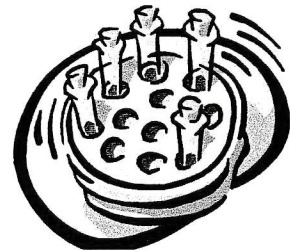
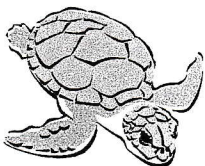
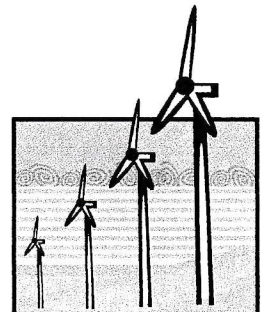
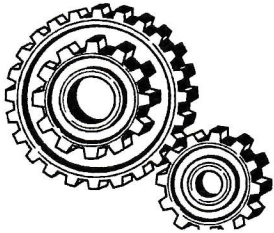
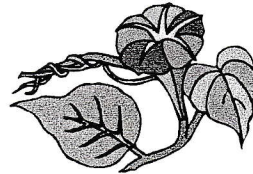
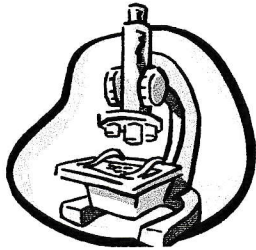


INVENTION PROJECT

3RD - 5TH GRADE



Student Information Packet



Helpful Hints for Students



- ⌚ Start EARLY; don't wait until the last two weeks before it is due.
- ⌚ Plan it out. It will be much more fun if you spread the time out over several days per week or several weekends, and you won't have to race to get it done! It might look like this:

Week 1 – Decide on your QUESTION – what you want to find out.

Week 2 – Collect and read books about your topic.

Week 3 – Work the steps of your project.

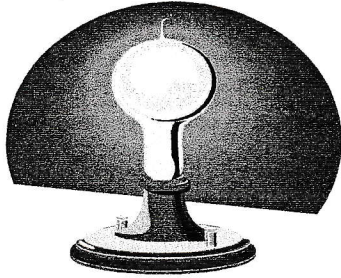
Week 4 – Think about the results and make your charts or graphs.

Week 5 – Write your report.

Week 6 – Make your display.

- ⌚ Check with your parent or teacher if you want to use a web site for research. Not all web sites give correct information.
- ⌚ Students in 4th and 5th grades should be doing almost all of this by themselves.
- ⌚ Students in 2nd and 3rd grades should be able to do many parts.
- ⌚ Students in Kindergarten and 1st grade will need help for most of the project.
- ⌚ This is to be a fun process. "Success" is a completed project where you had fun and learned a lot.
- ⌚ Enjoy the fun!

INVENTION: ENGINEERING NEW IDEAS



CREATING A SCIENCE FAIR INVENTION PROJECT USING THE ENGINEERING DESIGN PROCESS

For 3rd through 5th Grades ONLY

Nearly everything we use, work with, or wear is engineered. Someone had to think of how to design that object to solve a particular problem. Anyone can be an engineer! An engineer is someone who uses knowledge of science and math, and their own creativity to design objects or processes (inventions) to solve problems.

I. ASK

Ask a question about an everyday problem you would like to solve. Inventions can be almost anything created to solve a problem or meet a need. Examples include pencils, cups, cell phones, processes to clean water or move heavy objects, etc.

II. RESEARCH

Research products/processes already available to meet a need or serve a similar function. To do your research, look online, visit stores, and interview experts as well as potential invention users.

III. BRAINSTORM

Brainstorm possible solutions. Imagine a few different set-ups or designs. Compare and talk about the positive and negative points of each idea. Do not just try your first idea, but choose the *best* one. Reach consensus on which idea is the best possible solution.

IV. PLAN

Create a plan. Draw a diagram and label the parts of your diagram. Use symbols to label the parts. Make a list of the materials you would like to use for your invention and the amounts you will need.

