FOSS Middle School Multimedia Now Available Online

As of August 2006, all of the multimedia programs for the FOSS middle school courses are available online. The multimedia programs are browser-based (just like the CD-ROMs), and they are compatible with commonly used browsers, such as Internet Explorer, Safari, and Firefox. All of the multimedia are available to registered teachers and their students once they receive their passwords. Teachers can register for a password to share with students for the year. Students may use the teacher’s username and password to get on the site for that year. During a new academic year, each teacher should register on the site again and get a new username and password.

To receive a password, go to the particular course via www.fossweb.com. Click on the multimedia link at the top of the left-hand sidebar. Complete and submit the form. You will be asked for your name, e-mail, school, school district, city, state, and grades taught. A password will

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Multimedia continued

be sent to you via e-mail immediately after verification. If you do not receive a message within a day, you can contact foss@berkeley.edu.

In order to use the online multimedia, you should check to make sure your browser has all of the appropriate plug-ins installed, such as Shockwave and Flash. You can use the Check Browser link from the course Welcome page, as shown here, to make sure your browser is compatible.

Security Updates

Two new security settings (on Flash Player 8 and ActiveX Controls) could interfere with the use of FOSS CD-ROMs or FOSSWeb Flash activities on PCs and Macs. For information on resolving these issues, visit the FOSSWeb Welcome page (www.fossweb.com) and follow the link to the news item regarding security updates. You can download separate installers that will update the security settings on PCs (FOSSfix.zip) and Macintoshes (FOSSfix.dmg). More documentation in pdf format is also available at this site.

Teacher Preparation Videos Available Online and Soon as DVDs

By popular demand, the FOSS teacher preparation videos for grades K–6 are available now online as streaming videos and soon as DVDs. Using the digital format, you can now skip directly to the investigation and part of interest, such as getting ready sections and the conducting the investigation scenes from the classroom.

Check with your local FOSS Sales Manager about getting the DVD versions of the videos. You can find who your sales manager is at the Delta Education website, http://www.delta-education.com/science/foss/salesmap.shtml.

The videos are available for viewing on FOSSweb as streaming video. You can find them by going to www.fossweb.com and following the link For Schools and Districts.

In order to view these streaming videos, you will need to have RealPlayerTM installed. Instructions for downloading and installing RealPlayer can be found on the multimedia web page. The videos are best downloaded and viewed via a fast Internet connection, not by a dial-up connection. Most segments range from three to five minutes in length. If you experience difficulties viewing the videos at school, your school may not be equipped to handle streaming video due to bandwidth and firewall issues. You should consult with your school's technical support person for assistance with this problem.

Note: You need to get a different username and password to download the Student Lab Notebooks. Go to http://lhsfoss.org/fossweb/teachers/parents/dupmasters.php for more information.
Dr. Marla Wagner Jones, University of Pennsylvania, Millersville, Pennsylvania

As an instructor of elementary science teaching methods, I have 12 weeks to guide my students from that dark place known as “science phobia” to that brighter place where they are prepared to teach science to elementary children. Although this is not a small task, it is one that I relish each and every semester. I view this contact with my students as the one chance I have to inspire them to become “science enthusiasts” and enter the place the Albert Einstein described as “…exciting, interesting, and fun.”

There is a lot for the students to do in those 12 weeks: reflecting on their science readiness at the beginning and the end of the semester, reviewing journal articles, developing inquiry-based lessons, scavenging for cheap and free science materials, and developing their own science kits. Beyond the goal of developing competent classroom teachers of science, students must also know how to discriminate between science lessons that are mediocre and those that are exemplary. Because there are so many sources for science lesson ideas (textbooks, Internet sites, trade books, other teachers, and science-focused workbooks) and so few that qualify as exemplary, it is essential that students have the opportunity to examine, explore, and analyze those materials that model and describe the “best” science has to offer.

One way I provide such an experience for my undergraduate students uses a two-part process. During the first part, students engage in the FOSS Variables Module as an introduction to the format and focus of the FOSS program as a whole. By doing the investigations, they experience constructivist teaching and learning and develop a personal understanding of how multiple lessons build one upon the other to provide deeper conceptual understanding of the science topics. The second part of the experience is an assignment titled, Exemplary Materials Analysis and Report. Students are placed in groups of three or four, and each group is assigned a different FOSS module to analyze and report on.

