

CALIFORNIA STATE UNIVERSITY, NORTHRIDGE & VAN NUYS AIRPORT

THE NEW JOURNAL OF  
**STUDENT RESEARCH ABSTRACTS**  
**2012**  
VOLUME XVII

California State University  
**Northridge**



**Van Nuys**  
*Los Angeles World Airports*

CALIFORNIA STATE UNIVERSITY, NORTHRIDGE & VAN NUYS AIRPORT  
THE NEW JOURNAL OF  
**STUDENT RESEARCH ABSTRACTS**  
**2012**

**Volume XVII**

*Editor*

**Steven B. Oppenheimer**

California State University, Northridge

*Sponsor*

**California State University, Northridge**

*Contributing Sponsor*

**Van Nuys Airport**

# The New Journal of Student Research Abstracts

2012

Volume XVII

*An Annual Journal for Young Investigators and Their Teachers*

Copyright © 2012 by California State University, Northridge and Van Nuys Airport. All rights reserved.

Any opinions, findings and conclusions or recommendations are those of the individual authors of the abstracts presented in the journal, and do not necessarily reflect the views of California State University, Northridge, Van Nuys Airport, other contributing organizations and individuals, or the journal staff.

Permission in writing must be obtained from California State University, Northridge and Van Nuys Airport before any part of this work may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or by any informational storage or retrieval system.

Printed in the United States of America

Library of Congress: ISSN 1558-7932

California State University  
**Northridge**



## Staff

### *Editor-In-Chief*

**Steven B. Oppenheimer, Ph.D.**, Director, Center for Cancer and Developmental Biology and Trustees Outstanding Professor, the CSU System, California State University, Northridge

### *Primary Associate Editor*

**Helen H. Chun, Ph.D.**, Associate Professor, Biology Department, California State University, Dominguez Hills

### *Associate Editor*

**Mindy Berman**, Mindy F. Berman Communications

### *Sponsor*

**California State University, Northridge**

### *Contributing Sponsor*

**Van Nuys Airport**

### *VNY Contributors*

**Jess Romo**, Airport Manager, and **Diana Sanchez**, Public and Community Relations Director

### *Journal Design*

**Alvalyn Lundgren**, Alvalyn Creative

### *California State University, Northridge, Support*

**Dianne Harrison**, President; **Jolene Koester**, President; **Harry Hellenbrand**, Provost; **Jerry Luedders**, Vice Provost; **Vance Peterson**, Vice President; **Stacy Lieberman**, Associate Vice President; **Mack Johnson**, Associate Vice President; **Jerry Stinner**, Dean, College of Science and Mathematics; **Larry Allen**, Chair, Biology Department; **Randy Cohen**, Chair, Biology Department; **Mary-Pat Stein**, Associate Chair, Biology Department; **Paul Wilson**, Associate Chair, Biology Department; **Carmen Chandler** and **Randal Thomson**, Public Relations; **John Pepitone**, **Barbara Caganich** and **Maureen Fitzgerald**, University Development; **Scott Perez**, Research Support; **Hedy Carpenter**, Symposium Support; **Kavoos Blourtchi**, **Robert Espinoza**, **David Gray** and **Irene Rivera**, College Support; **John Brown**, **Mark Felix**, **Yan-chuen Tung**, **William Krohmer**, **Linda Gharakhanian**, **Vickie Everhart** and **Cherie Hawthorne**, Department Support

### *Los Angeles Unified School District Collaboration*

**Dan McDonnell**

### *Teacher Training Support*

**Maria Lopez Freeman**, California Science Project; **Karen Humphrey**, Improving Teacher Quality Program; **Gerry Simila**, **Gini Vandergon**, **Norm Herr** and **Steven Oppenheimer**, Training Leaders

### *Recognition of Some of the Scientist Mentors*

**Larry Allen, Ph.D.**; **Lisa Banner, Ph.D.**; **Larry Baresi, Ph.D.**; **Edward Carroll, Ph.D.**; **Randy Cohen, Ph.D.**; **John Colicelli, Ph.D.**; **Mary Corcoran, Ph.D.**; **Cathy Coyle-Thompson, Ph.D.**; **Steve Dudgeon, Ph.D.**; **Robert Espinoza, Ph.D.**; **Richard Flagan, Ph.D.**; **Janet Kubler, Ph.D.**; **Jennifer Matos, Ph.D.**; **Aida Metzzenberg, Ph.D.**; **Stan Metzzenberg, Ph.D.**; **Steven Oppenheimer, Ph.D.**; **Polly Schiffman, Ph.D.**; **Ryoichi Seki, Ph.D.**; **Gerry Simila, Ph.D.**; **Mary Lee Sparling, Ph.D.**; **Mike Summers, Ph.D.**; **Paul Tomasek, Ph.D.**; **Virginia Vandergon, Ph.D.**; **Paul Wilson, Ph.D.**; **Maria Elena Zavala, Ph.D.**; **Kathie Marsaglia, Ph.D.**; **Vicki Pedone, Ph.D.**; **Greg Grether, Ph.D.**; **David Epel, Ph.D.** (evaluation); **Susie Hakanson, Ph.D.** (evaluation); **Norman Herr, Ph.D.** (implementation)



# TABLE OF CONTENTS

Winner: Best Aviation Abstract for 2012	7	Abstracts	16
Experience Aviation in Action at Van Nuys Airport	8	Teacher Index	61
Test Your Skills: VNY Crossword Puzzle	9	Student-Author Index	61
From the Editor: Awesome Aviation Project Ideas	10	Abstract Topics Index	63
Student Artwork	12	Journal Survey	Tear-Off



Dr. Steven Oppenheimer (seated front row, second from left) visits the Blue Room in the White House, where he received a 2009 U.S. Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring. Arden Bement, director of the National Science Foundation, is standing at the far left.

## About the Editor

Steven B. Oppenheimer received the Ph.D. degree from Johns Hopkins University and is currently Professor of Biology and Director of the Center for Cancer and Developmental Biology at California State University, Northridge. He is author or co-author, mostly with his Cal State students, of about 200 publications, including 14 books and book editions; was awarded over \$7 million in research and science education grants serving as Principal Investigator; and served on National Institutes of Health and National Science Foundation grant review panels. He serves on the editorial board and is editor for the United States, Canada and South America of the international journal *ACTA Histochemica*, published by Elsevier. He is recipient of 26 distinguished teaching awards, distinguished research awards, outstanding professor awards, and other honors from local, statewide, and national organizations. In 1984, he was named statewide Trustees Outstanding Professor of the California State University system (the system's highest honor), and in 1992 he was elected Fellow of the American Association for the Advancement of Science (AAAS). The AAAS defines a Fellow as "a member whose efforts on behalf of the advancement of science or its applications are scientifically or socially distinguished." He is a recipient of a U.S. Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring.

Dr. Oppenheimer thanks the following organizations for funding his student-involved research programs: National Institutes of Health, National Institute of General Medical Sciences SCORE, RISE and MARC programs, the Joseph Drown Foundation, the Sidney Stern Memorial Trust, the National Science Foundation, and California Science Project.

Editor's e-mail address: [steven.oppenheimer@csun.edu](mailto:steven.oppenheimer@csun.edu)

Editor's websites:

[www.csun.edu/biology/faculty/oppenheimer.htm](http://www.csun.edu/biology/faculty/oppenheimer.htm)  
[www.youtube.com/watch?v=JQCd5NIFVoQ](https://www.youtube.com/watch?v=JQCd5NIFVoQ)  
[www.youtube.com/watch?v=KmlN6DHW3nQ](https://www.youtube.com/watch?v=KmlN6DHW3nQ)  
[www.youtube.com/watch?v=a-SvYIyjjj8](https://www.youtube.com/watch?v=a-SvYIyjjj8)

## About the Primary Associate Editor

Helen H. Chun received her Ph.D. and was a postdoctoral researcher at the University of California, Los Angeles. She currently is an Associate Professor in the Biology Department at California State University, Dominguez Hills. She researches the cellular response to radiation exposure, particularly in the stimulation of DNA repair and cell death.

## About the Sponsor

California State University, Northridge is ranked by the National Science Foundation in the Top 5 of over 500 similar universities in numbers of its science and social science graduates who go on to achieve doctoral degrees.

Sponsor's website: [www.csun.edu](http://www.csun.edu)

## About the Contributing Sponsor

Owned and operated by Los Angeles World Airports, Van Nuys Airport (VNY) ranks as one of the world's busiest general aviation airports, averaging 310,000 takeoffs and landings annually. A facility dedicated to noncommercial air travel, VNY meets corporate, private and government aviation needs – in the process providing vital aviation services, enhancing efficiency at the region's commercial airports, promoting business and serving as a valued San Fernando Valley community and educational resource.

As part of its community involvement, VNY supports several education programs, plus offers tours, presentations and other activities to help adults and youth alike learn about the exciting world of aviation in the San Fernando Valley and beyond.

Contributing sponsor's website: [www.lawa.org/vny](http://www.lawa.org/vny)

## About the Journal and Abstracts

*The New Journal of Student Research Abstracts* is published yearly in the fall. Continued publication is always dependent on funding.

The journal is intended to serve as (1) a vehicle to honor young investigators and their teachers by showcasing their work, motivating them to continue their involvement in research science; (2) a sourcebook for both students and teachers who are looking for ideas for research projects, particularly in the areas of aviation and aerospace; and (3) a volume to disseminate student research discoveries.

Many abstracts included in the journal demonstrate good science, i.e. clear introductions describing a hypothesis to be tested, appropriate methods and data analysis, results and conclusion statements, and – most important – sufficient numbers of appropriate control and experimental samples and repetitions of experiments. Some are idea abstracts, and some are abstracts of library or Internet research projects.

Abstracts are reviewed by the teachers and the journal editors. Although the journal editors delete very poor abstracts from the publication, some abstracts herein are quite flawed, and some lack at least one component of a good science experiment. Including some of these abstracts helps make this journal very useful for classes to learn what makes for a good experiment and a good abstract vs. a not-so-good experiment and a not-so-good abstract.

Some of the abstracts are experimental plans instead of completed projects. This is especially true in the case of long-term, sophisticated research programs that require extensive setup and planning. The journal encourages abstracts on the planning and progress of such projects.

The journal editor continues to reserve the right not to publish those abstracts that are seriously flawed. The journal does not notify authors if their abstracts have been deleted.

Any opinions, findings, and conclusions or recommendations are those of the individual authors of the abstracts presented in the journal, and do not necessarily reflect the views of California State University, Northridge, Van Nuys Airport, other contributing organizations and individuals, or the journal staff.

From the Editor:

### Golden Opportunity for Underrepresented Science Students Interested in Careers in Biomedical Research

To those underrepresented science students who select California State University, Northridge for your college experience: We have a golden opportunity for you. If you are a U.S. citizen or permanent resident and if you are possibly interested in a Ph.D. degree in biomedical science, you can apply for distinguished programs funded by the National Institutes of Health (Maria Elena Zavala, Director). These programs will open many doors and will pay you thousands of dollars to do research while a student at California State University, Northridge. We thank the National Institutes of Health, National Institute of General Medical Sciences MORE program for distinguished support for these student opportunities.

For more information, contact Steven Oppenheimer at [steven.oppenheimer@csun.edu](mailto:steven.oppenheimer@csun.edu).

## Submission of Abstracts

Any science teacher may submit student abstracts following the format used with the abstracts in this volume. After the title, followed by student author name(s) and teacher name (teacher), school and school street address, city, state and ZIP Code, abstracts should begin with the purpose of the study, followed by how it was done, and then the results and conclusions.

All abstracts should be typed in **11-point Arial font**, error-free. Messy abstracts and those not following proper format may be discarded. The journal is not responsible for any abstracts received or for publication errors. The journal does not acknowledge receipt of abstracts and there is no guarantee that they will be published or that the journal will be published in any given year.

Only teachers may submit their students' abstracts to the journal. Teachers must submit each abstract as an **electronic Word document** to [steven.oppenheimer@csun.edu](mailto:steven.oppenheimer@csun.edu). Abstracts not submitted electronically or not following the other guidelines provided herein may be discarded without notice.

The deadline for receipt of abstracts for each annual volume is June 1, but an issue may be closed at an earlier date. Publication is scheduled for each fall. Submitted abstracts are not returned to authors, so students and teachers are advised to keep a copy of all submitted materials. The only confirmation that abstracts will be published is if they appear in print.

**Note:** Thank you to teachers, administrators, students and parents for your input on last year's journal survey. We value your feedback and continue to work to incorporate it into future editions!

## Congratulations to Greg Zem and Journal Student-Authors

Kudos to Ernest Lawrence Gifted/Highly Gifted Magnet's Greg Zem, whose former students published in *The New Journal of Student Research Abstracts* are moving onto exciting futures in higher education:

Brandeis: 1

UC San Diego: 3

UCLA: 1

USC: 1

And thank you to former student Drew Edelberg for this letter:

June 25, 2012

Dear Dr. Oppenheimer:

I don't know if you'll remember me, my name is Drew Edelberg and I volunteered in your lab when I was in high school, through Mr. Zem. I would like to thank you for the invaluable research experience you provided me, which allowed me to succeed at Berkeley. I will be continuing onward for my Ph.D. in solid state physics at Columbia University starting this fall.

My experience in your lab was valuable in my development as a researcher. I know that my younger brother, Bryce, who is currently in high school and passionate about biology, would benefit greatly from a similar experience. If it is possible for him to volunteer in your lab, I would gladly introduce Bryce when he returns to Los Angeles in August. He is currently studying marine biology through COSMOS, a science program for high school students at UC Santa Cruz.

Again, thank you for providing me with a wonderful opportunity; I hope that my brother will be able to share the same experience.

Sincerely,  
Drew



**WINNER:**  
**BEST AVIATION ABSTRACT**

*Congratulations from Van Nuys Airport to the recipient of the best aviation or aerospace abstract (as selected by the journal editor) for 2012. This student-author will receive special recognition from the airport. Great work!*

**Will a Balsa Glider Travel Farther With Weight on It or Without Weight on It?**

*Andrew Langwald and T. Miller (teacher)*  
Holmes International Middle School  
9351 Paso Robles Ave.  
Northridge, CA 91325

The purpose of this experiment was to determine if a balsa glider would travel farther with weight on it. The hypothesis was that the balsa glider would fly farther without weight on it. The balsa glider was constructed and the launcher for the balsa glider was made. For the control, the balsa glider was launched 25 times without weight, and for the experiment, it was launched 25 more times with paper clips. One paper clip was on the far left side of the top wing, one in the middle of the top wing, and the other on the far right side of the top wing. The average distance for the control was 405 cm, and the average distance for the experiment was 390 cm. The results were recorded, and out of the 25 times the balsa glider was launched for the control, the farthest distance it flew was 627 cm and the shortest distance was about 254 cm. For the experiment, it flew 536 cm at the most, and 241 cm at the least. In conclusion, the hypothesis was correct. The balsa glider flew farther without weight on it.





# EXPERIENCE AVIATION IN ACTION AT VAN NUYS AIRPORT

## Did You Know?

- The first of hundreds of movies, TV shows and commercials with scenes filmed at Van Nuys Airport (VNY) was *Hell's Angels* in 1930.
- During World War II, Hollywood discovered none other than Marilyn Monroe on an aircraft assembly line at VNY.
- Planes built in the 1960s at an aerospace firm located at VNY transported massive moon rockets to Cape Canaveral in Florida, establishing the airport as a key player in the race to space.
- Celebrating the centennial of flight, VNY's 2003 Aviation Expo was one of just 10 venues in the nation selected to display a full-scale replica of the Wright Flyer, the first aircraft to achieve sustained, powered flight.

From its origins in the 1920s as a private airport favored by daring young aviators and Hollywood's famous faces, over 80-plus years VNY has grown into one of the world's busiest general aviation airports, averaging 310,000 takeoffs and landings annually.

A facility dedicated to noncommercial air travel, VNY meets corporate, private and government aviation needs – in the process providing vital aviation services, enhancing efficiency at the region's commercial airports, promoting business and serving as a valued San Fernando Valley community and educational resource.

## Today Van Nuys Airport Is:

- Home to more than 700 propeller aircraft, jets, and helicopters on 730 acres of land.
- A vital economic engine, contributing more than \$1.3 billion annually to the local economy and supporting over 12,300 jobs.\*
- A center for fire, police, and medical emergency flights that provide life-saving services to the community.
- The site of one of California's top aircraft mechanic schools.
- A still-popular Hollywood filming location.

\*Source: Van Nuys Airport Economic Impact Study: 2007

## Get an Insider's Look at the Airport Through:

- Our free 90-minute guided tours, which take you on a captivating journey through aviation past and present.
- See a variety of aircraft and the many activities of aviation companies and airport operations, and learn about VNY's rich and colorful history.
- Check out VNY's mascot Vinny – Los Angeles' first completely kid-proof, kid-friendly educational airplane – in "Vinny's Hangout." The Hangout lets you explore Vinny in a safe, friendly, hands-on learning environment, where you can poke, prod and peer into the cockpit while learning about the many parts of this brightly painted orange and purple airplane with a contagious smile.

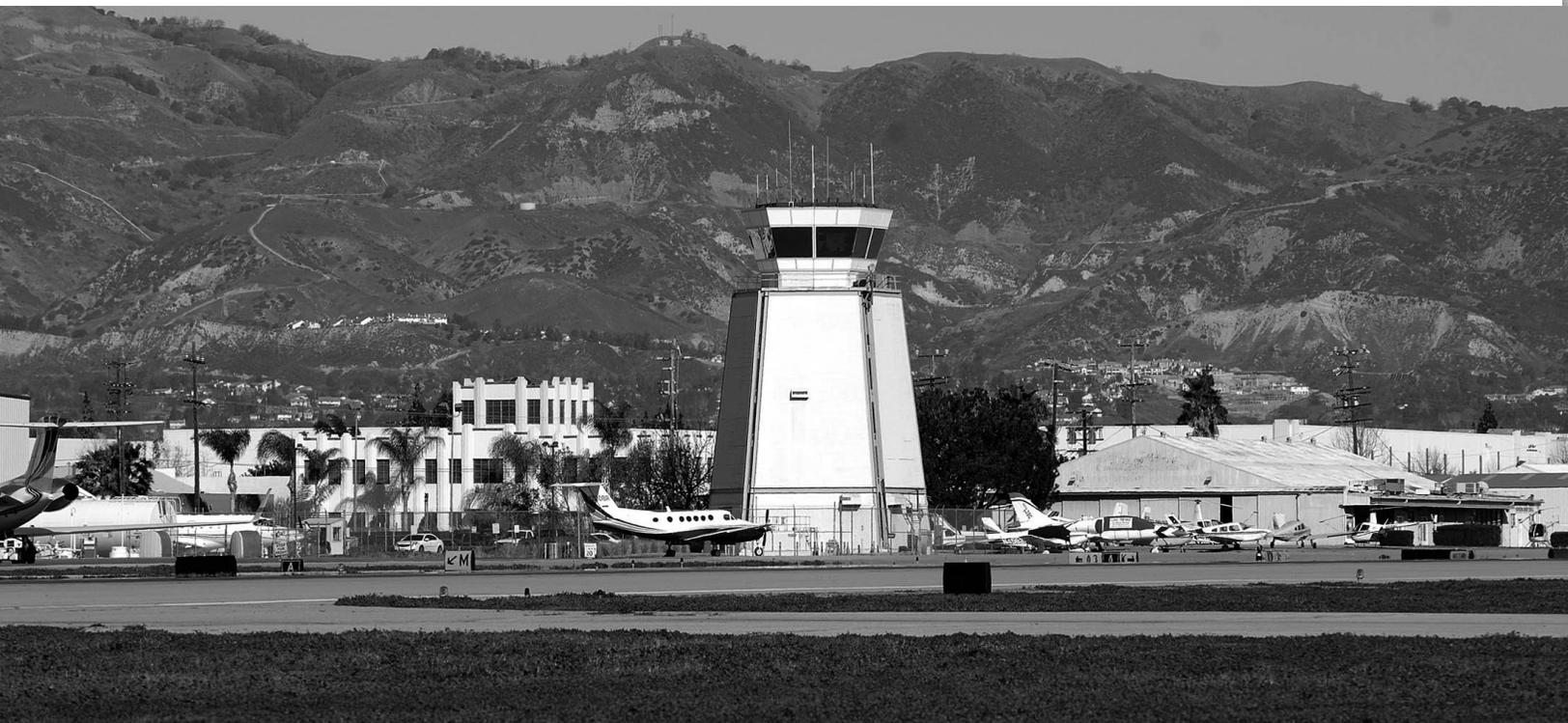
Tours are offered to groups of 20 or more – including school classes – and are available Wednesdays, Thursdays and select Saturdays by reservation. For more information, visit [www.lawa.org/vny](http://www.lawa.org/vny) (click on "News & Facts on the left-hand side and then on "Airport Tours") or call **818.442.6526**.

To learn more about additional VNY community and educational programs designed to make the airport a valuable resource and encourage aviation-related career and training opportunities, visit [www.lawa.org/vny](http://www.lawa.org/vny) or call **818.442.6526**.



FROM THE EDITOR:

# AWESOME AVIATION PROJECT IDEAS



Here are some aviation projects you can consider for your next assignment:

- What designs of paper airplanes make them fly best?
- What thickness or weight of paper makes paper airplanes fly best?
- Using purchased model airplanes (rubber band or electric or glider), what can be done to the design to make them fly best? For example, add weight to different areas of the airplane.
- Design ways to analyze what makes for a better flight. For example, develop quantitative criteria that can be used to evaluate flight.
- Using purchased toy helicopters, what can be done to them to improve their ability to fly?

Remember that good research includes many repeats of experiments, and, if applicable, many experimental and control samples.

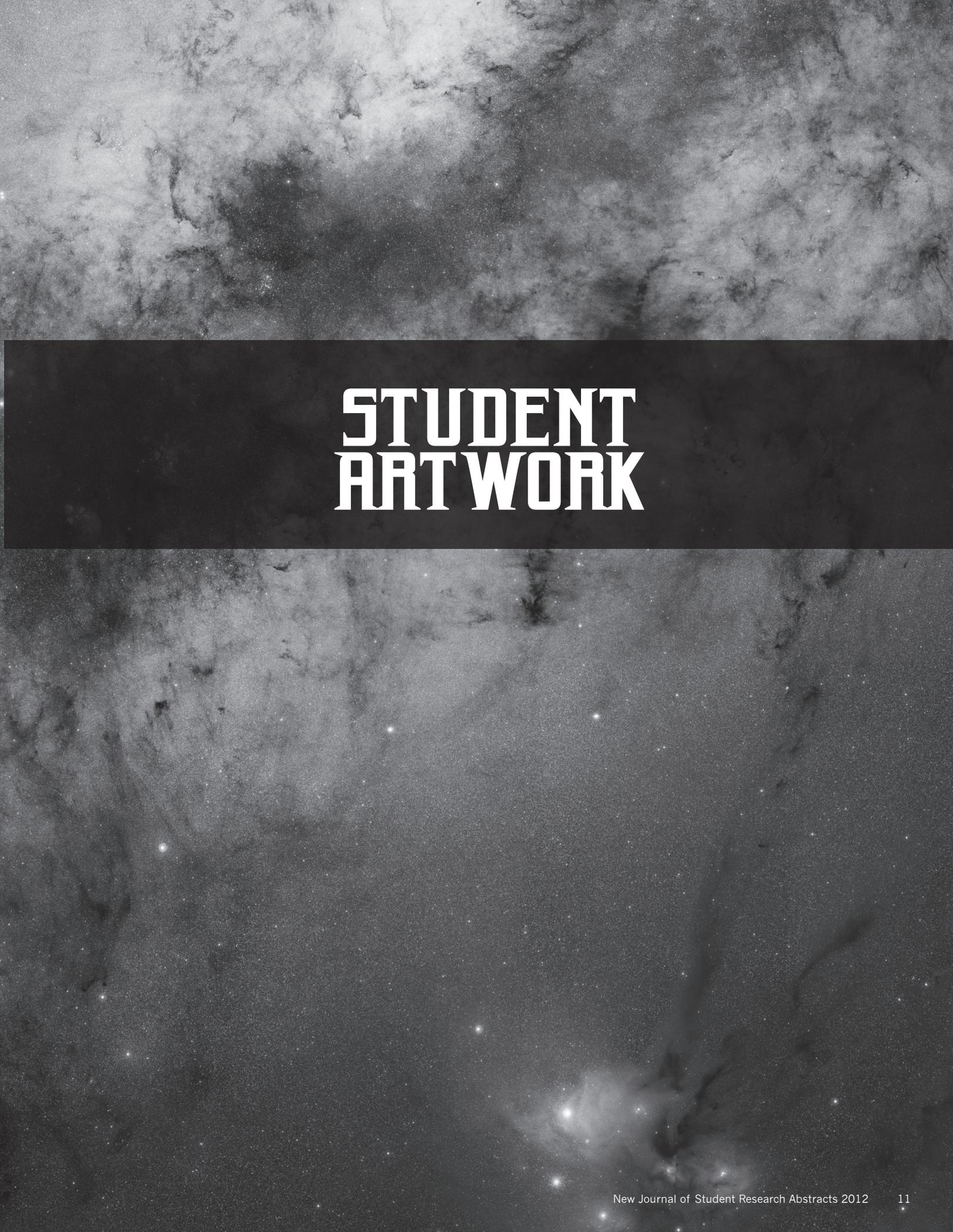
Also, it's best to conduct experiments with a hypothesis – meaning your assumption, or tentative explanation, for what you expect to occur once you conduct your experiment. For example, you might say, “My hypothesis is that paper airplanes made with heavier paper will fly best.” Then you test the hypothesis with your experiment and discuss the results and possible conclusions.

Check out more project ideas, cool aviation resources and fun facts on the following websites:

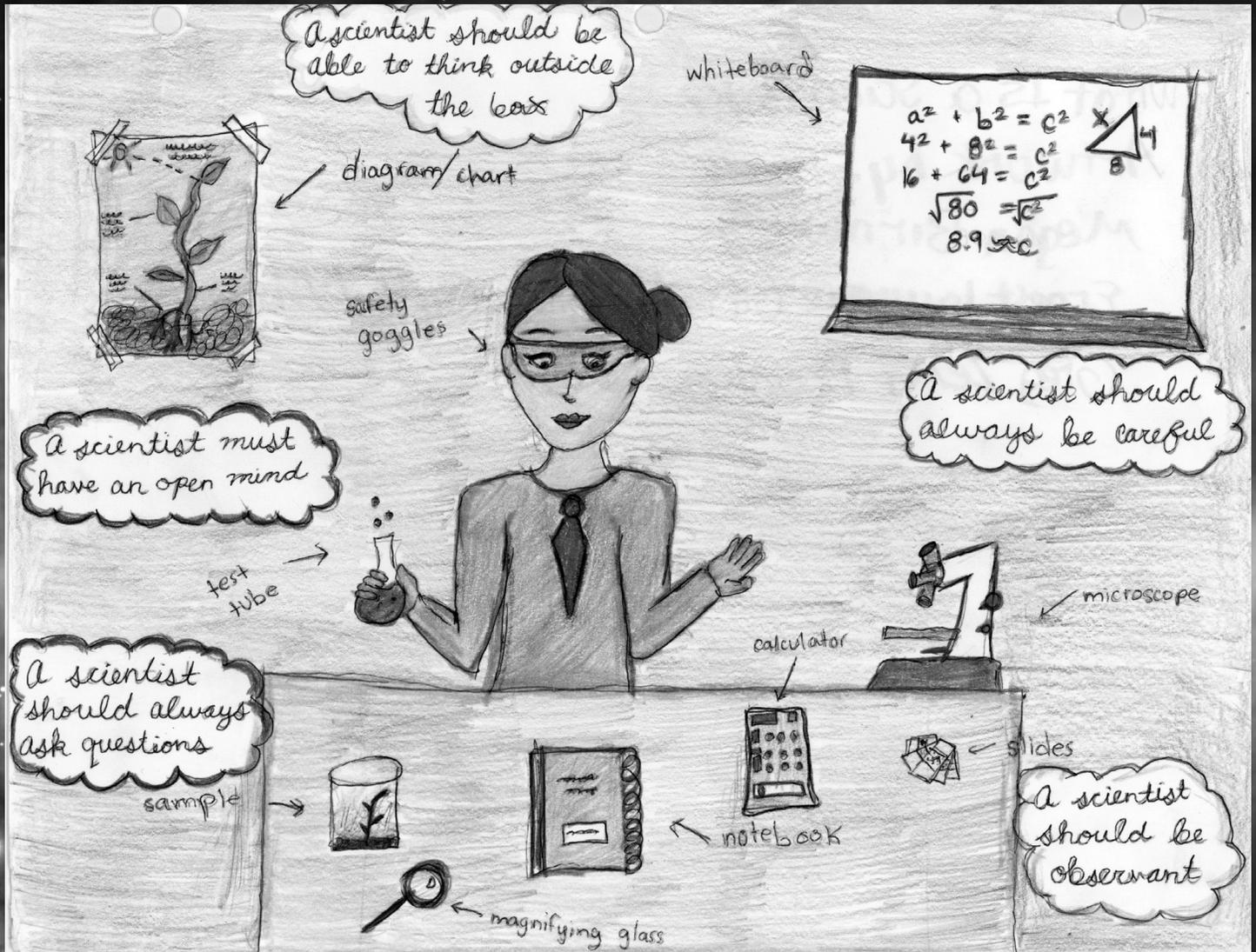
- Aeronautics Learning Laboratory for Science, Technology, and Research: [www.allstar.fiu.edu](http://www.allstar.fiu.edu)
- Aviation & Aeronautics & Aerodynamics: Science Fair Projects and Experiments: [www.juliantrubin.com/fairprojects/engineering/aviation.html](http://www.juliantrubin.com/fairprojects/engineering/aviation.html)
- NASA Quest: <http://quest.nasa.gov/>
- San Fernando Valley 99s Aviation Explorers 747 Program: [www.sfv99s.org/explorers.html](http://www.sfv99s.org/explorers.html)
- Women in Aviation Resource Center: Education: Just for Kids: [www.women-in-aviation.com/Education/Just\\_For\\_Kids/](http://www.women-in-aviation.com/Education/Just_For_Kids/)
- Young Eagles Program of the Experimental Aircraft Association: [www.youngeagles.org](http://www.youngeagles.org)

For more information about Van Nuys Airport, visit [www.lawa.org/vny](http://www.lawa.org/vny) – and for fun kids' stuff, check out Vinny's Hangout by clicking on the “Kid Page” link under the “Information” tab.

For information about the other airports owned by Los Angeles World Airports (LAWA), log onto [www.lawa.org](http://www.lawa.org). You can find more cool kids' aviation activities by going to the LAWA “Kid Website” page at [www.lawa.org/kidswebsite/mainpage.html](http://www.lawa.org/kidswebsite/mainpage.html).



