

SciMo Says

**The Newsletter for Science in Motion at Susquehanna University
Volume VIII Issue 8 April 2009**

Dr. Courtney Thomas, Director Says...

SIM would like to thank **ConAgra Foods in Milton PA** for the **science equipment donation** on March 2, 2009. SIM as well as the SU biology and chemistry departments received much needed science equipment and supplies from ConAgra. To see photos and a list of items, please visit the SIM website at www.susqu.edu/sim/support. Thank you again for the generous donation!



*Greg Stout and Dr. Courtney Thomas, SIM and Joe Carlson,
ConAgra Consultant.*

We are almost ready for our **SIM Capitol Day on Tuesday April 21, 2009**. All twelve SIM sites will have displays in the East Rotunda. A SIM press conference from the Capitol will be broadcast on PCN.

This summer we are planning a **SIM STEM Summer Workshop on Monday June 15 – Friday June 19, 2009**. Please complete and send the attached reservation form to SIM if you are interested in attending. We are **looking for teachers willing to give 1 hr long lectures or demos** on how to incorporate **STEM** into your classes.

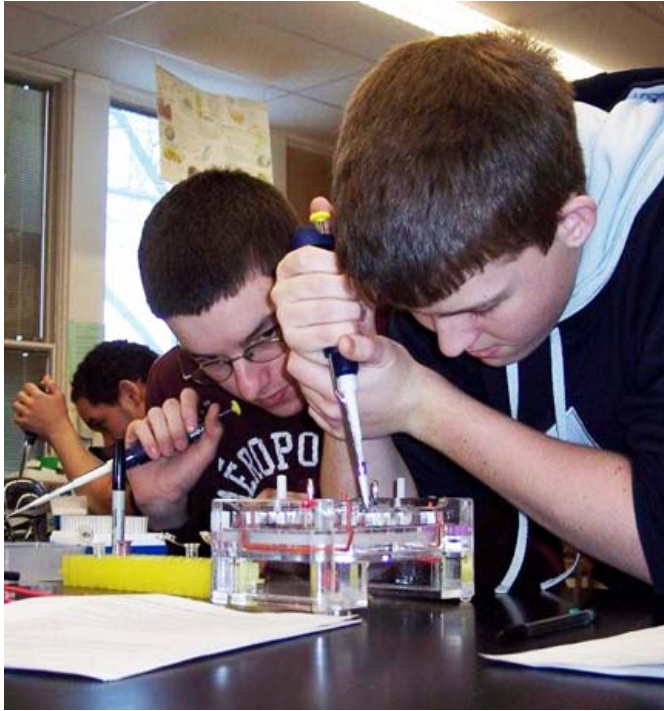
Presenters will receive \$100. Anyone who has recently attended a workshop on STEM education would definitely have information to share. Please e-mail me at thomasc@susqu.edu if you are interested in presenting.

Currently there is **no 2009-2010 funding for SIM in the state budget!** So, what can you do? Let your legislators know that funding for SIM is important! **Write your legislators and send a copy to SIM.** The length of your letter is not important, however, the volume of letters legislators receive could help restore SIM program funding to the budget. If you have already written your legislators, thank you so much. Please help us continue to serve you!

Madge Schworer, Biology Mobile Educator Says...

As always, the Bio van has been very busy. I visited **Pam Ulicny** at **Tri-Valley Junior-Senior High School** with *Gram Stain* for the Environmental Science classes and *What's Fishy about Evolution* for the Academic Biology class. **Donna Wood** at **Danville High School** brought *Photosynthesis and Respiration* to her Biology classes. Adjoining rooms made a double *Crime Scene Investigation* possible for teachers **Greg Laubach** and **Dana Hock** at **Central Columbia High School**. We had a very busy but fun week

doing Hair Analysis, Fabric Analysis, Fingerprinting, Blood Typing, and DNA Fingerprinting solving our crime. At **Selinsgrove High School**, **Paulette Armbruster's** Biology classes studied rates of *Photosynthesis* by following the change in DPIP using Vernier colorimeters. The same students extended their study using the *Plant Pigment Chromatography* lab. I was then back to **Danville High School** with



Bloomsburg Biology students carefully load crime scene samples onto agarose gels for electrophoresis.



North Schuylkill biotechnology student removes PCR samples from the thermal cycler.

