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BREAKTHROUGH DATA-COLLECTION TECHNOLOGY



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# The CALIPER



THE CALIPER IS A PUBLICATION FOR USERS OF VERNIER PRODUCTS

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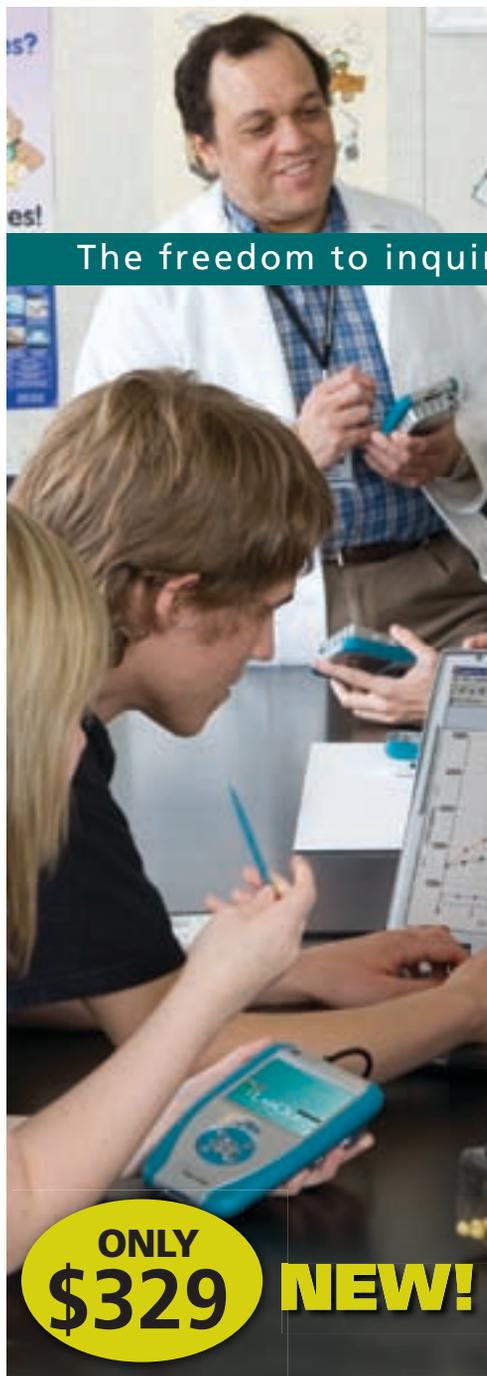
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The freedom to inquire. The technology to excel.



Before the first Vernier LabQuest shipped to customers, we decided to test the product with real science experts—the students at the School of Science and Technology in Beaverton, Oregon.

Within five minutes, students were collecting data in real time, navigating the LabQuest App effortlessly with the stylus, and seeing their graphs displayed on its sharp color screen.

Hector Morales, a chemistry teacher at the School of Science and Technology, led the students through an acid-base titration using a pH Sensor, a Vernier Drop Counter, and the new Vernier LabQuest.

According to Mr. Morales, "Once the students had a LabQuest in their hands, they were able to explore the menus and options very easily. It was intuitive to them, and they had fun. As a teacher, it allowed me to spend more time actually answering questions about the experiment itself, and it let me concentrate on the science they were learning."

What were the students' favorite features?

- The colorful graphs on the touch screen
- Built-in graphing and analysis software
- Features such as curve fit, linear fit, and statistics
- On-board applications, including stopwatch, periodic table and scientific calculator
- Built-in microphone for voice annotations
- On-board lab instructions and a place to write experiment notes

According to one of Morales' students, "I liked the fact that we could actually see the rate of change occur as we were doing the experiment. And with the periodic table and built-in calculator, we had everything we needed."

**ONLY \$329 NEW!**

See a short video of LabQuest in action at the School of Science and Technology in Beaverton, Oregon at:

**[www.vernier.com/labquest](http://www.vernier.com/labquest)**

More product details on pages 6-7.

# NEW Introducing engineering.vernier.com



Vernier Software & Technology continues to provide leadership on products and solutions for engineering educators. And now we are pleased to introduce a new web site with a sole focus on engineering education at <http://engineering.vernier.com>

Our recent work in engineering education includes providing LabVIEW examples for our interfaces, collaborating with National Instruments to develop the SensorDAQ™ interface,

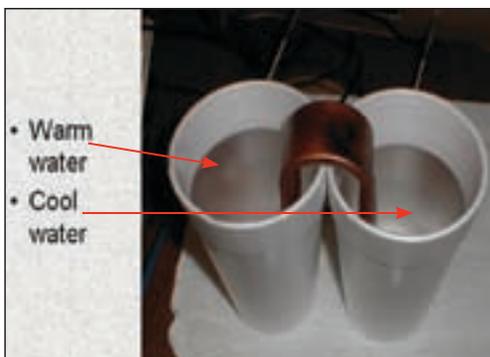
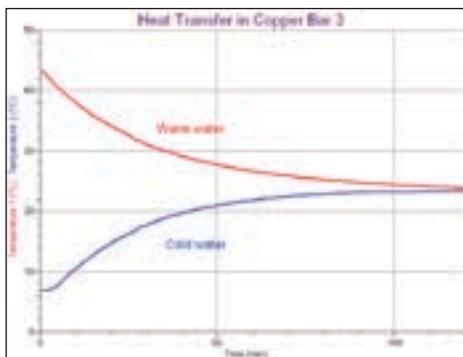
and collaborating with LEGO® to develop our NXT Sensor Adapter. This new web site is the next step in our continued effort to support engineering instructors, STEM educators, and NXT users.

