



# A SCHMAHL SCIENCE WORKSHOP

Presents to

Wednesday Homeschool

At San Jose History Park, 1650 Senter Rd., San Jose (at Senter and Phelan)

Like children everywhere, the children at A Schmah Science Workshop love science. And like children everywhere, they learn most when they are motivated, challenged and having fun. We are a partnership of students, parents, teachers, scientists and engineers who have come together to help foster this interest in science. We believe children are motivated to learn when their ideas are cultivated through the fun of designing and developing an experiment.

## 2<sup>nd</sup> - 5<sup>th</sup> Grade Chemistry Series

April 16, 23, 30; May 7, 14, 21, 28; June 4, 11

Wednesdays, 1:30 - 2:30 PM

Fee: \$117

- **Liquid Nitrogen and States of Matter:** Liquid Nitrogen is an extremely cold, liquefied gas. It can be used to demonstrate lots of interesting effects from superconductivity to the properties of gases & liquids, and a whole lot more! We will be using liquid nitrogen to investigate how cold temperatures affect materials. We will also be discussing the phases of matter and how the Kinetic Theory of Gases models these phases. (Code 11)
- **Conduction - Air Moves:** Using our flow density demonstrator, solar wind bag and singing pipe, students will learn that hot air rises and cold air sinks and how this principle is put to use in a conduction oven. Students won't believe their eyes as they explore the powerful properties of air as you put marshmallows to the pressure test. Students will be challenged to use Bernoulli's Principle to blow up an 8-foot long bag. With a little practice they will be able to inflate the bag using only one breath! (Code 103)
- **Fun with Chemistry:** Before we can discuss food chemistry, the students must understand basic chemistry concepts. The periodic table of the elements is the grand, unified theory of chemistry. With hands-on activities we introduce our students to The Periodic Table. We also present the Table as a landscape, with fields of metals, pools of mercury and bromine, clouds of gases, and the offshore island of rare earths. (Code 199)
- **Physical Property of Matter - Density:** Students discover the idea of density as a mathematical concept. Students determine the mass and volume of 48 density specimens, and graph the results. The data is not random, but shows a clear linear pattern with a slope characteristic of the material used. The slope is called the density of the substance. The samples will also be used for testing students' measuring abilities, and as samples of industrially important materials. (Code 260)
- **Heat Conductivity of Metals:** So, how does heat make it from the burner at the bottom of your pan through to the other side and into the food? The answer is: *Conduction*. Though not necessarily decisive, knowing how well a material conducts heat is the first step in making a cookware choice. At this workshop, students will perform experiments that will determine the heat conductivity of



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aluminum, brass, copper, iron and stainless steel. This knowledge is essential for selecting the appropriate pots, pans, and skillets used primarily on the stovetop, where heat-up speed and responsiveness to temperature changes can be critical and uniform heating is essential for preventing hot spots that burn food before it's entirely cooked. (Code 262)

- **Corrosion** - Materials that have highly desirable thermal properties also tend to be highly reactive (and vice-versa). Materials that are highly reactive tend to have chemical reactions with other substances around them. A good example would be iron, which tends to react with oxygen to form iron oxide or, as we commonly know it, rust. Students will use fresh fruits and vegetables to extract pigments that are sensitive to iron and tin. Color changes in the presence of metals offer insight into the chemistry of oxidation-reduction reactions and its application to the shelf life of preserved foods. (Code 286)
- **Acids and Bases** - For thousands of years people have known that vinegar, lemon juice and many other foods taste sour. However, it was not until a few hundred years ago that it was discovered why these things taste sour - because they are all acids. The term acid, in fact, comes from the Latin term *acere*, which means sour. While there are many slightly different definitions of acids and bases, in this lesson we will introduce the fundamentals of acid/base chemistry. Students will perform seven experiments: reacting metal with acids and producing hydrogen in safe quantities, collecting and safely testing hydrogen, reacting carbonates with acids and producing carbon dioxide, collecting and testing carbon dioxide, observing the effects of acids and bases on indicator dyes, measuring the concentration of acids by titration of an "unknown," and performing a neutralization experiment. (Code 285)
- **Determination For Vitamin C:** Vitamin C is in your orange juice, your broccoli, and your Flintstones. But do you know if it is in your apple? Is there more in a strawberry or a tomato? Do the test yourself! Vitamins are essential nutrients that all animals must get from their diets. (Code 224)
- **Crystals: Gum Drop Models:** Students build models of crystals using gumdrops to demonstrate the internal ionic structure of minerals and how the internal arrangement of ions is reflected in the crystal shape of the mineral. (Code 300)



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Child's Name \_\_\_\_\_ Grade 2007-08 \_\_\_\_\_

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Child's Name \_\_\_\_\_ Grade 2007-08 \_\_\_\_\_

Parent Name \_\_\_\_\_ email \_\_\_\_\_  
(registration confirmation sent by email)

Address \_\_\_\_\_

City \_\_\_\_\_ Zip \_\_\_\_\_

Home Phone \_\_\_\_\_ Emergency Phone \_\_\_\_\_

Any Medical issues for child (ren) \_\_\_\_\_

Please indicate names of children that will attend each workshop. **If you are using Ocean Grove Charter School to cover the cost of this workshop, please add a \$5.00 per child fee for processing.**

Workshop Series	Students' Names	# of Students	Amount Due
<b>Chemistry Series</b>			
<b>Fee: \$117 per student</b>			
<b>Fee for Ocean Grove Charter students (\$5.00 per student per session)</b>	<b># of sessions x # of student X \$5.00</b>		
<b>Total due</b>			

Payment is due with registration. Please only send check or money order made out to A Schmahl Science Workshop. No refunds. No substitutions. Mail registration to: A Schmahl Science Workshop, 171 Branham Lane, Ste. 10, PMB 223, San Jose, CA 95136

- Please check if you wish to be added to our mailing list for future workshops \_\_\_\_\_
- Please check if we may send information to you via email \_\_\_\_\_
- SSW may take pictures during the Workshops to be used for publicity for SSW. Names of children and locations where pictures were taken will not be published.