

Steps for the TMA Science Fair / Invention Project

Phase I: Concept Map – Nov. 30, 2011

Project Proposal Form - Dec. 7, 2011

A. Choose a science-related topic or invention that interests you. Go to the library and find some books and periodical articles on your subject. When you really understand your topic begin to think of an interesting science fair project and experiment or invention related to your topic.

B. Complete a Concept Map by end of class time on **Nov. 30th**.

C. Develop a Statement of a problem or question related to your topic.

D. Develop a Hypothesis for the problem or invention to solve the problem.

E. Develop the Design for an experiment to test your hypothesis or a design and drawing of an invention.

F. Record items in steps C, D, and E on a Proposal form. Keep a log book of everything you do on your project.

G. Submit the topic and title of the project for approval on the Project Proposal Form no later than Dec. 7, 2011. The Project proposal form and any additional sheets necessary (vertebrate animal and human subject projects require additional permission forms) will be reviewed and signed by the parent(s), mentor and Dean.

Phase II: Research Questions due Dec. 14, 2011

Research Paper due NO LATER THAN Jan. 11, 2012

Experiments should be completed by Jan. 25, 2012

A. Do research to provide background and observations about your topic. Make a list of **Research Questions** to guide you, **due Dec. 14th**. Compile a bibliography. (Use the Research Questions, Notefact, Organizing notefacts and Bibliography methods from Independent Investigations.)

B. Set up an experiment to test the hypothesis and check the experiment for problems, reliability, and overall suitability. **Or build a model** of your invention and test for reliability and feasibility.

C. Run the experiment (a few times if possible) to see whether it will work. **Or make modifications** on your invention.

D. Write a 5 page paper explaining your original ideas and goals, what you hope to prove, work you have done so far and related research. **Use the Notefact, Organizing notefacts and Bibliography methods from Independent Investigations.** The paper will cover steps A-D. Suites III, IV and V should include a rough draft of your abstract. An abstract is a short summary of your work. **Due no later than Jan. 11.**

E. Run the experiment and collect data. Run it as many times as you can to verify your results. Results (data) to be checked by your mentor. **Or build a working model of your invention.** Experiments should be completed by Jan. 25th.

Phase III Due NO LATER THAN Feb. 8, 2012

A. Build an exhibit display of your project. (Details for the display will be given out on a separate paper.)

B. Add the data collected from your experiment to the paper you prepared in the second phase. Data should be presented in an organized manner such as a **chart, table or graph** in your paper and on the display. Or make **final drawings** (to scale) of your invention.

C. Develop final conclusions about your original hypothesis using experimental data. Or make final statements about how your invention solves a problem and how feasible it will be to manufacture and market.

D. Revise your paper based on your mentor's comments and adding items from Phase III B and C. Be able to explain and defend your hypothesis and conclusion, or invention. Suites III, IV and V should include a 250-word (maximum) abstract as their first page. See the separate guidelines for Abstract. Your paper will also receive a language arts grade.

E. Present your project at the School Science Fair on February 8, 2012. **The final project display should include the Display Board, Model of invention or set-up of experiment if possible, Final Paper and Log Book.** (No animals or microorganisms will be allowed at the display so take pictures during your experiments.)