At first this task seems overwhelming to the students. I often sense that a number of them are even a bit resentful and may not comprehend the value of such an assignment, even though they are aware that 40 percent of the 501 school districts in Pennsylvania are using FOSS. I do explain to them the instructional value of the program, as well as the advantage they will have over other candidates who do not have any experience with FOSS.

Well, as the saying goes, “The proof is in the pudding.” Once the students go out into the schools for their field experiences, they fully understand the value of this assignment. I get phone calls, e-mails, and visits from them. They excitedly share with me how they got to use the FOSS modules in their field placements.

Following are some actual experiences my students shared with me:

“I just wanted to send you a quick e-mail to say hello, but also to let you know that I will be teaching a FOSS unit during my second half placement of student teaching. Both my teacher and I are very excited as it is a new unit for her to teach, and my previous experience with FOSS from professional block will be put to the test. I look back at those couple of super-stressful days of evaluating kits and chuckle as I remember thinking ‘What will I ever do with this? Why is she making me do this? I’ll NEVER use them.’ However, due to the rigorous evaluation process of the kits we went through, I have a sense of confidence going into the teaching of the unit I would not have had otherwise. Therefore, I just wanted to say thank you for stressing me out those few days as I am now confident in my ability to teach the unit, thanks to my familiarity with the structure of the kits. Thanks again!”

Keri K.

“Hello! I just started my second student teaching placement and guess what? My school uses FOSS. My teacher was very excited to know that I knew how to use the program. I am really glad we had the opportunity to use the FOSS kits in the class because I felt very comfortable teaching it. I just thought you would be happy to know that.”

Jennifer T.

“I wanted to tell you that my district started using the FOSS kits while I was there. It was very neat because I got to explain it to my teacher and the other fifth-grade teachers. Thanks for introducing them to us. I got to teach a few lessons from the Landforms Module, and it was so great to see the students’ reactions. It was also very fun for me to teach. I felt comfortable working with the kit thanks to you. The assistant superintendent was very impressed that I knew what the kits were about.

Thanks again and keep up the good work. I just wanted to let you know that at least one person appreciates the work you made us do.”

Melissa K.

“I am going to be doing my TWS [Teacher Work Sample] on electricity! I am so excited because I am going to be able to utilize my shoebox kit on static electricity in the unit. [The school] has the FOSS Magnetism and Electricity Module that will be the meat of my unit, but my fourth-grade co-op [cooperating teacher] would also like to see my input on other things (like my shoebox kit) to make my TWS more special.

My co-op was more than willing to let me handle the electricity unit…I am looking forward to spreading some science enthusiasm around.”

Dagny H.
Finding time to teach science is a common concern for all of us in science education. Science time was a major issue that the teachers and administration at Jay Jeffers Elementary School tackled during the planning year leading up to the opening day in August 2005. Located in Clark County School District, Nevada (Las Vegas), Jeffers Elementary is one of 12 new schools opened in Clark County in 2005.

Like every other elementary school in the district, Jeffers students’ academic performance in reading, writing, and math would be monitored by district, state, and national assessments. Principal Wendy Roselinsky knew her students would be 90% English language learners, and 90% would qualify for free or reduced lunch. Meeting academic standards would be a challenge, but Roselinsky was right where she wanted to be. She had a vision for Jeffers Elementary. Roselinsky would build the entire curriculum around science. With science as the curriculum core, finding time to teach science would not be an issue.

Roselinsky is an experienced educator. Prior to becoming a principal, she served as a Clark County Teacher on Special Assignment in math and science. She worked in schools with diverse student populations. She provided professional development for 30 schools over a period of three years. She attended week-long training sessions to learn how to implement FOSS and worked with teachers and principals to bring FOSS into Clark County schools. When she moved into an administrative role, she continued to encourage and support her teachers to use inquiry-based methods to teach science.

In order to make her vision a reality, Roselinsky would need to hire teachers who shared her educational philosophy and her desire to devote all their professional energy to the student population of Jeffers. As she began interviewing teachers, she made it clear that working at Jeffers meant that science was going to be taught, and time would be allocated to do it thoroughly. She looked for teachers with the requisite science teaching experience, as well as those who were open to the idea of using inquiry methods to build student understandings in science.
Planning for the opening of Jeffers Elementary started months before the building was even completed. The planning team included one teacher from each grade level, a librarian, an ELL facilitator, a reading specialist, and support staff. The first task was to prepare a mission statement—one that would reflect not only Roselinsky’s ideas about science and children, but those of the entire planning team. The mission statement follows.

