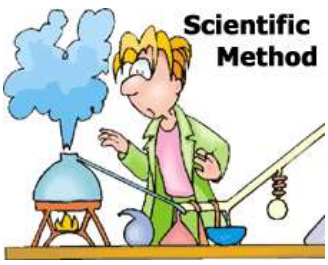
Science Research Project

Step Description / Timeline:	Points:	Due:
1. Research Plan and forms	50	11/12/2014 animal, lab, pathogens … 12/3/2014 all others...
2. Experimentation & Collect Data		12/10/2014 - 1/10/2015
3. Report	50	1/20/2015
4. Display Board	50	1/20/2015
5. Presentation		

- Students are expected to turn in a typed and printed Science Research Plan, all necessary completed forms, a display board, and a typed and printed report by the due dates listed above. Teams of 2 may share display board....not research plan, forms, journal or report. Conclusion should be unique to individual!
- Students will be provided with a workbook to help them produce each step. Workbook should be used to produce their rough draft. As steps are produced they should be typed into the computer and saved for the final product….the display board and report.
- Students should **not** perform any experiment until the research plan and all forms are turned in and **approved**.
- ISEF rules available at: https://student.societyforscience.org/international-rules-pre-college-science-research
- All special forms for projects requiring SRC approval must be downloaded, completed and turned in to Mr. Karcewski by **November 12th**. These are projects involving: **Vertebrate animals**, Pathogenic Agents, Recombinant DNA, Human and Animal Tissue. **No animal projects will be permitted after this deadline.** Forms can be accessed at: https://student.societyforscience.org/forms
- All special forms for **human subject projects** must be completed and turned in to your teacher by **December 3rd** . No human subjects can be used in an experiment without approved consent forms being signed by the subject's guardian or the subject themselves (if over 18). No taste testing is allowed. No exercise is allowed. No surveys are allowed. Forms can be accessed at: https://student.societyforscience.org/forms
- All projects that involve cooking, heating, pressure, chemicals, or any other possible dangers must complete a detailed material list, procedure, and complete a **risk assessment form** before experimentation can begin. The designated supervisor and sponsor must be present at time of experimentation!
- **All Projects (Report and display board) must include an abstract, a journal, measurements, a data table, a graph, and visuals.**
- **A neat and organized report of your project must accompany your display board.** The report should cover all steps of the science fair display board in report (12 pt font) format. See below.
- Students need to produce a report and display board with the following categories:



1) **Title** (Heading)
2) **Abstract** *A summary of your project*
3) **Purpose** *The purpose of my project is to show…*
4) **Statement of the Problem** *In the form of a question.*
5) **Background Research**
6) **Hypothesis** *I believe…*
7) **Materials** *List materials used.*
8) **Procedure** *List detailed steps of your experiment.*
9) **Variables** *Identify constants, variables, and identify the control group (if present).*
10) **Results (Data)** *Show and explain data table, graphs, charts, photos, and/or diagrams.*
11) **Analysis** *Analyze data and graph. Discuss your results.*
12) **Conclusion** *Answer Hypothesis, explain what you learned, relate to real life.. Expand!!!*
13) **References** *List references used in background research and selection of idea.*
13) **Journal or Log** should accompany the display board and report.

Research Paper (Report):

Title

Abstract
One or two brief paragraphs explaining your research project.

Purpose
The purpose of my project is to show…

Problem
In the form of a question.

Background Research
Define vocabulary. Discuss background information.

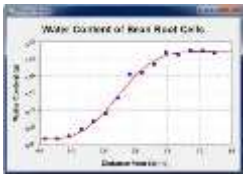
Hypothesis
I believe…..

Materials *List.*

Procedure *List in steps.*
1st ……
2nd ……
3rd ……

Variables *Identify and discuss variables such as constants, the experimental factor, and the control group.*
Results (Data)
Describe your result, Data table/charts. Show pictures.
Analysis (Graphs)
Show and discuss graphs/results.

Include data tables, graphs, and pictures!



Conclusion
How do your results compare to your hypothesis: Yes or No….explain.
Interpret results and discuss what you learned.
Acknowledgements

References
List two.

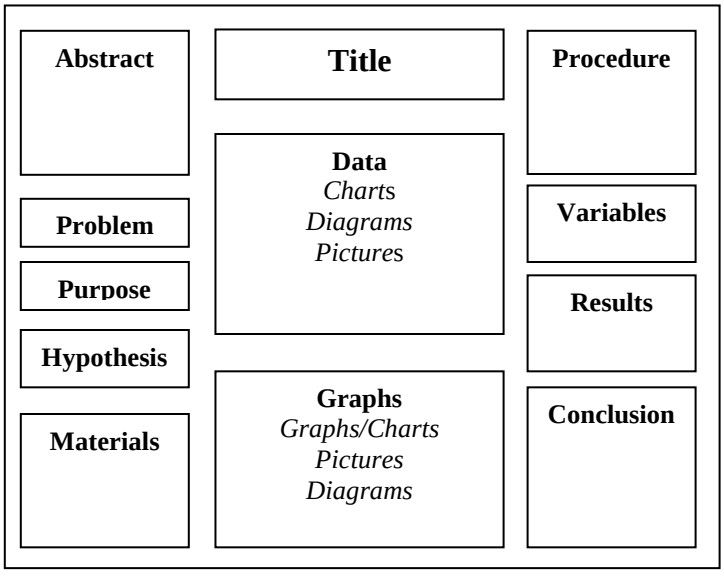
Journal / Logbook

A day to day journal of your research project. Mkke sure to include dates, Should be in front of your display board along with your report.

