

MASTER/STEP Summer Program  
Herbert Lehman College, CUNY  
Bronx, NY

Course: Consumer Chemistry  
Instructor: Zoraida Colon

On July of 2008 an abridged format of a consumer chemistry course was offered to honors students from Dewitt Clinton High School. There were four classes and each class attended for eight days of intensive hands-on activities.

**Day 1:** Introduction to Consumer Science, Safety, Chemical Principles  
Activity: Making gels, polymer chemistry.

Students understood the difference between science and technology. We discussed the historical aspect of everyday products such as plastics and analgesics. Safety in the laboratory was also covered based on the campus policy.

Then we introduced the concept of polymerization. Students studied mixtures of solids and liquids and observed the behavior of semi-solid, non-Newtonian fluids. This activity was chosen to practice observations skills and motivate students to learn more complex chemical principles.

**Day 2:** Making Gels con't. Introduction to Chemistry: the periodic table of elements, bonding, and chemical properties.

Upon completing the comparison of three types of gels, students were introduced to chemical reactions. The Identification of Ionic Substances kit provided students with the instruments and reactants needed to observe chemical changes and identify unknown substances.

**Day 3:** Antacids

Students understood the classification of drugs and regulatory factors governing its administration. Labeling and manufacturing processes were discussed. Then students investigated the properties of five known brands in order to classify them for the general public. Absorbability, solubility, and pH (through titration) were some of the properties discovered in order to determine the effectiveness of each brand. Students also learned to convert qualitative observations into quantitative observations.

**Day 4:** Ice Cream and Freezing Point Depression

In this activity students investigated colligative properties of mixtures and at the same time have fun making ice cream. Students understand that state of matter depends on the energy absorbed and released by a system. Temperature is an indicator of this change.

They learned that freezing points of solutions change based on the contents in the mixture, not on its chemical properties.

#### **Day 5: Aspirin**

Students gain an understanding of the analgesics industry and discover why there are so many brands of aspirin on the market. Students understand through titration, solubility, acid and base reactions the characteristics of various brands of this analgesic and uncover the reason for the variation.

#### **Day 6: Kitchen Chemistry & Soda Pop Science**

Students understand how scientists try to identify ingredients in kitchen products. Baking soda, baking powder, corn starch, and table salt are distinguished, and then students were asked to determine the presence of powders in an unknown mixture.

Students made observations regarding soda. They read ingredients, conducted physical and chemical tests and described the difference between carbonated and non-carbonated beverages. Sweeteners (corn syrup) and artificial sweeteners (saccharin, aspartame and sucralose) are described as well as the role of caffeine and citric acid. On the last day we demonstrate why temperature and surface area are also attributes to packaging carbonated beverages.

#### **Day 7: The Chemistry of Tie-Dying**

Students understand the concept of bonding through the tie-dying process. The chemistry involves understanding color, mixing colors, fixing dyes, and making dyes soluble. We begin the discussion with types of fabrics (fibers), the fashion industry, and the dying process. Students appreciate the technology of tie-dye as both art and science.

#### **Day 8: The Chemistry of Tie-Dying & Soda Pop Science Conclusion**

Students wash their shirts and view their work. A discussion of what makes a good tie dye concludes this activity. Students appreciate the work of others. By the end students have learned to work with each other and accept strategies offered by their team mates.

The end is a blast! We discuss the Mentos & Cocal Cola activity and how it evolved. Then we go outdoors and conduct a final experiment....