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NEWSLETTER

In the Land of the Rising Sun

By Larry Malone

*You're going to Japan in July?
That's the hottest time of the
year—and it rains all the time.
You'll be steamed! Why are
you going then?*

We (Larry Lowery, Linda De Lucchi, and Larry Malone) were going to Japan in July because that's when the Japan Society for Science

Education (JSSE) was having its 22nd annual meeting, and they were inviting us to present FOSS.

We had met Yasushi Ogura, then a graduate student, and now a researcher of the National Institute for Educational Research in Tokyo, at a National Science Teachers Association convention. He attended a FOSS introductory workshop and became interested in the active-learning philosophy and pedagogical approaches employed by FOSS activities. He and a number of his colleagues in Japan are trying to foresee the future of science education in their country, and they are not convinced that the traditional

Continued on page 2



THE FOSS STAFF BEING RECEIVED AT THE JSSE MEETING. FROM LEFT: HISAKI HITOMI, YASUSHI OGURA, LINDA DE LUCCHI, LARRY MALONE, LARRY LOWERY.

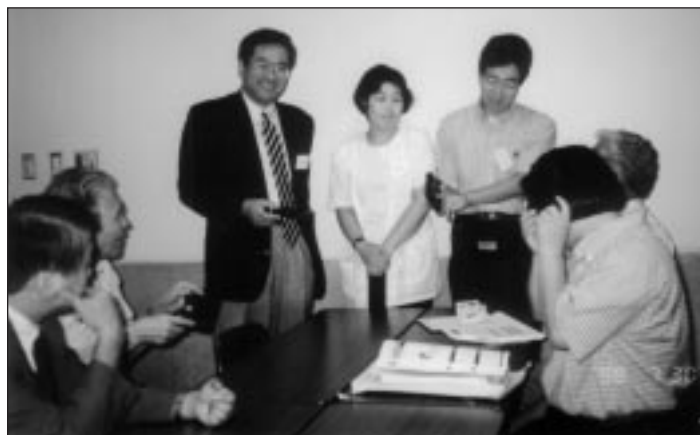
Rising Sun continued

approaches alone will serve in the future.

Ogura readily admitted that Japanese students perform very well on the rigorous national examinations, due in part to the cultural traditions of hard work and honor where academic performance is concerned. But the examinations rely heavily on students' ability to recall facts and names that have been committed to memory. This is shallow mastery of subject matter. And no one is going to be hired to take tests after completing their schooling—they'll be hired to develop new products and procedures, solve problems, and engage in long-term planning for the benefit of the people, the land, and the planet. Ogura and his associates are looking for ways to enhance the science preparation being provided the next generation of Japanese citizens. Ogura thought maybe the FOSS story could provide an infusion of fresh ideas for rethinking science education in Japan.

The JSSE meeting was held on the campus of the Tokyo Gakugei University (est. 1949), one of the leading teacher-training institutions in Japan. About 300 participants from all over Japan attended the three-day meeting. JSSE members are university professors in math, science, and education, graduate students, and others involved in science education. They are active in establishing the standards, courses of study, and learning materials that are used nationwide in Japan. They are the agents of change if change is to happen.

We arrived in Tokyo on Tuesday, July 28, in plenty of time for Larry Lowery's "most honorable lecture" on Thursday. The lecture was the featured general session. Larry spoke,



ATSUSHI YOSHIDA (LEFT) ADDRESSES THE WORKSHOP AUDIENCE.

with the aid of a most skilled interpreter, on the subject of active learning, brain development, and research on instructional methods and educational outcomes. Just about all of the audience could follow Larry's flow of ideas pretty well in English—the study of English is mandatory in Japanese schools—but it was nice to have the interpretation in order to convey the subtler and more technical dimensions of the address.

The second most honorable presentation was given by our colleague, Dr. Floyd Mattheis, Professor Emeritus at East Carolina University, Greenville, NC and one of the original FOSS trial center directors. His presentation at JSSE was entitled "Science Education Reform in the United States as it Relates to Curriculum Research and Development" and provided a forum for an exchange of ideas between educators from Japan and the United States. Floyd is highly respected by the Japan science education community as a result of his 13 study visits to the country since 1977.

On Friday we trotted out the FOSS kits and worked with a full house of 50 participants, again with the benefit of an interpreter (although the materials spoke for themselves in a

universal language that was fully understood by all). After a brief discussion of the FOSS history and philosophy, a summary of the educational/political environment in which it was developed, and the goals for students and society that FOSS strives to attain, we cut to the chase.