Report:

- Place name on the backside of report and journal.
  No names should be visible to judges.
- Use computer 12pt font and 1.5 or 2 space.
- Use bold heading titles for each section of the report.
- A Journal or logbook is expected.
- No pictures of people.
- Use web site to do graph. Google "createagraph".

Science Research Display Board:



Report **Journal**

Display Board:

- Use 3-5 dollar Display board.
- Don't write names on the front side of your report and display board. Use back.
- Include graphs, tables, and charts.
- Do not write directly on display board! Attach each section to board with rubber cement.
- Place **journals** in front of display.
- Place **report(s)** in front of display.
- No food, electricity, chemicals, liquids, animals, "smelly stuff", soils, or molds should be displayed with boards. Use pictures instead.
- Use borders, matting, and other decorations to improve the look of your board.
- Use your report for display board parts: print out each section of the report at a larger font size.
- Double pictures, tables, and graphs: one for report and one for display board.

Science Fair Website Resources

Chester County Science Research Competition
http://www.cciu.org/Departments/LER/SpecialEvents/scienc

Society for Science and the Public (SSP) (contains our forms as well as a rules wizard)
www.societyforscience.org

My Science Fair Workbook

Name: _____

Period: _____

Teacher: _____

Parent Signature: _____

1st Step. Come up with an idea. Make sure you can measure something!

1st Title. The title should be "catchy" and short. The Title should be displayed on the cover of your report and the top of your project display.

_____

_____

2nd Statement of the Problem. A statement of the problem should be a well stated question on the topic you have chosen. The statement of the problem should start with question phrases such as:

What is the effect of …….. on ……? What ……?
How do …… effect ……?
Which …… …… The best?

Statement of the Problem: _____

_____

_____

_____

3rd Purpose. The purpose should explain what you expect to show. It is similar to the statement of the problem.
The purpose of my project is to show ……..

Purpose: _____

_____

_____

_____

4th Background Information / Research

- ✓ Explore current events or problems that are related to your problem.
- ✓ **Key terms:** List and define vocabulary associated with your project.
- ✓ **Key concepts:** Write a brief explanation of a subject or concepst associated with your project.
- ✓ **References:** List at least two. (book name, authors, volume, topic name, company, year; internet site name, http:address, date.) Use Research Plan Sheet.
- ✓ **Pictures and Diagrams:** Find and draw pictures / diagrams associated with your topic. Attach.

5th References: (on back)

- ✓ List references used to select a science fair project or background information(above).
- ✓ Include: Author; topic; reference title and company, date, page numbers.
- ✓ Use website: http://www.easybib.com/MyBib/view.php

6th Hypothesis

- ✓ The hypothesis should be a strong statement based on background research and experience.
- ✓ Suggestion: start with "I believe…"

_____

_____

_____

_____

_____

2nd Step. Your Experimental Design.

7th <u>Materials</u>: List all materials that you will need to use when you do your experiment or investigation.

1/ _____ 6/ _____

2/ _____ 7/ _____

3/ _____ 8/ _____

4/ _____ 9/ _____

5/ _____ 10 /_____

8th <u>Procedure:</u> (Use the number of steps you will need)

- ✓ Give a detailed step by step description of the procedure you will follow in the course of your experiment or investigation. Number each step.
- ✓ Identify all variables involved and establish constants so that the experiment is performed in a fair way! All groups should be equal.
- ✓ What kind of measurements will you make and what tools will you use to make them.
- ✓ Make "subjective(opinion)" measurements more objective by setting up a rating chart of 1 to 10. Attach.
- ✓ Attach rating chart or questionnaire if using one. Must be approved!

1st _____

_____

2nd _____

_____

3rd _____

_____

4th _____

_____

5th _____

_____

6th _____

_____

7th _____

_____

8th _____

_____

9th _____

_____

10th _____

_____

11th _____

_____

12th _____

_____

9th Variables:

The **constants** in my experiment are (those things kept the same in order to make your experiment fair).

The **experimental factor (Independent Variable)** in my experiment is… (the factor you are experimenting with).

Dependent Variable: *What will you measure? What units of measurement will you use? How will you collect this data?*

My **control group** is…*(describe your control..the group you don't experiment with and use for comparison).*

3rd Step. Plan how you will set up your data table and graph.

10th Data Tables, Charts, Graphs, Pictures, and Models

- ✓ Draw **an example** of the kind of table or chart you will use to record your data when you collect it. If you will be rating something subjective you will have to create a sensible rating scale (1 to 5 or 1 to 10) and describe the conditions that apply for each rating. Use separate sheet.

11th Graph:

- ✓ Draw examples of the kind of graph you will use to analyze and display your data. Make sure you label the axes and give the graph a title. Use separate sheet.

4th Step. Complete experiment and gather data. Create data table. Analyze results.

12th <u>Analyze Results</u>:

- ✓ In words, state how your measurements and observations turned out. Use your graph and data table as a source of information. Take **digital pictures** of your procedure and results for your report-display board.

5th Step. Conclusion and abstract.

13th <u>Conclusion:</u>

1st Compare the results of your experiment to your hypothesis (Yes or no).
2nd Discuss your findings: explain what you learned.
3rd Relate your conclusion and findings to 'real life' situations and current issues.
4th Discuss any problems or what you could do different if you were to repeat or expand your experiment.

14th Abstract A brief summary of your total science fair project.

1/ The purpose of my project was to show ….
2/ My hypothesis was ….
3/ A brief description of procedure.
4/ A brief description of data.
5/ The conclusion of your project (yes or no to hypothesis).

Acknowledgements:

References: *(Use references listed in the research section of workbook).*