BCPS Science Fair Information & Requirements

1. BCPS reserves the right to remove any project that is considered unsafe.
2. A research paper is required
3. Project sounds, lights, odors, or any other display items must not be distracting to others.
4. NO food or drinks are allowed
5. MUST have a tri-fold science fair board.
6. The following must be on the board mentioned above:

Title	Materials
Introduction	Procedure
Purpose	Analysis
Hypothesis	Conclusion
Research	

7. The following ARE NOT allowed:
   - *Living organisms *taxidermy specimens
   - *Preserved vertebrate or invertebrate animals
   - *human or animal food *human/animal parts of fluids
   - *plant materials(living, dead, or preserved)
   - *all hazardous substances or devices
   - *dry ice *sharp items
   - *flames or highly flammable materials
   - *batteries with open top cells
   - *photos or other visual representation of surgeries, dissections, or other lab procedures that harm animals
   - *glass or glass objects unless approved
8. The following ARE allowed BUT with restrictions:
   - * soil, sand, rock must be in a sealed & labeled container
   - * all chemicals including water must be in a sealed & labeled Container
   - *any apparatus with unshielded belts, pulleys, chains, or moving Parts with tension (display only, not operating)
   - *lasers CAN NOT be used unless you have a sign "Laser Do not look into the beam"
   - * electricity can be used but you must provide own UL-listed 3-wire extension cord

PARTS OF A SCIENCE FAIR PROJECT

QUESTION:

Good science investigations begin with a question. This questions often asks "what if," "how," or "what effect something will have." The question should be one that can lead to an experiment which will yield either quantitative or qualitative data. A question that is well written will often identify the independent variable in the experiment.

HYPOTHESIS:

A hypothesis is an attempted answer to the question being investigated. The hypothesis attempts to predict that outcome of the experiment and suggests a possible reason (s) for this outcome. The hypothesis should be based on prior knowledge or observations and is proven true or untrue by the investigation.

MATERIALS:

Materials used in the experiment need to be listed in specific amounts and sizes. (Example- thee five gram weights) This allows other people to replicate the experiment exactly to see if they get the same results. This process is called verification.

PROCEDURE:

The procedure used in an experiment must be written in a clear, sequential manner in order to allow someone else to follow the same steps to replicate the experiment. Numbering the steps followed in the procedure is helpful to someone who is reading this procedure. In determining the procedure that will be used in the investigation the factors that will affect the outcome of the experiment, called variables, must be identified and controlled. There are three types of variables that must be considered.

- **Independent Variable (manipulated)** – the factor that will be intentionally changed during the experimental procedure in order to find out what effect it has on something else. An example of an independent variable is using different lengths of string to construct a pendulum in order to observe the effect the length of the string has on the swing of the pendulum.
- **Dependent Variable (responding)** – the factor that is observed and measured to see if it is affected by the change made in the independent variable. An example of a dependent variable is the number of swings the pendulum makes when the length of string is changed.
- **Variables that are controlled** – the factors in the experiment that must be kept exactly the dame to make sure they are not having any effect in the dependent variable. Variable that would need to be controlled in the pendulum experiment would be the mass of the pendulum, the type of string, and the release height of the pendulum.

RESULTS:

The results of the experiment include the measurements taken and observations made as well as a written explanation of the outcome. Data that are observed or measured during the experiment should be recorded as the experiment is conducted. The best format to collect data is called a data collection able. When constructing a data collection table, it should be remembered that repeated trails of the experiment must be conducted to obtain valid results. Data can then be analyzed and graphed. A statistical analysis of the collected data to include the mean, mode, and range can be completed where appropriate. It is helpful to present the data in the form of a graph so that the data illustrated can easily be interpreted. The two most commonly used types of graphs for science experiments are detailed below:

Bar graphs are usually used to display discrete data, or data that is distinct and separate from other information. Data shown on a bar graph often reflect measured or counted amount's. For example, the average number of drops of plain water versus the average number of drops of soapy water that will fit on a penny would best be shown on a bar graph. The bars drawn on a bar graph must all be the same width and are separated by spaces in between them.