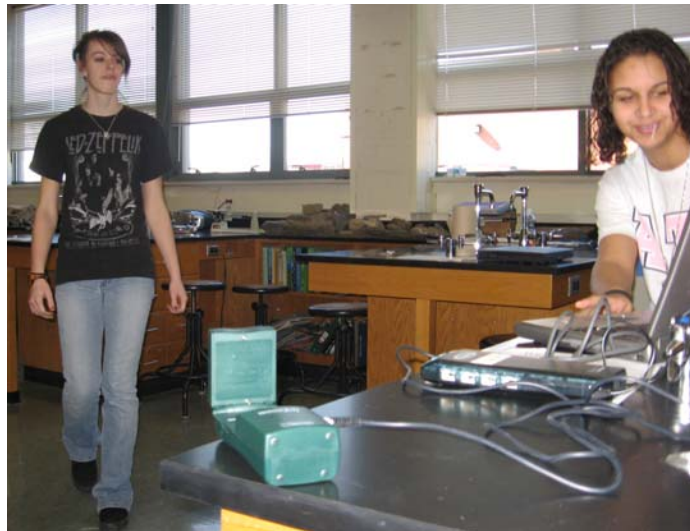
Sonia Crane to do the *GMO PCR* lab with the AP Biology students and *pGLO: Bacterial Transformation* and *Lambda DNA Restriction Fragment Electrophoresis* with the Honors Biology classes. At **Bloomsburg High School** it was *Crime Scene Investigation* time for **Jim Perry's** Honors Biology and Biology classes. Finally for this newsletter was a trip to **North Schuylkill Junior-Senior High School** with *Crime Scene PCR* for the Genetics and Biotechnology class taught by **John Slotterback**. These students were doing electrophoresis for a second time in the analysis of this lab and their confidence was quite apparent and rewarding. Thanks to all the students this month for their interest and cooperation. You made a busy schedule rewarding and fun for all.

SIM equipment went out to many schools this month. **Donna Wood** at **Danville High School** borrowed *Ninhydrin Fingerprinting* for the Forensics class and *DNA Extraction* for her Biology classes. **Greg Stout**, student teaching at **Selinsgrove High School** with **Clint Miller**, borrowed the *pGLO: Bacterial Transformation* lab for the Biology students. **Angela Gockley** at **Lewisburg High School** borrowed colorimeters and **Bo Meyer** at **Williamsport** borrowed a heat block for student labs. Finally **Jen Gurski** at **Shikellamy High School** used the digital microscopes for her own Biology crime scene.

I am looking forward to a full spring visit schedule. Between loans and visits, we are certainly making good use of Science in Motion equipment and personnel this season. Thanks for the support that you all give to the program.

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

Hi everyone! I hope your year is progressing well and you are finding Science in Motion helpful in your classrooms. I began my month with a visit to **Jocelyn Bailey's** physics students at **Milton High School**. The students performed the lab *Graphing Motion* where they use our Vernier Motion detectors to analyze and graph their own movement. They predicted position vs. time as well as velocity vs. time graphs for their motion and then tested their predictions.



Milton High School students use a motion detector to graph their own motion.

Carol Hoagland's Millville High School physics students used our dynamics tracks and carts to use this month to perform the lab *Impulse and Momentum*. In this lab, the students measure a cart's momentum change and compare it to the impulse it receives. In addition, they performed the lab *Momentum, Energy and Collisions*. In this lab, students measure the energy changes that occur as carts collide. They classify the collisions as elastic, inelastic or completely inelastic.

South Williamsport High School chemistry students of **Matt Eisley** performed the lab *Beers Law*. The students use a Vernier Spectro-Vis to measure the absorbance values of standard solutions they have prepared and then use their results to determine the concentration of an unknown solution copper (II) sulfate solution.

Lisa Strouse brought SIM into her chemistry classes at **Hughesville High School** this month. We did the lab *Endothermic and Exothermic Reactions*. The students observed and took temperature readings for the chemical reaction between citric acid and baking soda as well as for hydrochloric acid and magnesium. They were asked to evaluate which was an endothermic and which was an exothermic reaction. The students enjoyed the bubbling and smoking of the reactions and most students correctly identified the energy transfer. We also did the lab *Melting and Freezing Points* this month. Her students collected temperature data during the freezing and melting of water using our Vernier temperature probes. They determine the relationship between the freezing and melting temperatures of water by collecting and analyzing the temperature data.



Hughesville High School students collect temperature data.

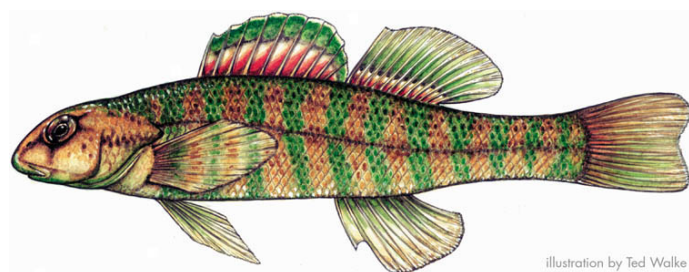
Joshua Greene brought SIM into his **Bloomsburg Christian High School** classrooms this month to perform the Physics CSI lab *The Case of the Clumsy Construction Worker*. In this lab, a construction