Go to <http://engineering.vernier.com> to find over 50 sensors, explore interface options such as the SensorDAQ, view sample engineering experiments and activities, download sample LabVIEW code, and watch movies of the LEGO NXT being used with Vernier sensors.

Engineering education in the United States is currently facing a challenge. Our new site demonstrates our commitment of facing this challenge and providing the tools required by engineering educators.

## Heat Conduction

Bernard Zalewski from Marianist Province USA sent us some information on how he uses our Go!Temp to do experiments on thermal conductivity. He uses several different metals. Here are some of his results.



Heat transfer in copper bar 3

## GREAT IDEAS FOR PHYSICS

As usual, there have been a lot of great ideas for using our sensors in the recent science teacher journals:

“Using a Digital Camera As a Measuring Device,” by Salvador Gil, Henán D. Reisin, Eduardo E. Rodríguez, in the September 2006 issue of *American Journal of Physics*, includes several ideas for doing physics by analyzing photos of water trajectories, hanging chains, and shadow lines. The analysis could be done with *Logger Pro*.

Michael C. LoPresto, Henry Ford CC, Dearborn, MI, has written several interesting articles about the physics of music. He uses our microphone and *Logger Pro* to study the sounds. Here are some references: “Experimenting with Woodwind Instruments,” in the May 2007 issue of *Physics Education*; “Experimenting with Musical Intervals,” in the July 2003 issue of *Physics Education*; and “Experimenting with Brass Musical Instruments,” in the July 2003 issue of *Physics Education*.

## NEW NXT Sensor Adapter

Get ready to supercharge your LEGO NXT projects. This fall we will be offering an NXT Sensor Adapter. Now you can create NXT robotic projects using over 40 of our analog sensors, including accelerometers, pH, Current, UV, Gas Pressure, Soil Moisture, Voltage, and Force sensors, to name just a few.



Not only does the NXT Sensor Adapter open up a whole new world of control projects, it creates a new, fun way to introduce standard science concepts. Some examples of the robots that we have created with our sensors include:

NXT Sensor Adapter  
Order Code  
**BTA-NXT | \$39**

- A robot that hunts down an acidic solution with a pH Sensor.
- A robot that ventures out into the sun with a UV Sensor to find the best sunscreen.
- A robot that waters house plants when a Soil Moisture Sensor reading dips too low.

We are very excited about the endless possibilities for incorporating science, control, and engineering into your NXT projects using this new interface and Vernier sensors. For more information go to [www.vernier.com/nxt](http://www.vernier.com/nxt) or <http://engineering.vernier.com>

## SCIENCE HUMOR

by Dave Vernier



When you think of Albert Einstein, you probably do not think of humor, but here is a funny story from the great new biography, *Einstein, His Life and Universe*, by Walter Isaacson. Einstein has often been said to have been slow in developing his verbal skills, but this story shows that by age three, he could make some quite witty comments.

When Albert was shown his new sister for the first time, he was led to believe that she was like a wonderful toy that he would enjoy. His response was to look at her and exclaim, “Yes, but where are the wheels?”

## NEW Vernier Cart Friction Pad and Cart Fan

After working hard to make our dynamics carts very low friction, we've now added some friction back, so that you and your students can study friction in a controlled way. Add a Cart Friction Pad to your Vernier Dynamics System, and watch the carts move under very consistent friction force. Here's a graph showing the uniform acceleration due to the pad: The cart was at rest initially, given a nudge, and it then slowed to a stop. Setting the friction amount is as simple as turning a knob.

Several Physics Education Research-informed curricula make use of fans to study motion under a constant force. We now have a two-speed Cart Fan. Attach the fan to a cart, and monitor the cart position with a Motion Detector. You can get a beautiful parabolic position vs time graph. Both the Fan and Pad attach to a Vernier Cart using the supplied magnets, so they are easy to attach and remove.

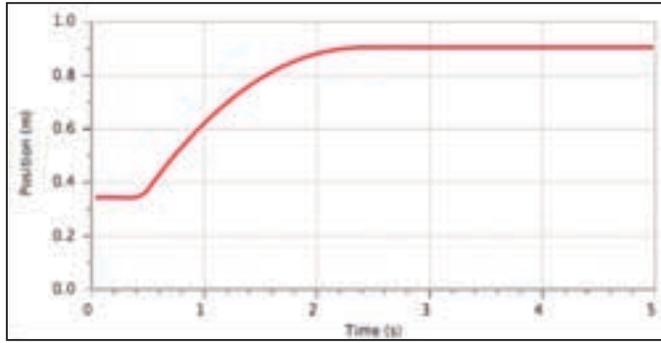


Friction Pad with Vernier Cart

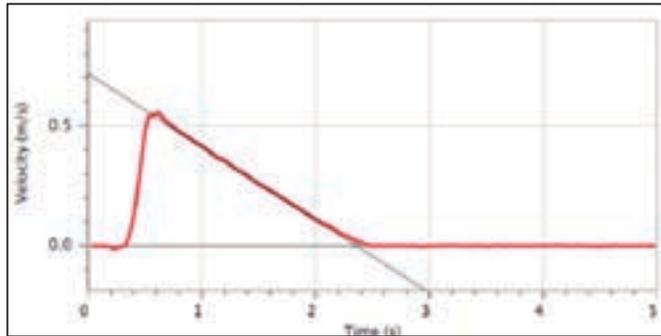
**Friction Pad**  
Order Code PAD-VDS | \$30