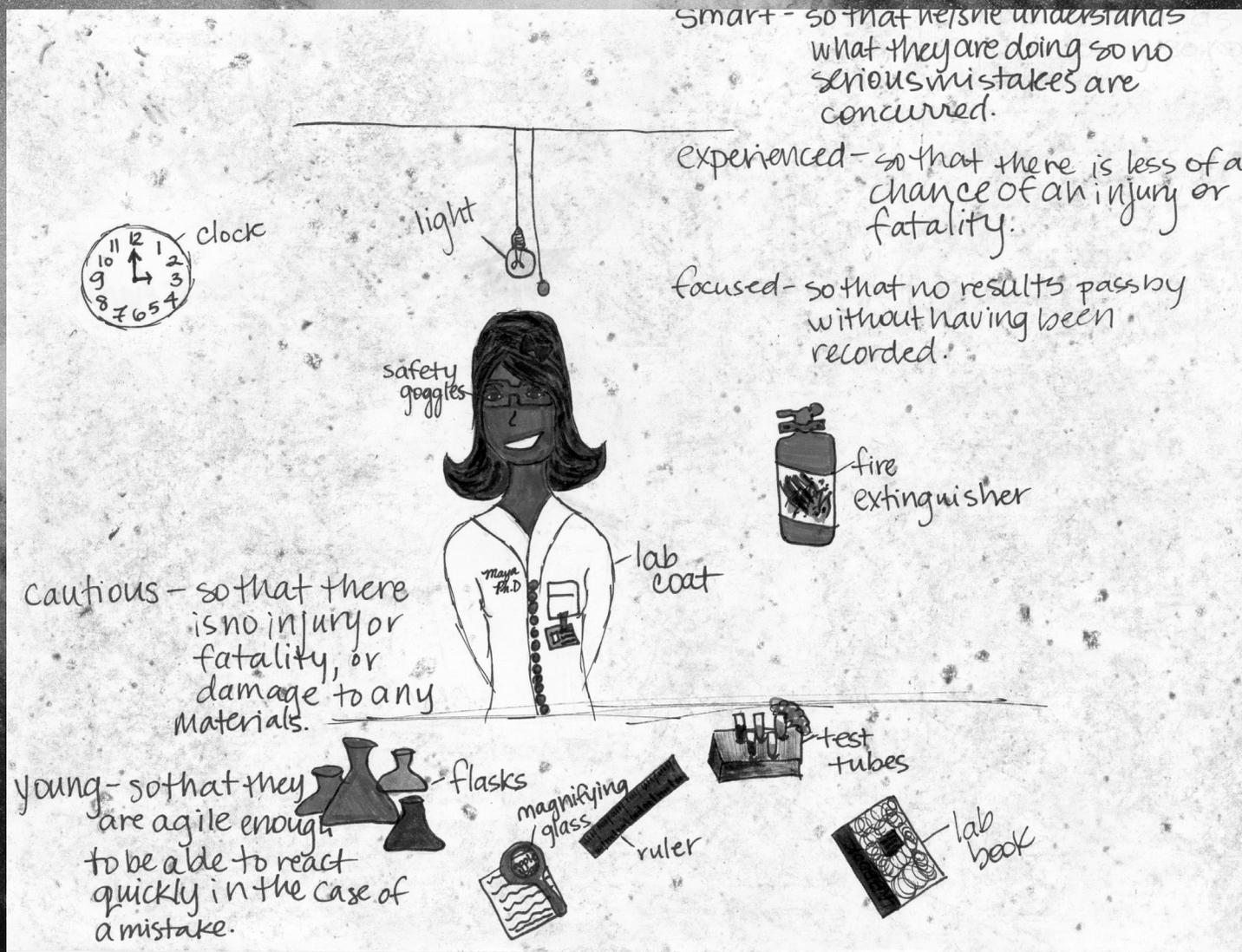
# STUDENT ARTWORK



# WHAT IS A SCIENTIST?

Artwork by  
**Megan Birnbaum**

Ernest Lawrence Gifted/Highly Gifted Magnet  
Greg Zem, Teacher

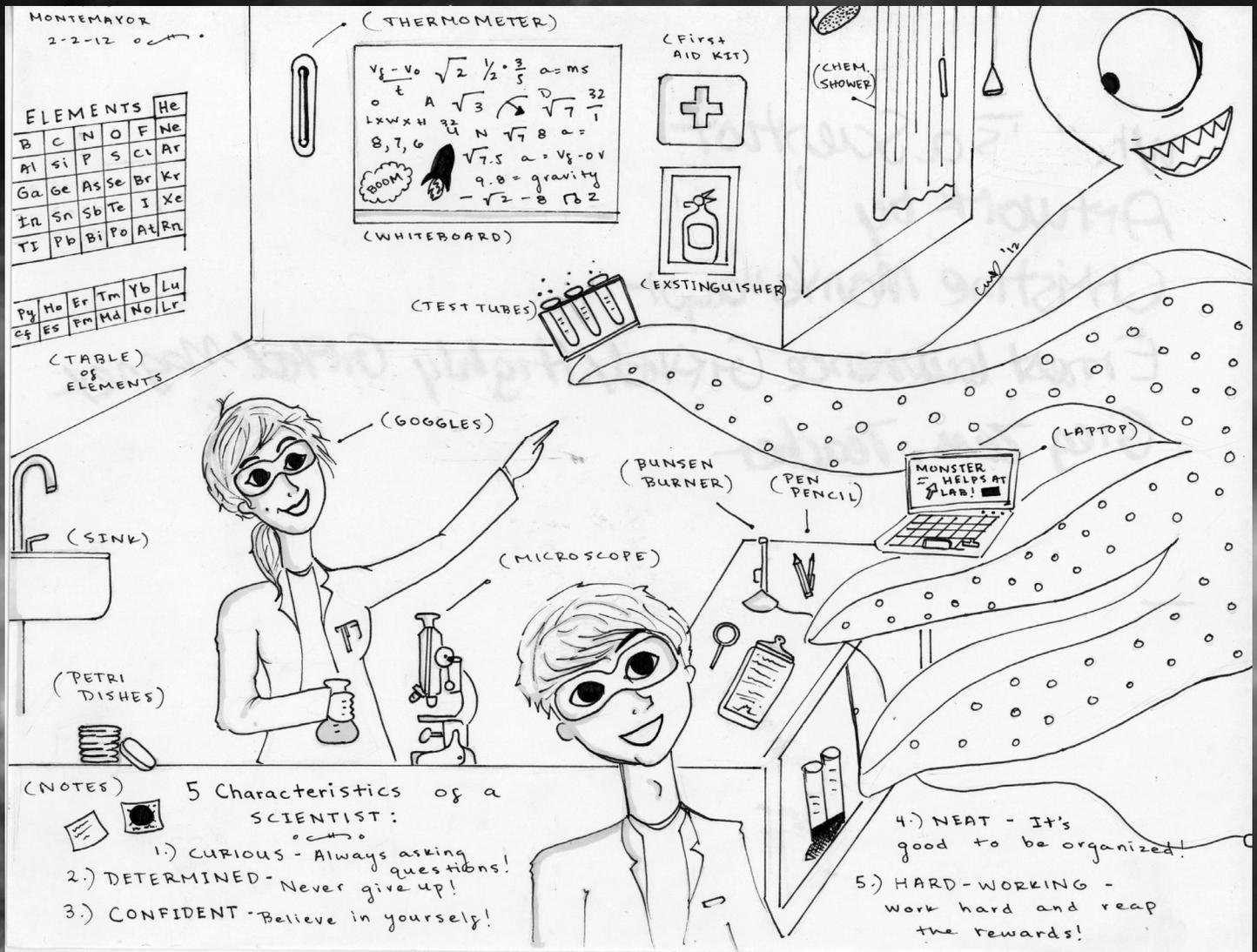


# WHAT IS A SCIENTIST?

Artwork by

**Maya Hankin**

Ernest Lawrence Gifted/Highly Gifted Magnet  
Greg Zem, Teacher

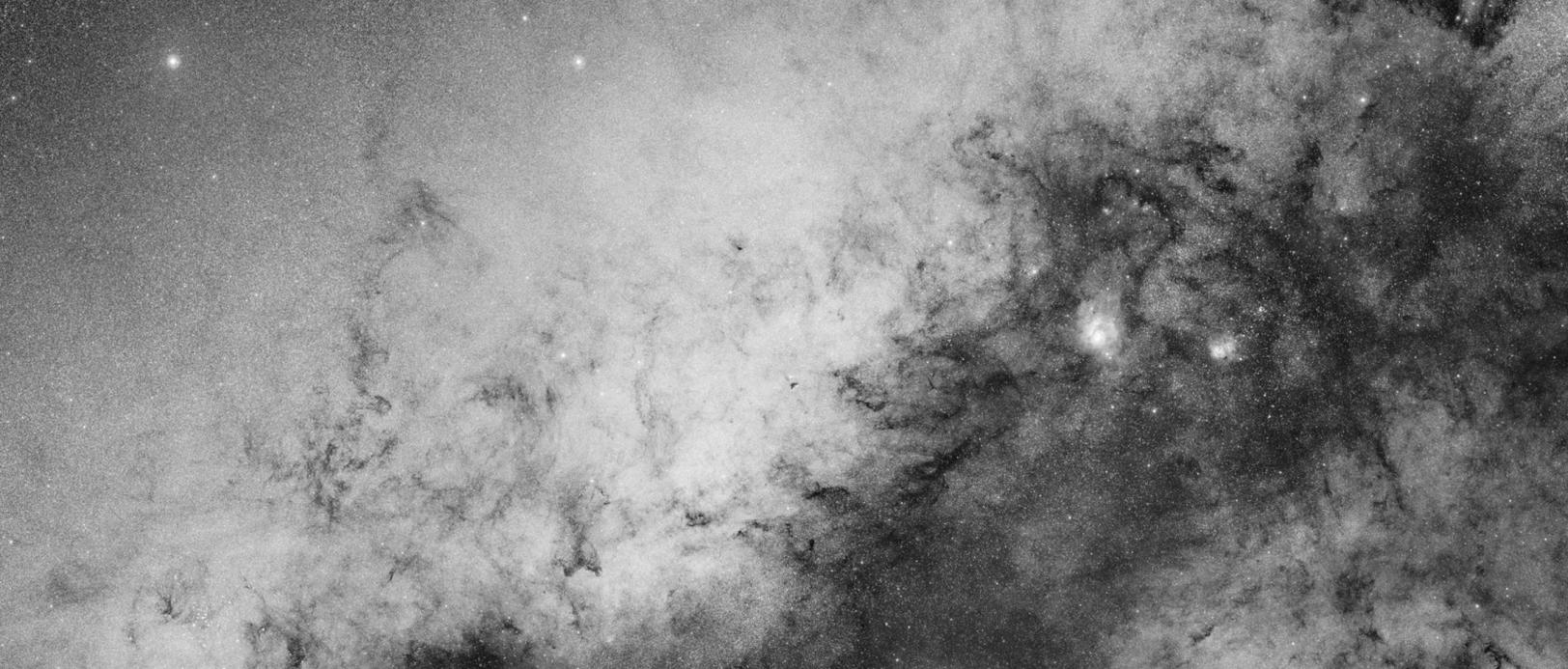


# WHAT IS A SCIENTIST?

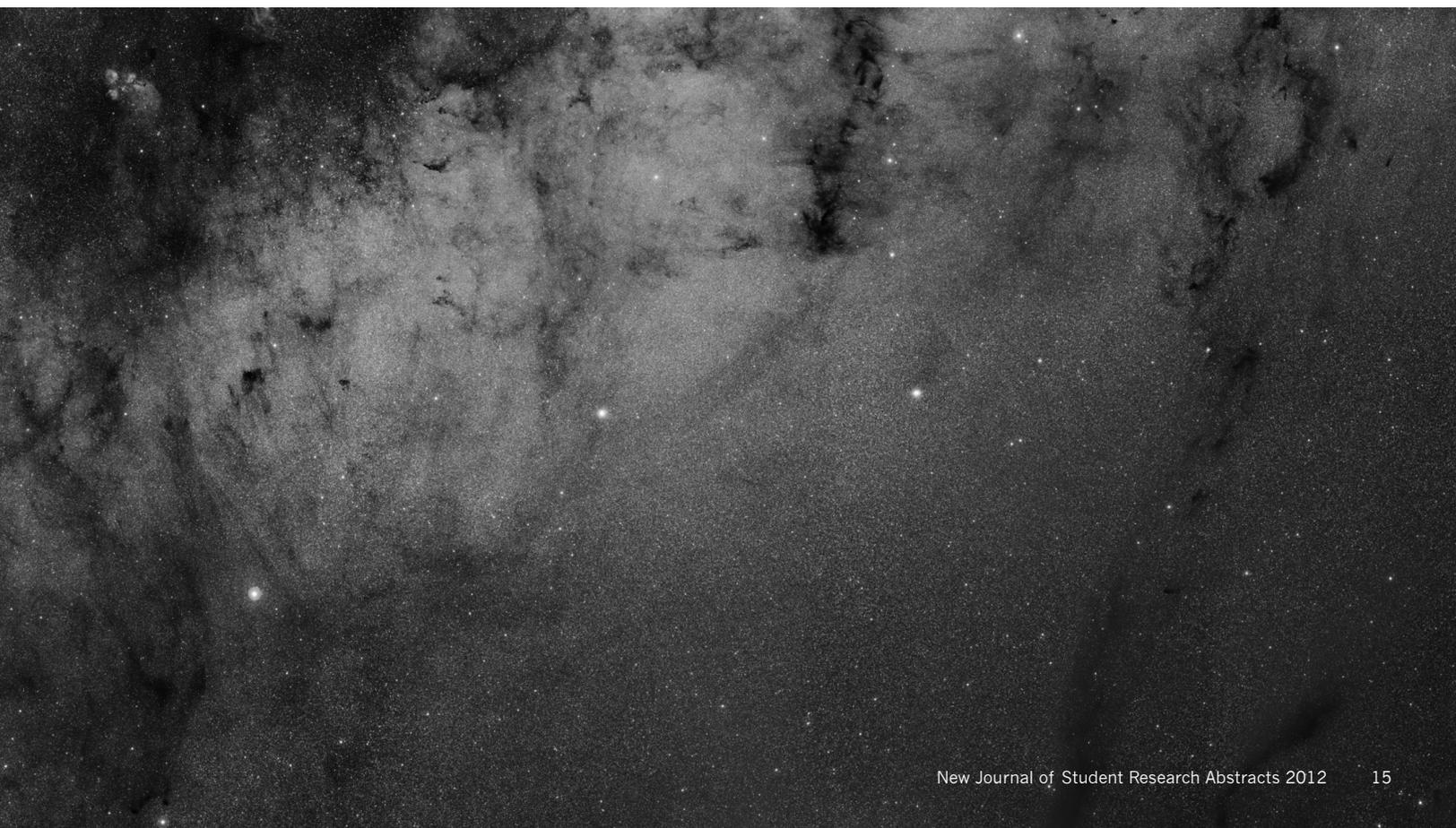
Artwork by

*Christine Montemayor*

Ernest Lawrence Gifted/Highly Gifted Magnet  
Greg Zem, Teacher



# STUDENT RESEARCH ABSTRACTS



5051

## Eggs and Osmosis

Winfred Ruiz and R. Tounian (teacher)  
Mid-City's Prescott School of Enriched Sciences  
3500 W. Adams Blvd.  
Los Angeles, CA 90018

I have always been interested to find out if water and other liquids can get in and out of an egg through a process known as osmosis. In this report I investigated the permeability of eggshells and eggshell membranes to water, seawater, maple syrup and corn syrup.

Eggs were immersed in cups filled with white vinegar for various periods of time and then they were transferred to cups filled with tap water (that was colored blue with food coloring) for a period of 24 hours. The eggs were boiled and cut in half to be able to determine the influx of blue tap water. Additionally, eggs without shells and with shell membranes were placed in seawater, maple syrup and corn syrup and were observed for time periods extending to five days.

Eggs were immersed in vinegar for 0, 2, 4, 6, 8, 9, 12 and 24 hours and were transferred to cups with blue tap water for a period of 24 hours. Eggs were boiled and cut in half afterward for observation.

No blue color was observed in egg whites that were immersed in vinegar for 0, 2, 4, 6, 8 and 9 hours. Blue color was observed in the egg whites of eggs that were immersed in vinegar for 12 and 24 hours (hypotonic condition). Four eggs that were immersed in vinegar for over 12 hours and then placed in filtered seawater became swollen, gaining much larger diameters (hypotonic condition). Eggs without eggshells and with eggshell membranes that were placed in maple syrup and corn syrup became smaller in diameter and wrinkled after the third day of immersion in maple syrup and corn syrup (hypertonic condition).

In conclusion, eggshells are solid calcium carbonate shields that control the influx and efflux of water to and from eggs. Eggshells are not permeable to water but eggshell membranes are. Eggshells completely dissolve after 12 hours of immersion in vinegar. Blue colored tap water was only able to infiltrate the eggshell membrane after eggshells were completely dissolved, making eggs permeable to water. Eggs with only eggshell membranes that were immersed in filtered seawater started to swell and gain larger diameters due to lower osmotic pressure inside the eggs compared to the seawater (hypotonic condition). Eggs without eggshells and with eggshell membranes that were placed in maple syrup and corn syrup lost water and shriveled due to higher osmotic pressure inside the eggs compared to lower osmotic pressure in maple syrup and corn syrup, which caused water to move out of the eggs into the thicker maple and corn syrups (hypertonic condition). Movement of other nutrients and molecules from and into eggs cannot be determined from this investigation.

5052

## How Sea Surface Temperature Anomalies Affect Chub Mackerel, *Scomber japonicus*, Landings in California Fisheries

Adrine Oganyan and D. Evans-Bye (teacher)  
Clark Magnet High School  
4747 New York Ave.  
La Crescenta, CA 91214

In the waters off the coast of California, as well as in many other oceanic regions of the world, there exists a phenomenon designated as "ENSO," which stands for El Niño Southern Oscillation. It is a remarkable occurrence that sends a warm current through the ocean approximately every three to four years. These anomalies may be accompanied by changes in the populations of fish species. Consequently, fisheries (organizations of commercial fishers) will be affected. This study aims to acquire information about whether or not temperature anomalies alter commercial annual landings of chub mackerel (*Scomber japonicus*). If changes take place in the habitat of a fish species, then one of two alternatives will occur: The fish

will either not be able to survive the conditions and experience a depreciating population; or, the new conditions will be in favor of the fish and will allow it to thrive, therefore causing an increasing population. Thus, sea surface temperature anomalies will indeed affect commercial annual landings.

For this research, data provided by the National Marine Fisheries Service was compiled and organized into graphs through the use of Microsoft Excel. The types of graphs used were column/line graphs, a scatter plot and a three-dimensional area chart.

The column line graphs were used because they make it possible for commercial annual landings (represented by columns) to be compared simultaneously to temperature anomalies (represented by a broken-line graph). From this graph, it can be understood that the metric tons of chub mackerel and temperature anomalies of the waters were relatively high from 1997-1998. In 1999, both values experienced a dramatic drop, reviving once again in 2000. In the following year, the metric tons dropped to less than half of the previous number, while the temperature remained about the same. Both values increased steadily for the next two years, but in 2004, temperatures reached an all-time high, while metric tons remained about the same. From 2005 to 2008, both values decreased and increased proportionally in two consecutive patterns.

The scatter plot was used to derive the  $R^2$  value, and the area chart was used to portray the differences in annual landings of the chub mackerel for a 56-year period. It showed drastic changes: large decreases and increases during about the same time of the El Niño Southern Oscillation.

The information was composed mostly of commercial annual landings expressed in metric tons, which were then transformed using logarithms to reveal a trendline. Because the  $R^2$  value derived from this chart was greater than 0.5, it showed that the data fit the trendline mostly accurately.

The hypothesis that sea surface temperature anomalies would affect commercial annual landings was accepted to be true. As discovered by Hernández and Ortega (2000) and noted by Ciechowski, *S. japonicus* produce more eggs in warm water. During El Niño, when the seawater becomes warmer, a larger batch fecundity is produced, which yields larger populations of chub mackerel available for commercial fishing. It can be concluded that the El Niño phenomenon has a positive effect on California chub mackerel fisheries.

5053

## Lemon Keyboard

Bremen Rudd and R. Tounian (teacher)  
Mid-City's Prescott School of Enriched Sciences  
3500 W. Adams Blvd.  
Los Angeles, CA 90018

I made a lemon keyboard because I was making a lemon clock at my friend's birthday party. When I finished the lemon clock, I decided to change it into something that made some noise. So I turned it into one of the world's smallest keyboards.

First I cut a lemon in half. Lemon serves as the battery in this setup. Then I inserted two zinc electrodes, one vertical and one horizontal, one in each lemon half. I then inserted two steel forks vertically, one in each lemon half. Electric wires were used to connect one fork in one lemon half with the horizontal electrode (keys) in the other lemon half. The vertical electrode in one half of the lemon and the steel fork in the other half of the lemon were connected by electric wires to a sound chip. As a variation to my first circuit, I used a second circuit with copper electrodes instead of zinc and used steel nails instead of steel forks. All other factors remained the same.

My first circuit worked as expected as soon as all of the wires were properly connected and the circuit was closed. The horizontal zinc electrode acted like a keyboard. As I touched different parts of the horizontal zinc electrode, the sound chip produced sounds with different frequencies (pitch), much like a keyboard. In my second trial, I could not duplicate my first trial's results. The sound chip would not make any noise. Therefore I replaced the zinc electrodes with copper electrodes and replaced the steel forks with steel nails and connected them exactly like my first trial. The

sound chip started to make a noise. Unlike my first trial, I was not able to use the horizontal copper electrode as a keyboard. Touching the copper electrode only broke up the noise coming from the sound chip but did not create the keyboard effect, which means it did not create sounds with different frequencies (pitch).

In conclusion, I learned that lemon can be a very good battery due to its acidic nature. I also learned that for an electric current to be generated, we need to select two metals (electrodes) with different electronegative values. Zinc is less electronegative than steel (iron mixed with carbon); therefore zinc electrodes will lose electrons and steel electrodes will gain electrons for a flow of electrons (current) to be created. This flow of electrons (electric current) is maintained in the acidic lemon juice (battery) and that is how a lemon keyboard works. My second trial did not work as well as my first trial. I initially thought that my sound chip had broken. The sound chip started working after I used copper electrodes and steel nails, but it did not have the keyboard effect that I experienced in my first trial using zinc electrodes. I need to repeat this experiment with zinc electrodes, steel nails or forks, and a new sound chip.

5054

## Does Carbon Dioxide Cause Global Warming?

*Carolina Vicente and R. Tounian (teacher)*

Mid-City's Prescott School of Enriched Sciences  
3500 W. Adams Blvd.  
Los Angeles, CA 90018

I chose to do my project on carbon dioxide and global warming because I believe that global warming is a very serious problem facing our planet. I wanted to learn about the major causes of global warming so I am capable of finding solutions to the problem. Most importantly, I want to be able to talk to people and my friends and make sure everyone is aware of a problem that is so vital to our future.

I used a machine called Gastec model GV-50PS to measure the outside (ambient) carbon dioxide concentration at our school. The carbon dioxide glass detector tube that fits on the Gastec machine is calibrated from 0.03 to 0.1 percent. That corresponds to 300 to 1,000 parts per million (PPM). I did two measurements on 11/22/2011 and 11/23/2011 during my lunch hour. I located myself in the center of the school so I could get the most reliable results. I also investigated global warming and greenhouse gasses, especially carbon dioxide, through NASA's publications.

I could only get a range for the outside carbon dioxide concentration in our school on both days and that range was between 0.04 and 0.05 percent. That corresponds to 400 to 500 PPM. My research showed me that the ambient carbon dioxide in the world has been rising at a very rapid rate. The concentration of carbon dioxide has increased from about 310 PPM in the 1960s to around 400 PPM currently (2011). Global surface temperature has increased about 1 degree Celsius since the 1900s.

In conclusion, my findings are amazing and scary. My school's outside carbon dioxide concentration is at a range of 400 to 500 PPM, which is much higher than the world's average ambient carbon dioxide level, which is at around 400 PPM currently. After considering all options, I am convinced that school location is a major factor for my two high carbon dioxide readings. Our school is enclosed within two major streets (Adams and Arlington), a school on the west side and homes on the south side. Students in our school and our neighboring school, people in all the homes, and cars and buses in our streets are definitely having a negative impact on the ambient carbon dioxide level at our school.

Carbon dioxide makes up more than 70 percent of all the greenhouse gases (GHG) in the world. Greenhouse gases trap the heat that is radiated from the Earth's surface and cause slow but steady warming of our planet Earth. A steady increase in the level of carbon dioxide has corresponded to a steady increase in the global surface temperature. This makes me believe that carbon dioxide may play a major role in global warming.

Global warming is very slow but steady and can have serious consequences. Ice cap melting is one of the major changes in our world ecosystems due to

global warming that can devastate polar life as well as raise water levels in our oceans, leading to flooding and other natural disasters. If not slowed down or stopped, global warming will eventually destroy most of our world habitats and cause several mass extinctions.

5055

## Will a Population of Collembola Increase If They Are Kept Under a 50-LED Red Light?

*Eric Abell, Lorraine Aguilar, Kayla Albania, Daniel Almaguer, Oscar Alvarado, Isaac Antonio De Marcos, Richie Aranez, Bryan Argueta, Adrian Avila, Alexis Bacaro, Jenna Brown, Linda Curiel, Tanya Dhiman, Faith Duran, Jennifer Flores, Jesse Garcia, Andy Garza, Andreana Gurrola, Justin Hernandez, Ralph Ibay, Antonio Lopez, Katarina Lopez, Nicole Lopez, Tatiyana Lopez, Arekg Manash, Ernesto Martinez, Edwin Matute, Wilmer Merino, Jasleen Munsalud, Noah Parada, Emma Pineda, Lawrence Raju Jr., Micayla Rendon, Emily Rodriguez, Grace Silva, Luis Zapata and T. Miller (teacher)*  
Holmes International Middle School  
9351 Paso Robles Ave.  
Northridge, CA 91325

The purpose of this experiment is to determine if a population of collembola (*Lepidocyrtus northridge*) will increase if they are kept under a 50-LED red light. As a hypothesis we believe the population of collembola will decrease if kept under the red light. Collembola are tiny arthropods commonly called springtails. One part charcoal and nine parts plaster of Paris were added to a container with water. It was stirred to about the consistency of yogurt. Then, it was poured into 18 petri dishes and allowed to dry for a couple of days. Half of the petri dishes were labeled as control and half labeled as experiment. All of the petri dishes were watered to make a moist environment for the collembola. Equal numbers of collembola were placed in the experiment environment and in the control environment. Yeast was added for the collembola to eat. The collembola in the experiment were placed under a 50-LED red light during school days. The control had regular light from being in the classroom. The collembola and eggs were counted twice a week using stereomicroscopes and magnifying glasses. Over 500 collembola were counted in the experiment and in the control: 37% of the collembola were in the control and 62% of the collembola were counted in the experiment. Forty-seven percent of the eggs were counted in the control and 62% of the eggs were counted in the experiment. Our hypothesis is incorrect. The evidence suggests the collembola reproduce faster under the 50-LED red light.

5056

## Will a Population of Collembola Increase If Two Sow Bugs Are Kept in Their Environment?

*Leonardo Avina, Wilber Barillas, Allixandria Bejar, Jessee Bonilla, Jane Cabanayan, Moises Cabrera Jr., Marc Cadonna, Hanbyul Choi, Britney Cifuentes, Victoria Diaz, Veronica Diaz, Fernando Escobar, Joaquim Francisco, Melanie Gallegos, Josue Gutierrez, Dianna Henriquez, Aaron Hernandez, Emily Herrarte, Sophia Justman, Monica Kharatyan, Andrew Langwald, Aldwin Mapula, Erick Martinez, Matthew Martinez, Jovanni Mixco, Anabi Molina, Rebecca Namuddu, Jesbua Olivias, Oscar Ortega, Kristina Radich, Matias Ramirez, Ramses Ramirez, Shane Schomer, Efua Sey, Antonio Tantamco, Jasmine Torres, Laura Turcios, Alicia Yang and T. Miller (teacher)*  
Holmes International Middle School  
9351 Paso Robles Ave.  
Northridge, CA 91325

The purpose of this experiment is to see if sow bugs and the collembola (*Onychiuridae encarpatus*) can live in the same environment. For our hypothesis we believe the population of collembola would decrease when living with sow bugs. Collembola are tiny arthropods that are found in soil environments. Environments for the collembola were made by placing nine parts plaster of Paris, one part charcoal and water in a dish and stirring it until it was completely mixed. It was the consistency of yogurt. We poured it into 18 petri dishes and allowed it to dry for a few days. Water was added to the petri dishes using eyedroppers. Yeast was dropped in the environment for

the collembola to eat. Collembola were added to each petri dish (10-12). To half of the petri dishes we added two sow bugs. Magnifying glasses and stereomicroscopes were used to observe and count the collembola. At the end of the experiment, 99.6% of the collembola were observed in the control and less than 1% in the experiment. Our hypothesis was correct. Sow bugs and collembola cannot successfully live in the same environment.

5057

### Will a Population of Collembola Increase Faster If They Are Kept in a Larger Environment?

*Nataly Alcalá, Amanda Aleman, Marizemnia Andres, Christopher Aragon, Edver Ayala, Liam Balaban, Anthony Cain, Daniella Candelario, Ellodee Carpenter, Sandra Casarez, Nancy Chavez, Ethan Corral, Marisa De Leon, Jesse Dominguez, Ryan Fletcher, Diana Flores, Iris Flores, Nelly Garay, Ricky Garcia, Moises Gonzalez, Ernesto Gutierrez, Leonardo Hurtado, Jocelyn Interiano, David Liu, Amy Martinez, Katherine Martinez, Rebecca Moffitt, Lorena Nunez, Vanessa Palafox, Valeria Sanchez, Andrew Serrano, Justin Takayesu, Ashley Tuang, Deanne Umbay, Camille Villaflores, Avery Wallace, Christian Yanez and T. Miller (teacher)*  
Holmes International Middle School  
9351 Paso Robles Ave.  
Northridge, CA 91325

The purpose of this experiment is to see if a population of collembola will increase if they are placed in a larger environment. We believed as the hypothesis that a population of *Onychiuridae encarpatus* will increase if placed into a larger petri dish. Collembola are tiny terrestrial arthropods. To make environments for the collembola we stirred one part charcoal, nine parts plaster of Paris and water in a small dish. We poured it into nine large (150 mm) petri dishes and nine smaller (100 mm) petri dishes. They were allowed to dry for two days. Water was placed in all the environments by using eyedroppers. Yeast was placed in each environment for the collembola to eat. Equal numbers of collembola were placed in the large and small petri dishes (10-12). The collembola were observed using magnifying glasses and stereomicroscopes. The collembola were counted as data twice weekly for six weeks. Our results showed 36.3% of the collembola were found in the smaller petri dish; 45.5% of the eggs and 63.6% of the collembola were found in the larger petri dish with 54.4% of the collembola eggs. The data suggests our hypothesis was correct. Collembola population increases with the size of the environment.

5058

### Extinction of the Golden Toad

*Montserrat Robles and R. Tounian (teacher)*  
Mid-City's Prescott School of Enriched Sciences  
3500 W. Adams Blvd.  
Los Angeles, CA 90018

The purpose of my project is to investigate how the Golden Toads (*Bufo periglenes*) of the Monteverde Region in Costa Rica became extinct. The Golden Toads were first discovered by Dr. Jay Savage of the University of Miami in Florida. Dr. Savage has been quoted saying, "What a terrible feeling to realize that within my own lifetime, a species of such unusual beauty should disappear from our planet." The Golden Toads reproduced by laying eggs in seasonal waters. Each female laid about 230 eggs that hatched after two months. These toads were once abundant in Costa Rica's mountainous Monteverde (green mountain) Region. Since 1989 not a single Golden Toad has been seen anywhere in the world.

I studied research papers published by well-known herpetologists such as Dr. Jay Savage and Dr. J. Alan Pounds, who spent several years studying the disappearance and possible extinction of several species of frogs, including the Golden Toads.

I found out very interesting things from my studies. The number of days of dry spells of five days or more increased from 1973 to 1998 in the Monteverde Region of Costa Rica. This number was highest in 1987 and 1998. There was a constant decrease in stream flow from the 1970s through 1990s in the Monteverde Region as well. Global surface temperature has gone up around 0.8 degrees Celsius from the 1900s to the present. Global warming

can raise ocean surface temperatures and that in turn can cause clouds to be formed at higher elevations.

In conclusion, I should say that I believe Golden Toads' possible extinction is caused by a number of factors. Human direct interference for financial rewards can be a cause for this super-pretty species' extinction. Global warming is the most important cause for the Golden Toads' extinction because global warming can cause higher ocean surface temperatures that can in turn cause clouds to form at much higher altitudes. These high clouds may pass over the mountains of Monteverde without dropping any moisture on them. Proof for my hypothesis is the increase in the number of days of dry spells and decrease in stream flow since the 1970s in the Monteverde Region. Lack of water (moisture) is devastating for all living organisms, especially frogs, that have a very sensitive skin that needs to remain moist at all times. The third suspects are chytrid fungi that can thrive in high-temperature and low-moisture environments and have already been found to cause extinction of a large number of frog species.

5059

### The Ability of an Electromagnet to Make an Object Fly

*Aditya Athota and D. Shab (teacher)*  
Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This study observes the possibility that an electromagnet can make an object fly. Magnets were placed on the bottom of a CD case with a plastic pillar. These magnets represented electromagnets with a high amount of electricity. The magnets all had their south side up. Many small magnets were attached to a CD. These magnets had their south side down. The hole in the CD was then put onto the plastic pillar. However, the CD didn't fall. It was kept up by the repulsion of the magnets. CDs, each of which weighed 15gm, were placed on top of the floating CD. Ten CDs were put on the floating CD and the CD was still floating. These results suggest that if electromagnets had as much power as a regular magnet, then the electromagnets could lift more than 150gm.

5060

### Relationship Between Electricity and Magnetism

*Alexander Landyshev and D. Shab (teacher)*  
Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This study examined effects of electricity on magnetism and vice versa. To demonstrate the relationship between electricity and magnetism, two different experiments were performed. The first experiment was intended to demonstrate that a larger magnetic field can generate a larger electrical field. To show this, 5-, 10- and 15-cm magnets were moved through a helix, and the voltage that this magnetic force generated was measured. The experiment was performed 30 times with each magnet size. Results showed that the 5-, 10- and 15-cm magnets generated an average of 2, 5 and 7 millivolts, respectively. Thus, the largest magnet generated the largest amount of electricity. The second experiment was set up to demonstrate that a stronger electrical current creates a stronger magnet. It consisted of a U-shaped iron core inserted into two helices. Different currents passed through the helices, turning the iron core into a magnet. Weights were hung from a hook that was magnetically attached to the iron core. The maximum weight for each current was measured. The AA battery, measuring 1.6 volts, was attached to the helices and generated a magnetic force that held a maximum of 0.7 kg. The two D batteries in series, measuring 3 volts, generated a magnetic force that held 1.6 kg. The 6-volt battery generated a magnetic force that held a maximum of 2.2 kg. This concluded that the stronger electrical field created a stronger magnet.

5061

## Effects of Music on the Average Human's Memory

*Alexandra Nicholas and D. Shab (teacher)*

Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This study explored the possibility that music can have a positive effect on the temporal and frontal lobes of the brain, resulting in an improvement in overall memory. A group of 24 human subjects was tested using various types of music. With three people per genre, seven genres and one non-music category were tested. Subjects were to listen to 30 seconds of a song from their genre (excluding the non-music subjects, who were simply given 30 seconds to look over the list) and were to look at a list of words chosen at random. When time was up they were given 30 seconds to write down the words they remembered. All of the results ended in very close averages. Each genre provided an average of just around five words, with the exception of one genre. Non-music had the highest average overall. The conclusion made was that music does not increase one's ability to remember, but instead each person has a different capability in this area of the brain.

5062

## Accuracy of Weather Forecasts in Predicting Windmill Energy Production

*Samar Allibhoy and D. Shab (teacher)*

Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This experiment measured the accuracy of weather forecasts in predicting the amount of energy produced by a windmill. Weather forecasts were gathered from the websites Weather.com, Accuweather.com and Weatherunderground.com, and predictions were made as to whether the windmill would produce small, medium or large amounts of energy based on the forecasts. After predictions were made with the individual forecasts, an average prediction was made based on the average prediction of the three individual predictions. The windmill was set outside with a rechargeable battery, used to store the produced energy, inserted in a battery charger attached to the windmill. The windmill was set outside at approximately 6:30 p.m. every day for three days. The gears of a generator were turned by the blades of the windmill spinning, which charged the rechargeable battery. At 6:30 p.m. the day after the windmill was set outside, the battery in the windmill was replaced with a new one. The amount of energy in the battery taken out of the battery charger of the windmill was measured using a voltmeter. The amount of energy the battery had before being inserted into the windmill was subtracted from the amount of energy the voltmeter displayed (the amount of power in the battery after being charged) in order to get the amount of energy produced, which was recorded each day. The amount of energy produced by the windmill was compared to the prediction of how much energy the windmill would produce each day. The average success rate in predicting the energy production was 1 out of 3. The results suggest that weather forecasts are somewhat accurate in predicting the energy production of a windmill.

5063

## Effects of Sprite, Brine Water, Chlorine Water, Milk, Orange Juice and Regular Water on Nickels

*Andrea Kim and D. Shab (teacher)*

Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This experiment studied the rusting of nickels when added to Sprite, brine water, chlorine water, milk, orange juice and drinking water. A nickel was added to each cup of 40 ML (salt and chlorine were each 15 ML) liquids and examined for three days. Each experiment was repeated three times. When a nickel was added to chlorine water, it was discolored and rusty. It was a shade of purple and the silver, itself, had become matte. When a nickel was added to Sprite, it was least affected. The results suggest that chlorine water rusts and affects a nickel the most.

5064

## Effects of Urine on Broccoli Plants

*Andrew Mishkin and D. Shab (teacher)*

Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This study examined the possibility that diluted urine could be used as a fertilizer on plants. Twelve broccoli plants were watered regularly and endured the same conditions for six weeks. Half of these plants were given diluted urine weekly. Results were recorded at the end of the experiment. The broccoli seedlings all began at around 6 cm. The group given urine grew an average of 6.28 cm., reaching 12.5 cm. tall, a 100% growth rate. The control group grew an average of 3.32 cm, growing to 9.62 cm., only a 53% growth rate. This means that urine increased the plant growth by 47%, suggesting that urine is effective as a fertilizer.

5065

## Comparison of Metabolic Efficiency of Sugar and Sweeteners

*Angela Yoo and D. Shab (teacher)*

Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This study observed and examined the question of yeast reproduction using various sugar substitutes in replacement of sugar, testing the metabolic efficiency. Yeast and 115° F water were mixed with, in turn, sugar, nothing, and the sweeteners saccharin, sucralose and aspartame. The different mixtures were correspondingly attached to a gas collection apparatus, and the amount of carbon dioxide collected after 15 minutes was recorded by measuring the amount of water displaced in the gas collection apparatus. Each experiment trial was repeated three times. Sugar, collecting an average of 68 milliliters of carbon dioxide, had the highest metabolic efficiency, followed by sweeteners saccharin, sucralose and aspartame at average amounts of 62 milliliters, 61.3 milliliters and 57.3 milliliters, respectively. The yeast solution with nothing in it did not bubble, which resulted in that solution collecting the least average amount of 3 milliliters. The results suggest that sugar is the most likely to have the highest metabolic efficiency.

5066

## Electrolyte Comparison Between Orange Juice and Gatorade

*Aria Soltankhab and D. Shab (teacher)*

Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This study examined the question of the difference in electrolyte content between orange juice and Gatorade. Electrolyte content was measured using a multimeter. After repeating three times for each liquid, results showed that Gatorade was slightly higher in terms of electrolyte content.

5067

## 180-Degree Angled vs. 45-Degree Angled Solar Panels

*Asbley Pak and D. Shab (teacher)*

Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

The objective of this project was to find out the most effective way to angle your solar panels to receive the most energy. The information was gathered on small solar-powered light fixtures. A 180-degree angled solar panel and a 45-degree angled panel were placed out in a wide area, with the 45-degree angled panel facing the sun as it rose. They were kept out in the sun for about 6 hours. Over the 6 hours the 45-degree angled panel was facing the sun for half the time, but the rest of the time it barely received sunlight.

The 180-degree angled solar panel received a constant amount of sunlight, whether stronger than or not as strong as the other panel. When the panels' lights were turned on, the 180-degree angled solar panel kept going the longest and the brightest, while the 45-degree angled panel lasted approximately 1 hour shorter and dimmer.

### 5068 Effects of Different Light Colors on the Solar Panel

*Austin Ho and D. Shab (teacher)*  
Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This study examined the question of possible energy (particularly electrical) between the solar panel and the incandescent flood light bulb. A circuit was set up in which the main source had a colored film/filter close by. The solar panel was connected by positive red (+) and negative black (-) electrical wires. After this, an LED light bulb and multimeter (also known as a multitester or VOM) were added for tested wavelength. Each experiment was repeated four to five times depending on the accuracy of the data. The average for the bright yellow light reduced energy power to 2.8775 volts (V) and 2.815 milliamperes (MA), while the control values were 2.91 V and 3.475 MA. The average blue and green were 2.3025 V and 0.22 MA, and 2.42 V and 0.205 MA, respectively. The darkest (closest to black) light was 2.5925 V and 0.8375 MA, and 1.85 V and 0.484 MA, respectively. The results suggested that white/regular light is most likely to be used as a light/energy source for solar panels for electrical energy.

### 5069 The Effect of Materials on Batting Gloves Absorbing Vibration

*Austin Yoon and D. Shab (teacher)*  
Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This study examined the material that is best for absorbing shock and/or vibration, using a batting glove to test the three materials that were the best for absorbing vibration. The three materials used on the batting gloves were VRS (vibration resistance system), VRS 2 (vibration resistance system 2) and also a regular batting glove (to see if the material inside it is the best). I then tested the materials with the glove three times each with a wooden bat. The VRS was the best for reducing vibration, and in a survey of the amount of vibration that each material took in, the VRS came out with the best results.

### 5070 Effects of Certain Types of Music on Hamsters' Performance in a Maze

*Azalin Rothwell and D. Shab (teacher)*  
Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This experiment observed the performance of hamsters going through a maze while listening to different types of music. Three hamsters performed six trials within four different classes of music: rock, classical, pop and country. They also performed six trials with no music. Their performance was recorded in time taken to go from one end of the maze to the other and gain their reward. One hamster had consistent performances of lower times with each trial and in a particular pattern depending on the music category. Another hamster had lower times with each trial, but times were most affected by the reward being an exit to the maze rather than food. The third hamster experienced difficulty with the maze and showed no real consistent pattern in time for maze completion. If exceptions were considered

anomalies, best performances were had when the hamsters were listening to rock music, with classical music following in a close second. Results from a hamster named Carmel did suggest music has an effect and that different types of music can increase or decrease performance. However, considering the inconsistency of the data, results were overall inconclusive.

### 5071 Effect of an Incandescent Bulb and a Fluorescent Bulb to See Which One Produces More Heat

*Bill Park and D. Shab (teacher)*  
Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This study was done to examine which light bulb produces more heat and to determine which bulb wastes more energy. A shoe box was modified to hold the heat of the bulb inside and the heat was measured. The temperature inside the box was measured before the light bulb was turned on. After the light bulb was on for 1 minute the temperature was measured once again. The results showed the incandescent bulbs produced more heat, which means more energy was wasted.

### 5072 Cleaning Pennies With Different Liquids

*Brenda Giselle Jackson and D. Shab (teacher)*  
Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This study examined the question of what liquid cleaned pennies best: vinegar, hot sauce, ketchup or Coca-Cola. The pennies were soaked in each liquid for 30 minutes and were then rinsed off with warm water. They were then examined and rated on a scale of 1 to 10, and data was recorded. Each experiment was repeated four times with each liquid. After observations were recorded, an average was calculated from each set of results. The results said that vinegar cleaned the best, which proved the hypothesis wrong, which was that Coca-Cola would clean the best.

### 5073 Difference of Sound Quality Between CDs and Records

*Christian Ramirez and D. Shab (teacher)*  
Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This study examined the question of whether the compact disc (CD) or vinyl record (a large disc used before the era of the CD) is better used. The CD was played for three testers to determine the sound quality of the CD in a human aspect. Later on the record was played to the same testers to again determine the sound quality of the record in a human aspect. (Notice: Testers were blindfolded to determine a non-biased rating.) The playing of the songs was repeated three times to give the testers a good number of samples. Once the sound testing was done, a different set of damaged discs was used to test the strength of CDs and records. The discs had pieces chipped off and were put on to play. The record played fine but just not the first few songs, but the CD didn't do so well. The CD couldn't play any song at all. Once I was given the ratings from the testers, the results showed the record was preferred more than the CD. The results suggest that the record is the better mechanism than the CD for sound and durability.

5074

## The Weight of Gum As It's Chewed

*Clare McDermott and D. Shab (teacher)*

Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This study examined the question of whether gum gains or loses weight as it is chewed. Three people were chosen to chew five different types of gum for 15 minutes. Each person weighed their gum every 5 minutes for the 15 minutes and repeated this three times. Each piece of gum lost at least 33% of its weight. The results suggest that the gumballs are the most likely to lose weight.