The Jay W. Jeffers Inquiry-Based Science Elementary School community provides a safe environment to support the learning of each student, parent, and staff member. We collaborate in the discovery of paths that each of us take to be responsible members of society, reach academic excellence, and remain curious lifelong learners.

With the mission statement in place, the teachers needed to identify and refine tools to help the students develop proficiency in reading, writing, and math while keeping science at the core. Roselinsky’s mantra during the development of the programs was, “Science is a common experience for children. With science as the core, we can build academic language.” The term “academic language” refers to the precise, specialized vocabulary associated with science and the conceptual understanding that it represents. The idea of developing academic language through inquiry-based science became the first goal that Roselinsky and the teachers at Jeffers would spend time working toward.

To encourage her teachers to devote class time to teaching science, Roselinsky had to clarify her expectations and provide support. Her initial expectation was that teachers would teach science at least three times a week, and they would have their students keep science notebooks in some form. When school finally began, Roselinsky initiated a procedure that activated science thinking first thing in the morning. After the students gather on the playground for roll call and to say the pledge, Roselinsky asks, “Who learned a new science word yesterday?” As students share words, such as “erosion” and “breezy,” she asks, “What do you think that word means?” While this seems very casual, it established the importance of words and their meaning. This type of dialogue between the principal and students became common in the classroom as well. Students soon realized that their principal valued science knowledge and the academic language that helped them express their science understandings.

The Core Curriculum

Teachers needed to teach the grade-level science standards adopted by the Clark County School District. And they were committed to developing science academic language. Teachers needed a curriculum that addressed both requirements simultaneously. First-grade teacher Rickie Yudin felt that the FOSS curriculum helped him get the job done. Yudin says, “Students essentially learn from their own experience, rather than having to listen to a lecture from a teacher or read a textbook, and then try to pick out, translate, and interpret language, and then make meaning of it all. …[the FOSS investigations] allow them to acquire knowledge firsthand.”

<table>
<thead>
<tr>
<th>Strand</th>
<th>Kindergarten</th>
<th>Grades 1-2</th>
<th>Grades 3-4</th>
<th>Grade 5</th>
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</thead>
<tbody>
<tr>
<td>Physical Science</td>
<td>Wood and Paper Fabric</td>
<td>Balance and Motion Solids and Liquids</td>
<td>Physics of Sound Magnetism and Electricity</td>
<td>Mixtures and Solutions</td>
</tr>
<tr>
<td>Life Science</td>
<td>Trees Animals Two by Two</td>
<td>New Plants</td>
<td>Structures of Life Human Body</td>
<td>Environments</td>
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<tr>
<td>Earth Science</td>
<td>Air and Weather</td>
<td>Pebbles, Sand, and Silt</td>
<td>Earth Materials Water</td>
<td>Landforms</td>
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<tr>
<td>Scientific Reasoning</td>
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<td>Measurement Ideas and Inventions</td>
<td>Variables</td>
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Before the school year started, the teachers set up a matrix identifying which kits would be used at each grade level. In addition, they wanted to encourage the development of the appropriate scientific thinking processes throughout the grade levels. Using the FOSS curriculum as a guide, they focused on comparing in kindergarten, organizing information in first and second grades, and advance organizing in third and fourth. Fifth grade stressed identifying and using relationships.

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I DO Have Time continued

Tools of the Academic Language Trade

As the teachers began to implement the FOSS curriculum, they soon recognized the opportunities for developing academic language. The time spent on language introduction and review exceeded that suggested in the FOSS Teacher Guide, but the time was well spent. Teachers realized that investing a little extra time making sure that students associated new vocabulary and the scientific meaning paid large dividends down the line. Kindergarten teacher Martha Grainger said, “Science vocabulary in context is no more difficult than any other English words they are learning. We may as well use correct terms now rather than have to re-teach them later.” Teachers began to modify the lesson to allow students more time to develop the language.

The following are some examples of how students acquired and used appropriate language while doing science.

First Grade

In a first-grade class, students were involved in the FOSS Pebbles, Sand and Silt Module. In Investigation 1, Part 3, students observe rocks, sort them, and describe the properties used to sort the rocks into groups. Students repeated the activity several times. They needed several experiences to develop the concepts “rough” and “smooth” and to use them to describe properties of rocks. The students needed to discuss these properties with each other, draw pictures of them, and repeat the tactile experience before they began to use “rough” and “smooth” as part of their natural academic language. The students then recorded their rock groupings in their notebooks, using words accurately to describe the properties of color, shape, size and texture. (See sample below.)