V. CREATE

A. Materials: Collect the materials you will need for your invention. It is best to borrow, make, or use inexpensive materials.

B. Build: Build your invention according to your "plan."

C. Test: See if it works! Keep a data log of when and how you tested. Evaluate the results.

VI. IMPROVE

Gather information from the "test" of your first design to help find problems that need improvement. Improve your first design and test again. Make it better!

ELEMENTARY INVENTION

WRITTEN REPORT CONTENT

3rd through 5th Grades

* **TITLE PAGE**

See *Written Report Format* on next page.

* **PURPOSE**

In three sentences or less, tell why you did your science project on the topic you chose.

* **ACKNOWLEDGEMENTS**

In one or more sentences, say "Thank You" to those who have helped you with your project. You should include those who gave you guidance, materials and the use of facilities or equipment.

* **TABLE OF CONTENTS**

List each of the following sections and the page numbers for each (see page 17). Type the page number at the bottom of each page after you have finished the final copy of your report.

* **PROBLEM**

State the problem in the form of a question. The problem is one sentence long and specific. Your page numbering begins here.

* **RESEARCH**

This part of your report has information that was found by other scientists and relates to your topic.

* **POSSIBLE SOLUTIONS**

Describe and/or diagram possible solutions you considered. Include a table that shows positive and negative points (strengths and weaknesses) for each. Identify the solution you chose to try, explaining why you chose it.



PLAN

* List the materials you used.

MATERIALS **PROCEDURE**

List the steps for testing your invention. Diagrams are helpful in this section. Do not use the words "I" or "you".

DATA

Show what you observed during the experiment. Include measurements you made. You may also use drawings to help show what you observed.

RESULTS

The results are a summary of your data. The results section of your paper is organized into graphs and charts. This is where you tell about your data and what you observed. *Remember, even if your data shows that your hypothesis was incorrect, your project is still good.*

* **CONCLUSION**

Look over your report, graphs, charts and tables. Use two or three sentences to evaluate how well your invention worked.

* **IMPROVE**

Based on your conclusions, describe changes you made to your invention so that it would work better. Tell about the results of your improved design.

* **APPLICATION**

Now that you have finished your project, use this section to share with others your thoughts about this experience. Did you have any problems? What would you do differently next time? Explain how what you learned from your project applies to the real world.

* **SOURCES / BIBLIOGRAPHY**

List all books, articles, pamphlets and other communications or sources that you used for researching your topic and writing your paper. You must have at least two sources, and only one may be an encyclopedia. Interviews with experts in your field of study are encouraged.

ELEMENTARY INVENTION WRITTEN REPORT FORMAT

Each line with a box () preceding it begins a new page in the report.

ALL of the items listed below must be included in reports for 3rd -5th grade projects.

Title page

Title in middle of page

In lower right-hand corner:

Last Name, First Name

Grade ____

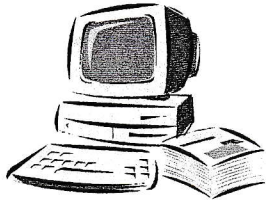
Teacher Name

School Name

Date (include year)

- Purpose
- Acknowledgements
- Table of Contents (with page numbers)
- Problem (Question) (page numbering starts here)
- Research
- Possible Solutions
- Plan
 - Materials
 - Procedure
 - Data
 - Results
- Conclusion
- Improve
- Application
- Sources / Bibliography (Use format on next page.)

1. The original report goes inside the report pocket on the display board.
2. A COPY should be kept at home or on the computer.



**ELEMENTARY INVENTION
WRITTEN REPORT FORMAT
FOR**



SOURCES / BIBLIOGRAPHY



Entries in a bibliography are alphabetized by the last name of the author or the first word of the title. An entry for which the author is unknown, such as a newspaper article or an unsigned review, is alphabetized by the first word of the title, excluding the articles *A*, *An*, and *The*.