5075

## Effects of Music on Blood Pressure and Heart Rate

*Cory Cumanan and D. Shab (teacher)*

Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This study examined the possible effects of different genres of music on heart rate and blood pressure. Subjects were seated listening to rap, classical and then rock music, each for 5 minutes. Rap is known to be both fast-paced and intense music; classical music is a relatively low-paced and soothing genre; and rock is loud and intense music. After 5 minutes of listening to each genre, blood pressure and pulse rate were recorded on a blood pressure monitor. Heart rate was recorded as well as systolic and diastolic blood pressure. The average control blood pressure was 113/72 and the average pulse was 72. The average blood pressure readings of rap, classical and rock music were 119/73, 113/71 and 117.5/70, respectively. The average pulse readings of the test subjects were 72, 72 and 69 for the genres rap, classical and rock, respectively. Systolic blood pressure was the only variable that did rise and fall expectedly with different genres of music. These results show that different kinds of music do indeed have the ability to fluctuate and directly affect the blood pressure of the human body.

5076

## Various Fishing Line Tinsel Strengths

*Daniel Spence and D. Shab (teacher)*

Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

Fishing lines come in many different sizes, strengths and colors, and are extremely important to today's fishing industry. In this scientific experiment, the objective was to test all three chosen fishing line strengths to see if they could withstand what they claim, 6 pounds. One of the methods used in the experiment was using dumbbells as the pre-measured approved weights. Another method was using a metal conduit as a support. The results had ups and downs; first of all one of the lines, South Bend, could only hold 4 pounds, but on the bright side, Maxima could hold 7 pounds. Izorline hit first place, with the power of holding 8 1/2 pounds. The conclusion made was that most fishing lines are practical and functional, but clearly there are better classes of products.

5077

## The Percentage of Water in Certain Fruits

*Davis Berkolds and D. Shab (teacher)*

Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This study examined the percentages of water in a watermelon, orange, kiwi and apple. The fruits were weighed thoroughly and the results were recorded. They were then placed in an oven that was preheated to 200 degrees Fahrenheit and they sat there for three hours. They were weighed again and the results were recorded. Watermelon was 88% water, orange 77%, apple 66% and kiwi 67%.

5078

## Effects of Carbohydrate Solutions on the Absorption and Dissolution of Aspirin

*Diane Bui and D. Shab (teacher)*

Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This study examined and compared the dissolving rate of aspirin when added to a cup of water, a cup with sugar added, and a cup with corn flour. The pH of the solutions in each of the three cups was measured before aspirin was added and for every minute (for 5 minutes) when aspirin was added. Each experiment was repeated four times. The aspirin was slower to dissolve in the cup with corn flour. The aspirin in the cup of sugar dissolved at almost the same rate as in the water alone. The results prove the hypothesis stating that the presence of carbohydrates will not affect the rate of dissolution of aspirin to be partially true.

5079

## Effects of Water With Different Acid Levels on the Growth of Radishes

*Drayden Wilson and D. Shab (teacher)*

Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This study examined the effect of water with varied pH levels on the growth of Cherry Belle radishes. Radishes were planted in groups of 25, with each group being watered with water with pH 3, pH 4, pH 5 or pH 6 once every three days for four weeks and the average weight for each group being measured. The total number of radishes was 100. pH 3 had an average of .044 grams, pH 4 had an average of .047 grams, pH 5 had an average of .052 grams, and pH 6 had an average of .068 grams. Therefore the lower the pH level, the more the radishes were affected.

5080

## Effects of Different Liquids on Growth of Beans

*Edmund Ob and D. Shab (teacher)*

Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This study examined the question of how Black Turtle Beans' growth is affected by different liquids. Beans were divided into five groups and each of them was given water, green tea, saltwater, orange juice or Sprite (sugared carbonated drink) as their nourishment for seven days. Each experiment was repeated three times. Green tea reduced the rate of growth 22% and saltwater 33%. For orange juice and Sprite the beans did not grow at all. The results suggest that water is the best for growing Black Turtle Beans.

### 5081 Falling Speed of Objects Based on Parachute Size

*Eedan Shwartz and D. Shab (teacher)*  
Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This study examined the effects of different-sized parachutes on the same object. Five different-sized parachutes were created and thrown off of a 5-meter building. All of the parachutes fell at different speeds. Parachute 1 fell the fastest, then parachutes 2, 3, 4 and 5 came after. Parachute 1 fell at about 250 cm per second, parachute 2 at 170 cm per second, parachute 3 at 130 cm per second, parachute 4 at 110 cm per second, and parachute 5 at 90 cm per second. This tells us that when the parachutes' increment is at about 3.5 cm greater, they will fall somewhere around 30 cm per second slower.

### 5082 Effects of Color on Taste Perception

*Emily Wheeler and D. Shab (teacher)*  
Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

My experiment tested whether or not the color of the food affected what you perceived the taste to be. To test this, each of the subjects had to taste different flavors of yogurt dyed different colors. None of the colors matched with the flavors. There were 12 subjects and each had to taste seven small cups of yogurt. The color did influence the taste, but not as much as I had thought. The percentage average of the tastes that were affected was 45.23%. These results suggest that the color does affect the taste perception.

### 5083 The Effect of Different Waters on the Growth of a Kidney Bean

*Enrique Linan and D. Shab (teacher)*  
Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This study examined the question of how the kind of water you use may be involved in the growth of the red kidney bean. Twelve plants, every three representing different waters, were planted and watered accordingly for four weeks and their heights per week were recorded. It showed that mineral water had a substantial improvement in height over the control (tap water), and purified water brought a decrease in height. These results suggest that the kind of water does play a role in the growth of a kidney bean.

### 5084 Which Surface Helps Earthworms Move Faster?

*Eric Nam and D. Shab (teacher)*  
Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This study examined the change in earthworms' speed on different surfaces. Earthworms were tested and timed to move 10 cm on all three different surfaces (glass, sandpaper and wood). Each experiment was repeated six times. Earthworms took 2.14.03 min. on glass, 1.14.36 min. on sandpaper and 2.05.46 min. on wood. The results suggest that sandpaper is the best surface to help earthworms move fast.

### 5085 Mental and Physical Exhaustion Effects on Concentration and Motor Skills

*Esther Choi and D. Shab (teacher)*  
Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This experiment tested whether physical or mental exhaustion affects one's ability to concentrate and one's motor skills. Subjects were in the age range of 12 to 13 and were the same gender to ensure consistent results. The subjects were separated into three groups, the control group, the exercise tested group and the mental tested group. The physical group went through 10 minutes of vigorous exercise that consisted of running and jumping rope to promote a faster heart rate, the control group relaxed for 10 minutes, and the mental group completed a series of mental quizzes for 10 minutes. After all the subjects completed their assigned tasks, they completed a maze that tested their steadiness. In the end, the results suggested that exercise helped improve the subjects' time and steadiness for completing the maze. Also, the results suggested that the mental exhaustion improved the subjects' time and accuracy during the maze.

### 5086 Supercharged Foods: Analyzing the Electrical and Conductive Properties of Fruits and Vegetables

*Ethan Harris and D. Shab (teacher)*  
Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This project tested the electrical charges of fruits and vegetables to see which ones generated the most power. The foods tested conduct electricity by keeping the zinc ions and copper ions separate, so that the electrons are forced to move in a current. Using fruits and vegetables, copper wire, galvanized nails and a voltmeter, the amount of electrical current generated by each food was measured three times. The foods tested were lemons, apples, potatoes, bananas and squash. The apple generated 0.84 volts, the potato generated 0.83, the banana and squash generated 0.77 volts each, and the lemon generated 0.74 volts on average. Therefore, apples present a viable source of alternative power. Higher ionic and water weight foods seem to produce and conduct electricity better.

### 5087 Testing the Level of Sugar in Drinks Advertised as Sugar-Free

*Hakan Alpay and D. Shab (teacher)*  
Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This experiment examined the possibility of sugar in POWERADE ZERO, Diet 7UP and SoBe LIFEWATER; these were drinks that were advertised as sugar-free. The control group was bottled water. Forty drops of a beverage mentioned and 10 drops of Benedict's solution were placed into each test tube, until all four of the beverages were used. Benedict's solution is a chemical used to measure the amount of simple sugars in a substance. To start the chemical reaction, the test tubes were put into their own shot glasses and filled with approximately 2 fluid ounces of 50° C water. After the chemical reaction took place, the results were recorded and the entire experiment was repeated three times. All beverages turned blue, except for the SoBe LIFEWATER beverage, which turned green. These results indicate that POWERADE ZERO and Diet 7UP are sugar-free, but SoBe LIFEWATER contains some sugar.

5088

## Does an Hour of Video Games Affect a Student's Math Test Score?

*Hesu Song and D. Shab (teacher)*  
Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This experiment was used to answer the question, "Does an hour of video games affect a student's math test score?" In the control group, 20 subjects took a one-minute math test. In the experimental group, 20 subjects played an hour of video games, taking the same grade level math test right after. The experimental group played the Wii (Nintendo): Mario Party 8, Mario Kart Wii and Wii Sports. The experiment was repeated three times. The control group had test score averages of 51%, 63% and 63% out of a possible 100%. The experimental group had test score averages of 49%, 55% and 54% out of a possible 100%. On average, the control group got better grades than the experimental group by 6.33%. According to the results, playing video games right before a test can lower a student's math test score.

5089

## Salt's Effect on Fruits

*Hyun Joon Kim and D. Shab (teacher)*  
Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This study examined the question of salt involvement in the loss of mass in fruits over a course of five days. Fruits were placed in three separate groups: no salt group, 6 grams of salt group and 18 grams of salt group. Each group had different amounts of salt put onto the fruits. Altogether, the fruits with 6 grams of salt lost an average of 48 grams more than the regular fruits in five days. The fruits with 18 grams of salt lost an average of 37 grams more than the fruits with no salt in five days. These results suggest that salt makes fruits lose mass.

5090

## What Kind of Liquid Grows Mold on White Bread the Most?

*Hyunji Song and D. Shab (teacher)*  
Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This experiment was to see what liquid would grow the most mold on white bread that we normally eat. The liquid was poured onto the bread, and it was kept for at least two weeks in a plastic bag. It didn't mold very well because of the preservatives in it, but it started molding later on in the week. To measure the amount of mold that grew on the bread, I used a grid paper to measure how many squares it took up with an estimated sketch. The results didn't really turn up as I expected. The bread that grew the most mold was water. I was kind of surprised at the result. But as I expected the least molded bread was lemon juice. Even after two weeks it hadn't molded a spot.

5091

## The Effect of Acid Rain on String Bean Plant Growth

*Isaac Kljian and D. Shab (teacher)*  
Portola Highly Gifted Magnet Center  
18720 Linnet Street  
Tarzana, CA 91356

This study examined the effect of acid rain on string bean plant growth. Four distinctive groups (low acid, medium acid, high acid and control) of the string bean plant were planted and treated with specific vinegar/distilled water solutions (5%, 12% and 25% vinegar/water solutions) or with distilled water for 60 days. The experiment was conducted three times

simultaneously, and the plants in each of the groups that were treated with the vinegar/distilled water solutions started to show signs of wilting and reduction in plant growth until they finally died. The plants in the control group flourished and kept on growing. The results suggest that acid rain simulated by the vinegar/distilled water solutions in this experiment causes reduction in plant growth and the eventual destruction of plants, such as the string bean plant.

5092

## The Sense Behind Sensors

*Jaewon Yang and D. Shab (teacher)*  
Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This project examined the effects of sensors on the success rate of a robot's missions. A robot was built and a mission path formulated with the same conditions every run. If the front edge of the robot's light sensors came within 2 centimeters of the end target, the run was considered a success. The robot was programmed first with sensors and then without to the best possible accuracy. For the first 20 runs, sensors were used, and the robot succeeded in completing its mission 19 times. Then, the non-sensor runs, with the exact same robot, were tried, succeeding 13 times out of 20. The result was that sensors do create a positive influence on the success rate of a robot doing a mission.

5093

## Effects of Different Fertilizers on Tomato Plants

*Jax Friedman and D. Shab (teacher)*  
Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This study examined the growth rates of tomato plants that were individually given organic seaweed fertilizer, chemical fertilizer and water. Plants were watered every other day and their heights were measured every other week. Twelve plants were used for each different liquid given to them. The plants being fed the organic seaweed fertilizer grew taller than the chemical fertilizer-given plants and the water plants. The results suggest that organic seaweed fertilizer is the most effective fertilizer to quickly grow tomato plants.

5094

## Effects of Liquid Nitrogen on 12 Metals

*Jean Campbell and D. Shab (teacher)*  
Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This study examined the possible effects of liquid nitrogen on metals: calcium, erbium, germanium, iron, lead, manganese, samarium, silver and yttrium. Each of these metals was individually submerged into liquid nitrogen for 3 minutes and the effect of the liquid nitrogen on each metal was recorded. Each experiment was repeated three times. While the control metals did not show any change, each metal submerged in liquid nitrogen demonstrated an increase in brittleness. The rate of brittleness was different in each metal depending on its molecular structure. The average brittleness of the metals submerged in liquid nitrogen was 6.65. The results suggest that liquid nitrogen likely affects metals by causing them to increase in brittleness when submerged for at least 3 minutes.

5095

### Effects of Music on Human Blood Pressure

*Joyce Kang and D. Shab (teacher)*  
Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This study examined the question of the effects of music on human blood pressure. Human test subjects were tested before and after listening to three different genres of music: classical, gospel and rap; the change in blood pressure after each song was recorded. Each experiment was repeated three times. Rap music is known for its intensity and loudness, whereas classical music is known for its soothing and calm beat. Gospel music is composed for many purposes, such as aesthetic, religious, ceremonial or entertainment pleasure/purposes; it can be loud or quiet. After three minutes of listening to each genre, data was recorded. The average control blood pressure was 106/68 and the average rap, gospel and classical blood pressures were 101/67, 104/66 and 101/69, respectively. The results show that different kinds of music do have an effect on human blood pressure.

5096

### Effects of Music on Heartbeat

*Katie Kim and D. Shab (teacher)*  
Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This experiment tested how the six genres of music – classical, rap, gospel, rock and roll, jazz and country – affected heart rates. One song was chosen for each genre. In this experiment, four people were tested. Each of them listened to a genre for two minutes with headphones until their heart rates were checked with an automatic blood pressure monitor. They were experimented on with each genre three times, with an interval of three minutes in between each round. The results were that gospel increased the heart rate the most, followed by country, rap, jazz, rock and roll, and classical. Classical music decreased the majority's heart rate.

5097

### Liquids That Have the Highest Boiling Point

*Mahmoud Morsy and D. Shab (teacher)*  
Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This study examined the question of which liquid will have the highest melting point. Each liquid was 3/4 of one cup (including butter). Each one was kept over a medium flame on the stove. The liquids were water, butter, milk, syrup and soybean oil. They all were at a fairly high melting point ranging from 200 degrees Fahrenheit to 385 degrees Fahrenheit. The soybean oil lasted the longest and boiled the hottest. The results show that soybean oil is the best for boiling.

5098

### Duration of Fire on Types of Wood

*Marcus Arnesen and D. Shab (teacher)*  
Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This study analyzed the question of the amount of time a log could stay on fire. The chemical equation consists of  $C_3H_8$  (fuel) +  $5O_2$  (air) = heat +  $3CO_2$  (carbon dioxide) +  $4H_2O$  (water). The types of logs tested were Duraflame logs, Applewood logs, Java-Log logs, oakwood logs and eucalyptus logs. Each log was first lit on fire with natural gas and the time on fire was recorded. Each log was tested three times. The Duraflame logs recorded 4:12:30 sec, 2:06:35 sec and 3:38:17 sec on fire. The Applewood logs got 0:00:00 sec, 0:20:00 sec and 0:09:27 sec. The Java-Log logs timed at 3:53:51 sec, 3:26:37 sec and 3:48:23 sec. The oakwood logs recorded 0:15:57

sec, 0:22:28 sec and 0:08:11 sec. The eucalyptus logs were on fire for 0:01:11 sec, 0:00:00 sec and 0:00:00 sec. I conclude that the Duraflame logs, as a combustible resource, support the life of a fire longer than the other logs because they contain plentiful amounts of the proper fuel.

5099

### How the Mass Affects How Much Navel and Valencia Orange Juice Are Produced

*Mariel Neri and D. Shab (teacher)*  
Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This study examined the question of whether Navel oranges and Valencia oranges of the same mass have the same amounts of juice. Nine Navel oranges and nine Valencia oranges of the same mass (they were checked on a scale just to make sure) were juiced and put into a pitcher. The total amount of Navel orange juice was 2 9/16 cups; the average amount of juice was 29/144. The total amount of Valencia orange juice was 1 13/16 cups; the average amount of juice was 41/144. The difference of the average juices was 12/144 cups of juice. The results suggest that Navel oranges produce more juice than Valencia oranges (having the same mass, yet a lower average amount of juice).

5100

### Growth of Normally Watered Sod Grass and Extra Watered Sod Grass

*Michael Starkman and D. Shab (teacher)*  
Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This experiment examined the possible effects of extra water on sod grass. A control group of three patches of sod grass was watered normally throughout one week. An experimental group of three patches of the same grass was watered two times the regular amount. The data was then recorded. The results showed that there was no significant difference in each of the group's growth. The plants probably took in all the water they needed, and no extra.

5101

### The Effect of the Color of the Candle Changing Its Burnout Time

*Michael Tan and D. Shab (teacher)*  
Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This study examined the question of the possibility that the color or shade of candles affects how long they burn. Nine candles were separated into three groups, with each group having one dark, light and white colored candle. In each group all three candles were simultaneously lit and recorded when each candle completely burned out. The results suggest that white candles did indeed last longer than light or dark colored candles.

5102

### Effects of Cold Water on Sunflowers

*Michelangelo Apanay and D. Shab (teacher)*

Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This experiment tested the theory that cold water would help boost sunflower growth. Nine sunflower seeds were divided into three three-seed groups, one group for cold water, one for hot water and one for room temperature water. Each group was watered with its specified water temperature every day at 5 p.m. for three weeks. After the time period, the sprouts were pulled out for measurement. The results show that the sunflower seeds watered with cold water grew faster than the others, but died shortly after the seedlings watered with the hot water. The hot water seeds died in a matter of days. In conclusion, it is more than safe to water sunflower seeds with regular, room temperature water, as they will show the best results.

5103

### Do Left-Handed People or Right-Handed People Write Faster in Mirrored Language?

*Michelle Keyfman and D. Shab (teacher)*

Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This study examined if left-handed people write faster in mirror writing than right-handed people. Four left-handed people and four right-handed people were asked to write in mirror language and were timed. Each experiment was repeated three times. The results suggest that left-handed people write faster in mirror writing than right-handed people do.

5104

### Effects of the Melting Process of an Ice Cube With Different Materials at Different Concentration Percentiles

*Nathaniel Kasmer and D. Shab (teacher)*

Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This study examined the question of how long it takes an ice cube to melt with different materials at different concentration percentiles. Ice cubes with 50 milligrams of water and 2% and 10% of salt or sugar concentration were frozen and then timed to see which cube melted the quickest. The experiment was repeated three times and then averaged out. The 10% salt concentration ice cube in all three experiments melted the quickest. In two of the three experiments, water melted the slowest. The results suggested that 10% salt was the quickest to melt, then 2% salt, then 10% sugar, then 2% sugar and finally water.

5105

### Effects of Carbon Levels Within Soft Drinks

*Nicholas Ta and D. Shab (teacher)*

Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This study examined the question of which soft drink has the highest carbonation level. The brands chosen were Sprite, Orange Fanta, Coca-Cola, A&W and Dr Pepper. Each of the different brands of sodas was shaken for two minutes and was opened. This was then compared to a control can and the amount of soda that left the can was recorded. This procedure was repeated six times for each brand. Orange Fanta had the highest carbon levels, with an average 27.25 millimeters of soda escaping. Dr Pepper had the lowest carbon levels, with an average 13 millimeter of soda escaping. The results suggest that Orange Fanta has the highest carbonation level of all five sodas.

5106

### Effects of a Paper Airplane's Wings' Angle on Flight Trajectory

*Nickan Fayyazi and D. Shab (teacher)*

Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This analysis investigates the effect of a paper airplane's wing position and angle on its maximum height and forward distance traveled in flight. A paper airplane was launched using an airplane launcher 10 times at two different wing positions. Results showed that the plane traveled much farther and much higher with the wings at a 120° angle as compared to a 60° angle. This means that airplane wings at a higher angle make the plane's trajectory higher and farther.

5107

### String Length's Effect on Sleep Times of Yo-Yos

*Patrick Sub and D. Shab (teacher)*

Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This study examined the question if string length affected the sleep time of yo-yos. Two different types of yo-yos were used and three alike strings that only differed in size. The strings were measured using measuring tape; one was measured and cut for regular length and the others were cut for 6 inches more and 6 inches less. Then the yo-yos were thrown, the regular string being the control and results were recorded. The experiments were repeated three times for every string length and yo-yo combination. The results confirmed that the longer string lengths did make the yo-yo spin the longest.

5108

### Study of the Effect of Gravitropism on Moving or Spinning Plants

*Patrick Yao and D. Shab (teacher)*

Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This study examined plants' growth rate and pattern while stationary or spinning. Bean seeds were set in wet cotton and placed in a plastic cup with holes on the edge of the wheel. The wheel spun at a steady rate for four weeks. This was repeated four times with a control and an experimental. The results stated that the control grew 6 inches while the experimental grew 5 inches. The ratio of growth to non-growth for the experimental was 1:3 and the ratio for the control was 1:0. Conclusively, the non-spinning control fared better.

5109

### Effectiveness of Anti-Frizz Conditioners in Reducing the Frizz of Hair in Humidity

*Rachel Levine and D. Shab (teacher)*

Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This experiment tested both curly and straight hair treated with different brands of conditioner in humid conditions. Straight and curly hair both were placed in a room with a humidifier on its highest power. The average width of the straight hair was 6.2 cm, and the average of the curly hair was 3.775 cm. The hair was then rinsed with 59.147 ml (0.25 cups) of water and washed with 15 grams (1 tablespoon) of its brand of conditioner. It was then rinsed again with 473.176 ml (2 cups) of water. After the hair dried, it was placed in the humidified room once more and measured. The process was repeated every other day for the next three weeks. The average percent of

decrease for hair treated with Garnier Fructis was 47.22 cm for the straight and 4.37 cm for the curly. The average percent of decrease for hair treated with Suave Professional was 46.3 for the straight and 38.79 for the curly. The average percent of decrease for hair treated with Pantene was 34.8 for the straight and 11.7 for the curly. The average percent of decrease for hair treated with Herbal Essences was 26.67 for the straight and 1.48 for the curly. Overall, Garnier Fructis worked the best on straight hair, and Suave Professional worked the best on curly hair.

### 5110 Which Activity Best Improves Short-Term Memory?

*Ravela C. Smyth and D. Shab (teacher)*

Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

My experiment tested the effect of certain activities (brain games, ballet, classical music, pop music, ball game, meditation, nap and brain food) on short-term memory. I tested eight different people each with all eight different activities, and each activity was followed by 15-question memory tests. I added the scores for each activity and these are the results: brain games-168; ballet-150; ball game-149; classical music-136; pop music-96; nap-128; meditation-167; and brain food-123. These results suggest that brain games have the best impact on short-term memory because they stimulate the brain directly. The results also suggest that concentration (meditation) does play an important role to improve memory.

### 5111 Effect of Flavoring on Unpopped Microwave Popcorn Kernels

*Renee Heller and D. Shab (teacher)*

Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This study examined whether or not the amount of sodium and saturated fats affected the number of popped kernels in your bowl. Popcorn was popped in a microwave. Then the remaining kernels were extracted and counted, and then grouped according to flavor. This experiment was repeated three times and done to five different flavors. The results stated that there was no real significance in the flavors to the number of kernels.

### 5112 Impact of Vitamins on Mold Growth on Pumpkin

*Riley Nichol and D. Shab (teacher)*

Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This study examined whether Vitamins C, D and E prevent mold growth on a cut and cleaned pumpkin. Each vitamin was applied to four sets of six pumpkin cubes in amounts approximating U.S. RDA allowances for adults. Two sets of pumpkin cubes were untreated. Each set of pumpkin cubes was sealed in a plastic container with a lid. The pumpkin cubes were observed for seven days, then again after three weeks, with measurements recorded of mold growth in millimeters (228.6 square millimeters [mm<sup>2</sup>] possible) and percent of the surface covered by mold. Of the vitamin treatments, Vitamin E was the most effective at preventing mold growth, with less than 2% of the total surface area of all four sets of pumpkin cubes covered by mold (approximately 4.6 mm<sup>2</sup>). Vitamin D was the next most effective, with 1%-2% (2.3-4.6 mm<sup>2</sup>) mold growth for three of the sets. However, one set had complete mold coverage, probably due to contamination with Vitamin C. The Vitamin C-treated pumpkin was completely covered with mold. The control group had 1% (2.3 mm<sup>2</sup>) of surface area covered for one set and 25% (57.2 mm<sup>2</sup>) for the other. After three weeks, the average mold growth for Vitamin E was 5.1 mm<sup>2</sup>, the average for Vitamin D was 74.8 mm<sup>2</sup>, and the average for the control was 129.2 mm<sup>2</sup>. These results suggest that Vitamin E and possibly Vitamin D may help to prevent mold growth, although Vitamin D did not perform conclusively better than the controls.

### 5113 Effect of Different Genres of Music on Human Blood Pressure

*Ruby Ferehawk and D. Shab (teacher)*

Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This study examined the effect of different genres of music on human blood pressure. The test subject was placed in a quiet room and listened to five different genres of music. Blood pressure was taken before, during and after each genre. The genres, though, just made the subject's pressure unpredictable. The results originally suggested that it escalated, but further into my testing, it became clear that it was inconsistent.

### 5114 The Effect of Electricity on Plants

*Sabil Singh Dhandi and D. Shab (teacher)*

Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This study examined the question of the involvement of electricity in the growth of tomatoes and cucumber plants. Five of each plant were planted with electricity; the electricity was supplied by a D battery with nails touching the terminals. The other end of the nails was in the soil. After each week (except the first week because nothing grew) the data was collected. The results suggested that the electricity worsened the growth of the 10 plants given electricity. So as a conclusion, electricity worsens plant growth.

### 5115 To Rust or Not to Rust? Which Will Rust: a Nail, a Paperclip or a Sewing Needle?

*Sarah Goodstein and D. Shab (teacher)*

Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This study examined the question of which solid would rust the quickest and the most in which liquid. The experiment tested nails, paperclips and sewing needles submerged in Sprite, bleach, hydrogen peroxide, ocean water and distilled water. Each experiment was tested three different times and lasted two weeks. The results were recorded each day, and showed the progression of the rust on each object in each liquid. The results showed that the nail placed in bleach rusted the most, while the nail in ocean water rusted the fastest.

### 5116 Where Does Steel Rust the Fastest?

*Sean Oh and D. Shab (teacher)*

Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This experiment was done to prove where rust forms fastest on steel. Steel nails were kept in place for three weeks fully submerged in water, half submerged in water, just above water, and with no water. For three weeks the results were recorded. Then, the whole process was repeated three more times. The steel nails placed fully submerged in water were slowly rusting. The nails submerged half in water were rusting quickly. The nails placed above the surface of the water were beginning to gradually rust little by little from the tips of the nails. The nails placed where there was no water weren't rusting at all. These results suggest that the place where the air and water meets on the surface of steel is where rust forms fastest and best.

5117

## Effects of Hard Drive Space on Overall Computer Performance

*Sinjon Santos and D. Shab (teacher)*

Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This study viewed the question of the relevance of hard drive space in the performance of a desktop. The Performance Test benchmarking software was utilized on a desktop with a 74.5-GB hard drive, 13 GB of which was free. The computer was restarted and had the test run again for a total of three trials with that hard drive. The computer's boot time was also timed at the start of every trial. These tests resulted in an average PassMark rating (the Performance Test result) of 220, and an average boot time of 2 minutes and 14 seconds. Programs and files were then manually deleted from the hard drive and the Disk Cleanup tool was also run to increase the amount of free space. This resulted in increasing the free space to 42.7 GB, which was 29.7 GB larger than in the first tests. The Performance Test program was then run again, and the computer restarted and re-tested for another total period of three trials. These tests concluded with an average PassMark rating of 229, and an average boot time of 1 minute and 37 seconds. The results suggest that the amount of hard drive space does play a role in the performance of a computer.

5118

## The Amount of Water Evaporated in Two Hours

*Tantum Nilkaew and D. Shab (teacher)*

Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This experiment shows how 50 millimeters of water can evaporate in two hours. Fifty millimeters of water was put into a cup graduated with millimeter measurements. The cup was put outside, in the sunlight, at a temperature of at least 50 degrees Fahrenheit. The cup was put in the sun for two hours, and then retrieved. According to the results, a temperature range of 70-80 degrees will evaporate a minimum of 7 millimeters of water. Temperatures of 70-60 degrees will evaporate roughly around 5 millimeters of water. Temperatures of 60-50 degrees will evaporate less than 5 millimeters. With the data, you can assume that temperatures of around 45 and below will not evaporate any water, and on a warm day, up to approximately 15-20 millimeters of water can evaporate.

5119

## Effects of Roundup on Pepper Plants

*Victor Qin and D. Shab (teacher)*

Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This study examined the effects of Roundup in inhibiting plant growth. In my experiments, three separate pots were used, each filled with the same amount of soil. One pot was left alone (the control), one pot received five squirts of Roundup Weed & Grass Killer (Roundup) and one pot received 10 squirts of Roundup. Three pepper plants were then planted in each pot. All pots were subjected to the same weather (i.e. sunlight, rainstorm, etc.), ruling out weather as a variable. All plants received water until the 15th day, when they should become self-reliant. The pot with the most Roundup had all three plants wilting by the 15th day, while all three plants in the other Roundup pot were wilting by the 18th day. However, all three plants in the control group survived. This shows that Roundup weakens the plants, rendering them unable to cope with drastic environment (i.e. weather) change. This demonstrates that normal plants without genetic engineering will be killed by Roundup.

5120

## How Do Elevators Affect Flight?

*Matthew Leonard and K. Schwiesow (teacher)*

Dixie Canyon Avenue Elementary School  
4420 Dixie Canyon Ave.  
Sherman Oaks, CA 91423

How do elevators on a plane's tail wings affect flight? Hypothesis: When the elevators are up, the plane will head up. When the elevators are down, the plane will head down. When the elevators are level, the plane will go straight. A homemade catapult launched a Styrofoam, rubber band-powered airplane. The plane was launched 15 times: five with the elevators up, five with them down and five with them level. Using a tape measure, I measured how far the plane flew. When the elevators were level, the plane stayed horizontally straight. When they were up, the plane headed up. When they were down, the plane pointed up twice and nosedived three times. The plane flew farther with the elevators straight. With the elevators up, the plane went highest. The wind could have affected unexpected results.

The data on flight distance was as follows (average flight distances): elevators level (17.9 feet), elevators up (11.6 feet) and elevators down (10.6 feet). When the elevators were up, for example, they probably gave the tail less lift, pushing the tail down and forcing the nose up. In the future I want to try to find the best elevator angle that would make the plane go farther and higher at the same time.

5121

## Effects of Squid, Shrimp and Tuna on the Ability to Culture Bioluminescent Bacteria

*Serafina Nieves and D. Shab (teacher)*

Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This experiment tested the effects of an additional medium to the current photo-bacterial medium. The control test tube contained no additional substances. The nine experimental test tubes contained squid, shrimp and tuna. The additional media were divided into three test tubes each. All of the test tubes were kept at a steady room temperature. The bacteria was left to culture for a period between 24-48 hours. The bacteria was tested with a photo-diode for the amount of light emitted. The results from the test in the box are inconclusive, but the results from the closet seem to show that the squid produced the brightest light out of the shrimp, tuna and control. This suggests that an additional medium does have an effect on the ability to effectively culture bioluminescent bacteria.

5122

## Effects of Heat and Cold on Air

*Harry Corden and D. Shab (teacher)*

Portola Highly Gifted Magnet Center  
18720 Linnet St.  
Tarzana, CA 91356

This paper examines the effects of heat and cold on air. An experiment was designed whereby air inside various balloons was heated and cooled. Measurements of the circumference of the balloons at room temperature, after heating and after cooling determined whether the air expanded or contracted prior to each measurement. The results suggested that air expands (the molecules move further apart) when heated and contracts (the molecules move closer together) when cooled.

5123

### Will Adding Spinach to the Diet of Sow Bugs Increase Their Population Rate?

*Antonio Lopez and T. Miller (teacher)*

Holmes International Middle School  
9351 Paso Robles Ave.  
Northridge, CA 91325

The purpose of this experiment is to determine if adding spinach to the diet of sow bugs will increase their population rate. The hypothesis is that the spinach will make the sow bugs reproduce at a faster rate. One part charcoal and nine parts plaster of Paris were added to a container with water. It was stirred to about the consistency of yogurt. Then it was poured into four petri dishes (150 mm) and allowed to dry for a couple of days. All of the petri dishes had water added to them to make a moist environment for the sow bugs. Two petri dishes were labeled experiment, and spinach and yeast were added. Two petri dishes were labeled control, and only yeast was added. Seven sow bugs were placed in each of the four petri dishes. The experiment tested the sow bugs for six weeks. In the control there were a total of 11 sow bugs. In the experiment there were 12 sow bugs. My hypothesis was incorrect. The population rate did not change because of their diet.

5124

### Will Collembola Survive If They Are Watered With Monster Energy Drink Rather Than Water?

*Edwin Matute and T. Miller (teacher)*

Holmes International Middle School  
9351 Paso Robles Ave.  
Northridge, CA 91325

The purpose of this experiment was to determine if collembola (*Onychiuridae encarpatus*) would survive if they were given Monster Energy Drink rather than water. As a hypothesis I believed the collembola would not survive being watered with the Monster Energy Drink. Collembola are tiny arthropods commonly called springtails. One part charcoal and nine parts plaster of Paris were added to a container with water. It was stirred to about the consistency of yogurt. Then, it was poured into two Petri dishes and allowed to dry for a couple of days. One of the Petri dishes was labeled as the control and one was labeled as the experiment. To one of the petri dishes water was added to make a moist environment for the collembola. To the other petri dish Monster Energy drink was added to make a moist environment for the collembola. Ten collembola were placed in each petri dish. Yeast was added for the collembola to eat. After six weeks, in the experiment there were five collembola and in the control there were seven collembola. There were no eggs in either of the petri dishes. As a conclusion, my hypothesis was incorrect. The collembola did survive with Monster Energy Drink.

5125

### Will Collembola Survive When Fed Cheerios Instead of Yeast?

*Katarina Lopez and T. Miller (teacher)*

Holmes International Middle School  
9351 Paso Robles Ave.  
Northridge, CA 91325

The purpose of this experiment was to determine if collembola (*Onychiuridae encarpatus*) would survive if they were given Cheerios for food. My hypothesis was that they would survive. I mixed one part charcoal and nine part of plaster of Paris in a container. I added water and stirred it to the consistency of yogurt, and then poured the mixture into two petri dishes and tapped them on the table. I let them sit for a couple of days and moistened them completely with water using an eyedropper. Then, I placed 10 collembola in both petri dishes. In one dish I added yeast and in the other I added Cheerios. At the end of six weeks, seven collembola were in the control, and 19 collembola in the experiment. There were zero eggs in both dishes. My hypothesis was correct because they did survive when being fed Cheerios.

5126

### Will a Population of Collembola Increase If They Are Fed Peas For Food?

*Britney Cifuentes and T. Miller (teacher)*

Holmes International Middle School  
9351 Paso Robles Ave.  
Northridge, CA 91325

The purpose of doing this experiment was to determine if a population of collembola (*Onychiuridae encarpatus*) would increase if fed peas for food. As a hypothesis I believed the population would decrease. Environments for the collembola were made by placing nine parts plaster of Paris with one part charcoal and water in a dish and stirring it until it was completely mixed. It was the consistency of yogurt. It was poured it into two petri dishes and allowed to dry for a few days. Water was added to the petri dishes using eyedroppers. Yeast was dropped into one environment (control) and peas were dropped into the other environment (experiment) for the collembola to eat. Collembola were added to each petri dish (10). A stereomicroscope was used to observe and count the collembola. At the end of my experiment collembola were able to survive eating peas. In the experiment, there were 27 collembola and 46 eggs. In the control, there were nine collembola and 70 eggs. The hypothesis was incorrect because the collembola and collembola eggs increased in the experiment, which suggests collembola can live while eating peas for food.

5127

### Will the Height of a Coca-Cola Eruption Increase If More Mentos Are Added to the 2-Liter Bottle?

*Melanie Gallegos and T. Miller (teacher)*

Holmes International Middle School  
9351 Paso Robles Ave.  
Northridge, CA 91325

The purpose of this experiment is to see if more Mentos affect the height of the eruption. The hypothesis for this experiment is the height of a Coca-Cola eruption will increase if more Mentos are added to the 2-liter bottle. One of the nine 2-liter bottles was placed 2.5 cm away from a tree. One Mentos was dropped into the bottle and the height of the eruption was measured. This was repeated two more times. The same procedure was used dropping three Mentos into the bottle and five Mentos into the bottle, and both repeated two more times. The average of one Mentos was 29.1 cm. The average of three Mentos was 53.8 cm. The average of five Mentos was 96.8 cm. My hypothesis was correct: An increase in Mentos resulted in a higher Coca-Cola and Mentos geyser.

5128

### Will Lemon Juice Lower the Reproduction Rate of Collembola?

*Jesse Garcia and T. Miller (teacher)*

Holmes International Middle School  
9351 Paso Robles Ave.  
Northridge, CA 91325

The purpose of this experiment is to determine if collembola (*Onychiuridae encarpatus*) can survive drinking only lemon juice. My hypothesis is that a population of collembola decreases when only given lemon juice to drink. Collembola are tiny arthropods commonly called springtails. One part charcoal and nine parts plaster of Paris were placed into a container and water was added. It was stirred to about the consistency of yogurt. Then, it was poured into four petri dishes and allowed to dry for a couple of days. Two petri dishes were labeled experiment and lemon juice was added. The other two petri dishes were labeled control and water was added. Yeast was added to both petri dishes for the collembola to eat. Ten collembola were placed into trial 1 and two petri dishes, control and experiment. At the end of three weeks the control in trial 1 had 13 collembola and the experiment in trial 1 had 0 collembola. At the end of the three-week period of trial 2, the control in trial 2 had 10 collembola and the experiment had 0 collembola. The hypothesis was correct: The collembola should not be fed lemon juice as their source of liquid.

