



JFS - Science of Leonardo da Vinci - Fall 2013

Schmah Science Workshops EXPLODES the myth that science is dull. Our instructors are talented scientists and engineers who engage students' curiosity, imagination and creativity using a fun, hands-on approach. Students learn to apply the scientific process as well as core scientific principles, all while making exciting new discoveries.

Students become engineers in the tradition of Leonardo da Vinci. They build clocks, disassemble gadgets, design submarines, build rockets, learn about lenses and light, construct trebuchets, drop parachutes, make pinhole cameras, dissect squid and cow eyes and explore anamorphic art.

09/12: Submarines: In this workshop, students create a remotely controlled submarine that will be used to collect mud and silt samples from the bottoms of lakes and other bodies of water. (Code 122)

09/19: Parachutes: Leonardo da Vinci said: "If a man is provided with a length of gummed linen cloth with a length of 12 yards on each side and 12 yards high, he can jump from any great height whatsoever without injury." A simple parachute will land a small payload-but how big a canopy does it take to bring a golf ball back down to Earth? We'll be making parachutes out of facial tissues, but testing some larger ones and their "carrying capacity." (Code 454)

10/03: Gliders: Children construct simple airplanes from paper that are remarkably elegant fliers. After testing their own designs for tails, bodies, and wings, they construct a rubber band launcher that allows them to more consistently evaluate all of these variables. (Code 217)

10/10: Simple Machines: Gears and Levers: Give me a lever long enough and a place to stand, and I will move the world." –Archimedes, 230 BC. Students will learn how gears and levers make work easier. (Code 87)

10/17: Earthquake Engineering: How do engineers construct buildings that withstand earthquakes? The students apply the lessons learned in their Strength of Materials workshop in building their structures. (Code 176)

DAY: Thursday – 13 workshop course

GRADES: 2-6 | 12:45pm-1:45pm

DATES: 09/12, 09/19, 10/03, 10/10, 10/17, 10/24, 10/31, 11/07, 11/14, 11/21, 12/05, 12/12, 12/19 (No workshops on 09/26, 11/28)

FEES: \$208 per student

MAX STUDENTS: 25 Students- **FIRST COME, FIRST SERVE**

LOCATION: Multi-Purpose Room - James Franklin School, 2220 Woodbury Lane, San Jose, CA 95111

HOW TO REGISTER:

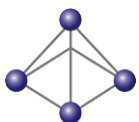
Complete Registration Form: Either use the attached form or print one out: go to www.schmahscience.org, select the Parents & Students tab and click on the "Afterschool" link to find the brochure & registration form for this series.

Payment Options:

- 1) Mail form and payment to Student Registration Schmah Science Workshops 171 Branham Lane Suite 10-223 San Jose, CA 95136 OR
- 2) If using a credit card, form can be scanned and emailed to customerservice@schmahscience.org OR
- 3) Pay online. Go to www.schmahscience.org select the Parents & Students tab and click on the "Afterschool" link. Once payment is made, mail or email registration form as above.

For more information contact: Customer Service at 408.281.7595 x10 or customerservice@schmahscience.org

Visit us at www.schmahscience.org | Schmah Science Workshops • 171 Branham Ln Ste 10-223 • San Jose, CA 95136
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10/24: Paper Bridges: Paper folded or rolled into columns and beams can be surprisingly strong. Through exploring the simplest type of paper bridges, children discover that they can make very strong structures with very limited materials. As they continue to take on more and more difficult bridging challenges and learn more about the capabilities of their materials, they gradually uncover a number of simple principles of bridge building. (Code 218)

10/31: Leonardo da Vinci Bridge: Sometime around 1485-1487, Leonardo da Vinci devised a method for building a self-supporting arched bridge that doesn't require any ropes or other fasteners. The bridge's own weight keeps it together; the more you stack on it, the more stable it gets. It was originally meant to be a quick bridge for military usage - just bring along the pre-cut pieces and slot them together. Students build an arch bridge that stands by itself without any fasteners or complicated joinery! (Code 466)

11/07: Soda Straw Rockets: Student make small flying rockets out of paper and propel them with air blown through a straw using an air compressor. (Code 367)

11/14: 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 the sixteenth and seventeenth centuries artists used anamorphosis to conceal spiritual or political meanings in their paintings. Viewing the painting from head-on (as you normally would) would not reveal the message but viewing the painting from its side would magically transform the anamorphic image to something recognizable. The first known example of Anamorphosis was found in Leonardo da Vinci: Codex Atlanticus c. 1485. 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! The image that "magically" appears is just science, math, and art all mixed together with a mirror. (Code 467)

11/21: Camera Obscura: "...Here the figures, here the colors, here all the images of every part of the universe are contracted to a point. O what a point is so marvelous!" In 1490, da Vinci wrote the first detailed description of camera obscura in his "Atlantic Codex," a 1,286 page collection of drawings and writings. The principle of camera obscura is simple, punch a hole in a dark box and put a piece of light-sensitive material on the other side and, voilà, you have a photograph. (Code 453)