Second Grade

In second grade, students worked with the FOSS Air and Weather Module. During Investigation 2, Part 1, students went outside, observed the weather, and recorded their observations in their notebook. After they observed and recorded for several days, the class had a word bank with words and pictures similar to the weather symbols provided in the teacher guide. Each day before the class went outside to make observations, the class would review the weather words that were introduced in previous lessons. The teacher would say something like, “Yesterday we used the word *windy*. What do you think windy means?” The students were familiar with this type of academic-language questioning from the science-activation questioning that started the day during roll call. The review helped ELL students recall the sound and look of words they might use to describe that day’s weather. As the students observed the weather, they talked with each other to seek the best word to describe the observed weather. The teacher would encourage students to be more descriptive or use more formal terms by asking, “You said there was air moving. How else could you say that?” At the end of the lesson, students are asked what words they used from the word bank and what they thought the word meant.

Rickie Yudin, a first-grade teacher describes why he focuses on academic language and content knowledge in his classroom,

Allowing students to talk with each other, with minimal teacher interference, has helped my students learn words. As they discuss the words, they complement each other’s understanding with new ideas, and then synthesize those ideas into more complex conceptual knowledge. Once they have created an accurate and complete concept, they are able to take ownership of it as something they have created, not something given to them by the teacher. As a result, they buy into what they are doing and take responsibility for learning and using the concept.
Fourth Grade

Students in a fourth-grade class used the FOSS Magnetism and Electricity Module. During Investigation 2, Part 2, students made open and closed circuits. During the Wrapping Up session, students discussed the meaning of “open” and “closed” with a partner and then, as a class, developed definitions for open and closed circuits using academic language.

As part of another strategy for working with English language learners, the teacher introduced the objective for the lesson, “Explore objects that can be used to complete a circuit.” The students worked to determine which objects in the bag of test objects could be used to complete the circuit. The teacher called the students to sit on the floor with their science notebooks. The teacher asked students to identify objects that completed the circuit and objects that did not. The names of the objects and the materials from which they were made were recorded in a class T-table. Students then transcribed the table into their notebooks.

When asked to describe what happened when test objects were placed in a circuit with a lightbulb, students explained that objects made of metal resulted in a closed circuit, but no one discussed the flow of electricity through the object. The teacher felt that the students had a partial understanding of the concept of conductors and insulators, so she introduced the words conductor and insulator, knowing she would need to spend time in the next lesson discussing the flow of electricity. The teacher understood that in order for the new vocabulary to rise to the level of academic language, students would have to develop functional conceptual models associated with the words conductor and insulator.

Reading in the Science Content Area

With science as the curriculum core, teachers at Jeffers Elementary reviewed and selected a substantial body of nonfiction text to support and enhance science concepts while at the same time exercising reading skills. The school librarian used the FOSS resource list and a list of nonfiction books provided by the district math and science department to help locate appropriate nonfiction books. “Reading about real things is more comprehensible to ELL kids. Nonfiction is more concrete and helps build academic language,” according to Roselinsky.

The staff uses a series of leveled readers during content-based reading time. Content reading happens during reading time, not during science time. Fourth-grade teacher Eric Hoose said, “The stories are great. They are about the same topics (e.g., the rain forest), but each student is reading at his or her own level. All the books have the same photos, graphs, charts, and so on, but the text is presented in various levels of complexity. This really helps eliminate the ‘good reader/bad reader’ stigma that sometimes becomes an issue. The books help with reading confidence and create the feeling of becoming a successful reader.”

Because reading and writing go hand in hand, teachers were encouraged to incorporate science notebooks into the inquiry science. Some teachers had had training with the use of notebooks, but many had not. Those with experience began to share their methods with others, showing particularly how they used science notebooks to develop academic language. The teachers quickly saw the dual benefits of using notebooks during the science lessons—their students were simultaneously developing and applying their language arts and math skills while communicating science.

“This time was well spent,” according to third-grade teacher Maria Dufek. “I have seen much more writing, recording, and explaining in math and science this year. When I compare the students’ notebook entries at the beginning of the year and now at the end of the year, the growth is very evident. Their questions are more science-focused than material-focused. That growth happens with each investigation.”