**Cart Fan**  
Order Code FAN-VDS | \$60



Position graph of a cart with friction

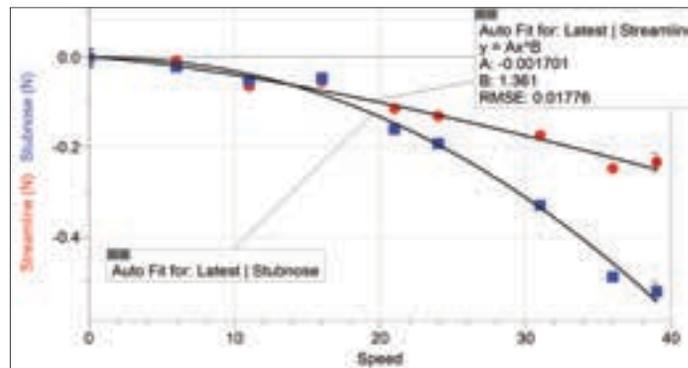


Velocity graph of a cart with friction

## What a Drag!

A customer recently called asking for ideas on aerodynamic drag experiments. This inspired us to do a little research with toy cars on the roof of a car. We mounted two toy carts: one streamlined, and one not as aerodynamic. They were connected so that our Dual-Range Force Sensor would measure the drag force on them as we drove them along through the air. Our team of investigators included a driver, a computer operator, and someone to yell out the speedometer readings. We collected Events with Entry data using Logger Pro. We tried to find a level stretch of road, and we

used a new feature of Logger Pro 3.5 that allowed us to do a 10-second sample of the average force for each reading. There are several sources of error, such as road vibration, changes in the road grade, wind, and the driver sometimes not holding the speed constant for the 10 seconds. Even so, the data pretty nicely show that the drag force is proportional to the square of the velocity, and that the more aerodynamic car had less drag.



Drag force vs speed for two cars



Two cars connected to Dual-Range Force Sensors to measure drag force



More innovative uses for engineering & physics:  
[www.vernier.com/innovate/](http://www.vernier.com/innovate/)

engineering & physics

# Improved CO<sub>2</sub> Gas Sensor Allows for Studies of Human Respiration

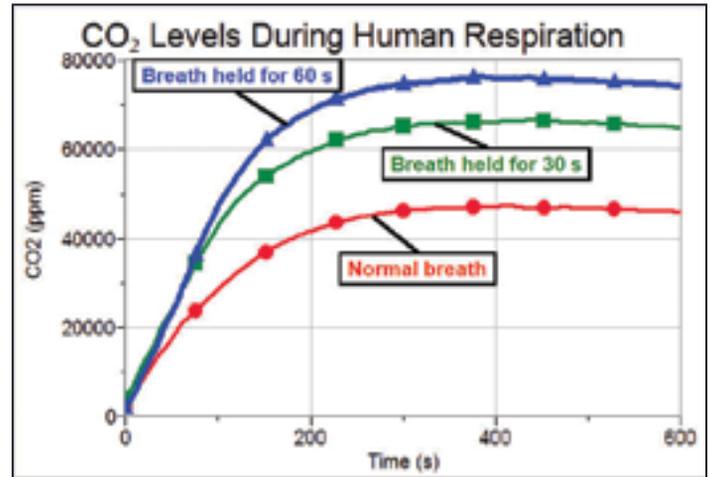
We all know that when you inhale, some of the oxygen gas in that breath is converted into carbon dioxide gas and then exhaled. But how much CO<sub>2</sub> gas is produced? Would more CO<sub>2</sub> gas be produced if you held your breath before exhaling? We used our new CO<sub>2</sub> Gas Sensor on its high-range setting and a BioChamber 250 to answer these questions.

First, a normal breath was exhaled through the neck of the BioChamber 250, filling the chamber. A #6 rubber stopper was placed in the top vent and a CO<sub>2</sub> Gas Sensor was placed in the neck, as shown.

Data collection was initiated with the results shown. This normal breath produced a CO<sub>2</sub> gas concentration of around 48,000 ppm. For the second run, the subject held her breath for 30 seconds prior to exhaling into the chamber. A CO<sub>2</sub> gas concentration of 65,000 ppm was measured. The final run, with the subject holding her breath for 60 seconds, produced a CO<sub>2</sub> gas concentration of 76,000 ppm. Clearly, more CO<sub>2</sub> gas was being produced the longer she held her breath. Was the oxygen gas being consumed in the same way? She'll have to get out her Vernier Oxygen Gas Sensor and start experimenting!



CO<sub>2</sub> Gas Sensor in a BioChamber 250



Logger Pro data of human respiration

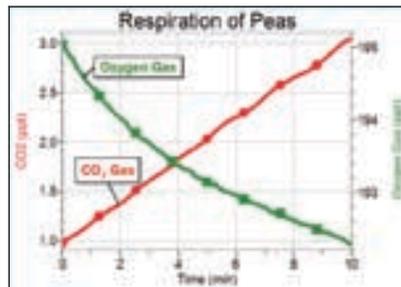
## BioChambers Enhance Experimentation

Many of you have used our CO<sub>2</sub> Gas Sensors to study the respiration rate of germinating peas. Now, with the BioChamber 250, it is easy to connect an O<sub>2</sub> Gas Sensor simultaneously as shown below. Simply soak some peas for a few hours and place them in the chamber. Connect the two sensors and begin data collection. The graph below shows the impressive results, utilizing Logger Pro's capability of adding a second y-axis on the right side.

