

## SCIENCE FAIR PROPOSAL: Due 10/2/2017 and 10/3/2017

How exciting! We have made it through the initial steps of the science fair! In order to put all the steps you all have worked so hard on together, you will be submitting a proposal.

The proposal needs to be:

- Typed, 12 pt font, Times New Roman
- Printed and brought to class AND emailed to [cassandra.winkle@archimedean.org](mailto:cassandra.winkle@archimedean.org)
  - I am requiring both a hard copy (so that I can provide feedback) and emailed copy (just in case the hardcopy gets lost or your saved version gets deleted from the computer. It's always better to be safe and have backups! )
  - For the email: please put in the subject: Your name and Proposal
- Include the following sections:
  - Title
  - Name of student, date, and class section
  - Problem Statement
  - Background Research
  - Bibliography
  - Variables (Independent variable, dependent variable, constant, and control)
  - Hypothesis
  - Materials
  - Procedures
  - Template for table to write data down (Data collection preparation)
- Evaluated: Students, evaluate the sections of the science fair that we have done so far using the following rubric:

CATEGORY:	MAX. POINTS:	CRITERIA:	POINTS:
Problem Statement	5	A complete well written description of the problem statement.	
Research: Background information	10	Sufficient background information should be provided for the question being investigated to be understood.	
Bibliography:	5	5 sources, including publish date, source, author, and date found.	
Hypothesis	5	A testable prediction based on observations and research. Written as an <b>if/ then statement</b> .	
Variables: Independent Dependent Constants Control Group	15	Independent and Dependent variables must be clearly identified as well as all appropriate constants and controls. <b>Independent variable</b> is what the student changed, and <b>dependent variable</b> is what the student measured, and <b>constants</b> are what the student kept the same to ensure validity of the experiment. A <b>control group</b> (the standard with which to compare) must also be clearly identified.	
Materials and Methods (Procedures)	10	A thorough list of materials used in the experiment including type of material and amount (5) and a well written description of how the experiment was performed. (5) Should be clear enough to repeat the experiment.	
Data and Results	15	The measurements and observations from the experiment should be presented in a clear and concise way. Tables and Graphs must be properly labeled and meaningful. All Results must be clearly stated in words. There should be evidence of multiple trials and some analysis of the data (totals and averages).	
Conclusion and	10	A well written statement of whether or not the hypothesis	

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*Following you will find descriptions of each of the above mentioned components with examples that will help you develop your project.*

## **□ Title**

**A project needs a title. It lets people know what you have worked on. The title should be in the form of a statement, unless you use the problem statement as your title. It should be in the form of a question. Consider the following:**

**Poor title: Soap Powder (does not say enough)**

**Better general title: Cleaning Power of Soap Powder**

**Problem statement as title: Which Soap Powder is the Best Cleaner of Catsup Stains?**

**These are some tips to help you select a title.**

- **Read in science books, magazines, newspapers**
- **Talk to your teacher, family, and friends**
- **Select a topic that interests you**
- **Follow your curiosity; select a topic that you do not know anything about**
- **Select a topic that you know a little about but you want to investigate an aspect further to see what will happen if...**
- **See a list of possible project ideas included**

## **□ Problem Statement**

**The question tells people what you are trying to find out. It should include what your independent and dependent variables are.**

**Poor problem statement: How does Soap Work?**

**Better problem statement: Which Soap Powder Works best in Removing Catsup Stains?**

## ☐ Hypothesis

A hypothesis states what you think is going to happen when you investigate a question, and why. Your “why” is supported with your background research. Here is an example:

**Question:** Which brand of paper towels is the most absorbent?

**Hypothesis:** If Viva, Bounty, and Suave paper towels are tested for their absorbency, then Viva paper towels will be the most absorbent, because research has shown that Viva has the most material that can then absorb liquid.

## ☐ Materials

List all materials used in your investigation. Include what, how much, and what kinds of materials you used. Keep in mind quantities are important. Be sure to use only metric units.

