

## Honors Biology & Honors Chemistry Summer Science Fair Assignment

If you have questions, HN Biology students may contact Dr. Potter at [mpotter@paulvi.net](mailto:mpotter@paulvi.net) and HN Chemistry students may contact Mr. Andrewes at [tandrewes@paulvi.net](mailto:tandrewes@paulvi.net)

**Due: Wednesday August 31, 2016**

**One proposal** for your science fair project: your proposal must follow the specific format outlined below.

**Your Proposal** will include the following in the order shown. Proposals not following this format will be marked down. Use Times New Roman font, size 12, 1" margins, double spaced.

**Page 1: Justification. (1 paragraph, 50 - 100 words)**

Why did you choose this topic? This explains why you decided to do this project, where you got the idea for your project. This is the “real world” connection that the science fair judges will want to hear from you.

**Page 2: Background Information. (200 words max.)**

This is not your procedure. It is book and internet research that you did relating to your project. This presents research done to give adequate background support to the project. Include your variables (dependent and independent), your control, how these variables will be measured, and your data will be analyzed.

**Page 3: References/Bibliography (1 page, MLA required)**

This is a list of a *minimum of two (2)* sources (i.e.: science journal articles, books, internet sites) you used to write the background information.

**Getting Started: Choosing a Topic**

Choosing a topic is the most difficult part of Science Fair for many students. Is there a hobby or interest that you have? Can you find a way to make some aspect of that hobby easier or better suited for the public? Is there a scientific phenomenon that you would like to know more about? There are many sources out there to help you choose a topic. However, don't be tempted to take a procedure from the internet or from a book you find; this is plagiarism. Those sources can be used as a guide, but be sure that your topic is original or find a *new innovative* way to test a topic that may have been tested before. This is why you need to do some background research about your topic: you want to make sure that the question you're trying to answer has not already been answered!

How do you find out? It may seem simple, but “Google©” it! Check the internet and see if you find a project matching yours. If it has been done before, or if the answer to your experimental question is already known, you need to formulate a new idea or ‘tweak’ your current topic so that your experiment approaches that topic in an original way. The more you read and think about your topic the more ideas of how you can test it, change it, etc. will occur to you.

While you may choose a non-biology topic, consider working with invertebrate organisms. Possible sources for invertebrate organisms include local pet stores (crickets, etc.) or biological supply companies online (Carolina Biological, Wards, etc.).

During first quarter you will be required to write a full research paper on the background for your project. Make sure your topic has sufficient depth to write the paper and is high school level work.

The following table presents some topics to avoid and why. **Projects that involve human subjects are not allowed. Projects involving plants, fruit batteries, and difficult to measure variables are also not allowed without prior permission. All projects must include data that can be accurately measured and analyzed using statistical or graphical methods.**

For ISEF official rules, student handbook, forms, and other paperwork go to: <http://www.societyforscience.org/page.aspx?pid=312> . Here, you can find online forms and information for students and parents. In particular, check under the “**Get Started**” heading for helpful information.

<b>Topics to Avoid</b>	<b>Why</b>
A simple preference or taste comparison. For example, "Which tastes better: Coke or Pepsi?"	These types of experiments are more of a survey and don't involve the kinds of numerical measurements and analysis necessary in a science fair project. <b>Not allowed: Human Subject Training Required</b>
Most consumer product testing of the "Which is best?" type. This includes comparisons of popcorn, bubblegum, make-up, detergents, cleaning products, and paper towels.	These projects only have scientific validity if the investigator fully understands the science behind why the product works and applies that understanding to the experiment. While many consumer products are easy to use, the science behind them is often at the level of a graduate student in college. <b>Not allowed.</b>
Topics that require people to recall things they did in the past.	The data tends to be unreliable. <b>Not allowed: Human Subject Training Required</b>
Effect of colored light on plants	Several people do this project at almost every science fair. Difficult to measure quantitatively. You can be more creative! <b>Not allowed.</b>
Effect of music or talking on plants	Difficult to measure quantitatively.
Effect of running, music, video games, or almost anything on blood pressure	The result is either obvious (the heart beats faster when you run) or difficult to measure with proper controls (the effect of music). <b>Not allowed: Human Subject Training Required</b>
Effect of color on memory, emotion, mood, taste, strength, etc.	Highly subjective and difficult to measure. <b>Not allowed: Human Subject Training Required</b>
Any topic that requires measurements that will be extremely difficult to make or repeat, given your equipment.	<b>Without measurement, you can't do science. True for any topic!</b>
Any topic that requires dangerous,	We care about your safety and your parents' pocketbook.

hard to find, expensive, or illegal materials.	
Graphology or handwriting analysis	Questionable scientific validity. <b>Not allowed: Human Subject Training Required</b>
Astrology or ESP	No scientific validity. <b>Not allowed.</b>
Any project in violation of state law, federal law, state science fair rules, or International Science and Engineering Fair rules.	In brief, you may not choose a project that involves: unacceptable risk (physical or psychological) to a human subject. Collection of tissue samples from living humans or vertebrate animals, drugging, pain or injury to a live vertebrate animal, or the use of illegal or prohibited materials is also prohibited.

Be aware of the following:

1. Experimentation may not begin in any form until project approval.
2. All “sensitive” projects require a much higher level of documentation and scrutiny including how materials were neutralized and that disposal was safe and proper. Additional forms are required for “sensitive” projects. Sensitive projects include any project involving a level of risk above and beyond that encountered in a student’s everyday life as well as any of the following:
  - a) Human or animal subjects
  - b) Non-human vertebrate animals
  - c) Human and animal tissues
  - d) Recombinant DNA
  - e) Hazardous substances, devices, or activities that involve a level of risk above and beyond that encountered in the student’s everyday life
  - f) Strong acids or bases regardless of the concentration
  - g) Production or use of alcohol
  - h) Production, cultivation, or use of bacteria, yeast, mold, spores, fungus.  
Many projects falling in this category have been well documented and lack the detailed science and quantitative analysis to compete beyond the PVI Science Fair.
  - i) Use of pathogenic agents or controlled substances