

# Chemistry Project Idea Sources

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## Topics

Environmental – Examples: Water quality testing for such things as water hardness, Fe, pH, dissolved oxygen, detergent level, nitrates, phosphates, etc. (Hach makes wonderful test kits for almost anything you want to test for. <http://www.hach.com/>)  
Measuring the level of ozone in the air.

Consumer products – Examples: Testing sandwich meats for amount of water and fat. Finding the amount of sugar in various soft drinks. Testing sunscreens to see how effective they are.

Basic chemical research – Examples: Investigating the kinetics of polyphosphate breakdown in water. Synthesis of a new glue. Comparison of stretching ability of plastics, elastomers, and fibers. The production of C<sub>60</sub>. The determination of the heat of combustion of different types of wood.

Projects can also be categorized by the apparent area of chemistry into which they fall: analytical, organic, physical, inorganic, biochemistry.

It is easy to find ideas for simple projects in chemistry – just type in science fair projects into the search engine Google! ([www.google.com](http://www.google.com))

You can also find some good starter projects from the list I have on my web site. ([http://www.apsu.edu/robertsonr/sciencefair/project\\_ideas.htm](http://www.apsu.edu/robertsonr/sciencefair/project_ideas.htm))

For more advanced projects you will want to consult some of the magazines and scientific journals below.

## Magazines and Journals

### **Journal of Chemical Education** (<http://jchemed.chem.wisc.edu/>)

- *The Ideal Solvent for Paper Chromatography of Food Dyes*, 65(10), October 1988, p. 899.
- *Determination of the Effect of Various Modes of Cooking on the Vitamin C Content of a Common Food, Green Pepper*, 65(10), October 1988, p. 926.
- *Sampling and Analyzing Air Pollution*, 71(4), April 1994, p. 318.
- *Using Kinetics Experiments from The Journal of Chemical Education as the Basis for High School Science Projects*, 65(12), December 1988, page 1067.
- *The Spectrophotometric Analysis and Modeling of Sunscreens*, 74(1), page 99.
- *The Extraction of Caffeine from Tea: A Modification of the Procedure of Murray and Hansen*, 73(12), page 1172.
- *Determination of Phosphorus in Cola Drinks*, 73(12), 1173.

- *Determination of Sugar Content in Commercial Beverages by Density: A Novel Experiment for General Chemistry Courses*, 75(9), page 1122.
- *The Gelation of Poly(Vinyl Alcohol) with Na<sub>2</sub>B<sub>4</sub>O<sub>7</sub> · 10 H<sub>2</sub>O: Killing Slime*, 74(1), page 97.
- *Kinetics of Platinum-Catalyzed Decomposition of Hydrogen Peroxide*, 80(7), page 788.
- *Simple Measurement of Magnetic Susceptibility with a Small Permanent Magnet and a Top-Loading Electronic Balance*, 79(8), page 1002.
- *Kinetic Studies in a Washing Bottle*, 74(5), page 566.
- *The Reaction of a Food Colorant with Sodium Hypochlorite: A Student-Designed Kinetics Experiment*, 75(9), page 1142.
- *Lightstick Kinetics*, 76(11), page 1514.
- *Rate Law Determination of Everyday Processes*, 79(8), page 989.

### **Chem 13 News** (<http://www.chem13news.uwaterloo.ca/issues.html>)

- *Does F Protect?* (Fluoride ion protection of egg shells from acid attack), October 1994, # 233.
- *Effects of NO<sub>x</sub> and SO<sub>2</sub> on Plant Pigments*, April 1990, #194.
- *Molecules of Life* (extraction of biochemical compounds), September, 1984.
- *Projectips*, October 1994, #233.

### **The Physics Teacher** (<http://ojps.aip.org/tpt/>)

- *Calibration and Efficiency of Microwave Ovens*, November 1990, p. 564.
- *The "Quicker - Picker - Upper"*, November 1990, p. 548.
- *Thermodynamics and Frozen Foods* (Enthalpy change during freezing), January 1993, p. 52.
- *Ideas for the Amateur Scientist*, November 1978, p. 544.

### **Scientific American** (<http://www.sciam.com/>)

- (The Amateur Scientist) *How to Monitor Ultraviolet Radiation from the Sun*, 263(2), August 1990, page 106.
- (The Amateur Scientist) (Stretching of polymers), February 1990, p.100.

### **The Science Teacher** (<http://www.nsta.org/>)

- *Investigating Carbon Dioxide - Measuring CO<sub>2</sub> in Air Samples*, David Keller, 61(8), November 1994, page 18.

### **The Mother Earth News** ([http://www.motherearthnews.com/index\\_js.html](http://www.motherearthnews.com/index_js.html))

- *Modest Experiment in Methane Gas Production*, Robert C. McMahon, #20, March, 1973, page 48.
- *John Ott: The "Light" Side of Health*, January/February, 1986, page 17.

### **Science of Food and Agriculture (Council for Agricultural Science and Technology)**

- *Zinc Chloride Preserves Fruit*, January 1990, page 10.
- *Water's Importance in Meat Processing* (Water binding to meat), January, 1990, page 8.

### **ChemMatters**

- *Measuring Ground Level Ozone*, September 2002, page 8.

- *Green Energy – It's Your Decision*, April 2003, page 8.
- *Filtered Water vs. Straight from the Tap*, October 2002, page 8.

## **Other resources**

### **Lab manuals**

### **Scientists**

### **TV**

### **Textbooks**

### **Newspaper**

- *Odors may help jog memories*, 85(164), The Nashville Tennessean, page 1A.

### **NSTA books**

*Experimenting with Model Rockets*

*Vitamin C Testing*

*Bubbleology*

## **Design**

Remember that your main project goal should be to design a procedure that will give quantitative information and allow you to answer a question.

- Ask a question
- Research what others have done.
- Decide on your procedure. Be as quantitative as possible.
- Perform the experiment.
- Take the data and make graphs, perform statistical tests, etc.
- Draw conclusions from the results.
- Evaluate the experiment and perhaps change the procedure based on your experience the first time through.
- Repeat the experiment until you have consistent results.

When this cycle is completed, I recommend that you write the project paper, then construct the board and the oral presentation. This should help you to organize your thoughts and communicate them to others better.