher for finding the graph template for me.

* I would like to thank Dr. Science for allowing me to interview her.
Abstract

- The abstract is a short version of your science fair project, no more than 250 words. It should include:
  
  1. Introduction—"So what" are we learning about
  2. Problem Question
  3. Procedures
  4. Results
  5. Conclusion—"So why" is this experiment important to us
**Dos and Don’ts**

*Do NOT experiment on perishable items.*

*Do include pictures of the experiment process. This is a requirement.*
Sample Project Display Board

**Problem**
Does the 5-second rule really work?

**Hypothesis**
The 5-second rule does not work.

**Procedure**
1. Obtain 10 people.
2. Place 10 marshmallows on 10 plates.
3. Each person is given a plate with a marshmallow.
4. Each person is asked to stretch out their arm and touch their hand to their chin.
5. Each person is asked to eat the marshmallow in 5 seconds.
6. Observe the results.

**Variables**
- **Independent Variable**: Time
- **Dependent Variable**: Ability to eat marshmallow

**Conclusion**
If they eat the marshmallow in 5 seconds, the 5-second rule works. If not, it doesn't work.

**Graph**
- Display the results of the experiment using a bar graph.
- Include a line graph to show the progression of time vs. success rate.

Please take 1 cookie, a cup of Cheerios, and 2 Jolly Ranchers, but don't chew!!!
Please make sure you have the three materials shown for the day of the Science or Social Science Fair.

PROJECT BOARD
RESEARCH PAPER
LOG BOOK
BEAM Robotics

Meet the Bots

Biology-
Electronics-
Aesthetics-
Mechanics-

Purpose

Hypothesis

Test Results

Conclusion

Current and Future Uses

ROBOWARNER.COM

RoboWarner First Place
List of Materials
Please make sure you have the three materials shown for the day of the Science Fair.
MAKE IT COLORFUL!

FIZZ-OLYMPICS

QUESTION.... What is the shortest "fizz" in a soft drink?

HYPOTHESIS

My hypothesis is that the flashlight with a battery of different types of batteries will last the longest.

PURPOSE

The purpose of this project is to see which of the three leading brands of batteries will last the longest.

VARIABLES

Manipulated variables - brand of flashlight

PROCEDURE

1. Label each flashlight with battery name and put the different batteries in each marked flashlight.
2. Turn on each flashlight.
3. Record the time and date each flashlight was turned on.
4. Wash the flashlight and record the time of the first flashlight that was turned on.
5. Repeat steps 1-4 for each brand of battery used.
6. Record and graph the results.

MATERIALS

3.25 each of brand A, B, and C flashlights

CONCLUSION

The experiment supported the hypothesis that the flashlight with a battery of different types of batteries will last the longest.
Which golf ball travels farthest?

Problem
Which golf ball goes the farthest when hit by my subject?

Hypothesis
If my subject hits the golf ball with the same initial conditions, then the golf ball with the lowest initial velocity will go the farthest distance. My subject is a 7 handicap and is a right handed golfer. The golf ball is hit with a 7 iron and a driver with a backspin.
WHAT TAKES THE BURN OUT OF HEARTBURN?
YELLOW: IT'S JUST NOT FOR BANANAS!
Problem:

Purpose:

Hypothesis:

Experiment:

Conclusion:

Abstract:
GOOD COOKIES
THE EFFECT OF FAT ON TASTE AND TEXTURE