The BioChamber 2000, the 2 liter version shown below, opens the door to an unlimited variety of experiments with its larger volume and easy-access lid.



Two sensors in BioChamber 250



CO<sub>2</sub> and O<sub>2</sub>



Two sensors in BioChamber 2000

CO<sub>2</sub> Gas Sensor  
Order Code **CO2-BTA** | \$249

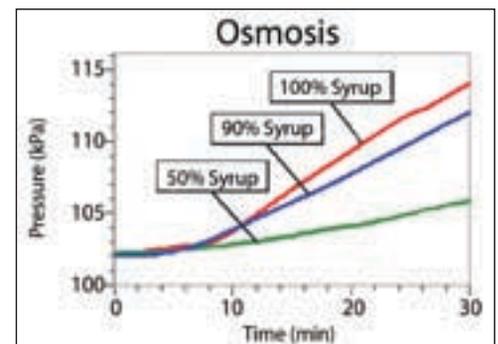
O<sub>2</sub> Gas Sensor  
Order Code **O2-BTA** | \$186

BioChamber 250  
Order Code **BC-250** | \$5

BioChamber 2000  
Order Code **BC-2000** | \$15

## Osmosis Experiment

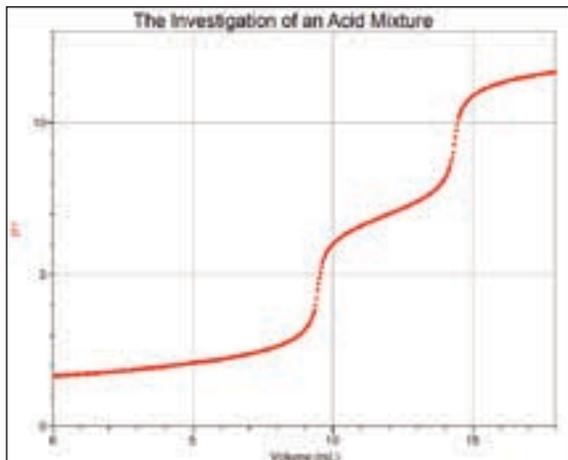
Finding examples of osmosis for the biology laboratory that can be manipulated to promote inquiry, offer relatively quick results, and are easy to set up have been hard to come by. A new osmosis investigation has been developed by Mike Collins, one of our staff biology teachers, that helps students understand this essential concept of cell homeostasis. Using a Vernier interface, a Gas Pressure Sensor, and various concentrations of maple syrup, this key biological concept "swells" to life. To download the complete set of instructions, visit [www.vernier.com/innovate/innovativeuse80.html](http://www.vernier.com/innovate/innovativeuse80.html)



Osmotic pressure response to varying concentrations of maple syrup

## Investigating an Acid Mixture

An interesting and challenging problem for AP Chemistry students is the investigation of a mixture. We have a great chemistry experiment available in which the student analyzes a mixture of hydrochloric acid and phosphoric acid. This lab presents the student with the task of conducting a seemingly routine acid-base titration. However, the student must analyze the titration data to determine how much HCl and how much  $H_3PO_4$  were mixed. As an added bonus, the student will determine the  $K_{a2}$  of  $H_3PO_4$ . This lab is available to download at [www.vernier.com/innovativeuse81.html](http://www.vernier.com/innovativeuse81.html)



Logger Pro data of an acid mixture

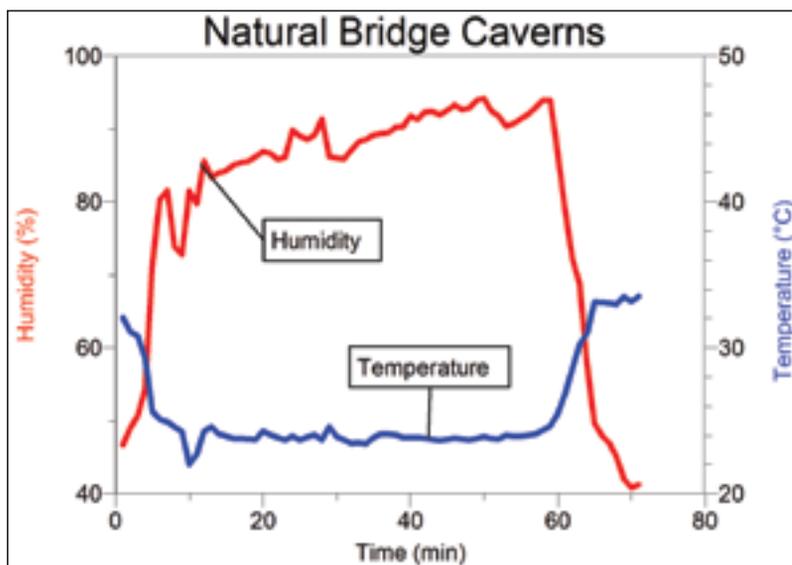


More innovative uses for biology & chemistry:  
[www.vernier.com/innovate/](http://www.vernier.com/innovate/)

## Natural Bridge Caverns

We recently attended the GLOBE annual conference in San Antonio, TX, where Vernier sponsored a field trip to Natural Bridge Caverns, a limestone cave. Sixty teachers made their way through the wet, drippy tour of the caverns and collected relative humidity, temperature, and barometric pressure data along the way. Due to the recent, heavy rains in the region, the water in the cavern rose high enough to measure the pH of the water in the aquifer.