5129

### Will a Population of Collembola Increase When Peanut Butter Is Added to Their Daily Food?

*Rebecca Namuddu and T. Miller (teacher)*

Holmes International Middle School  
9351 Paso Robles Ave.  
Northridge, CA 91325

The reason for doing the experiment was to determine if adding peanut butter to the diet of collembola (*Onychiuridae encarpatus*) would increase their population rate. The hypothesis was that the population of collembola would increase when peanut butter was added to their daily food. Environments for the collembola were made by placing nine parts plaster of Paris, one part charcoal and water in a dish and stirring it until it was completely mixed. It was the consistency of yogurt. It was poured into two petri dishes and allowed to dry for a few days. Water was added to the petri dishes using medicine droppers. Yeast was dropped in the control for the collembola to eat and smooth peanut butter was added to the experiment. Thirteen collembola were added to each petri dish. Stereomicroscopes were used to observe and count the collembola. After six weeks, there were 113 collembola and 10 eggs in the control. In the experiment there was only one collembola and no eggs. The hypothesis was incorrect. Collembola shouldn't be fed peanut butter.

5130

### Gatorade 01 and Collembola

*Arekg Manash and T. Miller (teacher)*

Holmes International Middle School  
9351 Paso Robles Ave.  
Northridge, CA 91325

Will Gatorade 01 in the collembola environment decrease the population of collembola? For the hypothesis, Gatorade 01 instead of water will increase the population. Collembola are small tiny creatures that dwell in soil and leaf litter. One part charcoal to nine parts plaster of Paris were placed in a plastic container, with the lid closed tightly, and turned until completely mixed. Some of the powder mixture was placed into a bowl. Water was added and it was stirred until it was the consistency of yogurt. The mixture was placed into the petri dishes and tapped on the table to make it spread through the entire dish; then they were left to dry for a couple of days. The collembola environments were moistened with Gatorade 01 (experiment) and water (control). A few grains of yeast were added for the collembola to eat. Finally, 14 collembola were added to each environment. At first, the collembola were reproducing rapidly in the experiment, but later they started dying, and there were more collembola in the control. The final count after six weeks was 127 collembola in the control and no eggs. There were two eggs and two collembola in the experiment. My hypothesis was incorrect; the collembola in the experiment produced rapidly in the first three weeks, but then started decreasing in population.

5131

### Does Color Affect Memory Retention?

*J. De Leon and G. Zem (teacher)*

Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

This study examined the question if colored printed words were able to be remembered more than those printed in regular black ink. A group of kids ages 9 through 12 were tested during this experiment. They were given a list with 40 words, half in black ink and half in color. I made sure to give them at least 2 minutes to read over that list. After that, I sent them off for exactly 15 minutes. After 15 minutes, I called the subjects back, gave them List #2 and asked them to check off words that they remembered most and to try their best. Both genders had a high average number of those words that were printed in color. But the girls were the ones who scored the highest on both colored and black printed words.

5132

### Which Wing Design Creates the Greatest Amount of Lift?

*J. Nguyen and G. Zem (teacher)*

Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

This study tested the amount of lift force created by six different airfoil designs. A wind tunnel was made using three panels of plexiglass and a hair dryer was used as a fan for the tunnel. Six airfoil designs, three conventional and three experimental, were flown at a 30-degree angle in the tunnel, with weights being added to test the lift. This process was repeated three times for each airfoil. The airfoil that created the most lift was the third experimental wing, which supported 14.4 grams of weight. The results of this experiment show that wing design does greatly contribute to the amount of lift produced by a wing.

5133

### Testing Permanent Markers

*Neelam Lal and G. Zem (teacher)*

Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

The main question is whether permanent markers are truly permanent. Four different brands will be tested to see if they all produce the same results or not, which will prove that they are made with the same products, except they are just from different companies. The four brands (Expo, Sharpie, Papermate and Foray) are drawn on a 100% cotton shirt where 3-inch lines are drawn in five different colors for each brand: orange, green, purple, blue and pink. Different methods will be used to attempt to remove the markers off the shirt, and we shall see which is the most affected by each of the methods. The methods will be bleach, nail polish remover and Windex, each poured into a cup and scrubbed with a toothbrush if necessary. For a result, the marker that lasted all of the trials and items that were used for removal was the Expo marker. The other brands and colors produced different results of morphing colors and fading completely, but Expo was the only brand that remained and did not disappear at all.

5134

### Effects of Salt and Change of Temperature on Surface Tension

*S.E. Morales and G. Zem (teacher)*

Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

This experiment examined the effects of salt and change in temperature to the surface tension of water. Aluminum foil was placed on the surface of water at room temperature, above 90 degrees and below 60, with and without salt. Grains of rice were then dropped onto the foil until it submerged. The hot saltwater sustained 144 grains, the cold saltwater sustained 145, and the room temperature saltwater sustained 150. The hot non-saltwater sustained 178 grains, the cold sustained 117, and the room temperature sustained 127. The hot non-saltwater proved to be the best condition for the strongest surface tension of water.

5135

## The Effect of Pool Location on Swimming Times

*Aileen Ghobadi and S. Tanaka (teacher)*

Gaspar de Portola Middle School  
18720 Linnet St.  
Tarzana, CA 91356

This experiment will show whether or not practicing swimming indoors or outdoors will affect my swimming times. This is a valuable experiment because it will demonstrate to swimmers and coaches which pool location will improve the swimmers' times. I believe that an indoor pool is more beneficial for swimmers. I chose this experiment because I would like to prove to my coach that an indoor pool will help swimmers function better during practice. In this experiment I used a TYR swim cap, TYR swimsuit, a stopwatch, my coach, Speedo goggles, a diving board and an Olympic-sized pool (25 meters long), one inside and one outside. In order to perform this experiment, my coach and I arranged to swim at the Pierce College outdoor heated pool the first three days at 5:30 am. The following three days, I swam in our indoor YMCA heated pool at 5:30 am. Prior to this experiment, I had to put on my swimsuit, goggles and cap. Then I had to step on the diving board and get into position. Once I heard the whistle, I dove in, my coach started the timer, and I started my streamline. Next I started my freestyle, and once I reached the wall I did a flip turn, streamlined and then started my freestyle again for my last lap. Once I touched the other wall with my hand, I was finished and my coach stopped the stopwatch.

In the experiment, I performed six trials in six days. The outcomes of the three trials done indoors and outdoors varied noticeably from each other. In the outdoor pool I started off with a time of 41 seconds and ended the third trial outside with 39.23 seconds. I improved by 1.77 seconds in my outdoor practices. In comparison, with the indoor practices, I started off with a time of 36 seconds and ended the third trial with 32.56 seconds. The difference between the three practices was 3.44 seconds. The improvements between the three practices in each setting were substantially different. The indoor pool caused my times to drop dramatically faster.

In conclusion, swimming indoors in a controlled environment, with adequate lighting and controlled weather, helps swimmers keep our body temperature stable, prevent cramps and swim faster. These results can be important to scientists and other swimmers around the world because they can use this as a source to show that practicing in an indoor pool will have a huge impact on how fast a swimmer can swim and help swim teams choose better practice locations.

5136

## Does Playing Guitar Hero III Improve Your Reflexes?

*Ashley Maynez and S. Tanaka (teacher)*

Gaspar de Portola Middle School  
18720 Linnet St.  
Tarzana, CA 91356

Does playing Guitar Hero III improve your reflexes? I have done an experiment that may or may not prove that playing Guitar Hero III improves your reflexes. I think that playing that video game does improve your reflexes. If this is true, there would be a reason for you to play the game. First, I got a ruler, a piece of paper, a pencil and four test subjects. Two of the test subjects were older, between the ages of 45-50. One was male and the other was female. The other two test subjects were younger, between the ages of 12-14. Both of them were female. I also used Guitar Hero III for the Wii.

First, I used the older male test subject. I used a ruler to test his reflexes with three different exercises, three times each. In the first exercise I held the ruler above his hand (1 cm being the closest to his hand), and when I said "go" I released the ruler and had him catch it as fast as he could between his thumb and his index finger. I repeated this three times. The average that he caught the ruler at was about 15.3 cm. In the next exercise that I used, he shut his eyes, I said "go" and dropped the ruler, and he caught it as fast as he could with the same two fingers. I repeated this exer-

cise three times too. The average that he caught the ruler at was about 11.3 cm. In the final exercise that I used, he closed his eyes and I tapped him on the shoulder. I dropped the ruler at the same time that I tapped him on the shoulder. I repeated this exercise three times, just like the others. The average that he caught the ruler at was 14 cm. Then, I had the same test subject play one song on Guitar Hero III that was about 4-5 minutes long. After, I tested the subject again, with the same exercises, in the same order. The average outcomes were 16.7 cm, 7.7 cm and 14.3 cm. There wasn't much change with the reflexes with this test subject, except for exercise two.

Next, I tested the older female subject with the same exercises, the same number of times, in the same order. Her average outcomes were 16.7 cm, 23.7 cm and 15 cm. I had her play the same song as my other subject. After, I tested her with the same exercises, the same way I had before. Her average outcomes were then 14.3 cm, 13.3 cm and 14.7 cm. With this test subject, there was only a dramatic change in exercise two, just like with the first test subject. I did the same process with the two other test subjects. Before, the first test subject's average outcomes were 10.7 cm, 18.7 cm and 16.7 cm. The second test subject's average outcomes were 13.3 cm, 14 cm and 12.7 cm. After the first test subject played the same song as the others, her average outcomes were 15 cm, 13 cm and 17 cm. After the second test subject was done playing the song, her average outcomes were 6.3 cm, 3 cm and 3.3 cm. In both of the test subjects, the most dramatic change was in exercise two, just like with the other test subjects.

After I had completed my experiment, I had found that there were only very dramatic changes in exercise two. In exercises one and three, there were only small changes, if any. So it is proven that playing Guitar Hero III does improve your reflexes, but only in certain ways. It mainly affects your reflexes that react to sound.

5137

## Science of Skateboarding

*Charlie Korman and S. Tanaka (teacher)*

Gaspar de Portola Middle School  
18720 Linnet St.  
Tarzana, CA 91356

For my experiment, I decided to find out if the size and shape of a skateboard affect the accuracy of performing a trick. I did this experiment because different board sizes may affect your ability to land a trick. I think that the thickest and widest board will complete the trick the fewest times.

The first thing I did was measure the length, width and thickness of each board. The three skateboards I used were a cruiser board, a regular shape board and an old school board. All three boards were very similar in length. The cruiser was 30 inches long, the regular board was 31 1/4 inches long and the old school board was 30 inches long. The width of the cruiser was 7.5 inches, the width of the regular board was 8 inches and the width of the old school board was 9 3/4 inches. The thickness of the cruiser was 3/8 of an inch, the regular board was 3/8 of an inch and the old school board was 7/8 of an inch. Then, I tried to do a 180° spin 10 times on each board. I decided to make a chart so that I could clearly see how many times I landed.

The data from my experiment was actually very interesting. I performed 30 trials in all, 10 times for each individual skateboard. For the cruiser board, I performed the 180° spin accurately eight times out of 10 (80%). For the regular board, I also performed the trick accurately eight out of 10 times (80%). For the old school board, I performed the trick seven times out of 10 (70%). The data proved my hypothesis correct, but not by much. I was expecting the results of the old school board to be much, much lower. I was also expecting the results of the regular board to be a little higher because that is the board I ride the most. I learned that the thicker and wider the board, the harder it is to perform a trick.

My results are important to the world because this will help people know the accuracy of performing a trick on different shapes of skateboards. People at skateboard companies could do a similar experiment to manufacture the best skateboard they can. I could take this experiment to the next level

by having people of different heights and weights do the same 30 trials. I think that this would come up with a very similar set of results. Because of this experiment, I now want to do the weight and height skateboard test. I also want to do an experiment where I do the same 30 trials on the same three boards, but with several different tricks.

5138

### Letting the Ball Drop: How Do Different Temperatures Affect the Bounce Height of a Ball?

*Chloe Sturmer and S. Tanaka (teacher)*

Gaspar de Portola Middle School  
18720 Linnet St.  
Tarzana, CA 91356

Dropping a ball in different temperatures may seem unimportant; however, it can have a great value for pilots, athletes and others. For example, if a pilot is flying a plane, he may need to know how to land in different temperatures so that the plane does not bounce off the surface of the ground. Athletes, like those in basketball, can estimate how high the ball will bounce in different temperatures to help them stay ahead in a game. One of the reasons that I chose this experiment is because I play sports, and I was curious to know how the air temperature may affect my game. My hypothesis was that the ball would bounce lower in lower temperatures and higher in higher temperatures. During winter break I went to Maine, which provided freezing temperatures for me to conduct my experiment. When I came home to California, I was able to experiment with warmer temperatures. During the first trials in Maine, I used a Spalding basketball with a PSI (pounds per square inch) of eight, and a thermometer. I made an eight-foot ruler out of construction paper and attached it to the inside of the garage door. Later, I replicated the experiment using the same ruler and ball in my garage in California, but instead of using a thermometer, I used weather.com for a temperature reading. The ball was dropped from a height of seven feet with a PSI of eight each time the experiment was done. At different times of the week I completed the experiment, recording the air temperature, time and date. I let the ball drop from seven feet and recorded what height measurement the ball bounced to.

I made a total of 14 trials (seven in Maine and seven in California). I began the trials in Maine on January 2, 2012, at 11:25 p.m., with an air temperature of 40 degrees Fahrenheit. The ball bounced to 2 feet and 3 inches. Three more trials were done on January 3. At 10:33 p.m., with an air temperature of 38 degrees Fahrenheit, the ball bounced to 2 feet 2 inches. Later at 11:25 p.m., with the air temperature still at 38 degrees Fahrenheit, the ball bounced to a similar height of 2 feet 1 inch. Two minutes later, with the same temperature reading, the ball bounced to 2 feet 2 inches. The next day, on January 4 at 8:00 p.m., another trial was done when the temperature dropped to 22 degrees Fahrenheit. The ball bounced to 2 feet 1 inch. The last two trials were done on January 5. At 10:55 p.m. with an air temperature of 29 degrees Fahrenheit, the ball bounced to 2 feet. At 12:14 a.m. and an air temperature of 28 degrees Fahrenheit, the ball bounced to 2 feet 2 inches. The trials in California were done on January 9. At 4:59 p.m. with an air temperature of 66 degrees Fahrenheit, the ball bounced to 2 feet 8 inches. This was a significant difference compared to the trials in Maine. At 5:00 p.m. the air temperature was the same 66 degrees Fahrenheit. The height bounced was a comparable 2 feet 7 inches. An hour later, at 6:00 p.m., the air temperature was 67 degrees Fahrenheit and the height bounced was 2 feet 5 inches. The exact same result was found at 6:38 p.m. with a temperature of 64 degrees Fahrenheit. At 7:48 p.m. the air temperature was 60 degrees Fahrenheit, and the ball bounced to 2 feet 2 inches on the ruler. At 8:34 p.m. and the same 60 degrees Fahrenheit temperature, the ball reached 2 feet 5 inches. The final trial was at 8:35 pm, when the ball bounced to 2 feet 4 inches at the same air temperature of 60 degrees Fahrenheit.

The average height that the ball reached in cold temperatures was 2 feet 1.6 inches. The average height that the ball reached in warm temperatures was 2 feet 5.1 inches. This is because the cold air is heavier, and therefore it is pressing down on the ball more than the warm air, which is lighter. These results prove that my hypothesis was correct. Other scientists can use my

abstract's results to help them in their work. For instance, a rocket scientist can make special tires for space shuttles, so when landing, the tires can adjust to different temperatures. This would allow the aircraft to smoothly land without bouncing off the ground in any weather. Athletes can use this information to determine how a ball will bounce or fly through the air in different weather. I found it interesting how the temperature of an invisible gas such as air can create different effects in our physical world.

5139

### Wooden vs. Plastic Boats

*Daniel Kboramian and S. Tanaka (teacher)*

Gaspar de Portola Middle School  
18720 Linnet St.  
Tarzana, CA 91356

I am trying to figure out if a plastic boat or wooden boat can hold more weight and have a faster speed. This is a very important experiment because if we find out the results and see that one of them is faster than the other one, then from now on we can make our boats out of the fastest and lightest material. My hypothesis is that the plastic one will go faster because it can be made stronger than wood and it can possibly travel faster on water depending on how much weight is carried. Also, plastic is flexible so in fast speeds it can withstand a lot of pressure without breaking, whereas a boat made out of wood is brittle so under pressure it does not show a lot of flexibility. This experiment is also important because it shows us that depending on the type of application of the boat we should select the proper material for its building.

First I bought wood and cut it into a punt boat that was all connected with my waterproof wood glue. Then I waterproofed the whole body by spraying an undercoat of paint. Then I sanded it and re-applied a few more layers. Next I took a shaft and I connected one end of the shaft to a motor that was sitting on the inside of the boat and the other end to a propeller that was sitting under the boat, in the water. After, I connected the motor to a battery pack that sat on the back of the boat. For the plastic boat I bought a ready-made boat that didn't have a motor. I bought a motor and installed it at the bottom of the boat. I then added a battery pack to the lid and made a small compartment to hold the pennies that I chose as weights. Both of the boats were 30 centimeters. I tested the boats in my pool, which is 1,080 centimeters. The procedure for each boat was the same. The only thing that changed was the weight that I put on the boat, for which I used pennies. I did three trials for each boat. The first trial had 15 pennies on the boat and then I tested to see how long it would take for it to get to the other end of my pool. The second trial was the same, but I had 25 pennies instead. Last but not least the third trial had 50 pennies on the boat, but was tested the same way as the first and the second.

I did three trials for each boat with different weights each time. On the first trial both boats got to the end of the pool in 15 seconds with 15 pennies on them, because there wasn't that much weight on the boats so they didn't go that slow. On the second trial the plastic boat got to the end of the pool in 30 seconds with 25 pennies on it. The wooden boat got to the end of the pool in 18 seconds with 25 pennies on it. In the third trial the plastic boat got to the end of the pool in 40 seconds with 50 pennies on it. The wooden boat got to the end of the pool in 30 seconds with 50 pennies.

My results show that the wooden boat can carry more and have a faster speed when it is carrying a lot of weight. My data disproves my hypothesis because the wooden one travels faster with more weight on it. The plastic one goes the same speed with fewer weights like in my first trial.

The results are important to the scientists who research building more efficient transportation vehicles like large boats that carry heavy materials from one place to another. This research is one of many studies that need to be done to select the best material and best shape for future boats under construction due to the ever-increasing price of oil or other sources of energy. These results are important to the world because we now know that different materials can be used in different ways to be more efficient.

## 5140 Which Cup Has the Best Insulation?

Daniela Morales and S. Tanaka (teacher)  
Gaspar de Portola Middle School  
18720 Linnet St.  
Tarzana, CA 91356

When people buy hot drinks, they don't immediately drink them at the exact moment they get them. Many times when people buy hot drinks they take them to go and don't get the time to drink them until 10, or maybe even 30, minutes after they get them. The purpose of my experiment is to find out which type of cup (ceramic, paper or Styrofoam) keeps hot drinks warm for the longest. This experiment will be important to people because it will let them know which cup is most convenient for their hot drink. I predict that the Styrofoam cup will keep the drink the hottest for the longest because it has the best insulation. This is because out of the three materials, Styrofoam has the highest R value. R value is the resistance to transfer heat. For my experiment I used one small Styrofoam cup, one small paper cup and one equally small ceramic mug, a thermometer, a timer, a measuring cup, three envelopes of hot chocolate mix, hot water and a piece of paper to record data. First I mixed 18 oz. of hot water and three envelopes of the hot chocolate mix to make hot chocolate. I then took the temperature of the mixture before I poured it into its individual cup. Next I measured 6 oz. of the hot chocolate and put 6 oz. into each cup. I set the timer for 10 minutes. After 10 minutes I took the temperature of the hot chocolate in each cup and recorded the temperature. After 20 minutes I recorded the temperature of the hot chocolate in each cup. After 30 minutes I recorded the temperature of the hot chocolate in each cup. In the experiment the only thing that I changed was the type of cup that each hot chocolate was in. I kept the hot chocolate the same.

After three different trials every 10 minutes I collected the data. Before I put the hot chocolate in the different cups, I measured the starting temperature, which was 141° F. The temperature in the ceramic cup decreased to 89° F after 10 minutes, 60° F after 20 minutes and 50° F after 30 minutes. The temperature dropped a total of 91° F in half an hour. The temperature in the paper cup decreased to 118° F after 10 minutes, 80° F after 20 minutes and 70° F after 30 minutes. The temperature dropped a total of 71° F in half an hour. The temperature in the Styrofoam cup decreased to 120° F after 10 minutes, 100° F after 20 minutes and 80° F after 30 minutes. The temperature dropped a total of 61° F in half an hour.

From the data that I collected I learned that the Styrofoam cup was the best cup for keeping the drinks hot, the paper cup was the second best and the ceramic cup was the least effective at keeping the hot chocolate hot. The Styrofoam cup kept the hot chocolate 30° F hotter than the ceramic cup. The data proves my hypothesis because the Styrofoam kept the hot chocolate the hottest for the longest.

Although Styrofoam is the best at keeping drinks warm, Styrofoam is not very good for the environment. Results that were found can be important to other scientists because they can learn to make a cup with similar properties as Styrofoam, but better for the environment. These results are important to the world because people can choose to have a Styrofoam cup if they need to keep their drink warm for a long time. Even though Styrofoam is great for keeping things warm, we should help the environment by minimizing the amount we use and recycling it whenever we can.

## 5141 Song Birds

Davina Zaman and S. Tanaka (teacher)  
Gaspar de Portola Middle School  
18720 Linnet St.  
Tarzana, CA 91356

The name of my project was "Song Birds." It was based on how birds react when listening to different types of music. The purpose of this experiment was to see what genres of music parakeets react to the most. I have researched that most parakeets like music. I have also researched that most parakeets enjoy rock and alternative music genres.

To complete this experiment I went to pet shop and purchased two parakeets, one blue male and one yellow female, and a black cage. I also purchased one 1.5-pound bag of Spectrum parakeet food. The birds were placed in the den and listened to different types of music through my playlist on www.myspace.com. I then made them listen to R&B, pop, rock, alternative and rap music for four days, conducting three trials for each genre per day.

On day one the birds listened to *Look At Me Now* by Chris Brown (R&B trial 1), *Pyramids* by Charice featuring Iyaz (pop trial 1), *Almost Easy* by Avenged Sevenfold (rock trial 1), *Numb* by Linkin Park (alternative trial 1), *Throw It In the Bag* by Fabolous (rap trial 1), *Halo* by Beyonce (R&B trial 2), *E.T.* by Katy Perry featuring Kanye West (pop trial 2), *Float On* by Modest Mouse (rock trial 2), *crushcrushcrush* by Paramore (alternative trial 2), *Black and Yellow* by Wiz Khalifa (rap trial 2), *Disturbia* by Rihanna (R&B trial 3), *You Spin Me Round: Like a Record* by Dead or Alive (pop trial 3), *Paint It Black* by the Rolling Stones (rock trial 3), *Break* by Three Days Grace (alternative trial 3) and *Day 'N' Nite* by Kid Cudi (rap trial 3).

On day one both parakeets (combined) chirped to R&B a total of 97 chirps. They chirped to pop a total of 70 chirps. They chirped to rock a total of 77 chirps. The parakeets chirped to alternative music a total of 50 times. Lastly, they chirped to rap, that day, a total of 51 times.

On day two the parakeets listened to *Motivation* by Kelly Rowland (R&B trial 1), *Set Fire to the Rain* by Adele (pop trial 1), *Don't Trust Me* by 3OH!3 (rock trial 1), *Animal* by Neon Trees (alternative trial 1), *Moment 4 Life* (album version (edited)) by Nicki Minaj (rap trial 1), *Bottoms Up* by Trey Songz featuring Nicki Minaj (R&B trial 2), *Poker Face* by Lady Gaga (pop trial 2), *Afterlife* by Avenged Sevenfold (rock trial 2), *Gives You Hell* (album version) by All-American Rejects (alternative trial 2), *Buzzin'* by Mann (rap trial 2), *Good Feelin* by Flo Rida (R&B trial 3), *Just Can't Get Enough* by the Black Eyed Peas (pop trial 3), *Let It Rock* by Kevin Rudolph (rock trial 3), *Misery Business* by Paramore (alternative trial 3) and *Blame It* by Jamie Foxx (rap trial 3). The totals for that day were R&B: 101 chirps, pop: 104 chirps, rock: 104 chirps, alternative: 97 chirps and rap: 132 chirps.

On day three the parakeets listened to *Watcha Say* by Jason Derulo (R&B trial 1), *Before He Cheats* by Carrie Underwood (pop trial 1), *Let There Be Rock* by AC/DC (rock trial 1), *Spaceman* by the Killers (alternative trial 1), *Good Life* (album version) by Kanye West (rap trial 1), *I Can Transform Ya* by Chris Brown (R&B trial 2), *Rocketeer* by Far East Movement (pop trial 2), *Learn to Fly* by Foo Fighters (rock trial 2), *Here Without You* by 3 Doors Down (alternative trial 2), *All of the Lights* by Kanye West (rap trial 2), *Break Your Heart* by Tai Cruz (R&B trial 3), *Marry the Night* by Lady Gaga (pop trial 3), *One Way or Another* by Blondie (rock trial 3), *All the Right Moves* by One Republic (alternative trial 3), and *Kiss Me Through the Phone* by Soulja Boy Tell'em. For the R&B category the birds chirped a total of 60 times; however, during *I Can Transform Ya*, both parakeets tilted their heads to their left sides and did not make a sound. As for the pop category, the birds chirped 130 times. For the rock category, the birds chirped 215 times. For alternative, they chirped 123 times, but during the last trial they stood still. Lastly, for the rap category, the birds let out 96 long chirps. During this day they let out many continuous chirps that would sometimes last well over two minutes.

On the last day the parakeets listened to *Ridin' Solo* by Jason Derulo (R&B trial 1), *Bass Down Low* by Dev and the Cataracts (pop trial 1), *Teenagers* by My Chemical Romance (rock trial 1), *Hungry Like a Wolf* by Duran Duran (alternative trial 1), *Beggin'* by Madcon Street (rap trial 1), *Beautiful Monster* by Ne-Yo (R&B trial 2), *Meet Me Halfway* by the Black Eyed Peas (pop trial 2), *Use Somebody* by Kings of Leon (rock trial 2), *Walk* by Foo Fighters (alternative trial 2) and lastly *Homecoming* by Kanye West (rap trial 2). The daily total for R&B was 75 chirps. The daily total for pop was 48 chirps. The total for rock was 51 chirps. The daily total for the alternative genre was 44 chirps. Lastly, the total chirps for rap were 10 chirps.

The combined totals for all four days came to R&B: 335 chirps, pop: 352 chirps, rock: 447 chirps, alternative: 314 chirps and rap: 289 chirps. From this experiment I discovered that parakeets react the most to rock music. This experiment proves my hypothesis correct.

5142

### Absorbing Impact

*Ethan Schwartz and S. Tanaka (teacher)*

Gaspar de Portola Middle School  
18720 Linnet St.  
Tarzana, CA 91356

In observing impact barrels on the side of the road that are filled with sand, I wondered if sand was the best material for impact absorption. The purpose of this experiment is to see which materials should be used as the best protection against impact.

For my experiment I tested impact absorption through water, sand, cornstarch and biodegradable foam packing peanuts. My hypothesis was that the sand would absorb impact better than water, cornstarch or foam packing peanuts. I believed sand would absorb the force of the impact better because it is a harder grain material and heavier in weight than the other tested materials.

This experiment utilizes four 1-gallon double ziplocked freezer bags, filled with water, sand, cornstarch or foam packing peanuts. First the bags were filled with 1 inch of each material. Then an 8" x 8" pan was filled with 1 1/2 inches of Play-Doh. A 5-pound weight was dropped from 30 inches up onto the Play-Doh. The indentation in the Play-Doh made by the weight was measured and smoothed out. Then the bag of sand was placed onto the Play-Doh pan and the weight was dropped onto it from the 30-inch height. The indentation made by the weight in the Play-Doh was measured and smoothed out. The process was repeated for the cornstarch, water and packing peanuts.

The weight left a 3/8-inch indentation when dropped on the unprotected Play-Doh. The Play-Doh, when being protected by the bag full of sand, had a 1/8-inch indentation from the weight and no visible indentation when protected by the bag of packing peanuts. The weight left a trace of an indentation in the Play-Doh when dropped on the bag of cornstarch. The bag of water was popped by the weight and the Play-Doh under it was left with a 1/16-inch indentation.

The results showed that sand was not the best material for absorbing impact. It appears the foam peanuts were better at impact absorption. This can be useful information when deciding what to use to protect valuables in shipping or deciding what goes into impact barrels that protect bridge supports and construction sites. Perhaps cities can use foam peanuts in impact barrels instead of sand to provide better protection for people. There are variables that may change the results. For example, if a softer substance was used instead of Play-Doh, the indentation made by the impact may have been more visible. In two instances the bags broke, so a stronger bag with a better seal may also have impacted results.

5143

### Candy Coloring

*Jasmine Puentes and S. Tanaka (teacher)*

Gaspar de Portola Middle School  
18720 Linnet St.  
Tarzana, CA 91356

This experiment tested which candy has the most food coloring. For this experiment, I tested Skittles, M&M's, Starbursts and Jolly Ranchers. I think that either Skittles or M&M's will have the most food coloring because they are both brightly colored. This experiment can be helpful to people when deciding which sweet snack is better for them to eat.

To conduct this experiment, you need the proper materials. So first, I went to the store and bought the different types of candy. I already had water, coffee filters, plates and a 1/4 teaspoon measuring spoon at my house. To

test this, I did three trials for each candy. I laid 12 coffee filters on plates and put one candy on each filter. I used the brightest color of each candy because they showed up the best on the filters. I used three orange Skittles, three green M&M's, three red Starbursts and three green Jolly Ranchers. Then, I placed 1/4 teaspoon of water on each candy and moved them to dry plates. I let them sit overnight so that all the coloring would come out. When I woke up in the morning, I measured the diameter of the circle of coloring that came out from each candy in centimeters and recorded the results. Then I averaged out the numbers to have one number for each brand of candy.

As aforementioned, I executed three trials for each candy. For Skittles, the diameters were 8 cm, 7 cm and 8 cm, with an average of 7.6 cm. For M&M's, the diameters were 4 cm, 3.5 cm and 4 cm, with an average of 3.83 cm. For Starbursts, the diameters were 4.5 cm, 2.5 cm and 3 cm, with an average of 3.6 cm. For Jolly Ranchers, the diameters were 2.5 cm, 2.5 cm and 2 cm, with an average of 2.3 cm.

I learned that Skittles have a lot more food coloring than the other candies and M&M's come up in second place. This proves my hypothesis. According to the site <http://healingautismadhd.wordpress.com/2010/02/12/artificial-food-coloring-is-evil/>, an excessive amount of food coloring in your diet can cause asthma, hyperactivity and autism. Apparently, the petroleum found in food coloring causes this, along with other chemicals used in the manufacturing process. The site also talks about why the FDA hasn't stopped this and other healthy habits to keep your diet on track. So, although Skittles are a delicious treat, they can cause some serious damage if you have too many and that's something to think about!

5144

### Where Should Your Elbow Face?

*Justin Munro and S. Tanaka (teacher)*

Gaspar de Portola Middle School  
18720 Linnet St.  
Tarzana, CA 91356

Do you think your basketball shooting percentage differs depending on if your elbow is tucked in or not? Well, I worked over the past three weeks trying to figure out which form provided me with the highest shooting percentage. I took 40 shots from the free throw line for 20 days (20 elbow in, 20 elbow out) to find out the answer. I chose this experiment because it will not only find an answer to my question, but will also improve my basketball game. The experiment is important because it can help young basketball players improve the shooting aspect of their game at a younger age. Before starting my shooting, I predicted that shooting with your elbow in would result in a higher shooting percentage of makes.

Before I started shooting I got all the materials I needed to shoot. First I got duct tape and measured 15 feet from the basketball hoop, so that my free throw shooting would be from the correct distance. Next, I put on my Adidas basketball shoes, grabbed my Jordan basketball and went outside to shoot. My basketball shoes are a size 7 and my basketball is size 29.5 centimeters. Each day for 20 days I shot 40 shots to test my experiment. The number of shots going into the basket varied every day and showed me which position was more consistent.

After 20 days of shooting I found out that my hypothesis was correct. However, not only did I learn that shooting with your elbow in resulted in a higher percentage, but also that shooting every day helped increase my percentage. In my first 11 trials I was normally getting 11/20 or 12/20, but then from trials 12-20 I was averaging about 14/20 or 15/20. When I shot with my elbow out I normally got 9/20 and I never got more than 12/20. I averaged 71% from the line with my elbow tucked in and 41% with my elbow out, which clearly shows that shooting with your elbow tucked in helps you be more consistent.

This experiment proved that shooting with your elbow tucked in and aimed toward the basket results in a higher percentage than shooting with your elbow out and not facing the basket. After this experiment I also became a better free throw shooter. Other scientists would find this

interesting because they can learn from this experiment and use this to help other athletes improve their game using similar techniques. The results are important to the world because all basketball players could improve their shooting game and get better at basketball by keeping their elbows tucked in toward the basket.

5145

### What Is the Most Efficient Stain Remover?

*Karina Finn and S. Tanaka (teacher)*

Gaspar de Portola Middle School  
18720 Linnet St.  
Tarzana, CA 91356

I chose this experiment because I often see commercials claiming to completely remove all types of stains (i.e. ketchup, wine and coffee) and I wanted to test if they were truthful. I conducted an experiment that answered which commercial stain remover best cleaned a red wine stain given different water temperatures. This experiment is important to other people because its results may help them choose an efficient stain-removal method. This may also benefit the environment because people won't have to waste water washing the same thing several times. I hypothesized that although they all claim to make stains disappear, they would remove the stains equally, independent of the water temperature.

For this experiment, the different stain removers and water temperatures were my variables, and the cloths, wine, amount of water and the laundry detergent were my constants. I soaked 12 15-cm x 8-cm white cotton cloths in half a liter of Three Wishes Merlot wine for 10 hours in a 30-cm x 10-cm x 5-cm bin. I then set them in the sun to dry for four hours. Afterward, I turned them over and let the backsides dry for another four hours. I separated the cloth strips into four groups of three each. The first group got no further treatment and served as the control. Spray 'n Wash Stain Stick was applied to the second group of the three soiled fabrics by applying it in a cross shape to one side. I repeated this procedure with groups three and four with OxiClean and Stain Be Gone.

Each strip was marked so I would know which was which after it was put into the washing machine. For example, I cut off one corner of all the cloths that had Spray 'n Wash. I did three different washing machine loads on the small load, cotton cycle with 60 ml of Tide laundry detergent. With each load, I set the water to a different temperature (i.e. hot, warm and cold) and inserted three cloths, each with a different type of stain remover, and one of the control strips. Finally, I put all of the cloths out in the sun to dry for four hours per side.

All of the cloths cleaned in cold water had exactly the same outcomes, regardless of the stain remover that was used or if none had been used. There were many spots of red wine remaining on both sides. The same was true for the warm load, except it had many fewer blemishes. Finally, all four cloths that went in hot water were completely clean, with not a spot of wine in sight.

My data had disproved my hypothesis. Although red wine can be removed from cloth, water temperature does make a significant difference. Not only was there no real difference in the effectiveness of the stain removers, there also was no real difference between the stain removers and just plain detergent and water, the control. Hot water and soap, not stain remover, proved to be the most successful way to eliminate stains.

This experiment is important to other people because they can now be more aware and understand that advertisements, whether in print, on television, etc., can be an exaggeration and even misleading. Additionally, people don't have to waste money on buying expensive stain removers. It does not matter which brand you use, as long as you have the right water temperature. This experiment also showed that it is not always necessary to use chemicals that may be harmful to the environment just to clean your clothes. These results may encourage the scientists who formulated these stain removers to try again.

5146

### Which Shoe Is the Best for Basketball?

*Kevin Hernandez and S. Tanaka (teacher)*

Gaspar de Portola Middle School  
18720 Linnet St.  
Tarzana, CA 91356

The purpose of this experiment is to determine which type of low-cut shoe is the best for basketball and how it affects two types of shots, a layup and a free throw. The following shoes are in the experiment: Nike Free Run, Nike 6.0 and Etnies recycled. The value of this experiment lies in how the shoes react to the jumping stress put on them during a shot. The reason why I chose this experiment is because I enjoy basketball and mostly because I like shoes. The reason why this experiment should be important to other people is because it shows that shoes affect how you play basketball and shows them the superior shoe. My hypothesis on what shoe will succeed is that the Free Run will be the best shoe.

The procedure of this experiment is complicated and there are many factors that have to be kept in check. The factors that must be kept in check are doing the shots in 5-minute intervals (because muscle memory could change the outcome), wind and lighting, ball size and the height of the court. Once all of the factors have been dealt with you can begin the experiment.

The necessary tools for the experiment are three low-cut shoes, a basketball, paper and pen, and a basketball court. Start by stretching and getting your ball. Go to the free throw line. Once you are at the line, shoot the ball. Once you shoot the ball, record it on your piece of paper. Then wait for 5 minutes to stop muscle memory. Do this 10 times, all with the different shoes. Once you have collected all for the free throws, do the same thing for the layups. Keep in mind that a layup is when you sprint toward the basket and lightly push the ball into the basket. All of the steps were done when I did my experiment. Nothing was changed from my experiment to this abstract.

The outcome of the experiment was that the Nike Free Run shoes were victorious, with free throws being made 80% of the time as well as layups. Their ergonomic design has little cuts on the sole of the shoe to allow more movement in different positions. With the Nike 6.0, free throws were made 70% of the time as well as layups. Etnies did the worst with free throws being made only 50% of the time and layups being made 70% of the time. The data prove that, in fact, the Nike Free Run is superior to the others in free throws and at layups, proving that my hypothesis was correct.

The experiment is relevant to other scientists because many must enjoy the sport of basketball, but don't want to deal with putting high tops on because they are hard to put on. So instead they can use this abstract to find out the best shoe for them. These results are important to the world because they can help find the perfect shoe for the perfect shot without using muscle memory.

