



Schmahl Science Workshops

A Schmahl Science Workshop

Schmahl Science Workshops, Inc.

Like children everywhere, the children at A Schmahl 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. A Schmahl Science Workshop is pleased to be able to present the following workshops to James Franklin Smith Elementary School.

DATES: Fridays, starting January 8. Please sign up for the **Grade 4 - 6 Science Series by December 20**. Pre-registration is required.

January 8, 15, 22, 29; February 5, 12, 26; March 5, 12, 19, 26; April 16, 23, 30; May 7

TIME: 2:30 - 3:30 PM. Children must arrive and be picked up punctually. Students not picked up by 4:25 will be brought to daycare.

PLACE: Grades 4-6

Fee: \$225 per student for 15 week session

1. **Air Pressure:** Students learn that air takes up space and has weight. They learn about some basic principles about pressure and discover how pressure and temperature differences cause air to move.
2. **Liquid Nitrogen:** Liquid Nitrogen is an extremely cold, liquefied gas. It can be used to demonstrate interesting effects such as superconductivity and the properties of gases and liquids. Students use liquid nitrogen to investigate how temperature affects materials. Students also discuss the phases of matter and the Kinetic Theory of Gases.
3. **Countertop Chemistry:** Students use simple ingredients to see the states of matter as they change from liquid to solid. They are also encouraged to pay attention to the chemistry in everyday cooking. Chemistry is the study of matter and its changes. Many of the changes that occur in cooking can be considered a form of chemistry.
4. **Fun with Chemistry:** The Periodic Table of the elements is the grand, unifying theory of chemistry. Hands-on activities introduce students to the Periodic Table. Students learn to think of the Periodic Table as a landscape, with fields of metals, pools of mercury and bromine, clouds of gases, and an offshore island of rare earths.
5. **Electroplating:** Students experiment with the bonding behavior of elements through electroplating (the art of producing metallic coatings by using electric currents.) Economically, metallic coatings are used to improve appearance, resist corrosion, or improve hardness. Examples include plating steel with copper, nickel, or chromium in the automotive industry; tin plated steel for food cans; and the manufacture of silver or gold.
6. **Roller Coasters:** Students work in groups to make a roller coaster with split foam tubes, marbles and tape. They discover amazing ways to get as many energy conversions as possible. This relates to potential and kinetic energy, friction, and inertia.
7. **Straw Rockets:** Student make small flying rockets out of paper and propel with air blown through a straw using an air compressor
8. **Sound:** Students participate in a musical acoustics workshop. Students learn about simple harmonics, standing waves, nodes and nulls, wavelength and amplitudes. Subjects covered are the following: sound travels in waves and is produced by vibrating objects; long = low pitch, short = high; pitch; sound intensity increases with amplitude; how to measure frequency.



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9. **Lights and Mirrors:** Students use their reflections in plastic mirrors to discover how to make a million eyes, a "tunnel" through the desk, periscopes, and how the "fun house" mirrors work. A laser is used to show the light path. This lesson only works in rooms that can be darkened. This relates to reflection, refraction, interference, rainbows, lasers, light waves, and color.
10. **Anamorphic Art:** An Anamorphic image is an extreme case of perspective, where the image is stretched beyond recognition and only appears normal when viewed from a certain point. In this unique interdisciplinary activity, students use science, math, and art skills to create an image on a curved grid. The resulting image appears distorted and may be difficult to recognize... until it is viewed with a cylindrical mirror!
11. **Experiments in Electrochemistry:** In 1791 Luigi Galvani discovered electrical activity in the nerves of the frogs that he was dissecting. He thought that electricity was of animal origin and could be found only in living tissues. A few years later, in 1800 Alessandro Volta discovered that electricity could be produced through inorganic means. In fact, by using small sheets of copper and zinc and cloth spacers soaked in an acid solution, he built a battery - the first apparatus capable of producing electricity. Naysayers were quick to predict that electricity would never serve a useful purpose. Obviously they were very wrong. Electricity has a central role in our lives and to this day Electrochemistry is a standard course of study. Students apply concepts relating to electrochemistry by constructing a fruit powered battery. This workshop is designed to compliment/reinforce discussion of concepts regarding electricity and chemistry (e.g., ions, electrolytes, voltage, & batteries).
12. **Electrolysis:** With this experiment a simple device is built which enables us to split water into its two parts : oxygen and hydrogen.
13. **Electricity- Sparks and Shocks:** Students learn about thunder, lightning, and electrons. They discover how to separate a mixture of salt and pepper, lightning safety, and with one hair-raising experience, they discover the nature of static electricity. This relates to weather, lightning safety, electrons, positive and negative charges, voltage, lightning bolts, and cloud formation. This workshop answers questions and explain how static electricity works. Students make their own static electricity generator to take home!
14. **Electricity - Circuits:** This is a good, simple introduction to electricity. The student learns about: current (electron) flow; potential (voltage) that produces the current flow; charge (coulombs); conductors to carry the current flow; and simple switches and lamps (including LEDs). In the hands-on sessions, the student builds a battery-operated system including two switches, two lamps, an audio sounder, and a pair of batteries.
15. **Homemade Loud Speakers:** Students build homemade loudspeakers using ring magnets and plastic cups. While constructing the loudspeakers, students will learn about electromagnetism, the interaction of magnetic fields, and the mechanical amplification of sound.



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Child's Name _____ Grade 2009-10 _____

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Child's Name _____ Grade 2009-10 _____

Parent Name _____ Email _____
(For registration confirmation)

Address _____

City _____ Zip _____

Home Phone _____ Emergency Phone _____

Any Medical issues for child(ren) _____

Workshop Series	Students' Names	# of Students	Amount Due
Chemistry/Physics/Electricity 15-week series: \$225/student			
Total due			

- **Mail registration to:** A Schmahl Science Workshop, 171 Branham Lane, Ste. 10, PMB 223, San Jose, CA 95136.
- **Payment is due with registration. No refunds. No substitutions.** Send check or money order made out to A Schmahl Science Workshop. Credit Card Payments: MasterCard, Visa, American Express (Circle One)
Card Number _____ Exp. Date _____ CID _____

Signature _____ Date _____

- Check here to be added to our mailing list of future workshops _____.
- Check here for information via email _____.
- SSW may take workshop photos for use in SSW's publicity. Names and locations will not be published. Check here if we have your permission to take photos of your children during our workshop(s) _____.