Five Vernier sensors meet GLOBE Program specifications: Relative Humidity Sensor, Stainless Steel Temperature Probe, pH Sensor, Conductivity Sensor, and Dissolved Oxygen Sensor. For more information visit [www.vernier.com/partners/globe.html](http://www.vernier.com/partners/globe.html)



Data collected during the GLOBE conference field day

20, 15, & 5  
 years ago  
 The **CALIPER**

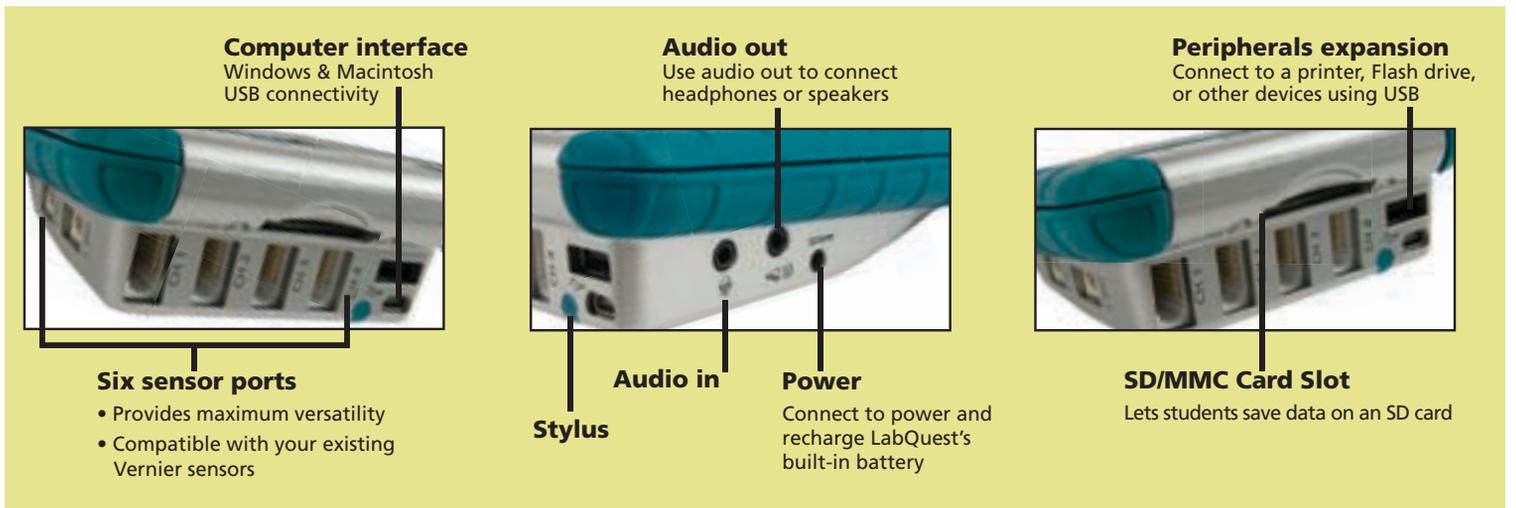
Vernier Software & Technology started out as a physics company, but over the years we have gradually developed sensors and curricula for many different science areas. Old issues of the *Caliper* show that 20 years ago, Fall 1987, we announced our first sensor designed specifically for chemistry—a pH sensor. Fifteen years ago, we announced our first probe designed specifically for biology, a Heart Rate Monitor. Five years ago, we announced our first Earth science book and UV sensors.

biology & chemistry

- Introducing the most powerful and intuitive interface for science education.
- Engage your students with hands-on science in your classroom or in the field.
- Take the LabQuest product tour, watch a video demonstration with Dave Vernier, or see a short video of LabQuest in action in the classroom.
- [www.vernier.com/labquest](http://www.vernier.com/labquest)

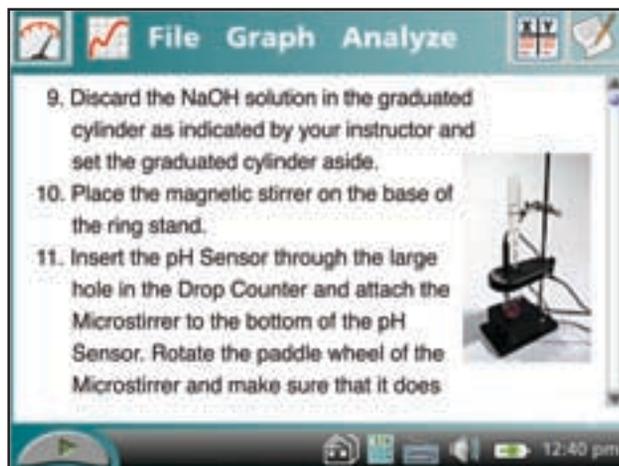


Order Code  
**LABQ | \$329**





Lab 7 Photosynthesis from *Biology with Vernier*



More than 50 on-board labs included

## Print Directly from LabQuest



Did you know that LabQuest can print directly to most HP printers? Simply connect the printer to the LabQuest with a standard USB cable and choose Print from the file menu. Choose full-color or grayscale, and you'll get a full-size print in moments.