5147

### Does Music Help You Remember?

*Leslie Saldana and S. Tanaka (teacher)*

Gaspar de Portola Middle School  
18720 Linnet St.  
Tarzana, CA 91356

People have always wondered what the best way to remember things is. I am experimenting to see if music can improve your memory. If music does help you remember things, it could become a new, easier and more interesting way to study. I think that music will help improve your ability to remember things.

To conduct the experiment I asked four people if they would like to be involved in this experiment. I asked two of them if they would study a sheet of notes that I wrote and provided for them. Then, I asked the other two people if they would listen to the *Mass Song* by Mr. Edmond on YouTube. I made sure that the people with the notes didn't listen to the song and that the people listening to the song didn't read the notes. After, all four people did what was asked of them. I gave them a seven-question test that

I made up with all the material that they had studied. Each person took the test separately with unlimited time.

Out of the two people who studied the notes, one of them got all seven questions correct. The other person who studied the notes missed one and a half questions. The average of their tests combined was 89.3%. On the other hand, the average of the people who studied by listening to the song was 96.3%. That means that one person missed none and the other person missed half of a question. The people who studied by listening to the song did better on the test than those who used the notes to study.

The data I collected from the test results tell me that the people who used the song to study did better than those who just read their notes. The data prove that music is a more efficient way to study and that it helps you to remember important information.

Other scientists could use my results in many ways, such as for their own personal needs, to test my results again or even to help find a cure for memory illnesses. The whole world could be using music as a way to remember little things to big things, like what to get at the grocery store, to visit a family member at the hospital or even to remember their daily schedule. Music could be more than just a way to study and remember things for an upcoming test; it could be a way of life.

### 5148 The Fat Content of Chocolate and Its Relationship With the Speed of Melting

*Madeleine Page and S. Tanaka (teacher)*

Gaspar de Portola Middle School  
18720 Linnet St.  
Tarzana, CA 91356

The hypothesis is that the chocolate with the greatest fat content will melt the fastest. I am choosing this experiment to find which chocolate has the most fat and which will melt the fastest. I also like chocolate and have wondered what causes it to melt. This is important for other people because then they will know which chocolate has the most fat and also how and why the chocolates melt. In this experiment I think that all of the chocolate will melt, but the Ghirardelli 86% Cacao Chocolate will melt the fastest because it has the most fat. I also think that many of the chocolates, like the Hershey's Milk Chocolate, the Dove Milk Chocolate and the Ghirardelli Milk Chocolate, will have very similar levels of fat because they are all milk chocolate. For my materials I used a pencil, Sharpie, baking sheet, parchment paper, camera, toaster oven, food scale, knife, paper, timer, oven mitt, calculator, Hershey's Milk Chocolate, Hershey's Special Dark Chocolate, Dove Dark Chocolate, Dove Milk Chocolate, Lindt 70% Cocoa Chocolate, Ghirardelli Milk Chocolate, Ghirardelli 72% Cacao Chocolate and Ghirardelli 86% Cacao Chocolate.

The steps that I took to perform this experiment were first gathering all my materials, and then I had to label my parchment paper for each chocolate bar. I then measured each piece of chocolate so they would each weigh 8g exactly. When that was done I placed them on the parchment paper next to their label. Next I heated the toaster oven to 150 degrees Fahrenheit. Then I placed the parchment paper with the chocolate on it onto the tray and put the tray in the oven. I set the timer for one minute, turned my camera on and put the oven mitt on one of my hands. After the timer beeped I took out the tray and took a picture of the chocolate melting. After I took the picture I put the tray back in the oven. Then I repeated these steps 10 times so the chocolate was only in the oven for 10 minutes. Lastly, when the 10 minutes were up I recorded the three fastest-melting chocolates. Throughout the experiment, I kept the weight of the chocolate the same. In every trial, each chocolate bar weighed 8g. From this experiment I collected the percentage of fat there was from the eight types of chocolate I used, and which chocolates melted the fastest. Many of the chocolates had very similar percentages of fat, but others were different. The Hershey's Milk Chocolate was 30%, Hershey's Special Dark Chocolate was 31%, Dove Dark Chocolate was 31%, Dove Milk Chocolate was 31%, Lindt 70% Cocoa Chocolate was 47%, Ghirardelli Milk Chocolate was 31%, Ghirardelli 72% Cacao Chocolate was 44% and Ghirardelli 86% Cacao Chocolate was 55%

fat. I had three trials when I did my experiment; the first time Ghirardelli 86% Cacao Chocolate melted the fastest, then Ghirardelli 72% Cacao Chocolate and then Lindt 70% Cocoa Chocolate. The second trial had the same results as the third trial; the fastest was Ghirardelli 72% Cacao chocolate, then Ghirardelli 86% Cacao chocolate and again third was Lindt 70% Cocoa chocolate. From this experiment I learned that having the most fat does not mean that the chocolate will melt the fastest. My data disproved my hypothesis because the Ghirardelli 72% Cacao Chocolate melted the fastest in two of the three trials, and it had the third-largest amount of fat. These results are important for other scientists because they know that when chocolates melt it doesn't have to do entirely with the amount of fat. These results are necessary and impactful for the world because now they will know which chocolates have more fat.

### 5149 Do Dairy Products Have an Effect on Singing and General Well-Being?

*Michaela Williams and S. Tanaka (teacher)*

Gaspar de Portola Middle School  
18720 Linnet St.  
Tarzana, CA 91356

It is a well-known fact that dairy products, or anything that is made from the milk of mammals, generally coat the throat and vocal chords due to the milk found in dairy. However, it is suspected that the effects are not long term and subside within a few hours. Common dairy products include milk, yogurt, cheese, butter, ice cream, etc. Many performers who use their vocal chords daily take this into account and are careful not to partake of anything that might interfere with their sound, which includes dairy. Dairy products are consumed differently by each individual, since some are more sensitive to dairy than others. Even so, I want to discover how dairy affects my singing voice because it is something that I practice with daily. I will conduct an experiment to see if excluding dairy from my diet for an extended period of time will affect the quality of my singing and general well-being. This experiment's results will be beneficial for people to analyze and learn from because they will be able to make conclusions and inferences relating to the effects of dairy. Perhaps many have dairy sensitivities, but are immune to the effects because the symptoms appear daily and, for the most part, seem insignificant (minor headaches, stubborn weight or weight gain, fatigue, etc.); these can be common symptoms of food sensitivities, including to dairy products. It is essential to understand as much as you can about health so that this generation and the next will have the capability to form new habits that will help us to live more comfortably. Also, fellow vocalists will be grateful to have the information from this experiment so they can make the appropriate decisions to alter their lifestyles according to the results. I predict that by enforcing restrictions on dairy products, I will see significant improvements in my singing and general well-being.

The introductory procedures will first involve obtaining the materials needed. In order to conduct this experiment, you will need a tape recorder, timer and a chart with a blank box for each day in three weeks (the length of the trial) to write down every single thing you ate for that day. Any general form of these supplies will suffice for this experiment. The rest is mostly dependent on your perseverance and control when it comes to excluding the dairy products. Some common foods that will be prohibited for the next three weeks include pizza, various breads, ice cream, cheese, some pastas, most baked goods, and drinking milk, which is also used for cereal. In order to chart the progress of this experiment, I will time a sustained note to see if my three weeks without dairy will affect my ability to hold the note out. The note will be a constant middle F, but my body will be affected differently according to what I consume each day. Also, in order for me to prove that I was consistent throughout the experiment, I must fill in the chart accordingly day by day. I will also take any other unusual changes into account and record them as well. After three weeks of collecting data and recording, I should have enough information to make an educated, reasonable conclusion.

As a result of the experiments that were run, I can conclude that for me, dairy does have an effect on my singing ability and can also cause other common annoyances to the body. I listed every item of food that I ate over the past three weeks on a chart, and by doing so, I was able to ensure that my results were accurate. I felt no discomforts in my first week, but I did notice some changes. Before I started my experiment, I got up to five headaches a week, usually starting at about 3 p.m. However, since I started experimentation, I have felt my headaches becoming scarcer. I also have more energy throughout the day, since I usually begin to feel fatigued by the late afternoon. For my first trial recording, I ended with a total of 18.63 seconds. By the second week, my new record time was 26.84 seconds. Compared to week one's trial, I was able to sustain the note for a whole 8.21 seconds more. Already, the experimentation showed that I may have food sensitivities to dairy. By week three, all of my suspicions were confirmed. I ended my last trial with a total of 34.4 seconds, which is a 7.56-second difference from trial two. Soon after experimentation ended, I decided to try a buttered roll, and almost immediately felt nauseous because my body had become sensitive to dairy. I then proceeded to get a blood test for food allergies and my results showed that I was, in fact, sensitive to dairy. With the trials finished and the final results in, I can conclude that dairy does affect many aspects of the human body, and not always for the better.

Further implications of my findings show that dairy does affect singing, and sensitivities to dairy products can cause common health deficiencies. However, more recent studies have shown that it is fairly common to have food sensitivities to dairy, but few notice the daily symptoms and, for the most part, can carry on with their lives without being tested. The information obtained through this experiment will enable scientists to correct their current theories and make accommodations that will help the human race to fix whatever health problems they may have. Through this experiment, others like me can gain a new understanding about dairy substitutes and feel more obligated to be tested, since they know what good might come from it. I know that the results have already benefitted me, and have improved my health considerably by helping me understand how to change my habits.

## 5150 Radiated Lentils

*Miles Cohen and S. Tanaka (teacher)*  
Gaspar de Portola Middle School  
18720 Linnet St.  
Tarzana, CA 91356

Imagine colonizing another planet that does not have a breathable atmosphere to humans. We would want to bring plants that grow quickly, so we could produce our Earth atmosphere swiftly. If the radiation levels on the planet were too high for the Earth's plants, our entire plan of colonization could be ruined. This is why we need to know how much radiation different plants can absorb before dying. In my project I plan to expose lentils to UV radiation for 30 minutes at a time. My hypothesis is that the UV radiation will increase the rate of growth of the lentils, because UV radiation occurs naturally and plants need it.

In total there were 84 test lentils and 84 control lentils. The lentil seeds that were used were from the brand Market Pantry. The soil that was used in this experiment was Farmers Organic. Four lentils were placed into small containers that faced south for optimal sunlight. The lentils were to grow for 14 days and then were to be irradiated for 30 minutes every other day for a total of three times. They were to be watered every other day so the soil could stay moist.

Out of the 168 lentils, only one grew, which was a test plant. After the plant sprouted it grew an inch and ceased growing. It was still alive even though it did not grow at all, which was very perplexing. The radiation had no visible effect on the solo lentil at all, so no information can truly be gathered from the irradiation of this single lentil.

No solid information can be concluded from this experiment because it did not have a control. Also, the irradiated lentils did not grow at all and did not react with the extra UV radiation. Perhaps the amount of UV radiation

that the plants were exposed to was not significant enough, but currently these results do not support or disprove the standing hypothesis.

Unfortunately for me, the only lentil that grew was unreactive to radiation, so my hypothesis still stands as possible. The future results of this experiment can prompt engineers to design a more protective space shuttle for plants when we colonize other planets. Future engineers can rule out which radiation is not harmful to lentils and devise a way to protect the lentils from harmful radiation.

## 5151 Do Different Music Types Affect Your Heart Rate?

*Ram Zallan and S. Tanaka (teacher)*  
Gaspar de Portola Middle School  
18720 Linnet St.  
Tarzana, CA 91356

The main purpose of this experiment was to see if different genres of music can actually change the rate of your pulse. I wanted to know how the different genres changed heart rate. To start the experiment, I decided on four different genres of music to test. They were Rock 'n' Roll, Ambient, Classical and Dubstep. I hypothesized that Rock 'n' Roll and Dubstep would raise the heart rate, while Classical and Ambient music would make the pulse drop. It could end up helping some people who are known for having a heartbeat that is above average, because they may want to stay away from types of music that may bring an unneeded rise in their pulse.

I tested these music types on my sister and my dad. First, I had them wear headphones with no music playing, and took a control. After that, I played one genre into their headphones for about 30 seconds to a minute, and then took their pulse. I did the same for the other three music types. I measured their BPM (or beats per minute) by counting their heartbeats for 15 seconds, then multiplying that number by four, adding up to how many heartbeats they had in 60 seconds. I played the same four songs, one for each genre. For Rock 'n' Roll I played *Kashmir* by Led Zeppelin. For the Ambient music, I played *1/1* by Brian Eno. I played *Mozart's Symphony #40 in G Minor* for the Classical genre. And for Dubstep, I let them listen to *Get Down Lay Down* by Ajapai.

First, I tested my 9-year-old sister, Noya. For the control, her pulse was 92 beats per minute. Listening to Rock 'n' Roll, her heart rate actually went up to 96 BPM. However, when Ambient music was playing, her BPM dropped to 84. The Classical music also dropped her pulse down to 88 BPM. Just like Rock 'n' Roll, Dubstep raised her BPM to 96. After that, I did the same tests on my dad, Jay. His control heart rate was 68 BPM. I found that for Rock 'n' Roll, Ambient and Classical, his heart rate rose to 72 BPM. However, for Dubstep, it rose to 76 BPM. The average of their controls was 80 BPM, while the average heart rate while listening to Rock 'n' Roll was 84 BPM. The average BPM while Ambient music was playing was 78, and for Classical the average was 80 BPM. The average for Dubstep was 86 BPM.

The average results actually supported my hypothesis. I was correct in saying that their beats per minute while Rock 'n' Roll and Dubstep were playing would be higher than the control. Also, I correctly predicted that while listening to Classical and Ambient music, their pulses would drop below what the control was. This experiment showed that different types of music actually can change one's pulse, whether it heightens it or lowers it. This could help doctors know what sort of genres of music that people with pulses that are higher than average should refrain from listening to.

5152

## Peanut Project

*Savana Dulberg and S. Tanaka (teacher)*  
 Gaspar de Portola Middle School  
 18720 Linnet St.  
 Tarzana, CA 91356

The purpose of my experiment is to examine how much stored chemical energy is in a tiny peanut, and other kinds of nuts. I will then use that energy to heat water by burning the nuts. This experiment is important because just about everything has potential energy stored in it; the problem is releasing that energy to be able to do some work. My hypothesis is that the peanuts will be able to heat the water. To begin my experiment I need a small bag/can of unsalted, shelled peanuts, a cork, a needle, a large metal juice or coffee can, a small metal can (like a soup can) with the paper label removed, a can opener, a hammer, a large nail, a metal BBQ skewer, about a cup of water, a thermometer, a match, and of course the three different types of nuts that I am testing (Brazil nuts, cashew nuts and peanuts). The same procedure I am keeping is lighting the different nuts. I am first carefully pushing the eye of the needle into the smaller end of the cork, then I am gently pushing the pointed end of the needle into a peanut. After I remove the two ends of the large juice can with a can opener, then I use the hammer and nail, and punch holes around the bottom of the large can. (These are air holes that will make the can act like a chimney and will contain the heat energy, focusing it on the smaller can.) After I remove the top end of the small can, using a hammer and nail, I punch two holes near the top of the small can exactly opposite of each other. I then slide the BBQ skewer through the holes of the small can, and then I pour 1/2 a cup of water into the small can and let it sit for an hour. (This will allow the water to be heated or cooled to room temperature.) Then I put the thermometer into the water and record the temperature. I then place the cork and peanut on a nonflammable surface; as soon as the peanut has caught fire, I immediately place the large can around the nut. I then balance the skewer holding the small can on the tip of the large can, allowing the nut to burn for several minutes until it goes out. I finally stir the water with the thermometer and measure the temperature. I performed a total of six trials, two trials per nut. For the cashew nuts the water temperature raised 13° F (from 75° to 88° F), the Brazil nut's water temperature raised 65° F (from 75° to 140°), and the peanut also raised 13° F (from 75° F to 88° F) The Brazilian nuts contain more energy than cashews or peanuts because the temperature raised more. The results are that the chemical energy stored in the peanut was released and converted into heat energy. The heat energy then raised the temperature of the water in the can. The data proves my hypothesis because I knew that peanuts contain energy and would be able to heat the water. The results show that different kinds of peanuts have different amounts of heat energy stored in them. So if scientists wanted an exact measure they need a machine called a calorimeter. These results are important to the world because a tiny peanut contains stored energy, and when we eat them the stored energy is converted by our bodies so we can do work.

5153

## Fruits and Vegetables Conducting Electricity

*Garrett Alvord and D. Shab (teacher)*  
 Portola Highly Gifted Magnet Center  
 18720 Linnet St.  
 Tarzana, CA 91356

In this experiment, fruits and vegetables were tested to see how well they could conduct electricity. Six common fruits and vegetables were used. They were lemons, kiwis, apples, cucumbers, squash and potatoes. To test how well they conducted electricity, a cathode and anode were inserted into each fruit and vegetable. A cathode is a negatively charged piece of metal and an anode is a positively charged piece of metal. Then a millimeter, a machine that measures volts, was used. The wires attached to the millimeter were connected to the cathode and anode. The millimeter recorded the amount of volts conducted. The results show that the "juiciest" fruits can conduct electricity the best.

5154

## Temperature Range That Makes Popcorn Kernels Pop

*Chloe Simson and D. Shab (teacher)*  
 Portola Highly Gifted Magnet Center  
 18720 Linnet Street  
 Tarzana, CA 91356

The purpose of this study was to see what temperature range would pop a kernel of the popcorn *Zea mays everta* in a kiln. Ten popcorn kernels were placed inside a kiln at temperatures of 50°C, 100°C and 150°C until the popcorn no longer popped. If the kernels popped within 10 minutes, that meant it was part of the temperature range. If the kernels started burning before popping, this was not counted as part of the range. This experiment was repeated three times. The results showed that, on average, the popcorn kernels would pop from about 100°C to 150°C and would burn at 483°C to 533°C.

5155

## The Effects of Soda on Teeth

*Sharon Kadosh and S. Tanaka (teacher)*  
 Gaspar de Portola Middle School  
 18720 Linnet St.  
 Tarzana, CA 91356

Many people know that soda isn't the healthiest for your body, but they may not be aware of the damage it can cause to your teeth. Therefore, I have decided to test the effects of soda on teeth, specifically the visible area, or enamel. In addition, I will observe which soda has the most negative effect on the enamel, so that people will know which ones they should drink in moderation. Of the four sodas that I will observe, I think that Diet Pepsi-Cola will do the most damage because of all the extra chemicals that have been added to make it "healthier" than regular Pepsi-Cola.

The first step in conducting my experiment was boiling four eggs, which would serve as models of teeth and their enamels because the eggshell resembles the tooth's outer layer. The next step was to pour four different sodas, in this case Sunkist, 7UP, Diet Pepsi-Cola and Mountain Dew, into separate glasses 3/4 full. I then observed what each boiled egg looked like before putting one in each glass. From then on, I observed each egg once every hour for five hours and then surveyed them again 24 hours from the last time I checked them. The variables that I kept constant during the experiment were the eggs, the size of each glass and the amount in each glass. The only changing variable was the type of soda in each glass.

All four of the boiled eggs had a smooth, white surface before I put them in their designated glasses. However, after just one hour, there were significant differences in their complexion and texture. The Sunkist egg was dotted with orange spots, but remained similar in smoothness, and the 7UP egg remained almost exactly the same. The Diet Pepsi egg, however, turned beige and was compressed in some areas. The Mountain Dew egg developed cracks and yellowed toward the bottom of the egg. After two hours, the Sunkist egg was completely orange and became smoother and the 7UP egg developed a crack, but the Diet Pepsi and Mountain Dew eggs remained the same. On the third hour, all four eggs remained in the same state. By the fourth hour, however, the Sunkist egg had dark orange stains on both ends that led to lighter stains toward the middle, the 7UP egg remained the same, the Diet Pepsi egg had brown stains similar to those of the Sunkist one, and the Mountain Dew egg remained the same. On the fifth hour, the Sunkist and 7UP eggs remained the same, but the Diet Pepsi egg compressed into a sphere and the Mountain Dew egg gained deeper cracks. Twenty-four hours after the fifth hour, the Sunkist egg grew smooth and had a darker shade of orange, the 7UP egg grew a little bit rough at the bottom, the Diet Pepsi egg gained a darker shade of brown, and the Mountain Dew egg had soda inside its shell.

Based on my findings, my hypothesis proved to be correct because the Diet Pepsi-Cola damaged the outside of the eggshell the most as a result of its dark stains and compressed shape. However, the Mountain Dew did

the most damage in terms of structure because of all the soda that broke through the shell and into the egg. Sunkist did major damage to the complexion of the shell as well, so it may have some components that are similar to those of the Diet Pepsi. As a result, 7UP is least likely to cause problems with the enamel, but provides high risk for cracks as with the Mountain Dew.

These findings can provide new information about the sodas that can do the most damage to the enamel and can lead scientists in discovering others that shouldn't be consumed frequently. Based on the effect these sodas had on the eggshells, people should know to drink them in moderation or else suffer from stained and cracked teeth or other dental problems.

## 5156 Is Your Diet Causing You Headaches?

*Sharon Molina and S. Tanaka (teacher)*  
Gaspar de Portola Middle School  
18720 Linnet St.  
Tarzana, CA 91356

You know those annoying headaches you get three to five times a week? The ones that keep you from enjoying yourself and don't let you sleep at night or relax? I do and, unfortunately, so does 90% of the human population. After seeing the suffering people get from headaches, I set out to investigate whether or whether not our diets have anything to do with the high rates of headaches we get. I decided to experiment on the idea that cutting back on meat and dairy products will lower our headache rates. My hypothesis is that entirely cutting out both dairy and meat products will lower one's headache rates. This experiment is important to other people because it might help people suffering from headaches find a method to lower their headache rates.

First, I found four research study participants. Each participant would have a dietary change. Participant #1 was to cut back on half the times he consumed dairy and participant #2 was to cut back on half the times he consumed meat. Participant #3 would consume neither dairy nor meat products and participant #4 would consume both dairy and meat products. Next, I recorded the number of times each participant experienced headaches in a week for four weeks straight. I also studied the difference between the average number of headaches the participants experienced in one week before the dietary change and the average number of times after the dietary change. Then, I set out to make charts of all the data to see the results more clearly and visually. Finally, I was ready to see if my hypothesis was correct.

For the four weeks that I did my experiment, I recorded the number of headaches each participant experienced each week. I did four trials – one trial for every week of my experiment. In the first week of my experiment, I noted that both participants #1 and #2 got three headaches. Participant #3 got only two headaches and participant #4 got four headaches. In the second week, participant #1 got four headaches, participant #2 got three, participant #3 got one and participant #4 got five headaches. Participant #1 got two headaches, participant #2 got three headaches, participant #3 got one headache and participant #4 got four headaches in the third week. In the last week of my experiment, both participants #1 and #2 got two headaches. Participant #3 got zero headaches, while participant #4 got four headaches.

After analyzing the data, I discovered my hypothesis was right. Entirely cutting out both dairy and meat products will lower one's headache rates. Participant #3, who did not consume dairy or meat products, experienced fewer and fewer headaches throughout the experiment. Before the experiment, participant #3 got, on average, four headaches a week. You can clearly see the difference from before the dietary change and after. The results of my experiment are important to other scientists because they can help with future medical studies other scientists might do. My results are important to the world because my results could help a lot of people suffering from headaches find relief. People suffering could use the method of cutting back on dairy and meat products to lower their headache rate. That's why my results are important to other scientists and the world.

## 5157 What Time of Day Is My Dog the Hungriest?

*Sbirel Coben and S. Tanaka (teacher)*  
Gaspar de Portola Middle School  
18720 Linnet St.  
Tarzana, CA 91356

Have you ever wondered what time of day your dog is the hungriest? Many people might not care but they should. A dog's health affects the dog's life span. I am doing this experiment so I am sure my dog does not eat more than she should and so that she can be a healthy dog. This should be important to others because knowing what time of day your dog is hungriest can save you an average of about \$30 to \$40 per month depending on the dog food you buy. If you know what time of day your dog is hungry, you can only leave the food out at that time so that the food won't become spoiled. Spoiled food means money down the trash. I think that in this experiment, my dog will eat a lot in the morning, not that much at lunch and an abundant amount at night.

The materials needed for this experiment are a dog, dog food, a 1/3 measuring cup, food bowl and a week to conduct the experiment. The one thing that you are testing or changing in the experiment is the time of day you will be giving your dog its food. You will be keeping the same dog, same food and same amount of food throughout the experiment. On the first day, in the morning, (7-8 a.m.) take the 1/3 measuring cup and fill it with the dog food. Pour it into your dog's food bowl and let your dog eat the food as he or she normally would. When it is lunchtime (1-2 p.m.), take the food bowl and write down, in a notebook, about how many pieces of food are left in the bowl. You should throw away the leftover pieces. After that, take the measuring cup and fill it with dog food and pour it into the bowl. Let your dog eat the food as it normally would. When it is about dinnertime (6-7 p.m.), take the bowl and write down about how many pieces of food are left in the bowl and then throw them away. After that, take the measuring cup filled with dog food and pour it into the bowl. During the next morning, check how much food is left in the bowl and write it down in your notebook. Follow these same steps for a week.

In this experiment, I performed seven different trials, one each day of the week. On the first day of the experiment, I learned that my dog ate the most in the morning. On the second day, she also ate the most in the morning. On the third day, she ate the most at dinner. On the fourth day, she also ate the most at dinner. On the fifth day, she ate the most at lunch. On the sixth day, she ate the most at dinner. On the seventh day, she also ate the food most at dinner.

My data tells me that my hypothesis was wrong. I guessed that my dog would eat the most food in the morning, but my trials showed that she ate the most food at night during dinner. Two days during the week, she ate the most food in the morning. Another day of the week, she ate the most during lunchtime. But four days of the week, she ate the most during dinner. This shows that my dog is probably the hungriest during dinnertime because of all the tiring activities she does during the day. My data also tells me that I could have made a more educated guess so that my hypothesis would be correct.

In conclusion, knowing what time of day your dog is hungriest is important to the world. People who own dogs care a lot about them and want to keep them healthy and around for a long time. Knowing what time of day your dog is the hungriest can help you prevent your dog from becoming overweight or obese. Leaving your dog's food out would tempt your dog to eat more. Research shows that over 40% of dogs in the U.S are either overweight or obese. Knowing what time your dog is hungry can also save you money. Leaving your dog's food out would cause the food to spoil and that would waste your money. These results are important to scientists because the percentage of overweight or obese dogs would drop significantly and people would save money. Lastly, this experiment will keep your dog healthy and around you for a long time.

5158

### Egg Water: Is It Worth the Stink?

Jenna Brown and T. Miller (teacher)  
Holmes International Middle School  
9351 Paso Robles Ave.  
Northridge, CA 91325

Will egg water (eggshell soaked in water) help Dwarf French Marigolds (*Tagetes patula*) grow taller? The purpose of this experiment was to determine if watering the plants with egg water would help the plants grow taller. The hypothesis was that the Marigolds that were watered with the egg water would grow taller than the Marigolds that were watered with tap water. Four and a half eggshells were placed into a jar that was 17.5 cm tall, had a 6.4 cm diameter and was filled with 750 ml of water. The jar was left to sit for a week. The Marigold plants came in two packs of six. The packs were cut apart so that the plants were separated, and each segment was placed into a cleaned cake-frosting container. Six containers were labeled "Experiment" and six "Control." The plants labeled "Experiment" were watered with egg water and the plants labeled "Control" were watered with tap water. The Marigolds were watered on Mondays, Wednesdays and Fridays. Also on Mondays, the Marigolds were measured and the number of blooms and buds they had was recorded. The average height of the plants labeled "Experiment" was, at the start: 7.75 cm; on week one: 7.6 cm; on week two: 7.6 cm; on week three: 7.8 cm; on week four: 7.75 cm; on week five: 7 cm; and on the final week: 7.6 cm tall. The average height of the plants labeled "Control" was, at the start: 7.25 cm; on week one: 7 cm; on week two: 6.8 cm; on week three: 7.2 cm; on week four: 6.6 cm; on week five: 7 cm; and on the final week: 6.8 cm tall. After seven weeks, the results were that the plants in the experiment did not grow taller at a faster rate than the plants labeled control. Also, the number of blooms and buds per plant was not significantly different. The egg water was not effective on Marigolds. The hypothesis was incorrect. Using a flowering plant may have complicated the results, because as the blooms were lost, the plants lost height. If I had used a non-flowering plant the results may have been different.

5159

### Will a Population of Collembola Decrease If Almonds Are the Only Food Source?

Christina Choi and T. Miller (teacher)  
Holmes International Middle School  
9351 Paso Robles Ave.  
Northridge, CA 91325

The purpose of this experiment is to determine if a population of collembola (*Onychiuridae encarpatus*) will increase if they are fed almonds for food. As a hypothesis it was decided that the population would decrease if they were fed only almonds. Environments for the collembola were made by placing nine parts plaster of Paris, one part charcoal and water in a dish and stirring it until it was completely mixed. It was the consistency of yogurt. It was poured into two petri dishes and was allowed to dry for a few days. Water was added to the petri dishes using medicine droppers. In the control, yeast was dropped in the environment for the collembola to eat, and in the experiment almonds were crushed and dropped in the petri dish for them to eat. Eleven collembola were added to each petri dish. Stereomicroscopes were used to observe and count the collembola. At the end of the experiment, 36% collembola and 62% eggs were observed in the experiment, and 63% collembola and 37% eggs were observed in the control. The hypothesis was incorrect; the population of collembola increased. They were able to survive with the almonds.

5160

### Do White Candles Burn at a Different Rate Than Colored Candles?

Jasleen Munsalud and T. Miller (teacher)  
Holmes International Middle School  
9351 Paso Robles Ave.  
Northridge, CA 91325

The purpose of doing this project was to find out which candles would last longer, either the white candles or the blue candles. My hypothesis is that the white and colored candles do burn at a different rate, and that the colored candles will burn slower. My parents first lit the two white and two colored candles every day. I set the timer for two hours and waited. After two weeks of doing this, I found out that the blue candles burned much faster than the white candles. The blue candles went from 15.24 centimeters to about 7.62 centimeters in two weeks. The white candles went from 15.24 centimeters to about 10.16 centimeters in two weeks. On average, the blue candles lost about 4.12 centimeters per week and the white candles lost about 2.8 centimeters per week. My hypothesis was incorrect. The evidence suggests that white candles burn slower than colored candles.

5161

### Will a Population of Collembola Increase If Given Orange Juice as Their Source of Liquid?

Alethia Placencia and T. Miller (teacher)  
Holmes International Middle School  
9351 Paso Robles Ave.  
Northridge, CA 91325

The purpose of this experiment was to see how collembola react to receiving orange juice as their only liquid. The hypothesis was that the population of the collembola would decrease because of the acidity in the orange juice. First nine parts plaster of Paris, one part charcoal and water were mixed until it was the consistency of yogurt. Then this mixture was placed into two petri dishes. These new environments were allowed to dry thoroughly. One of the petri dishes was labeled control, and the other experiment. Both were given yeast, the control was given water and the experiment was given orange juice. Fourteen collembola were placed into each petri dish and left in the classroom. Over the next six weeks the number of live collembola in each petri dish was recorded. At the end of the experiment the final number in each dish was recorded. In the experiment, there were 41 collembola and 10 eggs. In the control, there were 20 collembola and 5 eggs. The outcome of the experiment was contrary to the hypothesis. Since oranges are citrus fruits it was believed that there would be too much acid to create a healthy environment for the collembola. It turns out that the collembola ate the extra mold that grew from the orange juice. The hypothesis was incorrect.

5162

## Will a Magnet Become Stronger in Different Temperatures?

*Micayla Rendon and T. Miller (teacher)*

Holmes International Middle School  
9351 Paso Robles Ave.  
Northridge, CA 91325

The purpose of this experiment was to see if different temperatures affect the strength of magnets. The hypothesis was that the magnet would be strongest at room temperature. Fifty-nine paper clips and three magnets were used. One magnet went into the freezer, one magnet went into a pot of hot water, and the last magnet sat on the counter, for 5 minutes each. After 5 minutes each magnet was tested on how many paper clips it picked up. Each magnet was tested three times. For test 1, in room temperature: 50 paper clips; in the freezer: 21 paper clips; and in the hot water: 22 paper clips. For test 2, in room temperature: 31 paper clips; in the freezer: 40 paper clips; and in the hot water: 24 paper clips. For test 3, in room temperature: 35 paper clips; in the freezer: 32 paper clips; and in the hot water: 33 paper clips. The average for room temperature was 38 paper clips. The average for the freezer was 31 paper clips. The average for the hot water was 26 paper clips. The hypothesis was correct. The most paper clips picked up were in room temperature.

5163

## Will a Population of Collembola Decrease If They Are Fed Potato Chips?

*Efua Sey and T. Miller (teacher)*

Holmes International Middle School  
9351 Paso Robles Ave.  
Northridge, CA 91235

The purpose of the experiment was to determine if collembola survive eating potato chips for food. The hypothesis was they would not survive eating potato chips as food. Environments for the collembola were made by placing nine parts plaster of Paris, one part charcoal and water in a dish and stirring it until it was completely mixed and the consistency of yogurt. It was poured into two petri dishes and allowed to dry for a few days. Using medicine droppers, water was added to the petri dishes to moisten the environment. Fifteen collembola (*Onychiuridae encarpatus*) were put into each petri dish. Yeast was placed into the control and crushed Granny Goose potato chip crumbs were placed into the experiment. The experiment had a faster reproduction rate than the control, but many of the collembola died once they became adults. The control had a slower reproductive rate than the experiment, but had more adults. At the end of seven weeks, the experiment had 77 adults, 31 juveniles and 39 eggs; the control had 108 adults, 28 juveniles and only 13 eggs. The hypothesis was incorrect. The collembola in the experiment were able to adjust to their new diet and survive.

5164

## Will a Balsa Glider Travel Farther With Weight on It or Without Weight on It?

*Andrew Langwald and T. Miller (teacher)*

Holmes International Middle School  
9351 Paso Robles Ave.  
Northridge, CA 91325

The purpose of this experiment was to determine if a balsa glider would travel farther with weight on it. The hypothesis was that the balsa glider would fly farther without weight on it. The balsa glider was constructed and the launcher for the balsa glider was made. For the control, the balsa glider was launched 25 times without weight, and for the experiment, it was launched 25 more times with paper clips. One paper clip was on the far left side of the top wing, one in the middle of the top wing, and the other on the far right side of the top wing. The average distance for the control was 405 cm, and the average distance for the experiment was 390 cm. The results were recorded, and out of the 25 times the balsa glider was launched

for the control, the farthest distance it flew was 627 cm and the shortest distance was about 254 cm. For the experiment, it flew 536 cm at the most, and 241 cm at the least. In conclusion, the hypothesis was correct. The balsa glider flew farther without weight on it.

5165

## The Effect of Angle and Mass on a Projectile

*Pooja Lad and G. Zem (teacher)*

Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

This experiment examined what effect angle and mass have on a projectile as it is being "slingshotted." One of the ball's mass was 5.7 grams and another ball's mass was 17 grams. In this experiment I took a slingshot and slingshotted the two balls at three different angles: 90 degrees, 75 degrees and 45 degrees. I repeated each shot three times. The ball that went the farthest was the ball whose mass was 5.7 grams at 90 degrees. The ball that stayed the closest was the ball whose mass was 17 grams at 45 degrees. The results show that balls with less mass will go farther at any degree measurement. The results also show that the degree at which any size ball goes the farthest is 90 degrees.

5166

## The Impact of Special Characteristics of Humans on the Interpretation of Illusions

*Barsba Gautam and G. Zem (teacher)*

Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

This study was conducted to analyze the impact of special characteristics such as eye dominance, gender and age in the interpretation of illusions. This study is meant to answer, "Does eye dominance, gender or age have an impact on how people see illusions?" My hypothesis was that people with a dominant left eye, better grades, greater age, and greater activeness will interpret illusions differently than those who are younger, with right eye dominance, lesser grades, and less activeness. Wide ranges of people were given a test to complete. This test was composed of a series of pictures and verbal illusions. The optical and verbal illusions were organized into an orderly PowerPoint presentation where each participant took the test. Their answer to each question was recorded, and then compared with the answers of the other participants. I found that eye dominance, gender and grades didn't have an impact on how people interpret illusions. A factor that did count, however, was age. People between the ages of 11-25 perceived the illusions how they were meant to be and were able to explain how. They received high scores compared to the adults over 25, who received quite low scores compared to the children. Through this study I found that the majority of people who received high scores were the ones who spent more time on the computer doing non-homework-related things.

5167

## How Does the Number of Folds in the Paper Affect Paper Airplanes' Flight?

*Aditi Dwivedi and G. Zem (teacher)*

Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

The purpose of this experiment was to find the difference in the distance of the different paper airplanes. The experiment also leads people to think why this had occurred. There were five different types of paper airplanes with different numbers of folds used in this experiment. Each airplane had its own qualities and uniqueness. The less the weight was on the rear and heavier toward the nose, the better the paper airplane flew. The airplanes with an equal amount of weight on both sides flew an approximate distance

of five to six feet. The number folds did affect the paper airplanes' flight because of the balance and imbalance in the weight. The results of this experiment were intriguing.

5168

### How Does Ocean Acidification Affect Marine Life?

*Maggie Marazita and G. Zem (teacher)*  
Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Avenue  
Chatsworth, CA 91311

The whole point of this experiment was to prove the effects of ocean acidification on the marine life living in the ocean. The hypothesis this experiment proved is that the smallest marine creatures, zooplankton, are affected the most by ocean acidification. Also, since they are so low on the food chain, almost all marine animals depend on the survival of this microscopic creature. The experiment was performed over the course of three days, and within those days, there were remarkable and almost surprising results. Eggshells were used for representing the delicate shells of zooplankton. Three liquids were measured at 4 ounces each and then tested for their pH level. The three liquids were Coke with a pH of 2.5, vinegar with a pH of 2, and water with a pH of 7. Each liquid was then added to a cup with half of an eggshell and recorded each day. At the end, the eggshell in the vinegar had dissolved completely, and the other two had not changed very much at all. Overall, this concludes that yes, indeed, as time goes on, the shells of sea life will dissolve. Overall, the carbon dioxide will become acid, so really the only way we can slow this process down is to stop producing as many carbon emissions.

5169

### What's the Fizz?

*Chukwudi Mbanefo and G. Zem (teacher)*  
Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

The purpose of this experiment was to determine the soft drink with the longest-lasting "fizz." For the purposes of this experiment, the controlled variables were temperature and volume. Five different sodas were chosen to use in the experiment; the control group was left out at room temperature and the experimental set was all cooled by means of refrigeration for six hours without change of temperature. Multiple cans of each beverage were used on the control and the experimental condition in order to have varied results. The experiment was conducted on level surface. The chilled drinks were opened right after removal and were immediately poured, until empty, into a cup to minimize the loss of carbonation. Once the pouring began, a timer was started; the timer was only stopped once the carbonation had completely died out. The results concluded that chilled soft drinks had a longer fizz time overall, and that Root Beer bubbly had beaten the remaining four sodas. The results were inconsistent with research so it was decided that the experiment could be enhanced to account for the color of the sodas, to see if results varied based on amount of sugar and to determine whether drinks were homochromatic or heterochromatic.

5170

### Productivity of Sun Tracking vs. Fixed Mounted Solar Panels

*K.R. Chattopadhyay and G. Zem (teacher)*  
Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

This experiment explored the increased productivity of photovoltaic solar panels when mounted in a fixed residential rooftop mounting vs. mounted with sun tracking capability. A mathematical study predicted that the sun tracking configuration would produce 51.7% more electrical power than the fixed mounted configuration. A panel rated at 45 watts was mounted in the

same location on six consecutive days with similar weather conditions, with sun tracking enabled on alternating days, and disabled on the other days. The three days with sun tracking and three days of fixed mounting were each averaged into two sets of data and then plotted, producing a characteristic power production curve for the two mounting types. The results showed a productivity improvement for the sun tracking mount vs. the fixed mounted solar panels of 33%.

5171

### The Evaporation Rates of Water, Milk and Coca-Cola

*T. Nguyen and G. Zem (teacher)*  
Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

This project looks at which substance evaporates the fastest out of water, milk and Coca-Cola. The three substances were all put into 8 oz cups with equal surface area. Surface area helps determine how much of the substance gets evaporated. Over a course of seven days the cups were observed and measured. In the end, it turns out that water evaporated the fastest out of all of them, with Coca-Cola in second and milk in dead last. Coca-Cola has more chemicals than water; therefore it took longer to evaporate. In conclusion, water evaporates quickest because it has no added chemicals and it is just plain H<sub>2</sub>O.

5172

### The Effectiveness of Deodorants on the Human Skin

*H.J. Konecny-Pena and G. Zem (teacher)*  
Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

This was to figure out what was the best deodorant on various types of skin (oily, dry and normal). In this study, there were six test subjects, two for each type of skin, and the test subjects were given four different types of deodorant (solid, invisible solid, long-lasting stick, and spray). They were told to use each one for four days straight and then go onto the next one. Each day, around 6 to 8 PM, they were called to give their opinion on how the deodorant performed against sweat and odor and for comfort. It turned out that the best deodorant on all the skins was the long-lasting stick, but just by a little bit. So, if you want to get a good result from your deodorant, I suggest that you use Old Spice Long-Lasting Stick.

5173

### Veggie Power: Using Veggies to Make Electricity

*Hersh Gupta and G. Zem (teacher)*  
Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

This project was done to see which veggies and how veggies conduct electricity and the science behind it. I used various fruits/vegetables as the batteries or conductors of the electricity. I used alligator clips, pennies and galvanized nails, as I connected them in a circuit to generate the most electricity possible in one try. I connected the nail and the penny and I did that several times until all of the pennies and nails were all being connected in some way. As a result, the apple had the most voltage of .8 volts, while the potato came in last with only .42 volts. I believed the fruits with the most acidity would have the most voltage, since there would be more flow of the electricity, and I was correct with the apple and lemon being the top two and the potato coming in last place. I have concluded the higher acidity of a fruit, the higher the voltage it would give off or conduct.

5174

## Effects of Eye Color and Age on Peripheral Vision Under Different Amounts of Light

*D.T. Moss and G. Zem (teacher)*

Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

The purpose of this study was to determine the effects of iris color on peripheral vision under certain amounts of light, as well as the effects of age on general peripheral vision. Young teens, prime adults and older adults of varying iris colors were placed in a set location and tested under three different mediums of light. These were low, slightly dim and bright lighting. Peripheral vision was tested by the identification of a set of figures at one-foot intervals on the right and left sides of the subjects under each setting of light. New figures were created periodically to prevent emerging memory patterns. Light eyes did slightly better than darker eyes in darker light, while dark eyes did slightly better than lighter eyes in brighter light. The oldest subject, aged 57, was not able to identify any of the figures. In addition, all subjects did the best under slightly dim lighting, while the subjects in their primary adult years performed the best generally. The results suggest that darker eyes have better peripheral vision under brighter lighting, and lighter eyes under darker lighting, but that the influence of iris color is very slight. In addition, results suggest age is a much larger factor, with primary adults performing the best, and older adults the most poorly.

5175

## Bacteria in Cell Phones

*K. Chaleff and G. Zem (teacher)*

Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

This study tested different methods of cleaning cell phones. A survey was taken and found that the most popular methods of cleaning cell phones were baby wipes, sanitizing wipes, a damp cloth, and wiping it on clothing. Eight phones were swabbed before and after being cleaned with one of the four methods. The swabs were then rubbed against sterile petri dishes prepared with growth medium (agar) and left to incubate. Two controls were also used – one with a damp swab and one untouched petri dish. This procedure was repeated twice. The results showed that baby wipes failed at sanitizing the phones, but the other cleaning methods had inconclusive results because the data did not show a consistent trend.

5176

## Do Pot Marigolds and Sweet Peas Grow to Be the Same Height When the pH of Their Soil Is Manipulated?

*Jennifer Anne Dusto and V. Arnold (teacher)*

Reseda Science Magnet High School  
18230 Kittridge St.  
Reseda, CA 91335

The purpose of this experiment is to test whether Pot Marigolds and Sweet Peas grow to be about the same height when their soil's pH is changed to both lower and higher intervals than those of the recommended balance. Each group had five to six plants and each plant was measured twice a week for 11 weeks and watered every day as needed. The control group for the Pot Marigolds grew the tallest as of the 19th measuring and the leaves were also the broadest. The acidic group did the second best. These results occurred because the alkaline and acidic soils were taking away nutrients before the roots could absorb them, restricting the growth of each one. For the Sweet Peas the groups remained nearly the same, although the control did slightly better. The alkaline group came next. This happened because Sweet Peas do not need as many H<sup>+</sup> ions as a normal plant, so when H<sup>+</sup> ions were present they restricted the growth of the plant. The results were not in favor of

the hypothesis for the Pot Marigolds, because the hypothesis stated that the three groups would do about the same, but the control group sprang up faster. The hypothesis was correct for the Sweet Peas; they all stayed fairly constant and grew at the same rate.

5177

## Bacteria in Our Daily Life

*Nawaz Samaneh and V. Arnold (teacher)*

Reseda Science Magnet High School  
18230 Kittridge St.  
Reseda, CA 91335

I always wondered how much bacteria we interact with during our daily life. When we were assigned a science project I decided to pursue this topic. We must realize that there is a huge amount of bacteria that surrounds us in our daily life; whether it's using our cell phones or going to the bathroom, there are always locations for the bacteria to inhabit. Using agar, a jelly-like substance made from various kinds of red seaweed, I decided to find the amount of bacteria located in/on the few places that we visit the most; these areas were bathrooms, cell phones, kitchens and telephones. As the bacteria grew for five days in a warm and dark location I examined its growth. Surprisingly the two greatest bacteria-inhabited locations were our cell phones and telephones. This discovery led to the realization that we should clean our phones because there are many kinds of bacteria that call your phones their home.

5178

## Can You Remove Permanent Marker Stains?

*B. Parbu and G. Zem (teacher)*

Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

This experiment tested if I could remove permanent marker stains completely while using household items. My hypothesis was that it was possible to remove a permanent marker stain completely using household items. To test my hypothesis, I drew a line on a smooth surface (place mat) with a Sharpie permanent marker and waited for it to dry. Then I poured some non-acetone nail polish remover on a cloth and rubbed it on the spot where the marker was. I repeated this with hairspray, soap and warm water, all-purpose remover and Clorox disinfecting wipes. I found out that hairspray was the best at removing the marker and the all-purpose remover was the worst and barely removed the marker. My hypothesis was incorrect; even though the hairspray was the best at removing, the stain was not completely removed.

5179

## Insulation: Heat vs. Sound

*B.D. Morrison and G. Zem (teacher)*

Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

This experiment compared different types of insulation in order to determine which insulation would be best to use if you were attempting to insulate for both heat retention and soundproofing in your home. Three boxes were built and lined with a different insulation and a fourth box was left as the control with no insulation inside. The different insulations tested were fiberglass, foam and Homasote. Heat retention was tested first by placing a jar of 37°F water, with a thermometer in the jar, inside each box. The temperature of each box was checked every 10 minutes for 1 hour by pulling the thermometer out through a small slit in the lid of each box. Soundproofing was then tested by playing sounds of a barking dog, chainsaw, lawnmower and rock music through a speaker inside each box. Decibel readings were taken with a sound meter from the outside of each box as well as a control reading of the sound when played outside of the box. All of the temperature

and sound experiments were repeated three times. The final temperature after 1 hour was 45.7°F for the fiberglass and foam, 49°F for the Homasote and 51.7°F for the control box. The Homasote had the best noise reduction for the barking dog, chainsaw and lawnmower, while the fiberglass was the best for the rock music. The foam and control boxes came in third and fourth, respectively, for each noise. The difference between the Homasote and fiberglass results was only 1.3 to 3 decibels. The results suggest that the best product to insulate for both heat retention and soundproofing would be fiberglass.

5180

### The Biggest Bubble

*Maya Hankin and G. Zem (teacher)*  
Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

This study looked at the question of which kind of soap made the biggest bubble, among dish soap, liquid hand soap, laundry detergent and body wash gel. Each kind of soap was generously poured into a small bowl, all approximately the same amount, but not exact. Then, one-third of a cup of water was added into each bowl. A separate fork for each bowl was used to mix the solution, into which a straw was put and blown into to form bubbles (a separate straw for each bowl). The bubbles were measured by their approximate diameter in inches with a ruler. Four measurements for each bowl were taken. The average diameters of each soap's bubbles were as follows: hand soap: 3.9375 inches; dish soap: 3.3125 inches; body wash gel: 2.8125; and laundry detergent: 3 inches. The hand soap had the largest average diameter. This seems to be because it includes a chemical known as sodium lauryl sulfate. This chemical serves as a surfactant, or a surface tension reducer. The lower the surface tension, the bigger the bubble can grow.

5181

### Can Chewing Gum Improve Concentration?

*Kayley Cheng and G. Zem (teacher)*  
Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

The purpose of this experiment is to discover if a person can concentrate better while chewing gum or without chewing gum. For this experiment, two different subtraction worksheets were created, with the same number of problems. First, volunteers completed one worksheet without chewing gum. The time it took to complete and the number correct were recorded. Then the volunteers completed the other worksheet while chewing gum, and the time and number correct were also recorded. The results showed that on an average, people completed the worksheet 5.3 seconds faster when they were chewing gum. Also, the test with the gum did have slightly higher scores, but it was not a significant difference. Chewing gum helped the people focus so they were able to perform better on the worksheets. The data showed that it took less time to complete the math worksheets and the scores on the worksheets slightly improved while the volunteers chewed gum. This most likely was because the repetitive action of chewing increased the heart rate, making it easier to focus. In conclusion, chewing gum does improve concentration.

5182

### Looking Without Seeing

*Maggie Chen and G. Zem (teacher)*  
Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

Inattentive blindness is a phenomenon that can be deadly. Inattentive blindness is a condition in which people are unable to "see" an object or event that is within their line of sight. This study examined whether inattentive blindness affects males or females more often in a single age group. To test this, 25 8th-grade males and 25 8th-grade females were shown a video where unexpected events happen. They were asked to focus on a specific task throughout the video. After the video, each participant was asked individually whether they saw anything unusual in the video. Males were shown to observe the most obvious unexpected event 68% of the time, while only 16% of the females noticed this. The results suggest that males are less likely to be subject to inattentive blindness than females.

5183

### Which Gum Flavor Lasts the Longest?

*Josua Borovay and G. Zem (teacher)*  
Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

This experiment was done to see which gum flavor would last the longest and then knowing what pack to get. I used 11 pieces of gum. They were Dentyne Ice, Eclipse Spearmint, Doublemint, Mentos UP2U, Juicy Fruit, Orbit, Winterfresh, 5 Gum, Extra Fruit Sensation, Trident Layers, and Stride 2.0. After finishing the experiment I found out that Stride 2.0 lasted the longest at 1 hour 12 minutes and 14 seconds and Dentyne Ice lasted the least amount of time at 18 minutes and 16 seconds. This was the order from least to greatest: Dentyne Ice, Eclipse Spearmint, Doublemint, Mentos UP2U, Juicy Fruit, Orbit, Winterfresh, 5 Gum, Extra Fruit Sensation, Trident Layers, and Stride 2.0. So, in conclusion, if you ever have a choice to get a pack of gum choose Stride 2.0, because the flavor lasts the longest.

5184

### Will Cinematography and Music in a Film Affect an Audience Psychologically?

*Eric Abell and T. Miller (teacher)*  
Holmes International Middle School  
9351 Paso Robles Ave.  
Northridge, CA 91325

The purpose of this experiment is to determine if using music and cinematography in a film correctly can further enhance the story in a film. Cinematography is the angle and where the camera is pointing in a scene of a film. As a hypothesis, I believe the viewer will respond in different ways according to how the music and cinematography portray the tone. For example, ominous music would make a viewer feel something scary is going to happen in the scene. Shooting at a dutch angle (when the camera is tilted to the side) would have the same effect. I made three scripts, shot lists and storyboards in that order. Each script was made so that it could end in many ways but didn't show how it turned out. Then, I made five short films. Two of the films contained the same actions, but with different cinematography portraying different moods. The same was done with another two short films with a different story line. The last shot film was made with all medium shots. The first four films were then edited to my liking without music. This was done to truly test how cinematography adds to a film. Then I edited the fifth film to my liking, and duplicated that file so there were two windows of the same short film without music yet. I renamed the first window "Ominous" and the second "Happy."

I combined "Happy" with the short films that portrayed a happy tone due to the cinematography and added questions in between each film that asked the audience something like, "What do you think happens next?" The same

was done with “Ominous,” but I combined the short films that portrayed an evil tone. The audience was ready to answer questions after each video. Half the class viewed “Ominous” including the short films following it, and the rest of the films were shown to the other side of the class. For “Ominous” and the short films that followed, 18 out of 22 found that something bad was happening in the scene. In “Happy” and the short films that followed, 16 out of 22 found something happy was happening in the scene. According to the results my hypothesis was correct. The viewer will respond in different ways depending on how music and cinematography are used to affect the tone of a film.

5185

### Does Classical Music Affect the Growth of Plants?

*Afrab Shab and G. Zem (teacher)*  
Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

In this study I had a control plant and experimental plant. For the experimental plant I played classical music to it for two hours daily while the control plant was just treated normally. The results showed that classical music does affect affect plant growth since the experimental plant ended up being almost double the size of the control plant.

5186

### Solar-Powered Saltwater Desalination

*H. Jain and G. Zem (teacher)*  
Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

The purpose of this experiment was to test the performance of a solar-powered saltwater desalination device with/without an aluminum foil reflector. Two identical devices were made from general household items and placed in direct sunlight at the same time in the same place; weather conditions were monitored during the experiment. The experiment was conducted six times on different days with different weather conditions. The data showed that the aluminum foil reflector had a significant effect on most days. The results concluded that an aluminum foil reflector did boost performance of the device and that desalination is an admirable way to generate fresh water, with no additional power source.

5187

### Effects of Colors, Stem Length and Amount of Color on Carnations

*A. Nakamura and G. Zem (teacher)*  
Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

This study was to determine whether the color of water, amount of food coloring in the water, or the stem length changed the speed of color absorption and the amount of color the carnation ended up absorbing. Carnations A, B, C, D, E and F were all placed in 200 ml of water with two drops of food coloring, except for carnation D, with four drops. Carnations A, B, C and D had a stem length of 50 cm, while carnation E was 25 cm and F was 7 cm. Carnations A, D, E and F were placed in red food coloring, but B had light blue food coloring and C had black food coloring. Carnation A did not end up absorbing much; B absorbed more color overall and had more color near the edges. Carnation C had an overall dark blue color, and D only absorbed a bit more color than A. Carnation E was the fourth fastest flower for the color to start showing; Carnation F was first, C was second and B was third. Carnation F, like I mentioned before, was the fastest to start absorbing color. From these results, I believe that blue is an easy color to absorb; the more blue the food coloring has, the faster it absorbs, and that red doesn't absorb color very well.

5188

### If Collembola Are Fed Bananas for Food, Will Their Population Increase?

*Andy Garza and T. Miller (teacher)*  
Holmes International Middle School  
9351 Paso Robles Ave.  
Northridge, CA 91325

The purpose for doing the experiment is to determine if a population of collembola (*Onychiuridae encarpatus*) will rise if they are fed bananas for food. For a hypothesis, I think that it will make the reproduction rate of collembola go down because it will be too big and mushy to eat for the collembola. Collembola are arthropods that have six legs and are commonly called springtails. One part charcoal and nine parts plaster of Paris were added to a container with water. It was stirred to a consistency of yogurt. Then, it was poured into two petri dishes and allowed to dry. One was labeled control and the other experiment. Both of the petri dishes were watered to make a moist environment for the collembola. Eleven collembola were placed in each petri dish. Yeast was added to the control and banana was added to the experiment. The collembola and eggs were counted at least twice a week using a stereomicroscope and magnifying glasses. In the control at the end there were 67 collembola and 56 eggs. In the experiment there were 123 collembola and 44 eggs. The control had 35% of the collembola and the experiment had 65%. My hypothesis was incorrect and the evidence suggests that the collembola reproduce faster if they are fed banana.

5189

### Will Spinach Added to the Diet of Collembola Cause Their Population to Increase?

*Diana Flores and T. Miller (teacher)*  
Holmes International Middle School  
9351 Paso Robles Ave.  
Northridge, CA 91325

The purpose of this experiment is to see if a population of collembola increases if spinach is added to their diet. I believed that their population would increase with spinach added to their diet because of the nutrients in the spinach. Collembola are tiny terrestrial and aquatic arthropods. To make environments for the collembola I stirred one part charcoal, nine parts plaster of Paris and water in a small dish. I poured it in two small petri dishes. They were allowed to dry for two days. Water was placed in both of the environments by using medicine droppers. Yeast was placed in both environments for the collembola to eat, and in the petri dish for the experiment spinach was also added. Thirteen collembola were placed in both petri dishes. The collembola were counted as data three times a week for five weeks. The results showed 0 eggs and 6 collembola in the experiment and 7 eggs and 74 collembola in the control. The data suggests that my hypothesis was incorrect, because the collembola didn't increase with spinach added to their diet.

5190

### Which Fruit Juice Has the Most Vitamin C?

*Marizennia Andres and T. Miller (teacher)*  
Holmes International Middle School  
9351 Paso Robles Ave.  
Northridge, CA 91325

The purpose of this experiment is to determine which fruit juice has the most Vitamin C. Based on my research, I believe that the guava juice contains the highest amount of Vitamin C. An indicator for Vitamin C was made by boiling 4 cups of water and adding 1 ml of cornstarch. The liquid was then poured into five test tubes and eight drops of iodine solution were added to each test tube that caused it to turn dark blue. I added 1 ml drop of each juice to each test tube one by one until the solution turned clear. Then I carefully counted the drops and recorded them as my data. This was repeated six times for each of the juices: lemon, lime, apple, orange, pine-

apple and guava. For the control, I crushed a 500-mg Vitamin C tablet (standard solution) and dissolved it in 1 cup of water. Instead of using the juices, the dissolved Vitamin C tablet was used. To find the number of milligrams of each juice, I used this equation: ml of standard (needed to remove the dark color) divided by ml of juice = mg of Vitamin C. The results showed that the guava juice only took 2 ml of juice and has exactly 5.5 mg of Vitamin C. The average was 2 ml. The pineapple juice took 4 ml and has 2.75 mg of Vitamin C, and the average was 17.5 ml. The lime juice took 16 ml and contains .44 mg, and its average was 15.16 ml. The lemon juice took 18 ml and has 0.61 mg of Vitamin C, and the average was 17.5 ml. The apple juice took 32 ml and has 0.37 mg. The average was 32 ml. The orange juice took only 27 ml and has .44 mg. The control took 11 ml of the tablet and contains 1 mg of Vitamin C, and its average was 1.5 ml. The results show that my hypothesis was correct.

5191

## How Do Video Games Affect Human Heartbeat and Senses?

*C. Elian and G. Zem (teacher)*

Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

This study examined the effects of video games on the human heartbeat and senses, including responsive ability and vision. Three different aged persons' eye vision, responsive ability and heartbeat were recorded every 5 minutes for 15 minutes per game in two different video games, one violent game ("Call of Duty: Modern Warfare 3") and one non-violent game ("NBA 2K7"). A stethoscope and a stopwatch were used to record heartbeat, vocals and hearing, and measuring tape was used to record vision. The control group of the persons was a child and the two other experimental groups were an adult and a senior. The control group of the persons' heartbeat, responsive ability and vision were their normal heartbeat, responsive ability and vision. Each experiment was repeated three times. The results were conclusive in all three subjects while playing both video games. Both video games decreased response time and decreased vision. The results suggested that the child had the highest heartbeat after 15 minutes of playing both video games, the child had the best vision after 15 minutes of playing both video games, and the senior had the best responsive ability after 15 minutes of playing both video games. The results suggested that the violent game created a higher heartbeat and worse responsive ability than the non-violent game. The human vision was weaker in the non-violent game than the violent game since it contains brighter colors.

5192

## Piezoelectric Energy Harvesting

*Gyan Prayaga and G. Zem (teacher)*

Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

The goal of this project was to build a small piezoelectric device to harness pounding energy from the foot during walking or running. A parallel array of piezoceramic discs was inserted underneath the insole of a running shoe and subjected to different amounts of pressure. When stepped on, a parallel series of these discs yielded approximately 18 mA. When attempting to store the energy in a 1000 mF capacitor, enough energy was harnessed to illuminate a micro LED for 150 milliseconds. The results show that piezo discs are useful transducers that can be used to harness small amounts of energy from footsteps and store it for later use.

5193

## CaffeinSanity

*Austin Le and G. Zem (teacher)*

Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

The purpose of my experiment is to see if caffeine affects your concentration in a positive or an unsatisfactory way. First, 10 volunteers of various age groups ranging from 7 to 72 were given two concentration tests that required lots of focus. Their scores on how many they got correct and how long they took were recorded. After that, they were given 16 fl. oz. of Coca-Cola and a 15-minute waiting period to let the caffeine kick in. They then took the same two tests, and their scores and times were once again recorded. In this experiment I observed different reactions and concentration skills from each individual. The concentration tests without caffeine showed grades of 70% or better from the age group of 7 to 42 years old. With caffeine, people still passed with 70% or better, but the majority of the group scored lower than before. So instead of scoring an A, they scored a B or C. The senior citizens between 68 and 72 years old showed no difference in percentage, whether they had caffeine or not. This therefore concludes that drinking soda or any other drink with caffeine does not improve your concentration skills that much. It does make you work faster, but in the end there would be several careless errors.

5194

## Chickens and Egg Laying

*L. Kanz and G. Zem (teacher)*

Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

This experiment studied the number of eggs chickens would lay depending on the type of chicken feed they received. Every five days, the chickens received a different type of feed; the three possible types were Mash, Scratch and High Egg Laying formula. Every day, the numbers of eggs were recorded; finding out how many eggs were laid depending on the type of chicken feed received was done by counting the tally marks. The results were that Mash was the most effective feed, and in a period of five days, 14 eggs were laid. The Scratch chicken feed led the chickens to only lay six eggs in a period of five days, and the High Egg Laying formula chicken feed only produced seven eggs. To conclude, the Mash chicken feed was the most effective feed.

5195

## What Happens to the Sound If You Take Away Rosin or Use Replacement Rosin for the Violin Bow?

*Caitlin T. Yaneza and G. Zem (teacher)*

Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

The purpose of this experiment was to see if in fact the violin will sound the same or sound different when the rosin is taken away, or if you use another material to replace the rosin. My first thoughts were that once the bow was unrosined there wouldn't be a sound produced at all, then for the replacement rosin I predicted that it would sound better than rosin. My first hypothesis about the unrosined bow creating a much duller and unclear sound was correct. The reason why was because without the rosin then there was no stickiness on the bow to cause the grip and friction on the strings. My second hypothesis, though, was wrong, because the baby powder wasn't sticky enough to cause the bow to get less grip on the strings, which caused the violin to sound like the bow wasn't rosined at all. The sound wasn't at all how I expected it to be; in fact it was just horrible. The sound waves for the unrosined bow were much bigger than for the rosined and baby powdered bows. The rosined bow, though, seemed to be much smaller than the others.

5196

## The Interplay of Salt and Sugar in Food Seasoning: A Molecular Microbiology Perspective

Emmanuel P. Chan and G. Zem (teacher)  
Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

### Introduction

During the processing of raw meat, pathogenic bacteria can be introduced, which may lead to food poisoning. The addition of salt and/or sugar to season the meat can affect the growth of these bacteria. The presence of these pathogenic bacteria was examined in raw chicken meat purchased from a local supermarket and the effects of salt and/or sugar on the growth of these bacteria were examined.

### Methods

Raw chicken meat was incubated in the presence of various concentrations of salt and/or sugar solutions for three days. Aliquots of the solutions were removed for bacterial DNA extraction. Various genus-specific and species-specific PCR assays were performed and the resultant amplified products were analyzed by agarose gel electrophoresis. DNA sequencing was carried out to further characterize the nature of the amplified products.

### Results

The common pathogenic bacteria, *Campylobacter*, *Salmonella*, *Listeria monocytogenes* and *E. coli* O157:H7, were not detected in the raw chicken meat except for *Helicobacter* bacteria. The growth of these *Helicobacter* bacteria was enhanced by the presence of salt but apparently was suppressed by the presence of sugar. These *Helicobacter* bacteria did not contain the well-known pathogenic *Helicobacter* bacteria, *Helicobacter pylori* and *Helicobacter beilmannii*. DNA sequencing analysis of the *Helicobacter* genus-specific PCR products did not reveal the species identity of the bacteria.

### Conclusion

Pathogenic bacteria were not detected in the raw chicken meat. However, growth of *Helicobacter* bacteria was detected and was shown to be enhanced by the presence of salt but was suppressed by the presence of sugar.

5197

## Which Paper Towel Is the Strongest?

Alfonse Youssef and A. Antoniou (teacher)  
Robert Frost Middle School  
12314 Bradford Pl.  
Granada Hills, CA 91344

The purpose of this experiment was to test different paper towel brands for their strength. I made the paper towel wet with one teaspoon of water and placed 1 lb weight on it. I kept adding water one teaspoon each time until the paper towel ripped. I tested each paper sheet three times and calculated the average. The brands I used for this test were Bounty, Brawny, Viva, Sparkle and Pantry Essentials. My hypothesis was that Viva would be the strongest because it felt strong. Bounty ripped after an average of approximately 6.7 teaspoons of water (trial 1 = 3 teaspoons; trial 2 = 7 teaspoons; trial 3 = 10 teaspoons). Brawny ripped after an average of 5.7 teaspoons, Viva at an average of 3 teaspoons, Sparkle at 3.6 teaspoons and Pantry Essentials after 1 teaspoon. This experiment proved that Bounty is the strongest paper towel brand out of the five that I tested and my hypothesis was wrong.

5198

## How Does the Power of Suggestion Affect a Subconscious Mind?

Alondra Torres, Veronica Enriquez and A. Antoniou (teacher)  
Robert Frost Middle School  
12314 Bradford Pl.  
Granada Hills, CA 91344

My partner and I wanted to determine how much the power of suggestion affects the subconscious mind. Our hypothesis was that the older the person was, the less they would respond to the power of suggestion. We decided that the best way to test our hypothesis was to test 15 different people, male and female, between the ages of 10 and 65. One of us had a casual conversation with the volunteer as the other took notes. The interviewer would perform little actions throughout the conversation such as laughing, yawning, stretching, clearing the throat, cracking knuckles and coughing, hoping to get the interviewee to do the same. We observed that people between the ages of 10 and 35 showed more of a response to the interviewer's actions. Out of the six things the interviewer did, they copied, on average, four. Volunteers older than that only copied two or fewer. From our gathered information, we concluded that older people responded less to the power of suggestion, thus proving our hypothesis correct.

5199

## What Topic Is the Most Stress-Inducing in Teenagers?

Baani Dbanoa, Allison Kuo and A. Antoniou (teacher)  
Robert Frost Middle School  
12314 Bradford Pl.  
Granada Hills, CA 91344

We conducted an experiment to find out which topic causes teenagers the most stress. First we researched the most common topics that cause stress and we learned the most common stress-inducing topics were education/school, family, relationships, extracurricular activities and social image. Our hypothesis was if we surveyed each of the different age groups (14-17), then the most common stress-inducing topic would be education, because a person's education can impact his/her future greatly. We thought the least stress-inducing topic would be extracurricular activities, because these activities can be used as stress relievers. For our experiment we asked 10 boys and 10 girls for each of the age groups which topic caused them the most stress. From our surveys we learned that for both boys and girls of every age group the topic of school/education is the most stress-inducing: 42.5% of the girls and 37.5% of the boys interviewed voted for this topic. The average percentage of votes for school/education was 40%. The topic that was the least voted for was extracurricular activities, with only 2.5% of the girls and 12.5% of the boys. On average only 7.5% of people voted for this topic. In conclusion the topic that induces the most stress in a teenager is education/school and the least stress-inducing topic is extracurricular activities.

5200

## How Can I Create a BASIC Computer Program That Can Help People Pick Out Their Clothes?

Bryce Steven Durham and A. Antoniou (teacher)  
Robert Frost Middle School  
12314 Bradford Pl.  
Granada Hills, CA 91344

The purpose of my experiment was to find out how I could create a computer program that could help people pick out clothes to wear by using a program called Easy Data. I wrote lines of computer code in a computer language called BASIC (Beginner's All-Purpose Symbolic Instruction Code). Here is some of the code:

```
30 print "(1) for Monday"
40 print "(2) for Tuesday"
50 print "(3) for Wednesday"
```

```

60 print "(4) for Thursday"
70 print "(5) for Friday"
80 print "(6) for Saturday"
90 print "(7) for Sunday"
95 print
100 print "Put your choice here. Then, hit
Enter":
110 input d
120 if d < 1 or d > 7 then print "CHOOSE A
NUMBER FROM THE LIST!!!" go to 110

```

My hypothesis was that the program would be able to suggest clothing for the user to wear, based on the information input by the user. The program simply asks the user what the day of the week is, weather conditions and occasion. What I learned was that my hypothesis was right. As long as the user inputs factual data, the program quickly analyzes the data and gives the correct response. In conclusion, Easy Dress can save people time and help them look good.

5201

### Oral Health

*Calib Morgan and A. Antoniou (teacher)*

Robert Frost Middle School  
12314 Bradford Pl.  
Granada Hills, CA 91344

My project is about oral health. I am doing this project to see the effect toothpaste has on a young person's oral bacteria and an older person's bacteria. After doing my research and speaking with an expert I have found that oral bacteria can affect more than just your mouth. Oral bacteria are caused by not taking care of our teeth and tongues. It is very important to brush our teeth and tongues and also floss the teeth and use mouthwash. If we do these steps at least twice a day we can help prevent many diseases. Using toothpaste is important for killing bacteria and for refreshing one's mouth.

If oral health is not taken care of, it can lead to gum disease, plaque buildup, lost teeth, cavities and bad breath. In addition, the bacteria can travel into the bloodstream and affect the heart. People need to understand the importance of keeping their mouths healthy.

For my experiment, I took a swab from a 14-year-old and a 75-year-old person's mouth before brushing teeth and after brushing teeth. I observed the bacterial growth on petri dishes and found that the growth of the older person's sample before brushing teeth was much more than on any other petri dish. The petri dishes that had a sample of the after brushing teeth had a very small amount of bacteria compared to the petri dishes that had a sample of the before brushing teeth. This showed that brushing teeth is very important because it kills 99% of the bacteria in the mouth and protects people from diseases caused by oral bacteria.

5202

### What Are the Differences Between Child and Adult Dreams?

*Choice Plasencia, Stacy Kim and A. Antoniou (teacher)*

Robert Frost Middle School  
12314 Bradford Pl.  
Granada Hills, CA 91344

The purpose of our experiment was to figure out the differences between child and adult dreams. We also wanted to figure out what caused these differences. Our hypothesis was that children would have more nightmares than adults because children have a lot of unanswered questions about the world and they use their imaginations to answer them. Our hypothesis for the adults was that they were mostly going to have dreams about real-life situations rather than a fantasy world. For our experiment, we surveyed 20 children ages 5-17 and 20 adults over the age of 20 and compared the types of dreams and their frequency. We also did a lot of research to understand what dreams are and how they work. We found out that children have a

higher ratio of REM sleep than adults. REM is rapid eye movement, which is the normal stage of sleep in the period of the night when people actually dream. The results of our investigation were that 10% of children dream more of what they see on television, whereas 0% of adults have these kinds of dreams. Sixty percent of adults have dreams of real-life situations and 75% of children have dreams of unrealistic situations. The children's average frequency was 5.15 times a week and the adults' average was 4.75 times a week. In conclusion, children have more unrealistic dreams and a higher frequency than adults.

5203

### Will a Cold or Hot Tennis Ball Bounce Higher?

*Chris Dozal and A. Antoniou (teacher)*

Robert Frost Middle School  
12314 Bradford Pl.  
Granada Hills, CA 91344

The purpose of my experiment was to see if a cold or hot tennis ball would bounce higher. My hypothesis was that the cold tennis ball would bounce higher. I used tennis balls that were 85 degrees, 100 degrees and 50 degrees. I dropped each ball five times from 1 meter. The 85 degree ball's average was 46 cm. The 100 degree ball's average was 52 cm. The 50 degree ball's average was 13 cm. My results showed that the hot ball came in first, the 85 degree ball second and the cold ball last. My hypothesis was wrong and my conclusion is that a hot tennis ball will bounce higher than a cold tennis ball. Maybe tennis players can use this as an advantage in their matches.

5204

### Which Energy Drink Affects Blood Pressure and Pulse the Most?

*Chris Jimerson, Gio Osterman and A. Antoniou (teacher)*

Robert Frost Middle School  
12314 Bradford Pl.  
Granada Hills, CA 91344

For our science fair project, we tested energy drinks and saw which one gave us the most energy. We tested Rockstar-Juiced, Java Monster-Loca Moca, and Red Bull. For this experiment we both drank 8 oz. of each of these drinks, and then we tested our blood pressure and pulse. We tested our blood pressure and pulse once before we drank it, once half an hour after we drank it, and then again an hour after we drank it. For the Red Bull, Gio's blood pressure, before we drank it, was 153/114 and her pulse was 82. A half an hour later her BP was 76/47 and her pulse was 110. An hour later, her BP was 88/47 and her pulse was 92. Chris' BP before was 76/39 and his pulse was 75. A half an hour after, his BP was 89/56 and his pulse was 86; an hour later his BP was 91/54 and his pulse was 65. For the Java Monster-Loca Moca, Gio's BP before was 87/55 and her pulse was 71, a half an hour later her BP was 80/55 and her pulse was 79, and an hour later her BP was 96/60 and her pulse was 64. Chris' BP before was 101/67 and his pulse was 105, a half an hour later his BP was 105/77 and his pulse was 137, and an hour later his BP was 54/28 and his pulse was 74. Finally, for Rockstar-Juiced, Gio's BP before was 79/51 and her pulse was 73, a half an hour later her BP was 65/36 and her pulse was 85, and an hour later her BP was 138/109 and her pulse was 127. Chris' BP before was 97/64 and his pulse was 70, a half an hour later his BP was 109/66 and his pulse was 85, and an hour after his BP was 112/71 and his pulse was 71. We both have different weights; Chris weighs 121 lbs. and Gio weighs 101 lbs., but the drink that increased both our pressure and pulse the most was Rockstar-Juiced.

5205

## What Is the Effect of Coca-Cola on Teeth?

*Daniel Gregoryona, Jose Guzman and A. Antoniou (teacher)*

Robert Frost Middle School  
12314 Bradford Pl.  
Granada Hills, CA 91344

The purpose of this lab was to find out if Coca-Cola is really bad for our teeth. According to our research, the phosphoric acid in Coca-Cola weakens the bone by reacting with the calcium in it, making it weak. We also read that we could use chicken bones since bone contains calcium like teeth. We put a chicken bone in a cup and covered it with Coca Cola. We placed the cup in room temperature and observed it every hour. Our hypothesis was that the bone would become weak in two days. After 24 hours the bone felt like rubber and it was fragile. After 48 hours the bone was still like rubber and was breaking apart. Our hypothesis was correct and we concluded that Coca-Cola can harm the calcium in our teeth, the same way it does with bones.

5206

## Will It Float?

*Diana Ortiz and A. Antoniou (teacher)*

Robert Frost Middle School  
12314 Bradford Pl.  
Granada Hills, CA 91344

My experiment was to find out how much salt it takes to make things float. I tested a tomato, a hardboiled egg and a raw egg. My hypothesis was that for the tomato it would take about 10 tsp of salt, for the boiled egg it would take about 13 tsp of salt and for the raw egg it would take about 18 tsp of salt. I filled three containers with two cups of water each. Then I put the tomato in one, the raw egg in another container and the boiled egg in another container. I then added one teaspoon of salt at a time to each and counted to see how many teaspoons of salt it would take to make each item float. The results were that the raw egg started to float just a little bit on the 11th teaspoon, the tomato floated on the 22nd teaspoon and the boiled egg started to float just a little bit on the eighth teaspoon. My conclusion is that the hardboiled egg floats in a solution with less salt. My hypothesis was wrong.