worker claims that another construction worker tried to injure him by hitting him with a toolbox. A toolbox slid off the roof of a building, narrowly missing the alleged victim. The alleged victim claims that he saw the co-worker aim and push the toolbox from the top of the roof in an attempt to hit him. The accused attacker claims that the toolbox simply slid off the roof on its own. In this experiment, the students build a scale model of the crime scene and attempt to determine whether the toolbox slid off or was pushed off the roof using trigonometry and projectile motion knowledge. His physics students also performed the lab *Atwood's machine*. The students used our Atwood's machines along with our Vernier photogates to study the relationships between the masses on an Atwood's machine and acceleration. They did the lab *Newton's Third Law* where they are able to observe the directional relationship between force pairs. In addition, the students 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. His chemistry students performed the lab *Household Acids and Bases*. The students perform a variety of investigations on ordinary household solutions such as ammonia, vinegar, and drain cleaner to determine whether they are acids or bases.

Don't forget to get your reservation forms for the remaining days of the spring semester in before it's too late. If you plan to request a drop-off, be sure to get those reservation forms in as well to ensure that you can reserve the equipment. Feel free to e-mail me about any specific days or labs. Hope to see you soon!

Mike McDevitt, Mobile Educator Says...

The red gods of nature have been smiling on the water quality excursions, sunny days, low water levels, and most importantly, no rain. Now that I mentioned that, start a pool as to how long the rainless trips continue. Not all has been perfect, there have been many twenty degree mornings causing frozen flow rate meters, frozen nets, and iced water pumps. But through it all the students and teachers have prevailed. Samples were collected, measurements were made, and a few wonderful observations experienced.



Banded Darter

During March, Science in Motion has been especially busy with water quality visits. The water quality van has visited **Little Mahanoy Creek** in Gordon, PA with **John Slotterback** and his students from **North Schuylkill High School**. It also made a trek to **Little Shamokin Creek** with **Mary Dahlmann** and her students from **Shikellamy High School**. Her students were able to observe ten different types of aquatic insects. On a very cold morning the **Bloomsburg Christian**

School students accompanied **Josh Greene** to **Little Fishing Creek**. During this visit, I encountered my first Banded Darter; **Josh Greene** knew exactly what it was. I never saw one before. What a spectacular little fish. The above photo doesn't do the critter justice. I have fished, boated, kayaked, or fallen into every stream or lake in Central PA but had never seen a Banded Darter before. It is a four inch fish with brilliant teal and orange coloration, quite a treat (not the food item type of treat). Keeping with the critter theme, **Greg Laubach** and his student's from **Central Columbia High School** on a recent water quality trip were fortunate to view a mink hunting along **Ten Mile Run** near Mifflinville, PA.

As promised the crickets were again on tour. First, they were introduced to **Pam Ulicny's** biology students at **Tri-Valley High School**. Her menagerie was eyeing the crickets, but I was able to return them to the Science in Motion office unscathed. The following week the *Cricket Respiration* experiment was performed

by Paulette Armbruster's biology students at Selinsgrove High School. This time the crickets were also introduced to some frogs and turtles in Clint Miller's biology lab at Selinsgrove. Hopefully a few more cricket experiments will pop up during trout season in May. Jeremy Lauver's students at Lewisburg High School took advantage of a Science in Motion equipment loan to perform our *Plant Transpiration* experiment. I provided him with several plants. I cannot wait to learn which variety worked best.

Have a great Easter vacation everyone.

Experiment of the Month

Picket Fences

The physics experiment of the month features our new Vernier Picket Fences. The lab is #5 in the Vernier Physics with Computers manual and is called *Picket Fence Free Fall*.

We are all aware that the only force acting on an object in free-fall, disregarding any air resistance, is the Earth's gravitational force. We also know that this gravitational force is constant near the surface of the Earth. We designate this acceleration as g , otherwise known as the acceleration due to gravity on Earth. We must be sure that our physics students also have this crucial knowledge. There are a variety of ways to measure g . This lab offers an extremely precise and efficient way to teach this concept. The lab materials will be used to accurately measure the acceleration of a freely falling object. The freely falling object is called a picket fence.

The picket fences are long rectangular plastic bodies with alternating black and clear bands. The acceleration of the picket fence is measured using Vernier photogates. The photogate has a beam of infrared light traveling from one side to the other. The photogate can detect whenever this beam is blocked. As the picket fence falls freely through the sides of the photogate, the black bands block the infrared light. The computer will measure the time from the leading edge of one black bar blocking the beam to the leading edge of the next one. The timing will continue until the entire picket fence has traveled through the photogate. The students will be given the distance from one edge of a black band to the same edge of the next band. The program will calculate the velocities and the accelerations for this motion and produce graphs. The students will analyze the distance vs. velocity and the velocity vs. time graphs produced to determine g . We will be featuring our new Vernier picket fences as well as this lab at our summer workshop in June.



Picket Fence

A handwritten signature in black ink, appearing to read 'Courtney Thomas'.

Courtney Thomas, Ph.D.
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