I started with Black Boxes from the **Models and Designs Module**. It was a big hit. The concentration and diligence were palpable. And the results were typical—indistinguishable from the models developed by American science educators—

or sixth graders for that matter—around the world. And the reasons for including the activity in the module were absolutely clear to the participants. They enjoyed the challenge, weathered the frustration, seized the opportunities for creative problem solving, and took full advantage of the materials to develop, refine, argue, and revise their models. And the drought stopper stopped them all. The notion of a self-starting siphon was unfamiliar, but intriguing.

Note: Three weeks later one of our hosts, Hisaki Hitomi, was in Berkeley gathering additional science curriculum information for a research project. He brought a wonderful piece of Japanese folk art to us as a gift. It is a cup with a little gnome in the bottom, looking up at the drinker. He is a reminder that a polite guest does not fill his cup 100% full, but rather in deference to the host, fills his cup to only 80%, or possibly 90% capacity. If the guest has the temerity to fill his cup full, he gets a surprise. The entire contents of the cup streams out a hole in the bottom, onto his shirt and into his lap. The



SOME OF THE 50 FOSS WORKSHOP PARTICIPANTS.

cup, like the drought stopper, is a self-starting siphon.

Linda finished the workshop with the **Human Body Module**, demonstrating how an introduction to fundamental body systems can be accomplished with a hands-on approach. And the Mr. Bones assemblies looked very familiar—arms akimbo, lower legs reversed, lumbar vertebrae tried on as neck bones. Again, we were struck by the universality of the approaches people employ around the planet when they work with materials to construct understanding of the natural world.

We had a wonderful time. The participants had a wonderful time. But is that all? We're hoping to continue our dialog with our Japanese science educator friends. There was a mutually expressed sense that as members of two of the most influential countries on the planet, we share some responsibility for helping our citizens attain a substantial level of scientific literacy. Whether the FOSS methods will influence changes in Japanese science education remains to be seen, but we welcome the opportunity to continue the discussions.

During our visit we had an opportunity to participate in the Youngsters Science Festival held at the Japan Science Foundation's Science Museum, located on the grounds of the Imperial Palace in Tokyo. For one week each year the Science Museum is transformed into a hands-on science extravaganza where thousands of students, teachers, and families share in the excitement of science. Many of the exhibit booths are staffed by students who engage the festival participants in interactive science and engineering events. Because of the popularity of the festival, it has been recreated in many other parts

of the country. There really is no equivalent community/school science celebration in the United States.

We did have a few days after the conference to see some of the natural marvels and cultural locations in Japan. One stop in Nikko was the Toshugu Shrine, completed in 1636 to honor the first Shogun, Iyeyasu Tokugawa. Here at the sacred stable we saw a series of monkey carvings representing the "life of a man." One is the famous "hear no evil, speak no evil, and see no evil" icon depicting good advice being delivered from mother to child. It seemed like good advice for curriculum developers, so we took our vow of eternal integrity as we emulated the famous carving. This was just one of countless powerful locations we visited over the next few days.

I would like to recognize several people whose insight, kindness, and generosity made our trip to Japan a memorable life experience. First, Yasushi Ogura who initiated the whole adventure and made many of our arrangements for housing, transportation, and recreation. Thanks to Atsushi Yoshida for guiding us into the center of Tokyo to seek out a Japanese bird identification guide. And thanks to Hisaki Hitomi (and Hiroko) who guided us around Nikko, one of the cultural and scenic gems of Japan. And finally, thank you to Professor Takashi Shimojo, director general of the 22nd annual meeting of the JSSE, for making our visit to Japan a possibility. 🌸



CLOSEUP OF THE "HEAR NO EVIL..." WOODCARVING.



LARRY, LINDA, AND LARRY AT TOSHUGU SHRINE IN NIKKO.

Students Eat Stones and Dirt to Celebrate Science Learning

First graders in Jill Brooks' class at Sarah Adams School in Lake Zurich, Illinois, prepared and ate stone soup and dirt cups for lunch one day and loved it. They were celebrating the culmination of their science unit, Pebbles, Sand, and Silt.

While the food was real, the names given the items were not. The snow-capped dirt cups were actually layers of crushed chocolate cookies, chocolate pudding, gummy worms, and whipped topping. The layers were significant because they simulated the layering of soil samples that the children had studied in this unit.

By integrating the material learned in the science unit with an old folk tale, Stone Soup, the first graders spent the day reading, writing about the process, measuring and preparing the soup ingredients, and continuing their math through problem-solving activities focused on the purchasing of the ingredients.

It must have been a success. As one first grader said at the end of the day, "This has been the best day of my life!" 🌻



Earth Materials in Salem, Virginia

The following letter came to FOSS trainer and consultant, Leigh Agler, from Teresa Auldrige, a fourth-grade teacher in Salem, Virginia.