**Example of a “good listing”:**

- ☐ 3, 15x15 cm sq. each of Brawney, Gala, Scott, generic paper towels
- ☐ 250 ml graduated beaker
- ☐ 750 ml water 20<sup>0</sup> C
- ☐ 1, 20x20 cm sq. cake pan
- ☐ Celsius thermometer
- ☐ clock with a second hand

**□ Procedures**

**Your step-by-step directions are like a recipe. Anyone who reads them will be able to duplicate your investigation and get the same results.**

**Example:**

**Step-by-Step Directions:**

- 1. Cut 3, 15x15 cm sq. from each brand of paper towel**
- 2. Label each cut piece with brand name**
- 3. Pour 50 ml of 20<sup>0</sup> C water into 20x20 cm sq pan**
- 4. Place 1 square of generic brand paper towel into water and pan**
- 5. Leave for 30 seconds**
- 6. Remove paper towel**
- 7. Measure water remaining in pan and record**
- 8. Dry the cake pan**
- 9. Repeat steps 4-8 for each brand of paper towel**
- 10. Repeat entire process twice more for each brand of paper towel**

□ **Variables**

- **Independent Variable**

What you change on purpose in an investigation.

- **Dependent Variable**

The responding variable is what changes by itself.

- **Constants**

Everything else in your investigation must be held constant (kept the same)

- **Control**

The factor that is being used for comparison. The independent variable isn't applied.

**Example of variables:**

**Question:** Do all brands of paper towels absorb the same amount of water?

**Independent variable:** brand of paper towel (what you changed on purpose)

**Dependent variable:** amount of water that is adsorbed by each towel

**Constant:** The water used, the soak time, the temperature, the amount of paper towel

**Control:** Paper towel with a known absorbency to compare the others to.

## **Background Information**

Once you have chosen your science problem it is important to research the written materials available on your subject. By finding out as much background information as you can about the subject, you will gain better understanding of your problem. This will be valuable to you as you plan your project. Following are guidelines for conducting this research.

- 1. Read books and articles on your subject. Make sure this information is up-to-date (usually not older than five to ten years, depending on the subject.)**
- 2. Interview and talk with people who are knowledgeable about your subject.**
- 3. After reading books or interviewing people about your topic, write a paragraph that includes all the information that you gathered.**
- 4. Follow all facts with in text citations at the end of the sentence: (author, year).**
- 5. Must be in complete sentences and in your own words.**
- 6. Think about answering the following questions:**
  - Why am I using the materials I chose?**
  - What is already known about my project?**
  - What is unknown about my project?**
  - Tell a story that begins with your problem statement and leads to your hypothesis. What do you think will happen and what research supports your prediction?**

□ ***Bibliography***

***Make a list of all the books, magazines, interviews, or other sources that were used.***

**General Form and Examples:**

**BOOK**

**Author's last name, first name, and initial. Title of book, city of publication: publisher, year, pages used**

**Cured, Mary B., Medicinal Plants, New York: Moorehouse and Moorehouse Publications, 199, pp. 84-86**

**MAGAZINE**

**Title of article, title of magazine, volume and number, city of publication: publisher, month, year, pages or article used.**

**"Problem-Solving Processes," The Science Teacher, Volume 6, Number 4, Alexandria: National Science Teachers Association, April 1999, pp 16-19**

**INTERVIEW**

**Interviewed person's last name, first name, initial, title, type of interview, month date, year of interview, department of one interviewed, institution where the interviewed works, phone number.**

**Brown, Joseph T. Ph.D., telephone interview, September 17, 1999, Department of Botany, Somewhere University, (555) 444-3210**

**ENCYCLOPEDIA**

**Title of article, title of encyclopedia, place of publication, the publisher, date of publication, volume number, pages used.**

**“Seeds”, World Book, New York: World Publishers, 1999, Volume S, pages 1120-1121.**

## **WORLD WIDE WEB**

**Last name, first name. “Title”. Date published. <URL> Date accessed.**

**Freed, Toman. “Classical Muty: The Ancient Sources.” Dept. of Greek and Roman Studies, U of Victoria. 28 Mar. 1998 <<http://www.wesleyan.edu/cbays/homepage/tt1m>> accessed 24 September 2017.**

## **DATA COLLECTION PREPARATION:**

**Prepare a table of the information you are going to collect as you do your experiment. Make sure you include a table title, and units.**

**Title: Table Template for Data Collection**

<b>Label (Number of sample)</b>	<b>Independent Variable (different groups)</b>	<b>Dependent Variable (what is being measured)</b>
<b>1</b>		
<b>2</b>		
<b>3</b>		
<b>4</b>		
<b>5</b>		
<b>6</b>		