The UCSB Field Trip

Taking science outside of the classroom.

By Elizabeth Bottoms and Laura Vievard, 8th grade students

On Wednesday, December 3rd, Ms. Garza’s first and Ms. Kluss’ third period classes went on a field trip with the UCSB LEAPS scientists. All students gathered in Ms. Garza’s class before we were ready to leave. When we got to the UCSB campus, the LEAPS scientists explained the activities that we were going to do. We were all divided into four groups, once we knew what we were doing.

One of the four activities was the egg drop. We had to get in pairs of two and were given a bag with different items such as: newspaper, cotton balls, tooth picks, a plastic bag and a container. All pairs started to work on their egg parachute. After twenty-five minutes of working on our parachute project, we changed to a different station. In the 2nd station, we worked with dry ice and pennies. When we were working with the dry ice we got to put it into a liquid with some dye in a container and when we put the dry ice in the liquid it turned clear to yellow and to orange. When we were working with the pennies everyone got two of the pennies. First we put both of the pennies into zinc, the pennies turned silver. After that we put one of the pennies over a flame and it turned a gold color. We also went to a physics station full of fun demos and a nano-science station where we got to play around with some really expensive socks!

After everyone was done with their activities we went outside to have some lunch. Now we were ready for the competition to start. One by one the fellows dropped the egg parachutes from a six story parking garage. If your egg did not break the you got a glowing rubber duck. There were three different categories to win. 1: closest to the target - Evan Smith and Cody Henderson with “Interior Crocodile Alligator” 2: least mass - Jacob and Bryan Rodriguez with “Gaylord Focker” 3: Most dramatized crashed - Sam Wing and Aidan Hogge with “Miraculous Combustion.” Once we were done, everybody got back on the bus back to school after a long and fun day at UCSB.

Mr. O’Dea welcomes the students in a lecture room inside the California NanoSystems Institute.
Family Ultimate Science Exploration

A dynamite night!
By Daniel Guerrero and Matthew Figueroa, 8th grade students

Family Ultimate Science Exploration. That's what FUSE was. It was a night when 8th graders came to SB Jr. High with their families for the ultimate science experience. There were three stations planned, each led by UCSB graduate students.

One station was in chemistry. UCSB graduate students talked to parents and 8th graders about chemical reactions, different chemicals, and how they bond. We did a chemical reaction called elephant toothpaste; its name comes from the soap that looks like huge amounts of toothpaste. It consisted of first adding dish soap and food coloring to a beaker of hydrogen peroxide. Then we added potassium iodide and almost immediately a green and blue foam steamed out of the beaker, sending everyone backing up at the sudden chemical reaction. The potassium iodide made the peroxide breakdown into water and oxygen gas, which made the soap bubble.

The second station was called kelp beads which come from the slimy stuff on seaweed and is actually kelp sugar. First, they took the kelp sugar/slime and put it into 2 containers one with glitter and one without. We then put the kelp liquid into another liquid that was like seawater. We poured the kelp and seawater over a screen into an empty container and what laid on top of the screen was this clear, slimy, worm like or bead-like substance made from the kelp interacting with the seawater! We weren't able to see the kelp beads before we filtered them through the screen. We could see the kelp beads that had glitter added without the

Dr. Gretchen Hofmann -
Professor of marine science and ecological physiology.
By Alice Nguyen, LEAPS Scientist

The world is changing. For marine animals, they are not only experiencing global warming, they are also facing ocean acidification. Global warming is the current increase in average air and ocean temperature since the mid-20th century and it projected continuation. Ocean acidification is the ongoing decrease in ocean pH caused by the seawater’s uptake of atmospheric CO₂.

At UCSB, Dr. Hofmann and her research group study the effects of climate and climate change on performance of marine species. In particular, they use cutting edge molecular technology to study how changes in the environment can influence the

leading researcher in marine biology

featured scientist:

Archimedes

Archimedes of Syracuse (287 – 212 BC) was a Greek physicist, engineer, inventor, mathematician, and astronomer.

5 things you didn’t know about him:

1. There is a crater on the Moon (Archimedes) and a lunar mountain range (the Montes Archimedes) named in his honor.

2. His name means “to first think about or to meditate upon.”

3. He proved that the volume of a sphere is two thirds the volume of the smallest cylinder that can contain it.

4. He invented the Archimedes screw which raise water efficiently.

5. He discovered his principle of buoyancy while taking a bath, upon which he is supposed to have run naked through the streets of Syracuse shouting "Eureka!"

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Let's Explore!

**Density and Seawater**

Tropical or equatorial seawater is under a regular strong sunlight all year long, it doesn't experience seasons. This constant high heat causes the surface ocean to evaporate leaving behind saltier, more dense water. What happens when you have more dense water on top of less dense water? It moves! It sinks in fact, and this is the start of some ocean circulation in the tropics. This saltier water sinks vertically then it hits water of the same density (around 300 meters) and continues to move but now it is moving horizontally away from the equator and towards the poles.

In the polar oceans you have a different process happening. Frequent rain, snow and ice melt lead to fresher (less salty, less dense) surface seawater, but this water is very cold and it also becomes more dense then the seawater below. It also sinks and when it hits around 1000 meters deep it starts moving horizontally towards to equator. Somewhere in between the equator and the poles, the equatorial water slides over the colder denser polar water. Changes in density in seawater cause it to circulate and to distribute heat from the equator and cold from the poles. At the surface, water moves because of wind and deeper water moves because of changes in density. And this is how density and seawater are related!

### Fun Facts

- It takes approximately 12 hours for food to entirely digest.
- The temperature can be determined by counting the number of cricket chirps in fourteen seconds and adding 40.
- The largest eggs in the world are laid by a shark.
- The North Atlantic gets 1 inch wider every year.
- Sea water, loaded with mineral salts, weighs about a pound and a half more per cubic foot than fresh water at the same temperature.
LEAPS Scientist of the Month

Who or what inspired you to become a scientist?
The person who inspired me to become a scientist was my high school teacher, Mr. Dave Eddy. I absolutely loved his class. He took his classes on great field trips where he would show us the animals that we were studying in class in their natural environment.

How does your research impact the world?
Although we don’t come across many parasites living in the U.S, it is a major problem in other parts of the world. Schistosomiasis is a parasitic infection by a small flatworm and affects several million people all over the world. My research focuses on the genetic basis of host preference in another parasitic flatworm. Results from my study will help scientist better understand why some parasites are able to infect more animals than others.

What do you like to do for fun?
FOOD! Cooking and eating to be exact. When I have time, I love to cook huge feasts for me and my friends. Also, I know this sounds funny, but I like to challenge my friends to eating contests for fun. So far, I’ve been in a sushi and spring roll eating contest. I come from a family of big eaters, so I guess you can say its in my blood.

What is the strangest thing you’ve ever eaten?
The strangest thing I’ve eaten so far has to be caramel corn with meal worms! Yum. However, I’m sure I’ve had other things that people may think are strange but I think are quite normal like escargot.

Ms. Nguyen

About LEAPS

Let’s Explore Applied Physical Science (LEAPS) engages UCSB graduate and undergraduate Fellows as instructors and mentors for inquiry-based science in Grade 8 classrooms. By establishing collaboration between Fellows, science teachers, and UCSB scientists in school classrooms, the LEAPS project implements hands-on, minds-on learning experiences in physical science.

LEAPS offers after school clubs at junior high sites, including Santa Barbara Junior High School. The Fellows also help younger students to prepare for Family Science Nights that foster community interest to science education and opportunities.

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