Jeffers’s Science Notebook Statement

Science notebooks are a personal learning tool that we use to record and communicate our continuous questions, reflections, findings, and predictions throughout our scientific experiences in a way that makes sense to us.

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In June, several staff members attended a notebook workshop led by author Lori Fulton. According to Rickie Yudin, the workshop “motivated grade-level and school-wide collaboration to develop ideas and methods for using the notebooks. It gave us an opportunity to see what areas we could improve upon, but also what we have been doing well, how students are progressing, and what our next steps for success should be.” The group of teachers that attended wanted this workshop to do more than just help them in their individual classrooms; they wanted it to benefit the entire school. They developed a mission statement about the use of notebooks at Jeffers. (See top right of page 7.)

Jeffers Elementary has invested a lot of time and thought in pursuit of academic language and science knowledge. The principal and staff are dedicated to helping students develop science literacy and language literacy simultaneously. In thinking about the first year at Jeffers, with science as the core, Roselinsky had to say:

The science focus has been a very positive element for the Jeffers School community. We have noticed high levels of student engagement due to the science focus as well as parents commenting on their children’s excitement and interest in science. Teachers have been motivated to reflect upon the science and literacy connections they see in their classrooms. All in all it has been a great first year for all Jeffers’s stakeholders.

References:


To Whom It May Concern:

I am writing this email to you because I had something happen to me with this module that never happened before. I am using the Magnetism and Electricity Module right now (third grade). One of the activities we were to do involved creating a circuit with a switch. The students are supposed to open the switch and see if they can use the test items to complete the circuit, therefore learning that things made of metal are conductors and will complete the circuit. The magnetite is one of the items in the test bag. It is not supposed to conduct electricity, but I had a student who did use it to complete the circuit. My question is, “What do I tell the students?” I suppose it has to do with the amount of metal in the magnetite, but I am not sure. Can you clear this up for me? Also for the assessment, one of the questions asks the students to list an item in the test bag that sticks to a magnet but does not conduct electricity. The students were confused because from what we found there wasn’t anything. Is this correct? I hope you can help me with this.

Thanks
Mrs. Kathy Weber
Seville Elementary
3rd Grade

Hi, Kathy,

Great discovery! And what a surprise for you! Magnetite is an iron-rich mineral, and, as you and your students discovered, on occasion the concentration of iron will create a conductive pathway. Your assessment of the situation was exactly right. What I would tell the students is something like, “I’m surprised that the black rock (magnetite) conducts electricity. I’m wondering if all the black rocks conduct electricity or if it is just some. And if they conduct, do they conduct in whatever position you place it in the circuit, or just certain ways?” You should have the students explore this issue, come up with a conclusion, and record their thinking in their science notebooks. I suspect that only certain samples of magnetite will conduct, and that those that do will do so only in certain locations. When the data are in, ask the students to talk in their groups to come up with a model (explanation) for the observed behaviors. Let the groups present their models and compare. Leave the conclusion hanging without resolution by authority (you). That’s the way science goes.

Then, when you get into series and parallel circuits, and you have two D-cells in series (more voltage; more power), casually ask your class if they think the magnetite will conduct in a circuit with two or three D-cells providing the power. I don’t know what will happen, but I’m thinking that maybe a few more pieces of magnetite might conduct. Then challenge students to modify, revise, or add to their models to explain what is going on. They should record their revised thinking in their notebooks, too.

Concerning the test, there should be no confusion. In your class there were no materials that stick to a magnet but do not conduct. Scientific evidence trumps what may be suggested as a “right” answer. You can tell your students that the answer sheet in the teacher guide says magnetite sticks but does not conduct. Ask them what they think of that. They should say, and rightly so, that the teacher guide is wrong. Part of scientific thinking is to trust evidence, be skeptical, build arguments to support your claims, and challenge assertions that don’t agree with observations.

You and your students are on a journey of discovery into the natural world. The FOSS teacher guide is just that—a guide. But we don’t always know what you will discover on that journey. That’s the joy of it. You came to a juncture in the path, ventured down it, and found something interesting—magnetite that conducts. You are on your own at these times. But you are not alone, you are there with your students. This is where you all have to consult with one another to figure out what to do. That’s really fun.

Thanks for the note. Sorry for the confusion, but I’m glad you made an interesting discovery. And in the future, when unanticipated things present themselves that you can’t figure out, don’t be shy about telling your students that you don’t get what’s going on exactly—try to turn the question back on the students, as I suggested above. It will be just the kind of challenge that will get some of your students really going. And once you get a feel for that kind of willful departure from the charted path in the teacher guide, you may find yourself looking for opportunities to tell the class, “I don’t get this. Can you help me figure this out?”