*...I have taught **Earth Materials** to several fourth-grade classes over the past few years. My favorite **Earth Materials** story is about Patrick H., a student during the 1995-1996 school year. We started to do the **Earth Materials** module right after Christmas break. Because of frequent snow days, we ended up not being in school for more than two or three days at a time. So the module became somewhat fragmented. We did eventually finish **Earth Materials**. I was pleased with the students' performance but not sure how much would stick.*

*In May we were working on a class newsletter which summarized all of the things we had done during the year. Patrick asked if he could write and draw about the **Earth Materials** unit. He was a cute kid with lots of personality but his attention span was not noted for its longevity...I was amazed when he virtually recreated our **Earth Materials** unit in writing and pictures five months after we had sporadically worked on it. The only thing he couldn't remember for sure was whether we tested fluorite or feldspar in the original Scratch Test lesson! Please find enclosed a copy of the first two pages of that newsletter with Patrick's description and a copy of his computer art illustrating the unit. I think you will be as impressed as I was.*

*Sincerely,
Teresa Auldrige*

Auldrige Times

June 1996

MRS. CHITTUM

BY: TIM J. BURNS

MRS. CHITTUM WAS OUR STUDENT TEACHER. SHE WAS WITH OUR CLASS FROM THE 1ST DAY OF SCHOOL UNTIL DECEMBER 14TH. MRS. CHITTUM LIVES IN ROANOKE, VIRGINIA. I ALWAYS SAID THAT I WOULD FIND OUT HER PHONE NUMBER. MRS. CHITTUM IS THE BEST STUDENT TEACHER THERE WAS, IS, AND WILL BE IN THE WORLD.

SHE HAD US WRITE A REPORT ABOUT THE TOPIC "RANDOM ACTS OF KINDNESS". SHE READ US THE BOOKS **A CRICKET IN TIME SQUARE** AND **FUDGE-A-MANIA**. MRS. CHITTUM ALWAYS CHECKED MY WEBS. A WEB HAS 1 CIRCLE IN THE MIDDLE AND HAS LINES GOING OUT TO OTHER CIRCLES ABOUT THE TOPIC. IT IS USED FOR WRITING.

SHE GOES TO RADFORD UNIVERSITY. HER HUSBAND, MATT CHITTUM, WORKS FOR ROANOKE TIMES AND WORLD NEWS.

Next we mashed the piece of the mock rock and put the red and blue pieces in one cup and the sand- like stuff in another cup. After that we put the sand- like stuff in a cylinder and added some water in it and shook it up. Then we let it sit overnight. The next day there was some yellowish green liquid on top of the material.

The next step we did was to pour the yellowish green stuff into a petri dish and let it sit overnight. The next day, in the petri dish the material was dried. It had square shapes with Xs in it. On that day we did observations. Some people guessed that there was sand, salt, and nerds(the candy) in it.

The real ingredients were, red and blue aquarium gravels, pieces of oyster shells, sand, flour, alum, salt, and food coloring.

Scratch Test

Our next activity we did with rocks was the scratch test. When we did the scratch test we used a paper clip, a penny, and our finger nail to scratch calcite, gypsum, quartz, and fluorite to see which one was the softest and hardest.

Acid Test

After the scratch test we did the acid test. This time we put granite, limestone, sandstone, and marble in some acid (cold vinegar) to see which rock has calcite in it. If it bubbles it has calcite

Reports

A couple of days after we got to pick between Taj Mahal, Mt. Rushmore,

Rocks and Minerals

By Patrick Hornby

Mock Rock

In 1996 we learned about rocks and minerals. Our first activity we did with rocks was the Mock Rock. The mock rock is a fake rock that is made with earth materials. In our science groups, we had to draw a picture of our mock rock and study it with a magnifying glass. We could lick the rock if we wanted to to test it.

The next day we split the mock rock so that each partner could have some.

Crayfish—The Maine Event

Late last year I got one of those letters (e-mail actually) I cherish so much. It came right to the point and took the Crayfish Activity in **Structures of Life** to task.

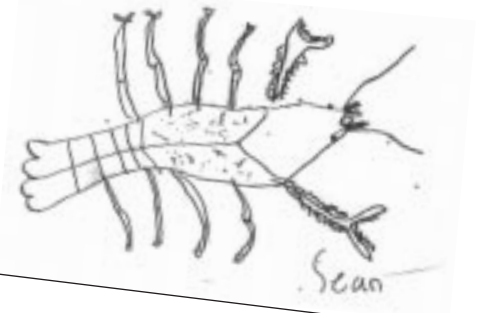
I did write back and suggested that their assumption that the preference for dark they observed in house selection may not necessarily extend to feeding container selection. Recumbent crayfish may have different needs than active (feeding) crayfish. I further suggested that the way to answer their question was to conduct more investigations. I pointed out that their experimental design indicated that crayfish avoided white houses, but did not necessarily prove a broader avoidance of white objects. I suggested that they might be able to design additional investigations to get more information, and asked them to let me know if they found out anything more.