# Vernier Lab Books Are Ready for LabQuest

Written by science teachers, each of our lab books guides you through core science experiments. The updated books contain a printed version of the student computer instructions and teacher information pages that cover data collection on all platforms. The CD that accompanies each book includes the word-processing files for the student experiments for data collection using LabQuest App, Logger *Pro*, EasyData and DataMate (for calculators), and Data Pro (for Palm handhelds). Each lab book is \$45.



**Biology with Vernier**  
(Order Code BWV)  
31 experiments



**Chemistry with Vernier**  
(Order Code CWV)  
36 experiments



**Physics with Vernier**  
(Order Code PWV)  
35 experiments



**Water Quality with Vernier**  
(Order Code WQV)  
16 tests



**Middle School Science with Vernier**  
(Order Code MSV)  
38 experiments



**Earth Science with Vernier**  
(Order Code ESV)  
33 experiments



**Advanced Chemistry with Vernier**  
(Order Code CHEM-A)  
35 experiments



**Physical Science with Vernier**  
(Order Code PSV)  
40 experiments



**Investigating Environmental Science through Inquiry**  
(Order Code ESI)  
35 experiments

Find out more about our lab books at  
[www.vernier.com/books](http://www.vernier.com/books)

## LabQuest Update

With LabQuest shipping September 15th to our customers who pre-ordered, the wait is almost over. Due to the overwhelming popularity of LabQuest, those ordering now will be receiving their LabQuest order in late October. We'll do everything we can to get a LabQuest into your hands as quickly as possible.

Go to [www.vernier.com/labquest](http://www.vernier.com/labquest) to take a product tour, look for free workshops in your neighborhood, and find up-to-date information on LabQuest availability.



Collecting temperature, dissolved oxygen, and flow rate data

## NEW Investigating Environmental Science through Inquiry

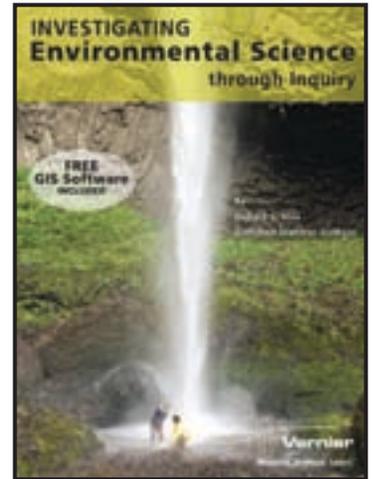
by Donald L. Volz and Gretchen Stahmer DeMoss

Available in October 2007

This new lab book contains 35 inquiry-based, environmental science investigations. Each experiment includes a preliminary activity, teacher information, sample researchable questions, and sample data. Labs are correlated to AP and IB standards. Topics covered include:

- Earth Systems and Resources/Air and Water
- Earth Systems and Resources/Soil
- The Living World
- Global Change and Population
- Energy Resources and Consumption
- Pollution

These experiments are based on recommendations from the National Research Council report, "Learning and Understanding: Improving Advanced Study of Mathematics and Science in U.S. High Schools" (2002) and leading inquiry-based learning experts.



Order Code ESI | \$45

### Did you know?

All IB Group 4 experimental science courses will require students to use sensors for data logging in an experiment and software for graph plotting starting with examinations in 2009.

## Scientific Inquiry

by Donald L. Volz, recently retired teacher and author of *Investigating Environmental Science through Inquiry*

The National Science Teachers Association (NSTA) Position Statement on Scientific Inquiry, adopted by the NSTA Board of Directors in October 2004, is a concise and informative document concerning scientific inquiry. The position statement can be seen at [www.nsta.org/positionstatement&psid=43](http://www.nsta.org/positionstatement&psid=43) Parts of the document are included below.

"The National Science Teachers Association (NSTA) recommends that all K-16 teachers embrace scientific inquiry and is committed to helping educators make it the centerpiece of the science classroom. The use of scientific inquiry will help ensure that students develop a deep understanding of science and scientific inquiry."

"Regarding students' abilities to do scientific inquiry, NSTA recommends that teachers help students:

- Learn how to identify and ask appropriate questions that can be answered through scientific investigations.
- Design and conduct investigations to collect the evidence needed to answer a variety of questions.
- Use appropriate equipment and tools to interpret and analyze data.
- Learn how to draw conclusions and think critically and logically to create explanations based on their evidence.
- Communicate and defend their results to their peers and others."

Data-collection technology is a powerful tool that enhances the success of inquiry based laboratory activities. When used in preliminary activities, it helps students to identify questions that can be answered through scientific investigation.

Concerning the second point in the list above, data-collection technology enables students to better conduct investigations and collect data. It also enables them to conduct many new investigations with measurements not previously obtainable in the classroom.



Measuring light level in the forest canopy

The software component of data-collection technology is the most powerful tool available for the analysis and interpretation of data. With its analysis capabilities, this software enables students to draw better conclusions. The software can also serve as a powerful presentation tool as students communicate and defend their results to their peers and others.

The new Vernier lab book, *Investigating Environmental Science through Inquiry*, includes strategies for accomplishing the tasks cited in the NSTA position statement.



## Energy Star Rating for Vernier

Vernier headquarters just received the “Energy Star” rating. Buildings are rated against similar size and use buildings in our area for their energy consumption. The top 25% are eligible for an Energy Star rating. Good indoor air quality and lighting is also required. We received an 86 out of 100 in the ratings. We have mounted our Energy Star plaque next to our LEED-EB Gold plaque near the front entrance of our building.