Let me know how it all comes out.

Regards,
Larry

Note: Teachers who have questions about FOSS investigations are invited to e-mail them to the FOSS staff at foss@berkeley.edu. This is a teacher-only site.
New from the Wordsmiths

This issue of the Wordsmiths includes titles on matter, weather, and the solar system. While most of these titles are geared toward second- and third-grade readers, readers from the various levels represented by the grade range for each title will find something of use.

You can find more FOSS reading resources, as well as software and video resources, at http://lhsfoss.org/fossweb/teachers/resources/index.html.

If you would like to recommend books or other resources to our FOSS users, we encourage you to do so, and you can submit your suggestions to http://www.fossweb.com/scripts/usersubmit.html. You should plan to include all of the information you see in the Wordsmiths listings (title, author, ISBN, publisher, date published, and a short description). We are particularly interested in books appropriate to FOSS modules that are published in Spanish and other languages.

Solids, Liquids, Gases
This book from the “Simply Science” series offers an introduction to the properties of matter. Using text and photos, solids, liquids, and gases are explored, along with how matter changes state. A glossary and a brief “Want to Know More?” section are also included. (Physical Science Strand)

Splish! Splash! A Book About Rain
These two books offer colorful, full-page illustrations and simple text to help children explore weather. Splish! Splash! describes rain, the water cycle, and the effect water has on our planet. Gusts and Gales describes the different types of wind and how they are formed. Facts, resources, a glossary, and an activity are found at the end of each book. (Earth Science Strand)

Gusts and Gales: A Book About Wind
The book includes a chart of the constellations for the Northern and Southern Hemispheres. Moon describes the formation, orbit, surface features, exploration, and future study of the Moon. Sun describes the composition, surface features, and exploration of the Sun, as well as its place in our solar system. Each book includes a glossary and references. (Earth Science Strand)

Constellations
This book from the “Our Solar System” series walk students through various parts of the solar system. Constellations takes students stargazing. Students learn about who first noticed patterns in the stars and named them; they also read parts of the stories people from around the world told about the animals and people they saw in the stars. The book includes a chart of the constellations for the Northern and Southern Hemispheres. Moon describes the formation, orbit, surface features, exploration, and future study of the Moon. Sun describes the composition, surface features, and exploration of the Sun, as well as its place in our solar system. Each book includes a glossary and references. (Earth Science Strand)

Note: Don’t forget to check out the News on www.fossweb.com regularly for updates to FOSS modules and courses, such as information about incorporating the latest news about Pluto’s change in status as a planet.
Populations and Ecosystems Workshop, Mayagüez, Puerto Rico, July 10-14, 2006

During the workshop participants were encouraged to keep a science journal to record their experiences as they learned the Populations and Ecosystems Course and visited many of the ecosystems studied.

Science Journal

July 9

I am so excited to be here in San Juan, Puerto Rico, for the FOSS Populations and Ecosystems workshop. I will be teaching this course next year to my students and I hope to get a deeper understanding of the course and the ecosystems my students will be studying. I also look forward to sharing what I learn here with the other teachers in my district.

I met with the other 20 participants and instructors, Teri Dannerberg, Terry Shaw, and Virginia Reed, at the Sheraton in Old San Juan. We packed our luggage into four minivans and began our drive across the island of Puerto Rico to Mayagüez. Along the road, we noticed some unusual hills. We found out they are called “haystack hills.” The vegetation on top of the hills is very dense and composed of many large trees. The valleys between are flat with no large trees. It looks like the valleys are used for cattle and agriculture. Everyone in my van had questions about the differences in vegetation on the hills and in the valleys. I hope someone will be able to explain more about this during the workshop.

We stopped for dinner in Guanica and ate at a restaurant overlooking the beach. A quick trip to the beach was fun and the short tropical rain shower was refreshing.

We arrived at the University of Puerto Rico, Mayagüez, and settled down in our rooms in dormitories. Tomorrow we begin the Populations and Ecosystems workshop in the biology building.

July 10

Our day began with a huge breakfast in the cafeteria and then we walked over to the biology building. Dr. Lucy Williams, the biology department head, greeted us and welcomed us to their brand new building. She made sure we had everything we need for our workshop.

We started the day by building habitats for milkweed bugs and mini-ecosystems. We will use them later in the week for detailed population studies, including reproductive potential and feeding interactions in an ecosystem.

We began a study of Mono Lake and created a food web of the major organisms. We will visit a saline lake later this week. I’ve never been to a saline lake; I really wonder what it will be like.
July 11
Finding the energy sources that fuel ecosystems was the task today. We burned snack foods, including cheese balls and goldfish crackers. Burning the food confirmed that there is energy in the foods we eat. The goldfish task was a real “fish fry.”

We then traced how energy moves through the ecosystem from producers to consumers. I was surprised to see how many producers were needed to support the consumers in higher trophic levels.

In the afternoon, Dr. Jesus Chinea talked to us about old-growth forests in Puerto Rico. He explained that they are on the “haystack hills” we saw on our drive to Mayaguez. There are very few old growth forests left in Puerto Rico, and they are working to restore them.

July 12
Today we are back in the van and driving to the western side of the island to visit El Yunque. El Yunque is a tropical rain forest managed by the USDA Forest Service. It is also called the Caribbean National Forest.

We had two guides for our trip, Dr. Pete Weaver, a researcher with the International Institute of Tropical Forestry located at the Botanical Gardens in San Juan, and Father Alejandro Sánchez, a local naturalist.

Dr. Weaver took us to trails that are not accessible to the many tourists that visit El Yunque. There are four types of forest found in El Yunque. First we visited the Sierra palm forest. The forest is located above elevations of 597 meters (1,958 feet) and is dominated by the Sierra palm. The Sierra palm forest is one of the populations and ecosystems in the area.

Next we went up into the cloud forest or dwarf forest above 762 meters (2,500 feet). It was much cooler and very, very wet in the cloud forest. All of the trees were smaller here and the ground was covered with a thick layer of sphagnum moss. The trails were less traveled and all of us emerged from the mist muddy and wet.
Father Sánchez helped us identify many of the plants and animals we saw. He could even identify the calls of the caqui frogs and birds that we could hear but couldn’t find. He also showed us how he gets some of those wonderful photographs on his website (http://www.kingsnake.com/westindian).

I really appreciate that they both took time from their schedules to spend the day with us. The experience of visiting the rain forest will be invaluable help when I teach Populations and Ecosystems in my classroom.

The drive back to Mayagüez was long, but it was a small price to pay to visit this unique ecosystem. I hope I will be able to come back to El Yunque to visit the other two forests here, the Tabonuco Forest and the Palo Colorado Forest.

July 13

This morning found us back at the biology building at UPRM. Alexis Torres came to talk to us about The Journey to El Yunque project. They have a great bilingual website for students in Puerto Rico (and elsewhere) to study the rain forests. http://elyunque.net/journey.html. We had time to explore the site and learn more about the forest we visited yesterday.

After lunch we were off on another adventure. We drove south to Cabo Rojo Salt Flats and Salinas Salt Lake. This area is very dry and hot compared to El Yunque.

Dr. Juan Gonzalez joined us to explain this ecosystem and the salt extraction industry. This ecosystem is very similar to Mono Lake. Millions of brine shrimp and brine flies provide a feast for the migrating birds that fly through Puerto Rico in the fall. When we walked to the water’s edge we found a layer of brine shrimp eggs. I collected some and will hatch them when I get back to school in the fall.

Salt extraction began at Cabo Rojo in 1511 and the process remains much the same today. It is the oldest industry still in production in North America.

Next we moved on to the fishing village of La Parguera. This is the location of the UPRM Marine Station. We boarded several boats piloted by Dr. Gonzalez’s graduate students. We spent the rest of the afternoon snorkeling on a nearby reef. Dr. Gonzalez was on hand to identify the many invertebrate organisms that the graduate students collected.
After snorkeling, we scattered throughout La Parguera for a quick dinner and then it was back to the Marine Station at sunset for a trip to the most unbelievable site of all, the bioluminescent bay. We all jumped into the black waters of the bay only to be dazzled by shimmering lights when we moved. Bioluminescent dinoflagellates glow wherever the water is disturbed. Who would have thought you could make “snow angels” in tropical water?

For such a small island, there are many different ecosystems in Puerto Rico. We have seen the old-growth forests, the sierra palm forest and cloud forest of El Yunque, the dry salt flats and saline lake in the southwest, the coral reef, and the mangroves that surround the bioluminescent bay. We have visited ecosystems that are very similar to many of the ecosystems studied in the Populations and Ecosystems Course.