Line graphs are used to display continuous data or data that goes on without a stop or break. Experiments that have dependent (responding) variables involving temperature, time, or distance will usually yield data that should be graphed as a line graph. Line graphs are useful to analyze relationships among collected data. In particular, line graphs can show trends in data- increasing, decreasing, or staying the same. The dissolving time of s solid in a range of different temperature would be an example of data best displayed on a line graph.

The independent (manipulated) variable is usually represented on the horizontal (x) axis of a graph and the dependent (responding) variable is represented on the vertical axis of the graph. The graph should also have:

- Numbers in even intervals
- Labels for both the horizontal (x) and vertical (y) axes; and
- A title that reflects the information that is being represented on the graph

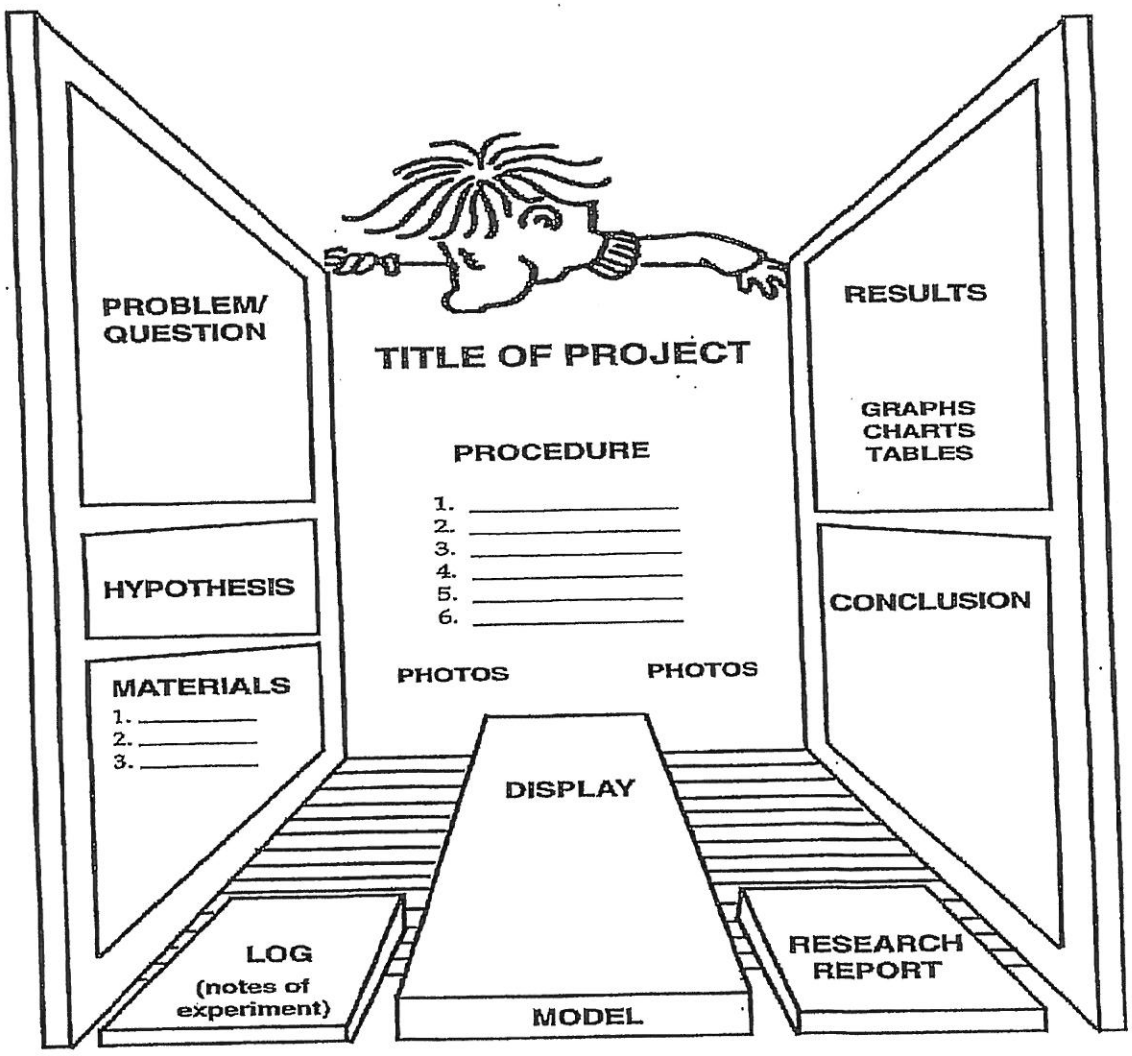
CONCLUSIONS:

A conclusion has four parts:

1.) It should reflect back on the original hypothesis and state whether it was supported or not.
2.) It should answer the original question that started the investigation and include results used as the basis for that conclusion.
3.) It should include inferences that can be made from the results of the experiment.
4.) It should include any additional questions that could be investigated or information that could be researched in the future. In addition, any problems that were experienced during the experiment can be discussed.

Science Fair Project Display Information

The picture displayed below with information is the criteria for a project to be entered into the BCPS District Science Fair.



TITLE: short, catchy, related to subject
QUESTION/ PROBLEM: a question to be tested
HYPOTHESIS: the predicted answer to the question asked in the question (problem); educated guess
MATERIALS: a list of the supplies, equipment to be used
PROCEDURE: a list of the steps followed to perform the experiment
RESULTS: short written description of exactly what happened and data graph or chart form to include data analysis (mean, median, mode, and range)
CONCLUSION: to be valid or invalid (supported or not supported)

Division of Student Learning
Bullitt County Public Schools
February, 2011

BULLITT COUNTY PUBLIC SCHOOLS
SCIENCE FAIR JUDGING SHEET

5= SUPERIOR 3=GOOD CHECK ONE OF THE BOXES TO THE RIGHT ACCORDING TO GRAND TOTALS		SUPERIOR 85-100 EXCELLENT 70-84 MERITORIOUS 1-69	

AREA	1	2	3	4	5	COMMENTS
CREATIVE ABILITY/KNOWLEDGE (30 PT. MAX)						
Presents a new or unusual idea						
Understands project's concept and process						
Shows curiosity and learning through research						
Creative use of materials and method of presentation						
Purpose, procedure, data & conclusions obvious in display						
Verbal presentation indicates good knowledge of subject						SUB TOTAL:
SCIENTIFIC THOUGHT (25 PT. MAX)						
Topic/Purpose/Hypothesis clearly stated and limited						
Materials clearly and adequately identified						
Scientific method followed to obtain results						
Results clearly stated with supporting data						
Conclusions confirmed by the data						SUB TOTAL:
THOROUGHNESS (10 PT. MAX)						
Correct spelling and labeling						
Neat/attractive and meets regulations (category/size/material)						SUB TOTAL:
SKILL (10 PT. MAX)						
Well constructed project & method of display that works						
New way or apparatus to show research						SUB TOTAL:
CLARITY (10 PT. MAX)						
Important points presented to show understanding						
Student is well prepared & shows time spent on project						SUB TOTAL:
DRAMATIC VALUE (EYE CATCHING) (10 PT. MAX)						
Used colors & design attractively						
Effective use of charts, graphs, and/or illustrations						SUB TOTAL:
WRITTEN REPORT (5 PT. MAX)						
Purpose, Hypothesis,Explanation,Summary,Conclusion						SUB TOTAL:
GRAND TOTAL						**GRAND TOTAL:**

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EXPERIMENT WRITE UP

Question:

Materials: (list specific amounts)

Hypothesis:

Procedure:

Independent variable:

Dependent variable:

Controlled variables

Steps:

Results: (Charts, Graphs, Diagrams)

Conclusion: