

# SciMo Says

**The Newsletter for Science in Motion at Susquehanna University  
Volume VIII Issue 4 December 2008**

## Director's Column

Due to state budget cuts, we are cancelling the SIM Winter Workshop on Thursday, January 8, 2009, at Susquehanna University.

SIM is experiencing **budget reductions due to the current economic crisis**. Decisions are being made in Harrisburg now regarding which programs to cut and by how much. Our budget has already been cut by 4.25% and we have been promised a second round of cuts to decrease our budget further for a total of 8%. Even more budget cuts could follow. **Please** take a few moments and **write a letter to your legislators** stating how your professional development opportunities are being reduced and how the educational opportunities for students in your classroom are being affected by the reduction in SU-SIM funding. If you could send a copy to SIM, it will help greatly when I visit legislators asking for their support to continue funding the program. We need your support now, more than ever!

On Tuesday, October 28<sup>th</sup>, I accompanied Greg Stout on a visit to **Paulette Armbruster's** classroom at **Selinsgrove High School**. Students analyzed the rate of photosynthesis in light and dark reactions. I enjoyed interacting with students and discussing their college aspirations.

On **Monday, November 24<sup>th</sup>**, SIM began accepting reservations for **spring semester visits and drops**. Please submit your reservation forms on-line for visits/drops during January through June 2009. If you are looking for experiments for this semester, we still have ME available dates:

**Mike McDevitt - Biology**  
December 10, 12

**Greg Stout – Biology & Water Quality**  
December 12, 15, 16, 17, 18, 19

To go directly to the SIM reservation form just control click on <http://www.susqu.edu/sim/reservation.htm>.

## Mike McDevitt, Biology Mobile Educator Says...

After a few months on the job I am noticing some clients having difficulty printing with our loan laptops to our loan printers. All our laptops are loaded with the appropriate drivers for all our printers. However, there are 4-5 printers of 4 different models. To ensure our laptops will print to the printer available to you please follow the following directions.

- Plug USB cord from the printer into your laptop

- Click on START in the lower left of the Desktop
- Click on Printers and Faxes
- Find the printer logo that has the word READY under its logo. (If none have the word Ready wait a minute and a new logo for your actual printer should appear)
- Right click on the Ready computer
- Click set as Default computer
- Right click again and click on Print test page. If this test is successful you should be able to print.
- Make sure when you try to print, the appropriate computer and copy # appears in the printer selection window.

Another aspect of our loan program involves the use of Vernier's *LabQuest* portable data collection device. It totally replaces our laptops and lab-pro interface. It reduces the space needed to conduct an experiment.



*Vernier LabQuest*

If you have been frustrated in the past when requesting an equipment loan due to the lack of availability of our laptops, we can now offer many more opportunities to provide equipment loans by using the LabQuests. Most Vernier experiments can be conducted using the lab quests. Here is an e-mail we received from one of our teachers after using the LabQuests:

"The Vernier LabQuest is awesome. I sat down with it for about a half hour to figure it out and then we put them to use. The kids picked up on them right away. We had a little trouble figuring out how to do linear regression and some statistics but we played with it for a little and figured out the interface. We wound up using the LabQuest for the simple machines too. Great tool and the kids loved using them." Hopefully the Vernier LabQuest can become an integral part of our Science in Motion program.

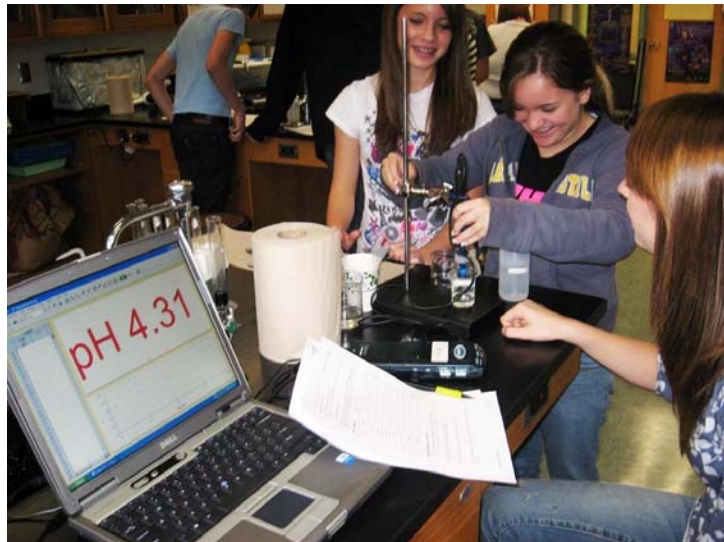
I experienced some wonderful visits during the last month. **Matt Eisley** at **South Williamsport** concluded his wonderful Chemistry week with our *Liquid Nitrogen Demo Day*. It included our series of demonstrations and at the end of the program each student tried a sample of our liquid nitrogen ice cream.

Our crickets were in motion once again. I went on safari on a Sunday to buy crickets at Superpetz in the Hummels Wharf store but they were out of crickets so I had to make the trek to Petco near the Lycoming Mall. I am now the proud owner of a Petco discount card. These crickets then went to my home in Danville, visited **Dan Smith** and his students at **Juniata High School** on Monday, **Allison Spencer** and students at **Berwick High School** on Tuesday and the following week dropped off for a few days with **Alan Zelnick** and his **Line Mountain High School** biology students. In one week the bio van traveled to **Muncy (Petco)**, **Mifflintown**, **Juniata High School**, **Berwick**, **Frackville** and **North Schuylkill High School** (digital microscope pickup), **Hughesville High School**, **Trish Edson's** seventh graders with the *Human Chromosome* experiment and then to **Williamsport High School** for an equipment drop with **Bo Meyer**.

My gratitude to whoever decided to lower the gasoline prices. Have a great holiday season!

## Jaclyn Todd, Chemistry/Physics Mobile Educator Says...

Hello everyone. I hope you all had a wonderful Thanksgiving holiday. I started out this month heading over to **Sunbury Christian High School**. **John Hernandez's** physics students performed the lab *Simple Machines*. In this lab, students use Vernier force sensors to determine the actual and ideal mechanical



*Milton High School students determine the pH level of various household products.*

advantage for various simple machines.

Then I was off to **Milton High School** where the students of **Kathy Bower** performed the lab *Household Acids and Bases*. The students performed a variety of investigations on ordinary household solutions such as ammonia, vinegar and drain cleaner to determine whether they are acidic or basic.

**James Robbin's** students at **South Williamsport High School** used our Spectro-Vis's this month to do the lab *Emission Spectra*. In this lab, students measure and compare the emission spectra of discharge tubes containing gases such as hydrogen, helium and krypton. **Matt Eisley's** students also of

**South Williamsport High School** used the Spectro-Vis's to perform the lab *Spectro-Vis-Beer's Law*. The students use the Spectro-Vis to determine the concentration of an unknown solution by measuring its absorbance and using the slope of the Beer's Law curve. The students also performed the lab *Visible Spectra of Commercial Dyes* where they measure the absorbance of food dyes and compare the spectra of the dyes to that of various commercial drinks and mouthwash products. **Stacey Saxon's Williamsport High School** physics students performed the lab *Static and Kinetic Friction* where they measure the force of static friction using a force sensor and determine the relationship between force of static friction and the weight of an object. They also use a Motion Detector to determine that the coefficient of kinetic friction depends on weight. Her students also performed the lab *Back and Forth Motion* where they use a motion detector to qualitatively analyze the motion of objects that move back and forth. Comparisons are made to catalog objects that exhibit similar motion. Objects analyzed include pendulums, dynamics carts, jumping students, springs, and bouncing balls.

**John Hernandez** brought SIM into his classes again this month to show his **Sunbury Christian High School** students the wonders of our **Starry Night software**. This stunningly realistic software makes it easy to bring the universe into your very own classroom. The software is accompanied by a guide that offers step-by-step exercises, activities, extensions and resources to cover any astronomy lesson. **Danville High School's Deborah Slattery** and **Erica Merriett** utilized our Vernier radiation detectors so her students could perform the lab *Lifetime Measurement*. In this lab, students measure the decay constant and half-life of barium-137. **John Tamblin's** chemistry students at **Hughesville High School** used the Vernier radiation detectors, nuclear shielding materials and radiation sources to perform the lab *Radiation Shielding*. His students used the radiation detectors to study how the radiation emitted by a beta source is absorbed by cardboard. His students also performed the lab *GC of Alcohols*. His students analyzed various compounds using our gas chromatographs to determine their various components. **Bloomsburg Christian's Joshua Greene** utilized an array of SIM's equipment this month to do quite a few labs with his students. His physics students performed the labs *Back and Forth Motion*, *Cart on a Ramp*, *Determining g*

on an Incline, Picket Fence Freefall, Bungee Jump Accelerations, and Projectile Motion. His chemistry students performed the labs *Boyle's Law*, *Pressure-Temperature Relationships in Gases*, and *Vapor Pressure of Liquids*. **Jeremy Lauver** of *Lewisburg* used our Spectro-Vis's this month so his students could perform the lab *Visible Spectra of Plant Pigments*.

Don't forget to check out our website to find the equipment list and available labs.

### **Greg Stout, Mobile Educator Says...**

This past month was very busy, with an abundance of visits for stream monitoring as well as classroom teaching opportunities. In the first two weeks of November, the weather cooperated and I travelled to eight streams to work with each of the School districts in our Chesapeake Bay Commission funded program.

The first week visits were made to **Little Fishing Creek (Bloomsburg Christian School; teacher Joshua Greene)**, **Roaring Creek (Southern Columbia Area High School; Kristen Vitkauskas)**, **Little Mahanoy (North Schuylkill High School; John Slotterback)** and **Miller's Run (Loyalsock Township High School; Sarah Puderbach)**. Students learned how to perform physical and chemical water quality tests on site and also collected water for eventual inorganic analyses at DEP's Harrisburg laboratory.



*Flow rate measurement of Miller's Run by Loyalsock Township students and teacher, Sarah Puderbach (right).*



*Conductivity (left) and pH analyses (right) of Limestone Run Stream water by Milton High School students.*

The second week I travelled to **Limestone Run (Milton High School; Karen Avery)**, **Little Shamokin Creek (Shikellamy High School; Mary Dahlmann)**, **Shamokin Creek (Shikellamy High School; Sheila Furr)** and **Ten Mile Run (Central Columbia High School; Greg Laubach)**. Students from all of these schools did a fabulous job of collecting their own data as well as water samples for analyses by the DEP. Once results are received back from the DEP lab, this data is posted on our SIM webpage. To see what these students are doing, go to <http://www.susqu.edu/sim/WaterQuality.htm>.

Switching now to regular SIM visits, I started out with a visit to **Tri-Valley High School** where teacher **Pam Ulicny** and I worked with her students determining the water quality of two local streams. We selected four analyses from Vernier's Water Quality manual and determined water quality indices of these streams based on our results. Next I was off to **Selinsgrove High School** where I worked with **Paulette Armbruster**, her

student teacher **Sara Bylen** and their students experimenting with Vernier's *Photosynthesis and Plant Pigments* labs.



*Teacher, Bob Hartman, and Shamokin High School students discussing Photosynthesis and respiration lab results.*



*Selinsgrove High School students conducting Vernier's transpiration lab using a Chrysanthemum.*

In mid-November I journeyed to **Shamokin High School** and we looked at Photosynthesis using a different Vernier lab, their *Photosynthesis and Respiration* lab. Teacher **Bob Hartman** and I used baby spinach leaves to show his Biology students the changes in CO<sub>2</sub> levels based upon which of these biological processes was occurring. Then I was back to **Selinsgrove High School** where we conducted Vernier's *Transpiration* experiment (Bio lab #10) on some beautiful Chrysanthemums purchased locally.

Before the month ended I was also able to prep some labs for drop-off. The first drop was Bio-Rad's *Genes in a Bottle* to **Selinsgrove High School (Armbruster/Bylen)**. I also again prepped both of the above mentioned Vernier Photosynthesis labs (Vernier 7 and 31B) for drop off to **Lewisburg High School** teachers **Jeremy Lauver** and **Brandi Spotts** to educate their students on the wonders of Photosynthesis! Mr. Lauver was assisted by student teacher **Madge Schworer**, well known to us here at SIM. (Go Madge!!)

As Dr. Thomas mentioned earlier, I still have available visit dates for this semester. And if you need a Biology drop, please feel free to contact me to arrange that.

## Experiment of the Month

### *Transpiration*

The Experiment of the Month highlights Biology with Vernier Experiment #10. Water is transported in plants, from the roots to the leaves, following a decreasing water potential gradient. *Transpiration*, or loss of water from the leaves, helps to create a lower osmotic potential in the leaf. The resulting transpirational pull is responsible for the movement of water from the xylem to the mesophyll cells into the air spaces in the leaves. The rate of evaporation of water from the air spaces of the leaf to the outside air depends on the water potential gradient between the leaf and the outside air.

Various environmental factors, including those conditions which directly influence the opening and closing of the stomata, will affect a plant's transpiration rate. This experiment will measure transpiration rates under different conditions of light, humidity, temperature, and air movement. The data will be collected by measuring pressure changes as the plant takes up water into the stem. Vernier's gas pressure sensor is used to measure these changes.



*Transpiration experiment measuring effect of increased air flow and temperature.*

Vernier suggests using plants with numerous leaves such as tomato, strawberry, bean, geranium, cyclamen and honeysuckle. As mentioned earlier in this newsletter, we at Science in Motion have had some experience using Mums. We have used those at this time of year, when the plants listed above may be hard to locate.

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