I also took the opportunity to suggest that even though it is tempting to explain crayfish behavior in terms of their emotional responses to situations, we don't have any scientific evidence that crayfish "hate" white; all we can do is observe and report what they do, not how they feel about it.

The students continued their investigations and reported their results to me in great detail. I read every word with great enthusiasm—the series of experiments and the conclusions reached were clearly the products of motivated students guided by a masterful teacher.

To make a long story short, the students determined that crayfish were not particularly influenced by the color of the bottom of the feeding basin. They confirmed their original position that the house had to provide dark surroundings to be suitable. They were careful to report their findings in terms of what the crayfish did, not how they felt about it. Congratulations to one and all in Mr. Williams' class!

But there is more...the students' excellent observation skills were made



Dear FOSS Science:

We are a fourth-grade class here in Cape Elizabeth, Maine. There are 20 kids in our class. We are doing science projects with the crayfish, using the FOSS science materials.

We have a question for you: Why do you use light-colored buckets for the crayfish to eat in?

We did an experiment with the crayfish to see what colors they like and what colors they hate. We put a crayfish (named Chocolate) into a bucket of water. We made different houses out of half flower pots and plastic cups that we cut in half to see which ones he wanted to go into. He went right into the dark-green pot. But when we put the half cup down for him to see, he would not go into it. He came right up to it and looked inside, but then he wouldn't go in. The inside of the cup is white. Afterwards, we covered the inside of the cup with dark-colored duct tape and tried it again. Chocolate went right in and made himself at home. This proves that crayfish like dark colors and hate light, white colors.

So why did you use white buckets for the crayfish? If it is in a white bucket, crayfish might be so unhappy that they will not eat.

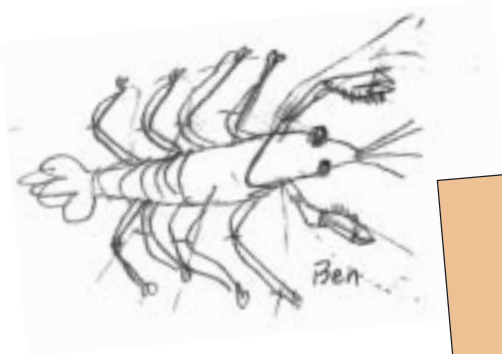
We hope you consider our point and write back.

—Mr. Williams' fourth-grade class (Alex, Austin, Ben, Corey, Colin, Corey, Dana, Hillary, Jess, Julia, Ken, Kristen, Liam, Matt, Max, Meghan, Meryl, Robert, Sarah, Sean, Tom)

evident by the remarkable scientific drawings they produced after close scrutiny of the crayfish. And the students used the crayfish theme to develop some math word problems for the class to share. A few examples are included.

Any more questions? Launch 'em our way and we'll see what path of discovery and inquiry we can wander down together.

Larry Malone
lmalone@uclink4.berkeley.edu



BoBo the crayfish has 110 food pellets. He eats 22 of them. How many does he have now?
(Sarah)

There were 25 crayfish and 6 kids. How many crayfish would each kid get?
How many would be left over?
(Megan)

There are 6 crayfish and two cans of crayfish food with 12 chunks of food in each can. How many chunks of food will each crayfish get?
(Robert)



If a mother crayfish had 28 pebbles and she wanted to give them to her seven crayfish children, how many pebbles would each crayfish child get?
(Hillary)

Tom had 200 crayfish. Fifty of them had lost both of their antennae. A hundred of them had lost half of their antennae. How many antennae were there in all?
(Tom)

There were 32 crayfish in a tank. They separate into groups in each of the corners of the container. How many crayfish will be in each group?
(Austin)



Mr. Ogden Williams teaches fourth grade at Pond Cove School in Cape Elizabeth, ME. His students are in fifth grade this year, continuing their science studies.

Air and Weather Flies in Washington State

Maureen Canny, K-12 Science Coordinator, sent us these photos and selections of student work from Karen Olson's second-grade class at Madison Elementary School in Olympia, Washington. This past spring the students were working on the FOSS **Air and Weather Module** and having a great experience by all reports. The Olympia School District includes 20 FOSS kits in their scope and sequence. This is their second year of FOSS implementation. Second graders do **Balance and Motion**, **Insects**, and **Air and Weather**.

Karen was amazed at the improvement in the students' quality of writing and vocabulary use when she compared the writing before and after the kit. When Maureen observed her class, the students were certainly enjoying science and had ready answers to Karen's questions concerning previous lessons. 🌻

(A reminder from Karen Olson: Please remind the students that it is okay to blow through the straws, but that they should not suck up any material including feathers.)