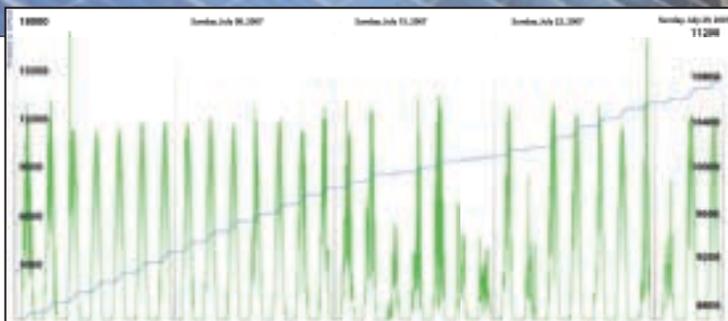


## Vernier Goes Solar

We mentioned in our last newsletter that the Vernier building recently qualified for a LEED-EB Gold “Green Building” rating. As part of that process, we installed 68 solar panels on our roof. You can see a live display of our power production, a camera view, and the weather conditions. You can see graphs of past energy production and weather. You can even download the data in a Logger Pro format. Even though we are in Oregon, with an average of 222 cloudy days per year, we hope to produce over 15,000 kWh of electricity this year. You can check out their production at [www.vernier.com/solar](http://www.vernier.com/solar)



Solar panels on top of Vernier roof with a view of Mt. Hood in the background



Energy and power readings from solar panels

## TI-Nspire™ Handheld and Software



TI has developed a new line of products called TI-Nspire. This product line includes handhelds and software that provide teachers with flexibility and versatility to meet different needs in the math classroom. These new learning products allow students to

- See algebraic, graphical, geometric, numeric and written representations of a problem.
- Link different representations of a problem to see how changes to one affect others.
- Use built-in interactive geometry to enhance the exploration of graphs.
- Enter and review expressions and formulas as seen in a textbook.
- Experience identical functionality between TI-Nspire handheld and TI-Nspire computer software.
- Explore topics from algebra to calculus.

Two different handhelds are available: TI-Nspire and TI-Nspire CAS. TI-Nspire includes a TI-84 Plus keyboard that can be used to replace the standard keyboard that comes with the handheld. This facilitates the transition from the TI-83 Plus and TI-84 Plus families of calculators to TI-Nspire. The TI-Nspire CAS handheld includes built-in CAS (Computer Algebra System) capabilities, which enables students to explore and manipulate mathematical expressions in symbolic form.

Windows versions of TI-Nspire software and TI-Nspire CAS software are available. Visit [www.vernier.com/calc/tinspire.html](http://www.vernier.com/calc/tinspire.html) for more information.



OREGON BUSINESS AWARD



2005 PHILANTHROPY AWARD



FOR OUTSTANDING CONTRIBUTION IN SUPPORT OF EDUCATIONAL EXCELLENCE



INTERNATIONAL AWARD FOR LOGGER PRO SOFTWARE

Logger Pro, Vernier LabPro, Vernier and caliper design, Go!, Logger Lite, Vernier EasyTemp, Vernier EasyLink, Vernier EasyData and Data Pro are our registered trademarks in the United States. Vernier Software & Technology, vernier.com, Vernier LabQuest, DataMate, and Graphical Analysis are our trademarks or trade dress.

All other marks not owned by us that appear herein are the property of their respective owners.

Vernier is proud to be recognized for its philanthropic commitment, steady growth, and as one of the Best 100 Companies to Work For in Oregon—for 8 years in a row.

# FREE Hands-On Data Collection Workshops

Looking for training on the Vernier LabQuest? Join us for one of our free, 4-hour, hands-on workshops to learn how to integrate our computer and handheld data-collection technology into your chemistry, biology, physics, math, middle school science, physical science, and Earth science curriculum. Training will be available with LabPro, TI graphing calculators, and GoLink, along with LabQuest. The workshops include lunch or dinner and lab handouts. Contact us or visit our web site for up-to-date information and registration.

This is a great opportunity for teachers who

- want to evaluate our award-winning data collection technology.
- are new to data collection.
- need a refresher course on their Vernier equipment .
- want to learn from the experts.

Sept 15: Tulsa, OK  
 Sept 17: Fort Worth, TX  
 Sept 17: Oklahoma City, OK  
 Sept 18: Dallas, TX  
 Sept 18: Wichita, KS  
 Sept 19: Waco, TX  
 Sept 20: Austin, TX  
 Sept 22: San Antonio, TX  
 Sept 24: San Antonio, TX  
 Sept 25: Corpus Christi, TX  
 Sept 26: Houston, TX  
 Sept 27: Lincoln, NE  
 Sept 27: Omaha, NE  
 Sept 29: Des Moines, IA

Oct 1: Cedar Rapids, IA  
 Oct 9: St. Louis, MO  
 Oct 11: Evansville, IN  
 Oct 13: Louisville, KY  
 Oct 15: Lexington, KY  
 Oct 16: Newark, NJ  
 Oct 17: White Plains, NY  
 Oct 18: New Haven, CT  
 Oct 20: Hartford, CT  
 Oct 20: Indianapolis, IN  
 Oct 22: Cincinnati, OH  
 Oct 23: Dayton, OH  
 Oct 25: Providence, RI  
 Oct 25: Columbus, OH