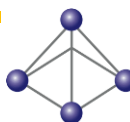
12/05: You're as High as My Eye: How do we tell how big something is, just by looking at it? Why do things look smaller when they are farther away? How can the brain compute the real size of things, even when they appear tiny? Astronomers first used parallax to measure distances to other planets in 1672, but living organisms have been using parallax for several hundred million years - ever since the first animals having two eyes evolved. Two eyes are better than one because they give you two different views of the world; by combining these views, your brain can estimate distances to nearby objects. The parallax measurements we will make in this lab use a technique you have been practicing since infancy. In some sense, you are already an expert at using parallax to measure distances, but at the same time, you may not know how your brain accomplishes this very useful trick. (Code 295)

12/12: Balloon Rockets: Students learn that air takes up space; the relationship between temperature, pressure, and volume (Boyle's / Charles' laws). Students learn that air moves (the Bernoulli principal) and that air has weight. Students will create an air-powered rocket that will travel the greatest distance. (Code 3)

12/19: Building Bridges: Paper folded or rolled into columns and beams can be surprisingly strong. Through exploring the simplest type of paper bridges, children discover that they can make very strong structures with very limited materials. As they continue to take on more and more difficult bridging challenges and learn more about the capabilities of their materials, they gradually uncover a number of simple principles about bridge building. (Code 218)

About Schmahl Science Workshops

Schmahl Science Workshops is a non-profit partnership of students, parents, teachers, scientists and engineers who come together to foster the innate curiosity and love of science that exists among children. Founded in 1996 by a group of four children and their parents, Schmahl Science Workshops provides pre-K through 12th grade children with an unmatched breadth of hands-on science workshops spanning biology, chemistry, earth science, forensics, math and physics. Our mission is to prepare children of all backgrounds for a future in which science and technology will drive every industry and vocation. We believe that children are motivated to learn when their ideas are cultivated through the joy of designing and carrying out an experiment. Through these authentic research experiences, our workshops enable students to explore and invent what inspires them, and to develop the skills needed to achieve success in all areas of their lives. 2013 © Schmahl Science Workshops



OFFICE USE RECEIVED: <input type="checkbox"/> CONF <input type="checkbox"/> SRF <input type="checkbox"/> RL <input type="checkbox"/> ACCTNG

Registration Form

JFS - Science of Leonardo da Vinci - Fall 2013

One (1) form per Student. Submit Registration Forms directly to Schmahl Science Workshops.

STUDENT INFORMATION

LAST NAME: . _____

FIRST NAME: . _____

GRADE LEVEL: . _____

Any Medical issues for student: **NONE** or,
LIST ISSUES: . _____

FOR ssw: Student is **NEW** **RETURNING**

PHOTO CONSENT: SSW may take workshop photos for use in SSW's publicity. Names and locations will not be published. Do we have your permission to take photos of your student/s during our workshop(s): YES NO

STUDENT RELEASE FORMS: We require that a new Student Release Forms packet be submitted every new school year - with the registration form. Without the SRF, we cannot accept your student. FORMS ATTACHED: YES NO

PARENT INFORMATION | PARENT FIRST & LAST NAME

MOTHER: . _____

PHONE#: . _____

FATHER: . _____

PHONE#: . _____

EMAIL: . _____

Add you to our mailing list of future workshops:
 YES NO

HOME PHONE#: . _____

ADDRESS: . _____

CITY: . _____ ZIP: . _____

How did you discover us? _____

EMERGENCY INFORMATION | FIRST & LAST NAME

CONTACT: . _____

CELL#: . _____

HOME#: . _____

WORK#: . _____

RELATIONSHIP TO STUDENT: . _____

YOUR STUDENT IS SIGNING UP FOR:

DAY: Thursday – 13 workshop course

GRADES: 2-6 | 12:45pm-1:45pm

DATES: 09/12, 09/19, 10/03, 10/10, 10/17, 10/24, 10/31, 11/07, 11/14, 11/21, 12/05, 12/12, 12/19 (No workshops on 09/26, 11/28)

FEES: \$208 per student

CHARTER SCHOOL STUDENT FEES: n/a Per student

TOTAL DUE

WORKSHOP COST

CHARTER SCHOOL PO FEE.....

(Per Student for each Charter School Purchase Order.)

TOTAL

Payment is due with registration.
No refunds. No substitutions.

ENROLLMENT OPTIONS:

EMAIL registration to:

customerservice@schmahlsience.org

MAIL registration to: Student Registration Schmahl Science Workshops 171 Branham Lane Suite 10-223 San Jose, CA 95136

FAX: 408-624-5367, Attention: Sales

PAYMENT OPTIONS (Pls. check all that apply):

ONLINE PAYMENT: Webcart /Invoice #: _____

CREDIT CARD PAYMENT:

MasterCard, Visa, American Express

CARD#: _____

CID: _____ EXP. DATE: _____

NAME PRINTED ON CARD: _____

SIGNATURE: _____

CHECK / MONEY ORDER made out to: Schmahl Science

Workshops. **CK#:** _____ **AMT\$** _____

CHARTER SCHOOL PURCHASE ORDER#: _____

Connecting Waters, FAME, Ocean Grove