3-5-98
March 5, 1998

In science I blew air from my lungs into a cup of soap and water. And the air made bubbles. Of soap and air. The next day we did a different experiment. We went outside and we blew the bubble stuff and made bubbles. And we washed them. And they fluddered.



Updating the FOSS Kit Refurbishment Process in Tucson

By Sharyn Chesser

After one year as coordinator of the elementary science materials with the reality of having to do more with less, I knew our team needed help. The FOSS boxes purchased in 1993 were beginning to show wear, so the first step was to move from cardboard to plastic boxes which could be locked. The search and purchasing happened in the spring semester while the transfers occurred during the summer.

In August I contacted the University of Arizona, Eller School of Business, to find out if the MBA Consulting Group (a group of MBA students) would provide professional assistance in streamlining the refurbishment system. The students were interested in opportunities to apply their expertise in the community. The charge to us would be the cost of photocopying the final report and an optional donation. The price was definitely right so the administration and our science team said go for it!

The MBA consulting team set the project objectives:

1. Analyze and improve the current process for receiving, refilling, and delivering science kits in order to reduce the cycle time of the process while maintaining an accurate inventory of kit contents. Parts of the process to be improved included the physical process layout, the coordination of deliveries, and the development of delivery schedules. It also included analyzing and documenting the tasks of the current staff and recommendations for appropriate staffing levels for each activity in the process.
2. Study the feasibility of implementing a computerized information system.

The students shadowed key staff members, participated in the refurb, and reviewed our entire process. They factored in that high school (business education) seniors hired annually refurbish the majority of the kits and special education teens count and sort items.

Once the benchmarks were observed and described, alternative methods to improve the process were considered. The team also conducted an audit of the information system to determine its effectiveness.

Their input was exciting. First, the group customized a new database (Microsoft Access) to track the scheduling, delivery, and availability of kits. The Tucson Unified School District technology department installed the software. (The system should greatly reduce the number of files required to track kit inventory, delivery dates, and locations, reducing the amount of data

entry.) Second, the team recommended a more efficient floor plan for arranging outgoing kits and prepackaging more supplies. Those suggestions are currently being tried. Their other recommendations will be considered in stages:

- a standardized measuring station;
- graphical packing instructions; and
- creation of a video of the refurbishing process to help train new or “float” help.

Part of the final report was a projection of possible problem areas as the Science Resource Center grows, namely, the need for more space, additional personnel, and new trucks.

Although it is too early to fully evaluate the changes, the preliminary results have been very encouraging. The new system should save the Science Resource Center office manager countless hours and simplify the paperwork, making it easier for other staff to assist. The refurbishment process continues to be streamlined, and the recommendations will be considered as time allows. The graduate students were so enthusiastic and sincere. I would urge any center to seek similar assistance. 🌻

Sharyn V. Chesser
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Tucson Unified School District
Science Resource Center
(520) 617-7126
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Online Connections for FOSS Modules

The World Wide Web keeps growing and being updated. More URLs that could serve as good extensions to FOSS modules appear almost weekly. The following sites are a sampling of good FOSS extensions we have noticed while surfing. Keep in mind that the World Wide Web is a fluctuating environment; links that you discover today might be gone tomorrow. You can find direct links to all of these web references and more by connecting with the FOSS home page at <http://www.lhs.berkeley.edu/FOSS/FOSS.HotLinks.html>

Life Science Strand

Food Finder

Olen Publishing

[http://www.olen.com/food/](http://www olen.com/food/)

This site provides access to nutritional information for food from several popular fast-food restaurants. The information is based on the book *Fast Food Facts by the Minnesota Attorney General's Office*. Students who are studying the FOSS **Food and Nutrition Module** will find some good information here.

Earth Science Strand



Cloud Catalog

Department of Atmospheric Sciences

University of Illinois at Urbana-Champaign

<http://covis.atmos.uiuc.edu/guide/clouds/html/oldhome.html>

This website includes images of a variety of different clouds that can help with identifying them. Students who get interested in clouds while exploring the FOSS **Air and Weather Module** should enjoy this website.

The Canadian Rockhound

<http://pangea.usask.ca/~dfs846/rockhound/home.html>

The Canadian Rockhound is a free educational magazine intended for those with an interest in rockhounding, mineralogy, mineral collecting, paleontology, fossil collecting, and geology in general. The articles published in each issue have been written by Canadians with a professional or a vocational background in geology. Most of the content is Canadian, but articles by authors outside Canada have been published as well. This is a good extension for the FOSS **Earth Materials Module**.

Water Science for Schools

U.S. Geological Survey

<http://wwwga.usgs.gov/edu/indexjs.html>

This USGS website includes a variety of information about the different aspects of water, along with pictures, data, maps, and an interactive center where you can give opinions and test your water knowledge. This is a good resource for the FOSS **Water Module**.