5207

## Do Visual Properties Cross Language Barriers?

*Dylan Mark, Ryan Mark and A. Antoniou (teacher)*

Robert Frost Middle School  
12314 Bradford Pl.  
Granada Hills, CA 91344

The purpose of our experiment was to see if visual properties can cross language barriers because we've noticed that the name and appearance of a product often affect how people like it. We found out that the Bouba-Kiki Effect was used commonly to test this. We surveyed five people from each age category (10-14, 15-30, 31-50, 51-70 and 71-90). Each category had individuals varying in languages known. Our hypothesis was that the young adult group (15-30) would identify "bouba" as the round shape and "kiki" as the pointy shape with the most accuracy because that age group is the age when cognitive levels are at their highest. We also thought that when "bouba" and "kiki" were changed to "kooka" and "bibi," individuals from all age groups would recognize "kooka" as pointy and "bibi" as round more often because of the prominent sound each letter makes. We tested individuals using the Bouba-Kiki Effect by drawing abstract figures, one with pointy, sharp points and one with bubbly, round curves, on each of 10 pages. The individuals were asked for their age/age group and were instructed to tell which one was bouba and which one was kiki. They were instructed to go with what they thought was right and that there was no right answer. We recorded how many responses out of 10 were identified, respectively. We then repeated the test but instructed the individuals to switch "bouba" and "kiki" to "kooka" and "bibi." We recorded which shape they recognized kooka as and bibi as. We observed that the participants usually mouthed the words before giving an answer. Our results were

that the groups 10-14, 15-30 and 71-90 all identified the shapes with 100% accuracy. The group 31-50 had two participants who had 80% and 60% accuracy, and the group 51-70 had one participant who had 90% accuracy. The groups 15-30, 31-50 and 51-70 all recognized the shapes with the names switched to "kooka" as pointy and "bibi" as round. The group 10-14 had three participants who identified the shapes reversed, along with the group 71-90, which had two participants who identified the shapes reversed. This shows that the appearance and name of something often influence what we think of it. If you want your product to sell, give it a catchy name that corresponds to its shape.

5208

## What Color Do Turtles Prefer?

*Elisha Gebelein, Ciara Vincent and A. Antoniou (teacher)*

Robert Frost Middle School  
12314 Bradford Pl.  
Granada Hills, CA 91344

Our experiment was to find out what color turtles prefer. Our hypothesis was that turtles would prefer the color green because that's the color of their food (lettuce). We used the colors red, green, yellow, blue, black and white. We used these colors because we thought they were the most recognizable to our turtles. We tested two different turtles 10 times each. Both turtles went to the green and to the blue colors. We think that they went there first because green is the color of their food and blue is the color of water. Our hypothesis was half correct.

5209

## How Permanent Are Permanent Markers?

*Elizabeth By and A. Antoniou (teacher)*

Robert Frost Middle School  
12314 Bradford Pl.  
Granada Hills, CA 91344

The purpose of my experiment was to find out what solution can remove permanent marker from cloth. The solutions I selected for my experiment were water, alcohol, vinegar, lemon juice, nail polish and hand sanitizer. My hypothesis was that nail polish would remove the permanent marker ink the best. To test the solutions, I wrote the same word on nine square pieces of cloth of the same fabric and washed them with each solution. The results were that two of the solutions worked the best. One was nail polish and the other was alcohol. In conclusion, my hypothesis was correct, but now I know that alcohol can also erase permanent marker ink.

5210

## Do Mice Really Prefer Cheese?

*Harlan Machhour, Armando Rubalcava and A. Antoniou (teacher)*

Robert Frost Middle School  
12314 Bradford Pl.  
Granada Hills, CA 91344

The purpose of this experiment was to find out if mice prefer cheese to other food in general. We spaced out evenly on a place mat processed cheese, aged cheese, bread and butter, peanut butter, and raw cookie dough. Our hypothesis was the cookie dough would be preferred because it is sweet. Next, we let out each mouse one by one and wrote down which snack they went to in order of preference. We found out that the snack mice preferred the most was peanut butter, then aged cheese, raw cookie dough, bread and butter, and finally processed cheese. So in conclusion, if you want to capture or attract mice to a desired location, you should use peanut butter or aged cheese. We think they preferred those two because they have the strongest fragrance.

5211

**Which Liquid Has Higher Solubility?***Jaradin Schacht, Ian Sherman and A. Antoniou (teacher)*Robert Frost Middle School  
12314 Bradford Pl.  
Granada Hills, CA 91344

The purpose of our experiment is to find out what liquid dissolves a peppermint tablet faster: water, carbonated water or Sprite. Our hypothesis was that the Sprite would dissolve it the fastest, then carbonated water, and then water. We used a stopwatch and observed the cup every two minutes. Our hypothesis was correct. The peppermint took 14:55 minutes to dissolve in Sprite and 16:09 minutes in carbonated water. The water took longer than an hour. These results helped us understand that not all liquids have the same solubility.

5212

**What Cleans a Penny the Best?***Isabell Torres, Destiny Hernandez and A. Antoniou (teacher)*Robert Frost Middle School  
12314 Bradford Pl.  
Granada Hills, CA 91344

The purpose of this experiment was to find out what solution would clean pennies the best. Our hypothesis was that bleach would clean the best because it has the tendency to whiten clothes and clean surfaces well. We tested our hypothesis with bleach, ketchup, dish washing soap, baby soap, detergent and Tapatio Hot Sauce. The results were that the hot sauce worked the best, proving our hypothesis wrong. We researched to see what the ingredients were and found out that it contains vinegar, which is an acid. In conclusion, products with vinegar or just vinegar cleans pennies the best.

5213

**What Plastic Coverings Will Allow a Plant to Grow the Tallest?***Jackie Delgado and A. Antoniou (teacher)*Robert Frost Middle School  
12314 Bradford Pl.  
Granada Hills, CA 91344

The purpose of my experiment was to find out which plastic would allow a plant to grow the tallest, naturally and successfully, in a month without harming its growth. Normally, plastics are used to prevent plants from frost damage, allowing plants to trap moisture inside. To construct my experiment, I used a wooden box divided into four sections. I then planted silk bean seeds and covered each section with a different plastic. I used a Ziploc bag, Saran Wrap, a grocery bag and a clear plastic sheet. I watered the plants and recorded my observations on a daily basis. My hypothesis was that the Saran Wrap covering would show the best results, letting the silk bean plant grow the tallest within a month, because the Saran Wrap was the thinnest plastic. On my last day of observation, the section covered with the Ziploc bag had a plant with a height of 15.9 cm, the clear plastic sheet section had a plant with a height of 13.5 cm, the Saran Wrap section had a plant with a height of 11.8 cm, and the grocery bag section had a plant with a height of 6.5 cm. My hypothesis was wrong because, instead, the Ziploc bag-covered plant grew the tallest within a month. In conclusion, when covering a plant with a plastic, a Ziploc bag helps a plant grow the tallest.

5214

**Which Invisible Ink Works Best?***Johnny Hidalgo and A. Antoniou (teacher)*Robert Frost Middle School  
12314 Bradford Pl.  
Granada Hills, CA 91344

The purpose of my experiment was to find out which invisible ink will be the best to use and how long it will take to reappear when using different ways. I researched and found out ways to make invisible ink and how to make it reappear. A simple way to make invisible ink is to use lemon juice or a baking soda and water solution. To do this experiment, I used lemon juice, baking soda solution, water, and commercial invisible ink for control. The two ways to reveal the "ink" are a candle and a hot iron. My hypothesis was that the water would be best and the candle would be the fastest and the best way to reveal the invisible ink. The scale for visibility was 0 to 3 (3 for commercial ink). The water with the candle took 3.45 minutes to appear with 2.3 visibility, and with the iron it took 2.01 minutes with 3 visibility. The baking soda solution took 3.54 min. with 2.5 visibility with the candle, and 2.00 min. with the iron and 2.8 visibility. The lemon juice with the candle took 2.12 min. with 3 visibility, and with the iron 1.78 min. with 1.9 visibility. My hypothesis was wrong. The lemon juice was the best homemade invisible ink and the candle was the best and fastest way to make it appear.

5215

**Which Liquid Freezes the Fastest?***Jonathon Mejia, Sergio Ramirez and A. Antoniou (teacher)*Robert Frost Middle School  
12314 Bradford Pl.  
Granada Hills, CA 91344

We wanted to find out which liquids would freeze the fastest. For this experiment, we chose to test Coke, water, vinegar and milk. The initial temperature of the liquids was room temperature and the amount was 4 ounces in clear cups. We placed all the cups in the freezer at -20 C. Each one took about two to three hours to freeze. We checked our samples every 15 minutes and wrote down our observations. Our hypothesis was that Coke would freeze the fastest because it's soda and the sugar in it would make it freeze faster than the other liquids. We thought that milk would take the longest to freeze because it's thicker. Our results were: Water took 2 hours and 10 minutes to freeze; Coke took 2 hours and 50 minutes; the third liquid to freeze was vinegar, which froze in 3 hours; and milk took the longest to freeze at 3 hours and 15 minutes. During the freezing process, none of the liquids changed color. The liquid to freeze the fastest was water. It took 2 hours and 10 minutes and milk took the longest. Our hypothesis was 50% correct.

5216

**What Kills Bacteria More Efficiently, Natural Ingredients or Prescription Antibiotics?***Kailee Bernardo, Tara O'Brien and A. Antoniou (teacher)*Robert Frost Middle School  
12314 Bradford Pl.  
Granada Hills, CA 91344

Our experiment was to find out what kills bacteria more efficiently: natural ingredients or pharmaceutical prescription antibiotics. The natural ingredients we used were tea tree oil and garlic. Our hypothesis was that the natural ingredient (garlic) would kill the *Serratia marcescens* bacteria more efficiently than the other substances. The pharmaceutical prescription antibiotics were amoxicillin and minocycline. We swabbed five agar petri dishes with *Serratia marcescens* bacteria. We then treated a 1/4" diameter pad with each of the following: tea tree oil, crushed garlic, amoxicillin, minocycline, and sterile water (as the control). Each pad was placed in the middle of a petri dish. We observed and recorded in our journal the growth of the bacteria and how the natural ingredients and antibiotics killed off the

bacteria. Our hypothesis was proven to be wrong. Our bacterium, *Serratia marcescens*, is commonly located in the intestines and garlic has been effective in killing bacteria commonly located in the intestines. So even though we were correct in saying that the natural ingredients would work best, we found that the tea tree oil killed the bacteria the best. Perhaps this was the outcome because according to our research, tea tree oil is effective against all fungus, bacteria and viruses.

### 5217 Which Liquid Dissolves Aspirin Faster?

*Karina Solis, Quennie Labasan and A. Antoniou (teacher)*

Robert Frost Middle School  
12314 Bradford Pl.  
Granada Hills, CA 91344

We wanted to find out which liquid would dissolve an aspirin tablet the fastest. We decided to use lemonade, orange soda, and water as the control. Since lemonade and soda are acids, we did some research and found out that acids have the ability to dissolve many things, including metals. Our hypothesis was that lemonade would dissolve the aspirin the fastest since it contains citric acid. We poured an equal amount of water, orange soda and lemonade into separate cups; then we put one aspirin tablet in each and timed it. The results were: Lemonade dissolved the aspirin in 45 seconds, water in 50 seconds and orange soda in 1 minute. Our conclusion was that the citric acid in the lemonade dissolved the aspirin the fastest.

### 5218 Which Common Sports Drink Contains the Most Electrolytes?

*Katherine Naberhaus and A. Antoniou (teacher)*

Robert Frost Middle School  
12314 Bradford Pl.  
Granada Hills, CA 91344

The purpose of my science experiment was to find out which sports drink contains the most electrolytes, so children involved in sports could find out which drink is best for their bodies. Electrolytes are needed in our bodies in order for our heart, muscles and nerves to function properly, and can be lost through sweat from physical exertion. To get these back, athletes need to drink electrolyte-replenishing drinks. I believed that Red Bull would contain the most electrolytes and that distilled water would contain the least. I tested distilled water, tap water, Gatorade G Series 1, 2 and 3, Red Bull, V8 juice, orange juice, Coca-Cola and sparkling water. I was able to test the number of electrolytes in these drinks by creating an open circuit. I used a multimeter, which measures the resistance of an object, so it was able to correctly estimate the number of ions in each drink. My results showed that Gatorade G Series 2 contained the most electrolytes, with 5.7 microamps. Microamps are an electrical unit used for readings of a multimeter. Distilled water, as I believed, contained the least, with 3.9 microamps. Red Bull and Gatorade G Series 1 contained 5.6 microamps, Gatorade G Series 3 and Coca-Cola had 5.5, sparkling water measured 5.4, tap water contained 5.3, and orange juice had 5.2 microamps of electrolytes. My hypothesis was partially correct, and I learned a lot about electrolytes and engineering. So, if you ever need to grab a sports drink, be sure to grab a Gatorade G Series 2, and keep your body healthy.

### 5219 What Is the Best Temperature for Growing the Purest Crystals?

*Kandace Jones-Webb, Tonita Johnson and A. Antoniou (teacher)*

Robert Frost Middle School  
12314 Bradford Pl.  
Granada Hills, CA 91344

Crystals come in all different shapes and sizes. However, the purest and cleanest crystals are usually also the ones that grow to be the largest in size. In this science project, we compared the size, shape, purity and formation time of crystals grown in three different temperature conditions: room temperature, refrigerator and in an ice bath (bowl of ice). Our hypothesis was that the best would be the ones growing in the ice bath. We used water and borax, a household cleaning product. Our results were that the crystals in room temperature started forming within 10 minutes and they were fully grown in 3 hours. The crystals in the refrigerator started forming within 15 minutes and were fully grown in 4 hours. The crystals in the ice bath started forming in 1 hour and were fully grown in 4 hours. The purest and biggest crystals were the ones that grew in room temperature, which did not agree with our hypothesis.

### 5220 Are Fingerprint Patterns Hereditary?

*Kenna Potter, Jannie Phung and A. Antoniou (teacher)*

Robert Frost Middle School  
12314 Bradford Pl.  
Granada Hills, CA 91344

The purpose of this experiment was to find out whether or not fingerprint patterns are hereditary. According to our research, fingerprint patterns are similar among family members. Our hypothesis was that since we inherit all our traits from our parents, fingerprint patterns would also be inherited. To test this we collected fingerprints from strangers, siblings and twins. If our hypothesis was correct, twins and siblings would have similar fingerprint patterns. We then carefully examined the traits of each fingerprint with a magnifying glass as we classified them under whorl, arch, loop or a mixture of any two. The sets of twins had almost identical prints, while siblings also had some similar traits. Strangers, however, had very few to no similarities at all, proving our hypothesis correct. Our conclusion is that fingerprint patterns are, in fact, hereditary.

### 5221 How Are Mirrors Used to Collect Solar Energy?

*Kristine Garcia, Carolina Cruz and A. Antoniou (teacher)*

Robert Frost Middle School  
12314 Bradford Pl.  
Granada Hills, CA 91344

The purpose of our experiment was to find out how many mirrors are used to collect solar energy. Our hypothesis was that the temperature of the mirrors reflecting the sunlight would stay between 200 to 300 Celsius. We used five mirrors in our experiment and a Celsius thermometer. We performed our experiment outdoors on a sunny day. The way we tested our hypothesis is that we would reflect one mirror at a time, then two, and so on until we had five mirrors and recorded the temperature each time. First we tested one mirror for 2 minutes and the temperature rose to 240 Celsius. Then we tested two mirrors for 4 minutes and the temperature rose to 260 Celsius. Then we put three mirrors together for 6 minutes and the temperature rose to 270 Celsius, and then four mirrors, 330 Celsius in 8 minutes. Finally, we tested all five mirrors together and in 10 minutes the temperature rose to 380 Celsius. Our hypothesis was wrong, so we concluded that the more mirrors reflecting the sun's light, the greater the temperature is going to be.

5222

## How Does Exercise Affect Heart Rate?

*Kyle Schiller and A. Antoniou (teacher)*

Robert Frost Middle School  
12314 Bradford Pl.  
Granada Hills, CA 91344

In my experiment I'm trying to answer the question, "How does exercise affect heart rate?" My hypothesis is heart rate increases with exercise. To test my hypothesis I measured subjects' pulse rates at rest and after they exercised. I used a pulse oximeter to measure pulse rate. For the experimental group, I measured resting heart rate and then had them perform 10 push-ups, 10 sit-ups, and jog in place for one minute. I then measured their heart rate after they were done with their exercise. For the control group, I measured resting heart rate and then had them sit quietly for two minutes. I compared the average heart rate before and after exercise for the experimental group to determine the rate of change of heart rate with exercise. The heart rate increased by 62% with exercise. There was no significant change in heart rate for the control group.

My hypothesis was correct; heart rate did increase with exercise. This makes sense because as you exercise, your muscles need more oxygen and fuel to do their work, and the heart has to pump faster to deliver the oxygenated blood to the tissues.

5223

## Does the Amount of Water Affect How Fast Alka-Seltzer Reacts?

*Maggie Rezian and A. Antoniou (teacher)*

Robert Frost Middle School  
12314 Bradford Pl.  
Granada Hills, CA 91344

The purpose of this experiment was to find out if water affects how fast Alka-Seltzer reacts. My hypothesis was that water does affect the reaction of Alka-Seltzer and that the 3 teaspoons would react first. I used 2 teaspoons of water, 3 teaspoons and 4 teaspoons of water in film canisters to test my hypothesis. Then, I put in half a tablet of Alka-Seltzer. I quickly placed the lid on the canister and closed it. Then, I turned the cups upside down. The 2 teaspoons of water popped in 5.7 sec., the 3 teaspoons popped in 6.2 sec., and the 4 teaspoons in 6.3 sec. Although the difference in reaction time was very little, the amount of water still had an effect on how fast the Alka-Seltzer reacted. My hypothesis was 50% correct.

5224

## Which Candle Melts Faster?

*Marina Alvarado and A. Antoniou (teacher)*

Robert Frost Middle School  
12314 Bradford Pl.  
Granada Hills, CA 91344

The purpose of my experiment was to find out which candles melt faster, colored or non-colored. My hypothesis was that the non-colored candles would melt faster because the dyes in the colored ones would affect the melting time. I used 11 different colored taper candles in this experiment. I lit all the candles at the same time and let them burn for three one-hour intervals. I found that all the candles melted at the same rate of 2.61 cm per hour. My hypothesis did not agree with my results. In conclusion, color does not affect the melting time of candles.

5225

## Does Magnetism Affect Plant Growth?

*Melinda Parkhani, Sobail Rabman and A. Antoniou (teacher)*

Robert Frost Middle School  
12314 Bradford Pl.  
Granada Hills, CA 91344

The purpose of this experiment was to find out if magnetism would affect plant growth. We used lentil seeds, because they grow really fast, and we put them in separate cups with soil and a hole in the bottom for water drainage. We placed magnets in one plant and left the other one without. We watered the plants regularly and observed their growth. The control plant grew to be 5 cm tall, but the experiment plant only grew to 4 cm tall after two weeks of observation. Then we stopped watering them to see which would die first. The control died in three weeks, but the experiment died in one week. Our hypothesis was that the magnetism would help plant growth and would affect the plant in a good way. According to our results, magnetism did affect the plant, but not in a good way. The magnetism plant grew less than the control and died the fastest. Our hypothesis was wrong. If we were to conduct this experiment again we would use a different plant and use more magnets.

5226

## Do Anubias Grow Faster When Planted in Aquariums Occupied by Goldfish?

*Melissa Rubio and A. Antoniou (teacher)*

Robert Frost Middle School  
12314 Bradford Pl.  
Granada Hills, CA 91344

The purpose of my experiment was to find out if the *Anubias*, an aquatic plant, grows faster in aquariums occupied by goldfish. My hypothesis was that the fish would help the growth of the *Anubias*. To conduct this experiment, I used four aquariums – each with the same amount of water – pebbles and *Anubias*. The first tank contained no fish, the second tank contained one fish, the third tank contained three fish, and the last tank contained five fish. I observed the growth of *Anubias*, measured and recorded my data for seven days. In the tank with no fish, the plant grew 0.7 mm; in the tank with one fish, it grew 1.3 mm; in the tank with three fish, it grew 2 mm; and in the tank with five fish, it grew 3 mm. In conclusion, the fish did help the *Anubias* grow more: the more fish, the greater the growth of the plant. The fish's waste and oxygen help fertilize and support the plant to help it grow. My hypothesis was proven correct.

5227

## What Is the Effect of Hydrochloric Acid on Different Rocks?

*Melody Pinckney and A. Antoniou (teacher)*

Robert Frost Middle School  
12314 Bradford Pl.  
Granada Hills, CA 91344

The purpose of my experiment was to see how different types of rocks are affected when hydrochloric acid is applied to them for a period of two weeks. In my experiment, the hydrochloric acid was used as the equivalent to acidic rain in the environment. Studies have shown that some types of acidic rain contain low pHs of hydrochloric acid. Rocks play a big role in everyday life. Some of the world's famous monuments, including the Washington Monument, the Lincoln Memorial, Stonehenge and the Pyramids of Giza, are made out of various types of stones. Rocks are found all around us – and I wanted to know how acid rain could affect them over the years. I also did this experiment to find out which rocks would be better to build future monuments from, based on their durability and resistance to acid. The results of my experiment were: granite lost 33% of its volume, hornfels lost 40% of its volume, sandstone lost 43%, slate 38%, scoria 49%, limestone 70%, shale 24%, and phyllite 40%. The stone that eroded the least was shale, followed by granite, slate, hornfels and phyllite. Sandstone, scoria and limestone had the most erosion. My conclusion is that building monuments from shale and granite would be best because they erode the least.

5228

## Does Eye Color Affect Peripheral Vision?

*Savannah Elam, Jasmín Abdulaziz and A. Antoniou (teacher)*  
Robert Frost Middle School  
12314 Bradford Pl.  
Granada Hills, CA 91344

The purpose of our experiment was to find out if eye color has an effect on peripheral vision. According to our research, people with darker colored eyes have pupils that open wider, allowing more light to come in and widen the range of their peripheral vision; and the lighter the eye color is, the smaller the pupil, therefore allowing less light to penetrate and decreasing the range of peripheral vision. Our hypothesis was that eye color will affect the peripheral vision because if the pupil is larger, then there will be a wider range of sight, increasing the chances of seeing the surroundings. Also, if eye color affects normal vision, then we believe that eye color will also affect peripheral vision. We conducted an experiment to prove our hypothesis. We tested four groups of people, one with blue eyes, one with green, one with hazel and one with dark brown. Five people were in each group. We took different objects such as pencils, water bottles and cell phones. We placed those objects 45 degrees to the right of the right eye, 12 inches away. As the subjects looked straight ahead, they named the objects they could see. The group with blue eyes saw on average 1.6 objects, the group with green eyes saw on average 2.2 objects, the group with hazel eyes saw on average 3.4 objects, and the group with brown eyes saw on average 4.4 objects. In conclusion, our hypothesis was correct. People with darker colored eyes have better peripheral vision than people with lighter colored eyes.

5229

## Potato Power

*Spencir Bridges and A. Antoniou (teacher)*  
Robert Frost Middle School  
12314 Bradford Pl.  
Granada Hills, CA 91344

The purpose of my experiment was to find out which type of potato powers a clock the longest. The potato can power a clock because it can conduct electricity due to its phosphoric acid content, which acts as a buffer between the zinc ions and the copper ions of the wires. The zinc and copper ions would still react if they touched within the potato, but they would only generate heat. Since the potato keeps them apart, the electron transfer has to take place over the copper wires of the circuit, which channels the energy into the clock. My hypothesis was that the Idaho potatoes would last longer than the red potatoes because Idaho is known for good potatoes, so I felt they would be fresher and better. The result of my experiment was that the Idaho potato lasted seven days vs. the red potato that lasted five days. Both potatoes were of the same size. My hypothesis was correct.

5230

## Will a Goldfish Grow Larger If Placed in a Larger Habitat?

*Trevor O'Hickey, Steven Saletta and A. Antoniou (teacher)*  
Robert Frost Middle School  
12314 Bradford Pl.  
Granada Hills, CA 91344

We wanted to see if a goldfish would grow bigger when placed in a larger habitat, so we placed three goldfish in three different size habitats. For the first habitat we used a large bowl that contained 2850 mL of water, for the second habitat we used a medium size bowl that contained 1575 mL of water, and for the last habitat we used a small bowl that contained 400 mL of water. In this procedure we used a graduated cylinder to measure the fish's volume in mm. We measured the volume of the three fish weekly and fed them the same amount of food twice a day for 10 weeks. Our hypothesis was that over a 10-week span the larger the bowl, the more the fish would grow. The large bowl fish was 10.2 mm<sup>3</sup> at the start of the experiment and at the end of the 10 weeks was 11.4 mm<sup>3</sup>, a total growth of 1.2 mm<sup>3</sup>. The medium bowl fish started at 11.5 mm<sup>3</sup> and ended at a total of 12.1 mm<sup>3</sup>, a total growth of 0.6 mm<sup>3</sup>. The small bowl fish started at 8.9 mm<sup>3</sup> and ended

at a total of 9.3 mm<sup>3</sup>, a total growth of 0.4 mm<sup>3</sup>. The large bowl fish grew 0.6 mm<sup>3</sup> more than the medium bowl fish, and the large bowl fish grew 0.8 mm<sup>3</sup> more than the small bowl fish. Our results proved that our hypothesis was true because the large bowl fish grew the most (1.2 mm cubed), the medium bowl fish grew the second most (0.6 mm cubed), and the small bowl fish grew the least (0.4 mm cubed).

5231

## Which Vegetable Grows the Fastest?

*Victoria Padilla and A. Antoniou (teacher)*  
Robert Frost Middle School  
12314 Bradford Pl.  
Granada Hills, CA 91344

For this experiment I planted four vegetables: cucumber, squash, tomato and tomatillo. I wanted to find out which one would grow fastest. I gave the plants equal amounts of water, measured their heights and counted their leaves for 103 days. My hypothesis was that the cucumber was going to be the fastest. The squash grew up to at least 16 inches in height. The cucumber grew up to 13.5 inches, the tomatillo 10 inches and the tomato 12 inches. The squash also had the most leaves.

5232

## What Detergent Takes Mustard Stains Off White T-Shirts the Best?

*Walter Colop and A. Antoniou (teacher)*  
Robert Frost Middle School  
12314 Bradford Pl.  
Granada Hills, CA 91344

The purpose of this experiment was to see what detergent brand would remove mustard stains from shirts the best. I used Tide, Ecos Plus, and Arm & Hammer with OxiClean. My hypothesis was that the Arm & Hammer with OxiClean would be the best because OxiClean is most commonly used to take out stains, and together with Arm & Hammer would just make it stronger and more effective. To conduct this experiment I used four 100% white cotton T-shirts, mustard and the detergents. I chose mustard stains because they are among the worst and hardest stains to remove from shirts, especially white shirts. I stained three shirts with the same amount of mustard and let it dry for an hour. The fourth shirt was used as the control. Then I put the shirts in warm water, added detergent on the stains and scrubbed them. I did this procedure three times for each shirt for best results. My results were that Arm & Hammer with OxiClean took off mustard stains the best, followed by Tide and Ecos Plus. My hypothesis was correct.

5233

## What Other Solutes Besides Salt Can Melt Snow?

*Erick Wilson, Doyoon Kim and A. Antoniou (teacher)*  
Robert Frost Middle School  
12314 Bradford Pl.  
Granada Hills, CA 91344

Have you ever seen someone throw rock salt on snow to melt it? Our science fair project was to test how effective this method is and if other solutes can have a similar effect on snow. Our hypothesis was that salt would be effective in melting snow but not the only one. We set up five glasses, each with a half cup of room temperature water. In each cup except one (control), we added a teaspoon of a different substance. We tested salt, sugar, pepper and Crystal Light water flavoring powder. We placed the cups in the freezer and observed every 15 minutes. Water, the control, froze in 3.75 hours. The salt-water froze in 4.75 hours. The sugar solution froze in 4 hours. The pepper, which did not dissolve in water, did not affect the freezing time, and froze at the same time as water. The Crystal Light froze faster than water, in 3.5 hours. Based on our results, our hypothesis was correct and the salt was the most effective because it lowered the freezing point of water. Another solute, sugar, slowed down the freezing process as well and can also be effective for melting snow.

5234

## Can a Robotic Arm Made of Pulleys Move an Object From One Place to Another?

Zachary Brinton and A. Antoniou (teacher)

Robert Frost Middle School  
12314 Bradford Pl.  
Granada Hills, CA 91344

The purpose of my experiment was to see if I could build a robotic arm to move an object by using pulleys. I read in a book that the motors that pull the cables have to be as powerful as the weight of the object they are moving. Knowing this I had to look for a strong motor to lift the heavy frame I built. The cables also have to be strong in proportion to the weight of the frame, so I had to test the different types of strings and cables I thought I could use. I found out that yarn was sufficient for the frame I built, but it had to be replaced often, because it would stretch and break after awhile. My hypothesis was that I could build a robotic arm using pulleys to move an object from side to side. The outcome of my experiment was very good. I was able to move the arm side to side with switches and it could lift small wooden blocks. The problems I had were that the materials I used to build the arm with (metal plates) would fall easily so I had to use screws to secure them. My conclusion is that a robotic arm can be built by using pulleys and strings. I can see that this project will continue on until I find a way to improve the movements of the arm to up and down and to lift heavier objects.

5235

## Which Popular Drinks Affect Our Teeth the Most?

Hoang Luong, Syed Abbas and A. Antoniou (teacher)

Robert Frost Middle School  
12314 Bradford Pl.  
Granada Hills, CA 91344

The purpose of our experiment was to find out which popular drinks affect our teeth the most. We have always heard about how some drinks are bad for our teeth, so in this experiment, we tested which drinks had the most negative effects. We did some research and found that eggshells were one of the best substitutes for teeth because we could not get real teeth. In our experiment, we put hardboiled eggs in cups with different drinks. Our hypothesis was that Pepsi-Cola would stain teeth the most. The drinks we used included Fruit Punch Gatorade, black tea, Pepsi-Cola, Capri Sun Fruit Punch juice and bottled water. We set the eggs in clear cups and waited two weeks to see what would happen. In the end, our hypothesis was close. According to the results, the Gatorade, black tea and Pepsi seemed to have the most conspicuous stains. The Gatorade, however, stained the most, which makes it number one in intensity. Water left no stains like we already expected, and that is why we used it as the control. From this experiment we concluded that popular drinks can leave unwanted stains on teeth, with Gatorade as number one and black tea and Pepsi following closely. Water is the safest way to go if we don't want stained teeth.

5236

## Chocolate and Dark Chocolate Effects on Acne

Christine Montemayor, Nora Lapeña and G. Zem (teacher)

Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

This experiment explored the effects of chocolate and dark chocolate on a person with Acne vulgaris. The participants ate one serving of Hershey's Kisses, one dark and the other regular. In a span of one week, each participant took a picture of the front and side views of the face. Both chocolate types caused breakouts. Dark chocolate subsequently had worse effects than the regular chocolate. Based on the results, dark chocolate had a greater effect on acne.

5237

## Does the Color of a Candle Affect How Long It Takes to Burn?

A. Batulan-Loacin and G. Zem (teacher)

Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

This experiment was conducted to find out if the color of a candle would affect how long it would take to burn out. There were four colors used, which were yellow, red, green and white. One of each colored candle was lit at the same time and then was timed until the candle's flame went out. The experiment was conducted a total of four times. The white candle burned for an average of 4 hours and 36 minutes, red at 5 hours and 26 minutes, green at 4 hours and 28 minutes and finally yellow with an average of 4 hours and 28 minutes. The results showed that the red candle took the longest time, with the average of 5 hours, while the white, green and yellow candles had roughly 4 hours. The darker colored candles, red and green, were expected to burn out faster than the lighter colors, yellow and white. In conclusion, the color of a candle would not affect the amount of time it took to burn out.

5238

## Nano Anti-Graffiti Paint

Michael Su and D. Gaughen (teacher)

Taft High School  
5461 Winnetka Ave.  
Woodland Hills, CA 91364

I compared the advertised graffiti-resistant paint with conventional house paint. My hypothesis was that the nano anti-graffiti spray would easily remove the graffiti, with the ease of removing spray can graffiti from painted surfaces containing nano particles vs. ordinary house paint giving a measure of effectiveness. I used bricks, traditional house paint, spray paint, anti-graffiti spray, a paint brush and some newspapers. I then made a controlled and experiment brick. The controlled was then painted over with traditional house paint, while the experiment was sprayed with the anti-graffiti spray. Then I spray painted all over both bricks to see which would take off the graffiti. I waited for the bricks to cure overnight. When I came back I used a paper towel and tried to wipe off the graffiti from both the experiment and controlled bricks. The experiment was successful in easily taking off the graffiti. What this will do is let us focus on applying this substance on buildings. I hope sometime in the near future that this product will be on all buildings so that the buildings will be protected from all these "taggers." It would really make everywhere more beautiful. The reason why the anti-graffiti spray works is because it makes the surface of areas "less stick" because of their small particle sizes, which are at the nanoscale, which is  $10^{-9}$  or one billionth of a meter.

5239

## How Different Liquids Affect Plants

*Alex Wicksman and G. Zem (teacher)*  
Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

My study was about finding out how different liquids affect both food plants and flowers. I tested using Coca-Cola, lemon juice, water and hydrogen peroxide. I also used four strawberry plants and four flower plants. The purpose of the experiment was to see if there was any better liquid to feed plants with other than water. My test was conducted over 14 days and every other day I added the liquids. I thought that the hydrogen peroxide plants would do the best, then the water plants, next the Coca-Cola plants, and the worst plants would be the ones with lemon juice. What I found out was that the hydrogen peroxide flower plant did the best overall, but the strawberry one did not do that well. My two water plants were the constant and they both did well as expected. The Coca-Cola and lemon juice plants both died and did just as I thought they would. So, the results of my lab showed that I should just stick with water as my best chance to feed both fruit and flower plants.

5240

## The Study of Music

*H. Serna and G. Zem (teacher)*  
Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

My experiment tested whether music affected your concentration level as well as being able to comprehend what you are studying. To begin this experiment I organized four test groups (pop, classical, heavy metal and no music), with five people in each group. They had to read the same passage while listening to a certain genre of music. After finishing the story they completed a questionnaire form, while listening to music, consisting of five simple questions. After grading all the sheets of paper I soon came to the conclusion of how certain types of music affected the level of focus for each person. The results came in that an average of 68% of the questions were answered correctly while listening to pop music, an average of 80% when listening to heavy metal, an average of 68% when listening to classical music, and an average of 76% when listening to no music. My hypothesis for this experiment was that if no music or classical music was played in the background while the test subjects read their stories, then they would comprehend more, resulting in higher scores in those two groups. Obviously, my hypothesis was incorrect and it was the heavy metal category that turned out to have the most questions answered correctly. I learned thorough this experiment that music has an influence on how well someone can concentrate on or comprehend something.

5241

## Red Cabbage: Accurate pH Indicator?

*V. Farkbondeh and G. Zem (teacher)*  
Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

This study examined the accuracy of a red cabbage used as a pH indicator. A head of a red cabbage was chopped into small pieces and placed inside a pot, where it was boiled with tap water for about 15 minutes. The red cabbage juice was poured into 100 ml test tubes and then poured into cups of 250 ml beverages. These beverages included water, lemon juice, orange juice, cranberry juice, Coca-Cola, vinegar, detergent, baking soda, milk, cream of tartar, black coffee and bleach. After the cabbage juice was poured into each beverage, the color of the beverage would immediately change according to the amount of pH in the substance. To accurately decide whether the substance was acidic or basic, you would look to a typical pH scale found on the Internet, and match the colors. If the substance was acidic, the color would normally change to a reddish-pink color. If the substance was neutral, it would change to a dark purple color, and if

the substance was basic, it would change to a greenish-yellow color. After matching every substance with the correct pH level, I would check on the Internet and see if I was correct. Each experiment was repeated three times with the same results. The results suggest that a red cabbage is about 95% accurate. Therefore it concludes that a red cabbage is a fairly accurate pH indicator.

5242

## How Did Coffee Grounds Work as Compost?

*Megan Birnbaum and G. Zem (teacher)*  
Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

This experiment investigated the use of a common household item as an eco-friendly fertilizer. Before I began I believed that plants with coffee grounds would do better than just plants by themselves, because coffee grounds would provide them with nitrogen, retain moisture and have been proven to be used successfully as an ingredient in compost. To do this experiment, I obtained a bowl of already used coffee grounds, two greenhouse kit/planters and two packets of seeds (sweet corn and green beans). I then planted the seeds according to the greenhouse instructions and covered one of the planters in coffee grounds. I watered the plants and took care of them, and waited to see what would happen. The results proved my hypothesis right. After just one week the coffee ground plants were already growing much faster than the regular plants. They were distinguishably taller, greener and had more leaves. It helped that the plants I used were known for flourishing in a nitrogen-rich environment. The research I did beforehand caused me to believe that the coffee grounds would work their magic. Many gardening websites highly recommended coffee grounds in the use of composting, and scientific statistics showed that the high levels of nitrogen in coffee are helpful to plant growth, but that after going through the coffee machine, enough acid is removed so that the grounds are not harmful to plants. This project suggests that applying coffee grounds to plants does indeed cause them to grow faster and better than plants would grow by themselves, though I would have to do this experiment a couple more times to completely prove it. In the end, I believe that this experiment was helpful to me in learning how to be eco-friendly and it forced me to be responsible enough to care for my own plants.

5243

## Temperatures and Conditions of Bubbles, Must Be Noticed Before It Rubbles

*Aqsa Iqbal and G. Zem (teacher)*  
Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

This experiment was made to determine under what circumstances a bubble lives the longest. For that a container, water, liquid bubble, bubble additives and a straw were needed. This experiment can take place in the freezer, microwave, and outdoors in warm and cold weather. When the bubble is being tested outdoors, it must be in an open environment, not in a locked up area. Results show that the bubble survived the longest in the freezer indoors with the lid on the container with the bubble in it. In addition, the additives gave different results in all of the conditions from one another. Humidity caused the bubbles to last long because when they were placed outdoors in a fresh environment, the evaporation cycle was continuous. When they were locked up, the bubble lived a pretty good life. In conclusion, the weather and where a bubble is blown make a great difference in the bubble's life span.