Books

Basic Form Bronowski, Jacob. The Ascent of Man. Boston: Little & Brown, 1973.

Two Authors March, James G., and Herbert A. Simon. Organizations. New York: Wiley, 1958.

Magazines

Weekly Tuchman, Barbara W. "The Decline of Quality." New York Times Magazine, 2 Nov. 1980: 38-57.

Monthly Brown, Norman O. "Apocalypse: The Place of Mystery in the Life of the Mind." Harper's. May 1961: 27-35.

Newspapers

Basic Entry Kristof, Nicholas D. "Oil Futures Plunge on OPEC Doubt." New York Times, 3 Jan. 1985: D13.

Reference Works

Encyclopedia Entry, Unsigned

"Huygens, Christiaan." Encyclopedia Britannica. 13th ed.

Dictionary Entry

"Advertisement." Webster's Third International Dictionary. (Because the number of the edition appears in the title, the date is not necessary.)

Atlas Entry

"Hidden Face of the Moon." Times Atlas of the World. 1981 ed.

Nonprint Sources

Video

Redford, Robert, dir. Ordinary People. With Mary Tyler Moore and Donald Sutherland. Paramount, 1980.

Computer Materials

Computer Software

Visispell: Fut.heuristix. Version 1.00. Computer software. San Jose: Visicorp, 1983. Disk.

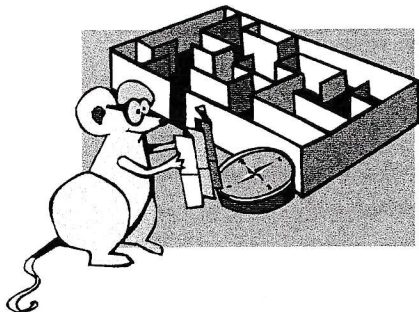
Web Sites

Corte, Corrinne. "Why Are British Sailors Called Limeys?" *Ask A Biologist*. Arizona State University.
<http://ls.la.asu.edu/askabiologist/research/scurvy/index.html> (8 Mar. 2001)

Interview

Persons name (last name first), position or work title, place of interview, date of interview.





ELEMENTARY INVENTION DISPLAY INFORMATION

BACKBOARD MATERIALS

The backboard must be sturdy and stand by itself on a table. Foam core-board and cardboard are the best materials. If you need to cut through the sides of your core-board to make "wings", do not cut all the way through.

COLORS

If you need to paint your backboard, enamel paint works best. Do not use water-based paint. Contact paper may also be used. Use a minimum of three contrasting colors on your board.

LETTERING

Your title and subtitles may be computer-generated or cut from construction paper. Do not freehand the letters. The title letters should be 3-4 inches high. The subtitle letters should be 1-2 inches high. The subtitles, which are mandatory on the display board, are: Problem, Hypothesis, Procedure, Results and Conclusion. All items on the display must be glued to the board. Do not use pins, tacks, staples, or tape.

DRAWINGS, PHOTOS AND GRAPHS

Drawings and photos are most useful on the display. Drawings should be drawn in pencil first and then retraced. Drawings should be in color and outlined in thin black felt tip pen. Graphs and charts must be used in the results section. They may be computer-generated. All graphs and charts must have explanatory titles. Graph axes must be labeled.

If you have a camera, you should photograph your experiment's progress. A photo of you with your experimental set up is encouraged. All photos must be titled.

DISPLAY DIMENSIONS

1. When backboard (display portion) is flat, it should be 48 inches wide.
2. Side panels ("wings") should be 12 to 18 inches.*
3. Height should be no more than 48 inches.

REPORT POCKET

There must be a "pocket" on the display to hold your report.

When you have decided what you are going to put on the backboard (display), lay the unglued display on the floor and look at it carefully. Have family and friends look at it and ask their opinions. Then, you should glue everything into place. Examples of displays will be shown and discussed in class.

DISPLAY SIZE & SET-UP

FOR SCHOOL SITE AND LBUSD SCIENCE FAIRS