The Electric Club Activities Handbook

http://schoolnet2.carleton.ca/english/math_sci/phys/electric-club/

This is an extensive resource for investigations and projects involving electricity and magnetism. Several of the projects may prove interesting to third and fourth graders who have completed the FOSS **Magnetism and Electricity Module**. This site was developed in cooperation with SchoolNet (Canada) by the The Sector Skills Council of the Canadian Electrical and Electronic Industry.



Simple Machines

<http://www.ed.uri.edu:80/SMART96/ELEMSC/SMARTmachines/machine.html#OVERVIEW>

A product of PROJECT SMART96 from Rhode Island, this website involves students in the investigation of simple machines and their usefulness in everyday life. The projects were developed by Rhode Island teachers with the purpose of integrating technology into the math and science curriculum. Students who are working with the FOSS **Levers and Pulleys Module** could find this a useful resource for more information and links to other sites focusing on simple machines.

FOSS Home Page Update

<http://www.lhs.berkeley.edu/FOSS/>

FOSS BULLETIN BOARD NOW ONLINE!

Something new is available on the FOSS website! If you have an Internet connection and a browser application such as Netscape or Internet Explorer, you can now connect with your FOSS colleagues at the FOSS bulletin board. To get to the bulletin board, connect to <http://www.lhs.berkeley.edu/FOSS/>.

Scroll down the page to the FOSS bulletin board link, click, and there you are. Check out the topics in progress or add your own.

Over the past few months, the following messages have been added to the bulletin board.

FOSS K-6 Integration Ideas

Susan Haskell—

We are incorporating journal writing with our **Insects Module** (Grade 1). Each child is responsible to make an entry in his/her "Insect diary" during "Bug detectives" time (during our learning center half hour) daily. We found the children were very willing to write, using some given vocabulary and then their own "kid-spelling" or invented spelling. The children are currently keeping records on five different insects.

Cathy Lipe—

Hewlett-Packard employees are willing to volunteer as mentors for your fifth and sixth graders who are exploring using FOSS. Use the HP e-mail mentor program to have some of your students communicate with HP employees about their science projects. Here's a blurb to pass along to any 5th-12th-grade teachers who might be interested.

HP's e-mail mentor program provides over 1500 mentors to 5th-12th-grade students and teachers who are integrating e-mail mentoring into their science and math curriculum. HP volunteers help students relate their science and math studies to personal

interests and encourage students to continue studying math and science. Schools can apply to request HP e-mail mentors for the 1998-1999 school year. Applications and information can be found at <http://mentor.external.hp.com>.

FOSS K-6 Reading Ideas

Susan Nixon—

For the **Insects Module**, which we used in second grade, I'd like to suggest *Coyote and the Laughing Butterflies* (edited by Harriet P. Taylor, Simon & Schuster, ISBN 0027888460). This story tells why butterflies "flit" the way they do when flying. It is a how-and-why story and can be integrated into Native American studies or literature studies of the why-story genre.

Susan Haskell—

We used *The Grouchy Ladybug* (Simon & Schuster, ISBN 0027888460) and *The Very Quiet Cricket* (Philomel Books, ISBN 0399218858) by Eric Carle with the **Insects Module**. The children not only enjoyed the stories, but made "ladybug cookies" using vanilla wafer cookies, pink icing and chocolate chips, and sequenced pictures showing the development of the ladybug from egg to beetle, and related the story to math (telling time).

The Very Quiet Cricket has an electronically generated cricket sound at the end of the book. The children played the sound near the cricket habitat to see if they could get a response from our live crickets. The children wrote a description of how crickets make this sound and how they start and stop with the environmental noise around them. Grade 1 Cedar Creek Elementary.



New from the Wordsmiths

The right book can enhance and strengthen your students' experience with the FOSS activities. The following list includes some possibilities. We would love to hear what books you are using and how you use them. Think about taking a moment to send us your ideas, either via snail-mail to the address on the back page of this newsletter, e-mail to skjagoda@uclink4.berkeley.edu, or on the FOSS bulletin board. (See page 11 of this newsletter.)

Grades K-2

The Plane
By Monique Felix. Creative Education, Mankato, MN, 1995. ISBN 0152009639
(Paper Module, Air and Weather Module)

A picture book (no text) depicting a mouse trapped in a paper room. The mouse decides to chew through the paper walls to reveal a farm scene. The mouse constructs a paper plane to explore the new area. This is a good book to promote oral language skills. Part of a series of "Mouse Books" which includes *The Boat*, *The Wind*, and *The House*.