5244

## What Makes Memory Wire So Special

*Paul Chang and D. Gaughen (teacher)*

Taft High School  
5461 Winnetka Ave.  
Woodland Hills, CA 91364

My project is to explore the properties and the behaviors of a memory wire (nickel titanium alloy), nitinol, and to apply the knowledge of these characteristics to design applications that can utilize other alloys that “remember.” The materials used for this experiment were a scale, a memory wire and a damaged one, a Bunsen burner, pliers, boiling water and ice cold water. I used the damaged wire to compare it with the other wires of the same length and diameter, such as copper and steel. I first placed the memory wire into ice cold water and bent it into a non-linear shape, then placed it into the boiling water and it returned into a straight line. Next I bent the wire into any desirable shape I wished to see if it remembered. I next placed the wire over the Bunsen burner and tried to train it in keeping its shape. Nitinol will try to return to a straight line. I kept repeating this process until it again kept the shape that I shaped it to be. When I crumbled the wire up and heated it up it, it went into the shape that I trained it to be. I am anxious to try other “memory” or “shape-shifting” materials to see if they have similar properties. Conventional metals and alloy I found do not “remember.”

5245

## Sunscreen Wars: Nanotechnology Better Than Regular?

*Ravneet Brar and D. Gaughen (teacher)*

Taft High School  
5461 Winnetka Ave.  
Woodland Hills, CA 91364

The purpose of this experiment was to see if sunscreens that contained nano scale particles were more effective in blocking out dangerous UVA and UVB radiation. To test my hypothesis, I used two UVA and UVB radiation-detecting probes attached to a Vernier interface device. Results were displayed using LabQuest<sup>TM</sup> software. This data collection system was calibrated at various times during the day (i.e. morning, noon and evening). Since I was unable to depend upon good sunlight days during the winter months, most of the experiments were conducted indoors. A black light was used as the control source of UVA/UVB radiation. I did, however, check the amount of radiation coming through a lab room window pane. I was able, therefore, to adjust for any ambient radiation that might contaminate the indoor experiment. Though not directly advertised, commercial sunscreen products with an SPF (Sun Protection Factor) of 50 and up were considered to be ‘nanotechnology enhanced.’ This meant that the sunscreen contained nano scale particles of zinc oxide (ZnO) and/or titanium dioxide (TiO<sub>2</sub>). This particle size creates greater amounts of light reflectivity, thus being able to protect someone better due to the enhanced surface area. I found this to be true for the most part, thus proving my initial hypothesis. Some concerns for this project that should be studied in the future are how long the applied sunscreen containing nano particles will last. The last concern to be addressed is that I used clear glass to measure the amount of UVA and UVB radiation penetrating through the sunscreen, which is not really a suitable substitute for human skin.

5246

## How Does Water Mimic Musical Notes?

*Tyler T. Struck and G. Zem (teacher)*

Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

In this experiment, the question that needed to be answered was this: How does water mimic musical notes? Eight glass cups, a drumstick and water were needed. First I had eight glass cups. Since there are seven basic musical notes, A through G, I needed seven, but to complete the scale of notes I needed “A” again so I needed eight cups. Cup 1 was filled with one-eighth of water. In order to figure out how much one-eighth was I had to find the total amount one cup could hold. Then I divided that number by eight. I filled cup 2 with two-eighths and so on until all were filled. After all of the glasses were filled with the proper amount of water, I started to tap each glass, recording the note it made. My hypothesis was that the notes were going to be in this increasing order: A, B, C, D, E, F, G and A. I was wrong. I came to find out that the sound decreased with more water in the cup. The order was: D, C, C flat, B, B flat, A, G and F sharp. The notes got lower when more water was filled because the more air there is the faster the sound waves can move because there is more room. The less air there is the slower the sound waves have to move or else they would break the cup. This is how water mimics musical notes.

5247

## How Do Boiling Points Change When Different Substances Are Added?

*Adilene Lorenzo and G. Zem (teacher)*

Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

This study is about the change in temperature of boiling points of water when different substances are added to the water. This study is based on four different experiments. The first experiment was the control experiment that only included boiling pure water. In the second, third and fourth, different substances were added such as salt, sugar and vinegar. These substances were each individually added to pure water into a cooking pot and boiled over fire. Then the water was measured with a thermometer when it started to boil. Each boiling point was different from the control. Since the density in the water increases when a new substance is added, the water will therefore boil more quickly. I think this experiment proved that all different liquids boil at different temperatures no matter if there is the same amount of heat or the same number of grams of water is boiled. Therefore in order for something to have the same boiling point it must have the same amount of water and same substance added.

5248

## Silly for Silly Putty

*Jasmine Nungaray and G. Zem (teacher)*

Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

This study was to find out how to correctly make your very own home-made silly putty. What I did was obtain the following ingredients: borax, white glue, water, 2 cups, a spoon and food coloring (which was optional). Basically, in 1 cup you take 1 teaspoon of borax and 5 tablespoons of water, and then mix them together completely. Then, in the other cup, you mix 1 tablespoon of water and 1 tablespoon of white glue. This is when you add the food coloring if you desire. Next, put 2 teaspoons of the borax solution into the glue solution and stir. Take the finished product out of the cup and knead to desired consistency. My final results turned out to be a soft, malleable lump of perfectly made silly putty, exactly what I wanted. For storage, I kept it in an airtight bag.

5249

**Moldy Burgers**

*A.C. Carrillo and G. Zem (teacher)*  
Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

The purpose of this study was to measure and find out the amount of preservatives in the main fast food burgers. The three items that were used to analyze the purpose of this experiment were the Whopper from Burger King, the Big Mac from McDonald's and a regular cheeseburger from In-N-Out. The three burgers were placed in a room temperature setting for a period of five weeks. To measure the effectiveness of the amount of preservatives present in each burger, the decomposition level of each burger was analyzed once a week. At the end of the sixth week, all three burgers were compared to distinguish the one with the least amount of composition. After thorough investigation and observation of the three fast food burgers, the amounts of mold evident in all the burgers were different. This led to the conclusion that In-N-Out had the least amount of preservatives present in its food, because it contained the most amount of mold throughout the entire burger. Meanwhile, McDonald's had the highest amount of preservatives present in its food. Burger King obviously still uses fresh ingredients since mold was only predominantly present in the meat and bread as opposed to the entire burger.

5250

**How Electromagnets Affect Certain Kinds of Metal**

*Vincent Mai Nguyen and G. Zem (teacher)*  
Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

This study examined how several items were affected by a single electromagnet. The electromagnet was put on the table without it being connected to the battery, and the first item was put onto the table as well, which was the bottle cap. The wire was then attached to both ends of the battery to power up the electromagnet. The battery was D-Cell. Each item from the experiment was repeated five times to make sure the distance of the reaction was accurate. As said from my hypothesis, the results varied from the weight and size of the object. The biggest of the items, the metal binder, needed to be really close to the magnet for it react, but the items weighing the least and that were small didn't need to be too close to the electromagnet. From doing this experiment, I was able to determine how much power is needed to work metal mechanism, starting from the basics of its work using electromagnets.

5251

**Effects of Soda on the Human Body**

*David Howell and G. Zem (teacher)*  
Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

The purpose of the experiment was to find the negative effects of soda on the teeth and human tissue. There were two white eggs and two pieces of chicken. One of each was placed in a jar filled with soda, while the other one was placed in a jar filled with regular tap water. The jars sat unopened for five days and then they were taken out and placed on a paper plate for observation. The piece of meat left in the soda was heavily stained and mildly corroded compared to the meat left in the ordinary tap water. The egg left in the soda was deeply stained and mildly corroded compared to the egg left in ordinary tap water. The ingredients in soda can be harmful to a person's health. Soda can have negative effects on a person's teeth and human tissue after prolonged exposure.

5252

**Comparing Bacteria Growth on New and Used Makeup**

*M. Haroush and G. Zem (teacher)*  
Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

The purpose of this experiment was to determine when to toss your makeup based on the amount of bacteria found on the makeup at a certain time. This can definitely explain the reason that after a certain amount of time, your makeup stops working the way it did when you first bought it, or why it's dried up or a different color. Performing this experiment is an easy way to find out if your makeup is still in good condition – you only need a few materials that are easy to obtain. Many women find that after a few months of using the same makeup, it begins to lose quality. They simply just buy a new set. Wouldn't you want to know why that occurred? It is merely an excess of bacteria on your makeup that has developed over time. I found out that new makeup has much less bacteria than used makeup, and that is why new makeup usually works a lot better than old makeup, as I suggested in my hypothesis. One of the most important variables in my experiment that was the key to the result was the use of blood agar plates. Blood agar plates centralize the bacteria and make the bacteria form colonies rather than most plates that allow the bacteria to grow everywhere. All in all, this experiment proved that my hypothesis was true, but also gave me some peculiar results. I found out that many types of mascara have a special preservative that makes it so that bacteria cannot grow whatsoever. Although I got the results that I wanted, I would have liked to explore much more about these preservatives and why they are there. Next time your makeup stops providing good results, think about the bacteria that's there and consider getting new products!

5253

**What Plants Demonstrate the Lotus Effect?**

*A. Azvar, B. Jones, S. Martinez and D. Gaughen (teacher)*  
Taft High School  
5461 Winnetka Ave.  
Woodland Hills, CA 91364

In this experiment, we adapted the National Science Teachers Association (NSTA) nano-scaled materials (10en-9m). Nanotechnology has often borrowed phenomena found at this scale in nature. The 'lotus effect' is one such phenomenon found on the leaves of certain plants. It has been emulated by scientists to design water- and dirt-resistant surfaces in commercial fabrics. The lotus effect allows water to bead up on plant surfaces and collect dirt and other material. Nano-scaled fibers keep the plant surface from getting wet and allow the water to roll off, collecting the surface debris. This ability of plant leaves to not get wet or bead up when liquids are applied is called superhydrophobia. For this experiment, we sought to discover what types of plant leaves more clearly demonstrated the lotus effect. To do this, the materials used were chalk powder, graphite, water, corn oil and glue. The plants were Nasturtium (*Tropaeolum*), Mustard (*Cruciferae*), Geranium (*Geranium dissectum*) and a Mystery Plant. The experiment was conducted by placing all five substances on the leaves individually, and recording which substances beaded up on which plants. The Geranium and the Nasturtium exhibited more signs of hydrophobicity than the Mustard and the Mystery Plant. This leads us to the conclusion that the waxy leaves are more hydrophobic than other plants. This corroborated our hypothesis.

5254

## Nano H<sub>2</sub>O Purification

*S. Colin, J. Lacap, W. Vu and D. Gaughen (teacher)*  
Taft High School  
5461 Winnetka Ave.  
Woodland Hills, CA 91364

Clean water is essential to human life. When it becomes contaminated, health and safety concerns arise. Our study of nanotechnology was adopted from the water purification protocol offered by UCLA's California NanoSystems Institute, CNSI. Three contaminants were added to distilled water (d H<sub>2</sub>O): Copper (II) Sulfate (CuSO<sub>4</sub>), Yellow Dye #6 and *acidophilus* bacteria in separate vials; we were able to display the unfiltered solutions on a display sheet. Copper (II) Sulfate was a deep blue, Yellow Dye #6 a bright orange and the bacteria a cloudy yellow. The nano scale filters contain activated carbon, zeolite and a bacterial membrane. Solutions of each filter solid were allowed to settle before being placed into gel caps placed on the bottom of syringes containing the contaminants. The contaminants CuSO<sub>4</sub> and the Yellow Dye #6 solutions were forced through the syringe gel caps and displayed on the results sheet. The *acidophilus* was forced through the syringe containing the bacteria membrane. To see how much bacteria survived the filters process agar treated petri dishes one half of the treated and untreated bacteria. We found very little bacterial growth after filtration. The results sheet showed that activated carbon removed or absorbed the Yellow Dye #6, whereas the zeolite was an effective ion exchange in removing Copper (II) Sulfate. The treated water samples were clear on our results sheet. We concluded nano scale particles (10<sup>-9</sup> meters), owing to their immense surface area, can be effective water purifiers.

5255

## Replicating the Microbial Lava Lamp (MLL)

*E. Guzman, N. Gutierrez, R. Hartswick and D. Gaughen (teacher)*  
Taft High School  
5461 Winnetka Ave.  
Woodland Hills, CA 91364

We replicated four standard Microbial Lava Lamps (MLL) using the protocol designed by CSUN professors King and Tomasek. The MLL uses alginate/colored glass/yeast beads that emit CO<sub>2</sub> bubbles in a one-liter sugar solution, water and varying amounts of sugar for each two-liter bottle. The bubbles collect on the beads and make the beads rise to the water's surface. The glass powder will then cause the beads to fall when the CO<sub>2</sub> is released from the beads. A fermenter is attached to the top of the two-liter bottle. The fermenter allows for CO<sub>2</sub> production so we could measure the amount of CO<sub>2</sub> produced for the varied sugar contents. We found that the optimum amount of sugar causing the greatest amount of CO<sub>2</sub> production was 100g of sugar. We found this by recording the activity level of CO<sub>2</sub> production in all four MLL bottles. To test the germicidal effects on yeast, we made one MLL the control bottle, while three were made the experimental bottles. To the three bottles, we added 5g of silver particles to the 100g of sugar MLL, 5g of silver nitrate to 150g of sugar MLL, and 5g of sodium citrate to the 200g of sugar MLL. These chemicals were recommended by UCLA's California NanoSystems Institute, as silver is a proven germicide and sodium citrate is a popular electrolyte found in energy drinks. Our hypothesis was that the silver would kill the yeast and sodium citrate would increase the activity in the beads. Our hypothesis was partially off as the silver nitrate stopped CO<sub>2</sub> production, but the sodium citrate also had stopped the CO<sub>2</sub> production while silver had little effect. Our thoughts of why this happened is that the sodium citrate dissolved the beads before we had a chance to record our data and that the silver was not crushed, thus having little surface area to have an impact. We also concluded that the outer part of the bead, made from the alginate and glass matrix, protected the yeast inside from the silver, whereas the silver nitrate ionized to penetrate the alginate/glass matrix. More replications of those experiments are needed to validate our results.

5256

## Growth of Flower When "Watered" With Tea, Soda and Water

*Kevin Kravets and G. Zem (teacher)*  
Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

This study was done to examine the contrasts in "watering" the same seed with water, soda and tea. The concluding hypothesis was, "He/she thinks the plant that gets water as its primary food and drink will grow taller (length) and at the fastest rate of time (days) than the other seeds." The conductor placed plants A, B and C under the same exact conditions. Then, 1/4th of a 16 oz. bottle of Lipton Iced Tea was poured into Plant A. Immediately after, 1/4th of a 16 oz. bottle of Arrowhead Mountain Spring Water was poured into Plant B. Finally, 1/4th of a 16 oz. bottle of Coke was poured into Plant C. The time span of this experiment was two weeks (14 days). Plant B grew very well, while Plants A and C struggled to grow. This occurred because Lipton Iced Tea and Coke have a lot of substances that hurt plants and other living things.

5257

## Do You Really Have a Symmetrical Face?

*Grace Kang and G. Zem (teacher)*  
Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

This study was done to show how symmetrical a human face really is. Research shows that the human eye is biased and prefers to see a symmetrical face. The human eye processes images upside down and turns them right-side up. The process of how the eye sees images may be why the eye sees an unsymmetrical face as flawed. This study required many pictures of human faces, and a program to draw a straight line down the middle of the face. The program most effective for this study is the program Paint, which is a very simple program and allows you to draw anything and everything easily. The results of this study were very surprising. In almost every single human face, there was middle symmetry instead of a variety of symmetry. In fact, all of the faces had middle symmetry. They did not have unequal symmetry, or were seen to be "flawed." It is safe to say that almost all of the faces are all symmetrical.

5258

## What Angle Will Make the Projectile Go the Farthest?

*Arsh Rustogi and G. Zem (teacher)*  
Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

This study examined the angle of a catapult arm to launch the projectile the farthest. An ogre catapult was built and launched at five different angles (each angle was tested twice) using wooden blocks. The angles were chosen within the range of the best hypothesis, which was 50 degrees give or take 10 degrees. Sixty degrees was the starting point and decreased by 5 every time. Forty degrees was where the tests stopped. The average for 60 degrees was 358.5 in. The average for 55 degrees was 371 in. The average for 50 degrees was 382 in. The average for 45 degrees was 382.5 in. The average for 40 degrees was 377 in. The best angle was concluded to be 47.5 degrees.

5259

### Does The Sixth Sense Exist?

*Carolina Hernandez and C. Barris (teacher)*

Mark Twain Middle School  
2224 Walgrove Ave.  
Los Angeles, CA 90066

My question was if humans really have a sixth sense or if people can use their minds (extrasensory perception, ESP) instead of talking to communicate and have knowledge of the future. My hypothesis was that girls or women have better ESP than boys/men. I placed four playing cards on a table face up. I asked 10 boys/men and 10 girls/woman to study the cards for 30 seconds and then asked them to put the four cards back in order. I performed this test 20 times for men and 20 times for women. In 17/20 tries, girls/women got it right. In 11/20 tries, men/boys put the cards in the correct order. My hypothesis was correct. Women and girls appeared to have a better sixth sense.

5260

### How Much Electrical Energy Is Produced in Vegetables and Plants?

*Xekias Haynes and C. Barris (teacher)*

Mark Twain Middle School  
2224 Walgrove Ave.  
Los Angeles, CA 90066

After researching that electrical energy from fruit could provide power for a small miniature light, I wanted to test plants, vegetables and fruits myself. My hypothesis was that fruits held more energy than vegetables. I used a voltage meter to measure the amount of electricity that each whole item had. I used potatoes, one apple, one lemon, celery and spinach. Each was tested and the movement of the voltage meter was recorded. The potatoes moved somewhat, but the lemon moved the most, then the apple. I thought that the fruits with the greatest acidity had more electricity. I recorded the pH of each item and the lemon and then the apple had higher electrical energy. My hypothesis proved to be correct. This was an interesting project.

5261

### How Do Various Types of Music/Video Games Affect a Person's Heart Rate and Blood Pressure?

*Alex De La Cruz and C. Barris (teacher)*

Mark Twain Middle School  
2224 Walgrove Ave.  
Los Angeles, CA 90066

Some people really take playing video games seriously. I thought it would be interesting to research the effects of gaming and music on people. My hypothesis was: Does the type of music you listen to affect your heart rate, and gaming make your heart rate increase? Research was completed on classical music, rock and rap. Classical music was played for three minutes to three of my friends, and then a measure of their heart and pulse rates was taken. Each of my friends' heart rates remained calm and constant. Rock and rap music seemed to increase their heart rates the most. I retested each one of my friends three times each with the same results, so my hypothesis was correct.

5262

### How Does Eating Before You Go to Sleep Affect Your Sleep?

*Grecie Recilla and C. Barris (teacher)*

Mark Twain Middle School  
2224 Walgrove Ave.  
Los Angeles, CA 90066

Sometimes I would have strange dreams when I ate late at night and I wondered if the time and what I ate affected my sleep. My hypothesis was that eating late would make me have bad dreams. For one week I recorded the types of food I ate and the time I ate them. Eating late caused severe fatigue for me. My hypothesis was that eating late contributed to my bad dreams. My regular dinner time was 6:00 pm and my new dinner time was moved to 10:00 pm. Each time I ate late, my dreams were strange. Research indicated that eating late contributed to nightmares. When I returned to my regular dinnertime, the nightmares stopped. My hypothesis was supported by my experiment.

5263

### How Does Superconductivity Work?

*Shant Sassounian, Hovhannes Dagdevirian and A. Antoniou (teacher)*

Robert Frost Middle School  
12314 Bradford Pl.  
Granada Hills, CA 91344

The purpose of our experiment was to see under what conditions a rare earth magnet would levitate and how superconductivity would work. A superconductor is a special class of ceramic called perovskite that works when it reaches a certain temperature. Superconductors have the ability to carry an electrical current without loss of energy, unlike current conductors of electricity. A rare earth magnet is a strong permanent magnet made from rare earth elements such as alloys. They are abundant and used to create a strong magnetic field that allows the flow of the electric currents because its interaction with the liquid nitrogen keeps these materials from causing resistance. This "non-connection" is known as levitation. In our hypothesis, we had stated that the rare earth magnet would only levitate when liquid nitrogen was poured onto the superconductor. We used two materials to cool our superconductor. The first one was dry ice and the other was liquid nitrogen. In conclusion, we found that the dry ice didn't cool the superconductor enough. When we used the liquid nitrogen, it did cool to lower temperatures, which caused the rare earth magnet to levitate. Our hypothesis was correct and we observed a slight levitation of the rare earth magnet, which made the superconductor work.

5264

### Is There a Connection Between Secondhand Smoke and Asthma?

*Edith Carbajal, Diana Morales, Jose Hernandez, Omar Pacheco*

*and C. Barris (teacher)*  
Mark Twain Middle School  
2224 Walgrove Ave.  
Los Angeles, CA 90066

In this research project our question was, "Is there a connection between secondhand smoke and asthma?" Our hypothesis is that there is a connection between secondhand smoke and getting asthma. In our research we discovered that the number one way children get asthma is second-hand smoke.

5265

### Which Type of Mineral Absorbs the Most Water?

*Marisol Garcia and C. Barris (teacher)*

Mark Twain Middle School  
2224 Walgrove Ave.  
Los Angeles, CA 90066

The two minerals I have chosen for my experiment are Variscite and Lepidolite. Variscite (MOH 4) is similar to turquoise. Lepidolite (MOH 2.5-3) is a mineral used in cutting due to its hardness. My hypothesis is that Lepidolite will absorb more water than Variscite. Variscite did not absorb more water, however. After measuring the amount of water displaced in a graduated cylinder, Lepidolite absorbed more water.

5266

### Does the Color of a Room Change Your Mood?

*Angela Garcia and C. Barris (teacher)*

Mark Twain Middle School  
2224 Walgrove Ave.  
Los Angeles, CA 90066

What colors make you feel happy? Which ones help you relax after a busy day? My hypothesis is that bright colors cause acceleration in heart rate and earth colors slow your heart rate. I took large 12x24 poster boards and painted them red, orange and yellow, brown, tan and forest green. I tested 10 people by holding each color up and checking their heart rate by taking their pulse. My hypothesis was correct, as all of the people I tested had higher rates with the brighter colors, while the earth colors were more calming.

5267

### Substance Abuse and the Effect on the Human Brain

*Rochelle Bello and C. Barris (teacher)*

Mark Twain Middle School  
2224 Walgrove Ave.  
Los Angeles, CA 90066

How do alcohol, tobacco, marijuana and other drugs affect your brain? My hypothesis is that cocaine is the most addictive. Research on cocaine supports that it causes the most addiction, as the portion of the brain affected by it causes immense craving for the drug, even though it is not physically addicting or psychologically addicting.

5268

### How Does Autism Affect a Child's Life?

*Diana Plasencia and C. Barris (teacher)*

Mark Twain Middle School  
2224 Walgrove Ave.  
Los Angeles, CA 90066

Autism is a developmental disorder that affects the brain, making communication and interacting with people difficult. My hypothesis is that autism affects child development, making developmental learning difficult. Three types of autism are used to classify the disorder: Classical Autism, Asperger Syndrome and Rett Syndrome. I have a young cousin who at 3 was diagnosed with autism. My hypothesis is what type of autism does my female cousin have? My research led me to conclude that my cousin, who now is 4, probably suffers from Rett Syndrome. Rett Syndrome affects females more frequently than males and is extremely uncommon, with less than 4% of all autism cases.

5269

### Which Gum Flavor Lasts the Longest?

*Steven Santiago and C. Barris (teacher)*

Mark Twain Middle School  
2224 Walgrove Ave.  
Los Angeles, CA 90066

Does Winterfresh Mint last longer than peppermint? I tested three brands of gum to determine which would last the longest. I chewed each piece for one hour. The Winterfresh gum lost its flavor the first and Trident was the best.

5270

### Does the Way You Shoot a Basketball Affect Your Accuracy?

*Ivan Aquilar and C. Barris (teacher)*

Mark Twain Middle School  
2224 Walgrove Ave.  
Los Angeles, CA 90066

The purpose of the study was to determine if the way a ball is thrown makes you more accurate. I wanted to study the way people throw a basketball: overhand or underhand. I studied my favorite college basketball and professional NBA players. My hypothesis was: Does the larger the range of motion put in making baskets affect the arch or accuracy? I studied 30 players in all, comparing their free throw and 2- and 3-point accuracy. After careful review, information supported my belief that a player's arch was affected by a high arch. Players with a non-exaggerated arch were more accurate, so my hypothesis was right.



**TEACHERS  
STUDENT-AUTHORS  
ABSTRACT TOPICS**

## TEACHER INDEX

### A. Antoniou

Robert Frost Middle School  
12314 Bradford Pl.  
Granada Hills, CA 91344

### V. Arnold

Reseda Science Magnet High School  
18230 Kittridge St.  
Reseda, CA 91335

### C. Barris

Mark Twain Middle School  
2224 Walgrove Ave.  
Los Angeles, CA 90066

### D. Evans-Bye

Clark Magnet High School  
4747 New York Ave.  
LA Crescenta, CA 91214

### D. Gaughen

Taft High School  
5461 Winnetka Ave.  
Woodland Hills, CA 91364

### T. Miller

Holmes International Middle School  
9351 Paso Robles Ave.  
Northridge, CA 91325

### K. Schwiesow

Dixie Canyon Avenue Elementary School  
4420 Dixie Canyon Ave.  
Sherman Oaks, CA 91423

### D. Shah

Portola Highly Gifted Magnet Center  
18720 Linnnet St.  
Tarzana, CA 91356

### S. Tanaka

Gaspar de Portola Middle School  
18720 Linnnet St.  
Tarzana, CA 91356

### R. Tounian

Mid-City's Prescott School of Enriched Sciences  
3500 W. Adams Blvd.  
Los Angeles, CA 90018

### G. Zem

Ernest Lawrence Gifted/Highly Gifted Magnet  
10100 Variel Ave.  
Chatsworth, CA 91311

## STUDENT-AUTHOR INDEX

Number following name refers to abstract number

Abbas, S.	5235	Chaleff, K.	5175	Garay, N.	5057	Kasmer, N.	5104
Abdulaziz, J.	5228	Chan, E.P.	5196	Garcia, A.	5266	Keyfman, M.	5103
Abell, E.	5055, 5184	Chang, P.	5244	Garcia, J.	5055, 5128	Kharatyan, M.	5056
Aguilar, L.	5055	Chattopadhyay, K.R.	5170	Garcia, K.	5221	Khoramian, D.	5139
Albania, K.	5055	Chavez, N.	5057	Garcia, M.	5265	Kim, A.	5063
Alcala, N.	5057	Chen, M.	5182	Garcia, R.	5057	Kim, D.	5233
Aleman, A.	5056	Cheng, K.	5181	Garza, A.	5055, 5188	Kim, H.J.	5089
Allibhoy, S.	5062	Choi, C.	5159	Gautam, B.	5166	Kim, K.	5096
Almaguer, D.	5055	Choi, E.	5085	Gebelein, E.	5208	Kim, S.	5202
Alpay, H.	5087	Choi, H.	5056	Ghobadi, A.	5135	Klijian, I.	5091
Alvarado, M.	5224	Cifuentes, B.	5056, 5126	Gonzalez, M.	5057	Konecny-Pena, H.J.	5172
Alvarado, O.	5055	Cohen, M.	5150	Goodstein, S.	5115	Korman, C.	5137
Alvord, G.	5153	Cohen, S.	5157	Gregoryona, D.	5205	Kravets, K.	5256
Andres, M.	5057, 5190	Colin, S.	5254	Gupta, H.	5173	Kuo, A.	5z199
Apanay, M.	5102	Colop, W.	5232	Gurrola, A.	5055	Labasan, Q.	5217
Aquilar, I.	5270	Corden, H.	5122	Gutierrez, E.	5057	Lacap, J.	5254
Aragon, C.	5057	Corral, E.	5057	Gutierrez, J.	5056	Lad, P.	5165
Aranez, R.	5055	Cruz, C.	5221	Gutierrez, N.	5255	Lal, N.	5133
Argueta, B.	5055	Cunanan, C.	5075	Guzman, E.	5255	Landyshev, A.	5060
Arnesen, M.	5098	Curiel, L.	5055	Guzman, J.	5205	Langwald, A.	5056, 5164
Athota, A.	5059	Dagdevirian, H.	5263	Hankin, M.	5180	Lapeña, N.	5236
Avila, A.	5055	De La Cruz, A.	5261	Haroush, M.	5252	Le, A.	5193
Avina, L.	5056	De Leon, J.	5131	Harris, E.	5086	Leonard, M.	5120
Ayala, E.	5057	De Leon, M.	5057	Hartswick, R.	5255	Levine, R.	5109
Azvar, A.	5253	De Marcos, I.A.	5055	Haynes, X.	5260	Linan, E.	5083
Bacaro, A.	5055	Delgado, J.	5213	Heller, R.	5111	Liu, D.	5057
Balaban, L.	5057	Dhandi, S.S.	5114	Henriquez, D.	5056	Lopez, A.	5055, 5123
Barillas, W.	5056	Dhanoa, B.	5199	Hernandez, A.	5056	Lopez, K.	5055, 5125
Batulan-Locsin, A.	5237	Dhiman, T.	5055	Hernandez, C.	5259	Lopez, N.	5055
Bejar, A.	5056	Diaz, V.	5056	Hernandez, D.	5212	Lopez, T.	5055
Bello, R.	5267	Dominguez, J.	5057	Hernandez, J.	5055	Lorenzo, A.	5247
Berkolds, D.	5077	Dozal, C.	5203	Hernandez, J.	5264	Luong, H.	5235
Bernardo, K.	5216	Dulberg, S.	5152	Hernandez, K.	5146	Machhour, H.	5210
Birnbaum, M.	5242	Duran, F.	5055	Herrarte, E.	5056	Manash, A.	5055, 5130
Bonilla, J.	5056	Durham, B.S.	5200	Hidalgo, J.	5214	Mapula, A.	5056
Borovay, J.	5183	Dusto, J.A.	5176	Ho, A.	5068	Marazita, M.	5168
Brar, R.	5245	Dwivedi, A.	5167	Howell, D.	5251	Mark, D.	5207
Bridges, S.	5229	Elam, S.	5228	Hurtado, L.	5057	Mark, R.	5207
Brinton, Z.	5234	Elian, C.	5191	Ibay, R.	5055	Martinez, A.	5057
Brown, J.	5055, 5158	Enriquez, V.	5198	Interiano, J.	5057	Martinez, E.	5055
Bui, D.	5078	Escobar, F.	5056	Iqbal, A.	5243	Martinez, E.	5056
By, E.	5209	Farkhondeh, V.	5241	Jackson, B.G.	5072	Martinez, K.	5057
Cabanayan, J.	5056	Fayyazi, N.	5106	Jain, H.	5186	Martinez, M.	5056
Cabrera Jr., M.	5056	Ferehawk, R.	5113	Jimerson, C.	5204	Martinez, S.	5253
Cadonna, M.	5056	Finn, K.	5145	Johnson, T.	5219	Matute, E.	5055, 5124
Cain, A.	5057	Fletcher, R.	5057	Jones, B.	5253	Maynez, A.	5136
Campbell, J.	5094	Flores, D.	5057, 5189	Jones-Webb, K.	5219	Mbanefo, C.	5169
Candelario, D.	5057	Flores, I.	5057	Justman, S.	5056	McDermott, C.	5074
Carbajal, E.	5264	Flores, J.	5055	Kadosh, S.	5155	Mejia, J.	5215
Carpenter, E.	5057	Francisco, J.	5056	Kang, G.	5257	Merino, W.	5055
Carrillo, A.C.	5249	Friedman, J.	5093	Kang, J.	5095	Mishkin, A.	5064
Casarez, S.	5057	Gallegos, M.	5056, 5127	Kanz, L.	5194	Mixco, J.	5056

Indices

Moffitt, R.	5057	Phung, J.	5220	Simson, C.	5154
Molina, A.	5056	Pinckney, M.	5227	Smyth, R.C.	5110
Molina, S.	5156	Pineda, E.	5055	Solis, K.	5217
Montemayor, C.	5236	Placencia, A.	5161	Soltankhah, A.	5066
Morales, D.	5140	Plasencia, C.	5202	Song, H.	5088
Morales, D.	5264	Plasencia, D.	5268	Song, H.	5090
Morales, S.E.	5134	Potter, K.	5220	Spence, D.	5076
Morgan, C.	5201	Prayaga, G.	5192	Starkman, M.	5100
Morrison, B.D.	5179	Puentes, J.	5143	Struck, T.T.	5246
Morsy, M.	5097	Qin, V.	5119	Sturmer, C.	5138
Moss, D.T.	5174	Radich, K.	5056	Su, M.	5238
Munro, J.	5144	Rahman, S.	5225	Suh, P.	5107
Munsalud, J.	5055, 5160	Raju Jr., L.	5055	Ta, N.	5105
Naberhaus, K.	5218	Ramirez, C.	5073	Takayesu, J.	5057
Nakamura, A.	5187	Ramirez, M.	5056	Tan, M.	5101
Nam, E.	5084	Ramirez, R.	5056	Tantamco, A.	5056
Namuddu, R.	5056	Ramirez, S.	5215	Torres, A.	5198
Namuddu, R.	5129	Recilla, G.	5262	Torres, I.	5212
Neri, M.	5099	Rendon, M.	5055, 5162	Torres, J.	5056
Nguyen, J.	5132	Rezian, M.	5223	Tuang, A.	5057
Nguyen, T.	5171	Robles, M.	5058	Turcios, L.	5056
Nguyen, V.M.	5250	Rodriguez, E.	5055	Umbay, D.	5057
Nichol, R.	5112	Rothwell, R.	5070	Vicente, C.	5054
Nicholas, A.	5061	Rubalcava, A.	5210	Villaflores, C.	5057
Nieves, S.	5121	Rubio, M.	5226	Vincent, C.	5208
Nilkaew, T.	5118	Rudd, B.	5053	Vu, W.	5254
Nunez, L.	5057	Ruiz, W.	5051	Wallace, A.	5057
Nungaray, J.	5248	Rustogi, A.	5258	Wheeler, E.	5082
O'Brien, T.	5216	Saldana, L.	5147	Wicksman, A.	5239
O'Hickey, T.	5230	Saletta, S.	5230	Williams, M.	5149
Oganyan, A.	5052	Samaneh, N.	5177	Wilson, D.	5079
Oh, E.	5080	Sanchez, V.	5057	Wilson, E.	5233
Oh, S.	5116	Santiago, S.,	5269	Yanez, C.	5057
Olivas, J.	5056	Santos, S.	5117	Yaneza, C.T.	5195
Ortega, O.	5056	Sassounian, S.	5263	Yang, A.	5056
Ortiz, D.	5206	Schacht, J.	5211	Yang, J.	5092
Osterman, G.	5204	Schiller, K.	5222	Yao, P.	5108
Pacheco, O.	5264	Schomer, S.	5056	Yoo, A.	5065
Padilla, V.	5231	Schwartz, E.	5142	Yoon, A.	5069
Page, M.	5148	Serna, H.	5240	Youssef, A.	5197
Pak, A.	5067	Serrano, A.	5057	Zallan, R.	5151
Palafox, V.	5057	Sey, E.	5056, 5163	Zaman, D.	5141
Parada, N.	5055	Shah, A.	5185	Zapata, L.	5055
Parbhu, B.	5178	Sherman, I.	5211		
Park, B.	5071	Shwartz, E.	5081		
Parkhani, M.	5225	Silva, G.	5055		

Answers to VNY Crossword Puzzle:

1. Airtel
2. Hangars
3. Cockpit
4. Towers
5. Charter
6. Wingspan
7. Airshows
8. FAA
9. Sherman
10. Helicopters
11. FAA

**ABSTRACT TOPICS INDEX**

Number refers to abstract number

**AEROSPACE, ASTRONOMY  
AND AVIATION**5106  
5132  
5164  
5167  
5120**CHEMISTRY**5051  
5063  
5087  
5089  
5094  
5097  
5104  
5115  
5116  
5118  
5122  
5127  
5134  
5138  
5140  
5152  
5171  
5180  
5190  
5211  
5217  
5219  
5233  
5238  
5241  
5245  
5247  
5248  
5253  
5254**COMPARISON**5066  
5072  
5073  
5077  
5078  
5100  
5105  
5107  
5135  
5137  
5142  
5143  
5144  
5148  
5154  
5155  
5160  
5169  
5178  
5195  
5203  
5206  
5209  
5212  
5214  
5215  
5223  
5224  
5231  
5235  
5236  
5237  
5243  
5265  
5269  
5270**COMPUTER SCIENCE**5117  
5200**CONSUMER SCIENCE**5069  
5074  
5076  
5098  
5099  
5101  
5109  
5111  
5133  
5145  
5146  
5172  
5183  
5194  
5197  
5204  
5232**ENVIRONMENTAL BIOLOGY**5052  
5054  
5058  
5067  
5068  
5071  
5108  
5168  
5170  
5186  
5221  
5227  
5242**HUMAN BIOLOGY**5061  
5075  
5095  
5096  
5113  
5136  
5149  
5156  
5174  
5182  
5193  
5205  
5222  
5228  
5251  
5261  
5264**INVERTEBRATE BIOLOGY**5055  
5056  
5057  
5084  
5123  
5124  
5125  
5126  
5128  
5129  
5130  
5159  
5161  
5163  
5188  
5189**MICROBIOLOGY, MOLECULAR  
BIOLOGY AND GENETICS**5065  
5090  
5112  
5121  
5175  
5177  
5196  
5201  
5216  
5220  
5249  
5252  
5255**PHYSICS**5053  
5059  
5060  
5062  
5081  
5086  
5092  
5139  
5153  
5162  
5165  
5173  
5179  
5192  
5218  
5229  
5234  
5244  
5246  
5250  
5258  
5260  
5263**PLANT BIOLOGY – CHEMICAL**5064  
5079  
5080  
5083  
5093  
5119  
5187  
5239  
5256**PLANT BIOLOGY – ENVIRONMENTAL**5091  
5102  
5114  
5150  
5158  
5176  
5185  
5213  
5225  
5226**PSYCHOLOGY**5082  
5085  
5088  
5103  
5110  
5131  
5147  
5151  
5166  
5181  
5184  
5191  
5198  
5199  
5202  
5207  
5240  
5259  
5262  
5266  
5267  
5268**VERTEBRATE BIOLOGY**5070  
5141  
5157  
5208  
5210  
5230  
5257

**This page is intentionally blank**



California State University  
**Northridge**



**Van Nuys**  
*Los Angeles World Airports*

**ISSN 1558-7932**