Oct 27: Worcester, MA  
 Oct 27: Pittsburgh, PA  
 Oct 29: Boston, MA  
 Oct 30: Portsmouth, NH  
  
 Nov 13: Cleveland, OH  
 Nov 14: Toledo, OH  
 Nov 15: Detroit, MI  
 Nov 17: Grand Rapids, MI  
 Nov 27: Chicago, IL  
 Nov 28: Chicago, IL  
 Nov 29: Milwaukee, WI  
  
 Dec 1: Madison, WI  
 Dec 3: La Crosse, WI

## FREE Hands-On Training at Conferences



Vernier will offer hands-on workshops at each of these conferences. For a full listing of our conference exhibits, check our web site at [www.vernier.com/workshop](http://www.vernier.com/workshop)

- New Jersey Science Convention, Somerset, NJ, October 9-10
- Technology & Learning Conference, Nashville, TN, October 17-19
- NSTA North/Midwestern Area Conference, Detroit, MI, October 18-20
- California Science Teachers Association, Long Beach, CA, October 25-28
- Science Teachers Association of New York State, Ellenville, NY, November 4-6
- Virginia Association of Science Teachers, Williamsburg, VA, November 8-10

- NSTA Western Area Conference, Denver, CO, November 8-10
- Conference for the Advancement of Science Teaching (CAST), Austin, TX, November 15-17
- National Association of Biology Teachers, Atlanta, GA, November 28- December 1
- NSTA Southern Area Conference, Birmingham, AL, December 6-8



More information on summer workshops at [www.vernier.com/workshop](http://www.vernier.com/workshop)

## Vernier Sponsors Two NABT Awards

Congratulations to the winners of two awards sponsored by Vernier Software & Technology at the 2006 NABT Professional Development Conference in Albuquerque:

- Judy A. Reeves of Baldwin County High School, Bay Minette, AL, was awarded the 2006 Ecology/Environmental Teaching Award.
- Chrissa A. Wright of SUNY Plattsburgh, accompanied by her mentor Dr. Nancy Elwess, was the winner of the Student Poster Competition at the 2006 Four-Year College/University Section Poster Session.

The 2007 winners of both of these awards will be announced this December in Atlanta.

It's not too early to begin planning for 2008, when Vernier will again sponsor these awards. The NABT Ecology/Environmental Teaching Award will be given to a secondary teacher who has successfully developed and demonstrated an innovative approach in the teaching of ecology/environmental science and has carried his/her commitment to the environment into the community. Our sponsorship of this award includes \$1000 toward travel to the 2008 NABT National Convention in Memphis, TN, and \$500 of Vernier equipment. The recipient also receives a plaque to be presented at the NABT National Convention, and a one-year complimentary NABT membership. Nomination deadline is March 15, 2008.

The NABT Four-Year College/University Undergraduate Research Award will be given to the student whose poster covers the best research question, utilizes the scientific method to carry out his/her experimentation, and integrates the teaching and learning of biology either directly or indirectly into their work. The deadline for submission of a Poster Proposal Form will be in July 2008.

Nomination forms are available at [www.nabt.org](http://www.nabt.org)



## 2008 NSTA/Vernier Technology Award

*Deadline for submission is October 15, 2007*

The Vernier Technology Award is your opportunity to be honored for innovative uses of data-collection technology with your students. Seven awards are offered annually—three high school (grades 9-12), two middle school (grades 6-8), one elementary (grades K-5), and one college. The award consists of \$1,000 in cash, \$1,000 in Vernier data-collection

technology, and up to \$1,000 in expenses to attend the 2008 NSTA conference in Boston. For more information or to download an application, visit [www.vernier.com/grants/nsta.html](http://www.vernier.com/grants/nsta.html)



**It's not too late to submit your 2008 entry.**  
**[www.vernier.com/grants/nsta.html](http://www.vernier.com/grants/nsta.html)**



## Toyota TAPESTRY Grants

*Deadline for submission is January 28, 2008*

Toyota Motor Sales, U.S.A. Inc., and NSTA are pleased to announce the 18th Annual Toyota TAPESTRY Grants for Science Teachers Program.

This year, Toyota will offer \$550,000 in grants to 70 to 82 teams of teachers. A total of 50 large grants of up to \$10,000 each will be awarded, along with 20 to 32 mini grants of up to \$2,500 each. Large grant winners will also receive an all-expenses paid trip to the NSTA National Conference in Boston. Mini grant awardees receive a one-year NSTA membership.

The deadline for submission of online mini and large grants proposals is January 28, 2008. For more information go to [www.vernier.com/grants](http://www.vernier.com/grants)

## Best Buy Teach Awards

*Deadline for submission is September 30, 2007*

Best Buy is offering several awards to educators for the use of technology in the classroom. Since 2004, Best Buy Teach Award program has awarded nearly \$14 million to over 5,000 K-12 schools. This year Best Buy will present awards to more than 1,300 schools. Here is a list of the different awards available (Awards are granted in the form of a Best Buy Gift Card or Best Buy spending account.)

- \$2,000 Best Buy Teach Awards for up to 1,300 schools
- \$10,000 will be awarded to up to 50 schools
- \$100,000 will be awarded to 8 school districts

K-12 schools using interactive technology in classrooms are eligible to apply. Schools must be within 50 miles of a Best Buy store to apply. Educators must apply by September 30. The 2008 Teach Award Winners will be announced on February 18, 2008. For more information go to [www.vernier.com/grants](http://www.vernier.com/grants)

professional development