Grades 1-2

Ant
By Michael Chinery. Illustrated by Nicholas Armstrong. Photographs by Barrie Watts. (Life Story Series) Troll Associates, NY, 1991. ISBN 0816720991
(Insects Module)

An introduction to the physical characteristics, habits, and natural environment of various types of ants. Shows how to find, house, feed, care for, and observe an ant.



The Big Balloon Race
By Eleanor Coerr. (An I Can Read Book) Harpercrest, NY, 1992. ISBN 0060213531
(Air and Weather Module)

Ariel almost causes her famous mother to lose a balloon race, but, in the end, helps her win it.



Storm in the Night
By Mary Stolz. Harper & Row, NY, 1988 (Reprinted 1990). ISBN 0064432564
(Air and Weather Module)

Thomas and his cat live with Grandfather. One night during a thunderstorm, the electricity goes off, leaving them in the dark. The old man begins to tell Thomas about his experience on a similar night when he was a boy and was very frightened. Grandfather's gentle tale allows Thomas to relax and admit his own fear.



Who Sank the Boat?
By Pamela Allen. Demco Media, NY,
1996. ISBN 0606100679 (**Balance and Motion Module**)

Guess who causes the boat to sink when five animal friends of varying sizes decide to go for a row? This hilarious picture book will delight small children, while teaching the principles of balance.

Bookfinding Hints:

There are now several booksellers with sites on the World Wide Web. As you search for copies of these books and others, consider surfing to one or more of the following sites.

Amazon Books

<http://www.amazon.com>

Barnes and Noble

<http://www.barnesandnoble.com>

Border's Books and Music

<http://www.borders.com>

Powell's Bookstore

<http://www.powells.portland.or.us/>

Become a FOSS Penpal!

The FOSS staff had several requests from teachers and students who wanted to communicate with e-mail penpals who are also using the FOSS program. So we created a FOSS Penpal page which you can also link to via the FOSS home page.

The following individuals and classes are interested in hearing from other FOSS users via e-mail at this time.

• **Jim Tearpak**

tearpak3@volcano.net is a fifth-grade teacher at Pine Grove Elementary School in Pine Grove, **California**, who is looking for penpal buddies for his class. Pine Grove is a small community in California's Gold Country.

• **Bobbi Robledo**

voyloca@aol.com is a fourth/fifth-grade teacher in the Santa Ana Unified School District in **California**. They are doing a long-term project raising crayfish as part of the **Structures of Life Module** and would like to share information with teachers and classes who are also involved with crayfish.

• **Betty Buginas**

bbuginas@hotmail.com is producing a newsletter about science teaching using FOSS for the West Contra Costa Unified School District, **California**. She would especially like to hear from teachers in her district about their experiences with FOSS, but welcomes e-mail from others as well.

• **Tom Chiola**

tchiola@eclipse.net is a second-grade teacher at Slacked Elementary School in Lawrenceville, **New Jersey**. His students will be doing the **Pebbles, Sand, and Silt Module** beginning in September 1998. He would like to hook them up with another second-grade class. He is also interested in getting ideas for a butterfly exchange.

• **Maureen Canny**

mcanny@osd.wednet.edu is requesting penpals for a fifth-grade class in the Olympia School District, **Washington**. They are particularly interested in communicating with other students using the **Landforms Module**.

• **Diane Olenchek**

olenchek@pitnet.net is a fifth-grade teacher at Swallow Elementary in Hartland, **Wisconsin**. Her classes are using the **Food and Nutrition, Levers and Pulleys, Variables**, and **Solar Energy** modules.

If you or your class are interested in becoming e-mail penpals, contact Sue Jagoda at *skjagoda@uclink4.berkeley.edu*. Keep checking the FOSS penpal page as the list of e-mailers grows!



Sounds Fishy?

The following question was forwarded to the FOSS staff at the Lawrence Hall of Science by Susan Hardy, a FOSS Regional Sales Manager.

Has the specter of death reared its ugly head regarding any of your living materials when they get to the classroom? I am specifically asking about guppies. Lately, we have been shipping fresh, healthy guppies to our schools from a reputable local vendor. Within a day or two, they are dead, while the remaining fish back at the store are still happily swimming about.

Our prime suspect right now is contamination of the aquarium tanks, which we ship out in the modules. It's possible the residue from a cleaning agent remained on the tank walls and spelled imminent doom for any fish placed in them.

Sound familiar? Plausible? I'd like to hear from anyone who has dealt with this or has ideas.

Thanks.

Greg Calvetti, Manager
ASSET Materials Support Center

Larry Malone responds:

Guppy problems are not new; I've been around them for three decades. From their reputation you'd think they would be bullet proof, indestructible little critters. But, quite to the contrary, they are sensitive to changes. Once established, they are forever, but I don't know what your specific problem might be, so let me suggest several variables to consider.