July 14

It’s Friday already! It’s our last day in the beautiful biology building at the University of Puerto Rico, Mayagüez.

Back in the classroom, we learned all about genetics and natural selection with larkeys. This part of the Populations and Ecosystems curriculum is almost a mini-course on genetics. First we investigated adaptations and how they benefit organisms. We all participated in a simulation that showed how different colored walkingsticks had advantages in different environments. This affected what the population looked like after just a few generations.

Dr. Stephanie Whitman came to talk to us about the spread of gypsy moth in the northeastern United States. We’ve seen how an introduced species can affect the ecosystems here in Puerto Rico and how they can affect the continental United States.

Next we studied the genetics of the larkey. We “bred” several generations of larkeys with a set of allele tiles that simulates the random transfer of genetic information from one generation to the next.

The final investigation introduces natural selection and how environmental pressures work to change the genetic makeup of a population. It took everything we did all week and brought it together in this last investigation.

We ended with reflections on the workshop and our experiences in Puerto Rico.
FOSS Institutes

Delta Education will host one-day FOSS Institutes in conjunction with the 2006 NSTA Regional Conferences. There will be a K–6 Informational Institute and a Middle School Informational Institute before all three NSTA Area Conferences. These Institutes are designed for all educators—lead teachers, administrators, curriculum coordinators, professional developers, and university methods instructors.

The K–6 Institute will provide an introduction to the elementary school program by focusing on several modules from the different grade levels. FOSS developers will be there to lead each workshop and provide program updates and introduce new components.

The Middle School Institute will provide an introduction to the program by focusing on a few of the nine courses. FOSS development staff and experienced teachers will lead the Institutes. There is no charge, but participants must register in advance to attend. To secure your spot at the Institute of your choice, please call, write, fax or e-mail:

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FOSS INSTITUTES, 2006

Wednesday (10/18)
Omaha, NE

Wednesday (11/1)
Baltimore, MD

Wednesday (12/6)
Salt Lake City, UT

For more calendar events, visit FOSSweb at [http://www.fossweb.com/news/calendar.php](http://www.fossweb.com/news/calendar.php). If you would like to be added to the mailing list to receive this newsletter, send your name and address to:

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NSTA FALL AREA CONFERENCES, 2006
(no preregistration necessary)
October 19–21 Omaha, NE
November 2–4 Baltimore, MD
December 7–9 Salt Lake City, UT

FOSS WORKSHOPS IN THE NSTA PROGRAM

Thursday (10/19; 11/2; 12/7)
8:00–10:30 Breeding Larkeys in the FOSS Middle School Populations and Ecosystems Course
11:30–1:00 FOSS Forum: Implementing the Full Option Science System K–6
1:30–4:00 Chemical Interactions—The New FOSS Middle School Course

Friday (10/20; 11/3; 12/8)
8:00–11:00 Using Science Notebooks Featuring FOSS
12:00–1:30 A New Accountability: Valuing Academic Progress in Grades 3–6 (ASK, Assessing Science Knowledge)
2:00–4:30 Using Science Notebooks Featuring FOSS Middle School

FOSS WORKSHOPS AT THE CALIFORNIA SCIENCE EDUCATION CONFERENCE, 2006

October 19–22 San Francisco, CA

Friday (10/20)
8:00–9:00 New FOSS California for Kindergarten, Physical Science
8:00–9:00 How Do I Teach Energy to Third Graders?
12:00–1:00 New FOSS California Grade One, Physical and Earth Science

Saturday (10/21)
8:00–11:00 Earth History: California and San Francisco Bay Area Focus (Short Course)
11:00–12:00 New FOSS California Grade Five, Physical Science
12:30–1:30 New FOSS California Grade Four, Physical Science
1:30–4:30 Literacy in Science Inquiry: Weathering, Erosion and Deposition (Short Course)
2:00–3:00 New FOSS California Grade Three, Physical Science
3:30–4:30 New FOSS California Grade Two, Earth Science

For more details about these workshops and other upcoming events, visit the online FOSS Professional Development Calendar at [http://www.fossweb.com/news/calendar.php](http://www.fossweb.com/news/calendar.php).
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:

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Berkeley, CA 94720-5200

The deadline for submissions to the next issue is December 15, 2006. We’re waiting to hear from you.

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See you at the NSTA Area Conferences this fall!

New Chemical Interactions Middle School Course coming soon!