Your suggestion of contaminant residue in the containers sent out to the schools is possible, but I would guess that routine attention to rinsing during the cleaning process would make this a very low probability variable.

Guppies are on the edge of tropical. They are sensitive to temperature change, particularly cooling. A chilling of several degrees over a short period of time may be enough to cause a mortal shock.

Water purification (chlorination) can be deadly. What chemical is used in the Pittsburgh area? Traditional chlorination is relatively easy to manage. Open exposure (aging) for a day, or boiling and cooling eliminates chlorine. If, however, you have chloramines in your water, chemical

treatment is required. Chloramines do NOT dissipate with time and must be neutralized chemically. If local water is a problem, I recommend bottled spring water, at least for starters at the time of delivery.

Oxygen requirements go up during times of stress, like relocation. It is desirable to keep the time in transit to a minimum, and it might be a good idea to have an air bubbler in the new container for a period of time to insure good oxygen saturation right after relocation.

Relocation shock is a catch-all category for mortality due to no identifiable cause. Sometimes it seems like all due attention has been paid, but the fish still fail. We need a fish psychologist to look into the subject, interview a few of the survivors, and generate a profile of the Relocation Stress Syndrome. Maybe a little Prozac in the water just before shipment...

I'd recommend that teachers anticipate the arrival of the fish by having aquaria filled with treated water sitting around for at least three or four days before arrival. Then use the standard precaution for reducing temperature shock—float the shipping container, fish and all, in the new aquarium to equilibrate the temperature over a period of an hour or so. Then dump them into the new abode and watch them do their fishy thing.

If you haven't already, set up some containers, hike off to your vendor, purchase five batches of guppies, and experiment. Have some treated, four-day-old water ready in several containers, straight tap in another, and bottled water in one. Let one batch get cold during shipment, and do an immediate transfer of one batch when you get them to your "lab." Use a bubbler in one. You get the idea. Have some fun with it, and let me know if anything seems to work. We'll put it in the *FOSS Newsletter*.

You might try contacting some local experts if all else fails. You have the NY-PENN Council of Aquarium Clubs in your neighborhood. Here's their website: <http://members.aol.com/nypennfish/file.html> 🌿

Calendar of Events

► FOSS Institutes

Delta Education will host four 2-day Informational Institutes this academic year in conjunction with the NSTA Area and National Conventions. These Institutes are designed for all educators—lead teachers, administrators, curriculum coordinators, university methods instructors, science committee members, and school board members—who are interested in finding out what FOSS is, who developed it, what philosophy of education it supports, and to begin networking with other FOSS users. A lot of time at these Institutes is spent with the program materials, doing activities and engaging in inquiry.

During the summer Delta hosts Implementation/Leadership Institutes. These meetings are designed for educators who have adopted FOSS and are into their implementation process. Some time will be spent working with the FOSS materials, but a greater proportion of time will be spent delving into issues of management, teacher preparation, materials maintenance, and a host of other subjects.

Most Institutes are led by FOSS development staff. There is no charge, but participants must register in advance to attend. Times and locations are listed in the calendar. To secure your spot at the Institute of your choice, call, write, or FAX.

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FOSS NSTA Pre-Convention Informational Institutes

October 27–28, 1998 (Tues.-Wed.)	Seattle, WA
November 17–18, 1998 (Tues.-Wed.)	Birmingham, AL
December 1–2, 1998 (Tues.-Wed.)	Albuquerque, NM
March 23–24, 1999 (Tues.-Wed.)	Boston, MA

Yes! I'm interested in attending a FOSS Informational Institute.

Yes! I'm interested in attending a FOSS Implementation/Leadership Institute.

Please send me registration information for the _____ institute.
(Date and Location)

Name

School

District

Title

Address

City

State

Zip

Daytime Phone

I did **not** receive this FOSS newsletter in the mail. Please add my name to the mailing list.

About This Newsletter . . .

The intent of the FOSS Newsletter is to help FOSS users develop a network of support across the country. Delta Education and LHS will work together to bring you news two times per year, including articles regarding the latest development of modules, tips about management from teachers and administrators, ways to make connections with other teachers and districts, extensions and reading materials to add to modules you are already using, and informative articles about good educational practices.

So, we need your help. If you have a tip that enhances the teaching of FOSS or would like to submit an article (with photos) about exciting activities or school programs, management, implementation projects, etc., please send them in. We would also like to hear from your students, whether they have questions about the content, projects they have done, photos or other images they have created, or insights into how they use the World Wide Web with FOSS. Send your contributions to:

FOSS Newsletter
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Berkeley, CA 94720-5220

The deadline for submissions to the next issue is January 18, 1999. We're waiting to hear from you.

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A very special THANK YOU . . . to all the local and national trial teachers who have helped make FOSS such a great success!