FOSS

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FOSS NEWSLETTER

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In this issue:

Work in Progress: FOSS Grows in Brooklyn

by Arthur Camins

Science is coming alive for youngsters in Community School District 16 in Bedford-Stuyvesant, Brooklyn, an urban community in New York City. Beginning in 1989 as a pilot in grades 3 and 4 with selected teachers, FOSS is now being used by over 200 teachers in grades K-6 in all 14 elementary schools. In 1991, following a Summer Leadership Institute in Washington, D.C. sponsored by the National Science Resources Center (NSRC), a team from the district developed a five-year district-wide implementation plan, selecting FOSS as the district science program. This led in the fall of 1992 to a National Science Foundation grant, *Science in the SEAMLESS Day*.

Teachers in Community District 16 are like teachers all over the country. They recognize the tremendous benefits that students receive in a good science program: understanding of and respect for the

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CAROLINE YEE AND EVELYN GERTLER COMPARE CORN PLANTS

Live Wires: Turned On to Science

by Caroline Yee

"Would you like to study the structures of the crayfish or have your fingerprints taken?" queried a third grader. Across the auditorium a fifth grader was busy describing the formation of a delta to another visitor, and out in the entryway another student was persuading the director of the Lawrence Hall of Science to buy a candy bar in order to raise funds for Science Camp. Everywhere

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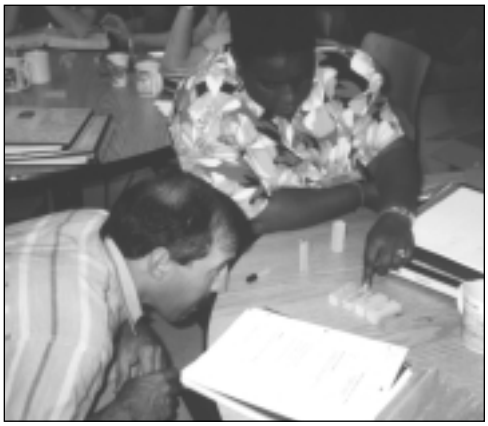
FOSS in Brooklyn continued

natural world, the ability to think critically, knowledge needed for jobs in the twenty-first century. But when we asked our teachers, "What are the impediments that keep you from providing a quality science education experience for your students?" most often they reported no curriculum, lack of materials, limited experience and training, and not enough time.

We listened to our teachers and studied the research. FOSS provided the curriculum and materials that fit our needs, but we had to develop our own implementation plan. We knew we had to be simultaneously visionary, empathetic, demanding, and supportive. In the end we adopted what we call our "No excuses/Do it all" approach.

We do whatever is needed to make the program work for teachers. We conduct after-school workshops, after-school "make-up" workshops, Saturday workshops, and we run off the FOSS student sheets centrally for all teachers. We manage the rotation, distribution, and refurbishment of FOSS modules, all tracked on a computer database. We work diligently with building principals and assistant principals to gain their understanding and support. We go into classrooms as model FOSSilitators, co-teaching, helping with groups of children, helping to organize materials, helping to clean up, or just listening—in short, whatever is needed.



ARTHUR CAMINS AND SHEILA DUNSTON DISCOVER WOOD

Time continues to be a nagging concern—how to fit science into the already overbooked day and still respond to the need for emphasis on language development. The SEAMLESS Day, our interdisciplinary approach, addresses this issue. We believe that in terms of both pedagogy and time effectiveness it is the only way to go. As teachers move beyond the "initial use" stage of FOSS implementation, they begin to use FOSS as a vehicle for language development and mathematics problem solving. We emphasize the interrelatedness of language, thinking, and learning science concepts. Interdisciplinary connections are flexible: they can be topical, thematic, or skill related. We envision a day when all of our teachers will be using "seamless day" methods and strategies in their classrooms—a core of activities that provide real experiences that call in the skills of language and mathematics for expression and extended learning.

We've seen enormous progress. A teacher half complained the other day: "It was 2:30 and I told my students we wouldn't have time for FOSS today. They rebelled. 'Thirty minutes is plenty of time.' They demanded to do FOSS." Some teachers who used to report that their children really enjoy the chance to learn science are now reporting that they really enjoy teaching science. We are definitely moving in the right direction.

ARTHUR CAMINS DURING A QUIET MOMENT WITH HIS FOSS KITS

__Arthur Camins__ is the Science Coordinator for Community School District 16 in Brooklyn, NY, and has been a member of the FOSS Advisory Board and a FOSS Trial Center Coordinator for five years. Arthur is assisted by __Sheila Dunston__ and __Jennifer Goddard,__ and supported by __Mildred Jones,__ District Superintendent.

Live Wires continued

people were engaging in science lessons from the FOSS program—magnets, electric circuits, sound sources, variables, chromatography, and much more—and first to sixth grade students were the teachers for one special evening. It was the Live Wires *Celebration of Science.*

Parents, school board members, and invited guests came to see students present their skills and understanding to the community. Of course the students didn't know who was who, they just did their thing, inviting visitors to investigate and discover alongside them. At the end of the evening, one student was heard to say, "This is the best night of my life. I wish I could stay here forever."

The *Celebration of Science* took place at Sequoia Elementary School in Oakland, California, culminating a two-year focus on improving the quality of science instruction for students and providing access and opportunity for all students to develop science thinking processes, as well as to reinforce basic skills. Funded by the U.S. Department of Education, the Live Wires project included several components:

- ❍ acknowledgment of teachers' time and extra efforts;
- ❍ staff training facilitated by the developers of FOSS;
- ❍ the encouragement of professional growth and accountability through bi-weekly science meetings;
- ❍ the purchase of FOSS kits and other appropriate science materials;
- ❍ the strengthening of the quality of content and process of science instruction;
- ❍ the implementation of a hands-on science program for all students;
- ❍ the employment of a science manager to organize, prepare, and inventory materials;
- ❍ scholarships for students to enroll in summer science classes, and;
- ❍ the special opportunity for learning by supporting members of the staff to attend national science conferences.

Supplementing the funds from the federal government, but of no less importance, was the pooling of resources both from the school community and the scientific community. With these resources, additional training was provided and additional materials were purchased. This was a true collaboration of educational and community resources, a partnership linking students, teachers, parents, district support, the university, resources from the Bay Area Science and Technology Consortium (BASTEC), and your tax dollars.

The Sequoia staff was probably like that of many schools with a broad range of teacher interests and skills, including sometimes a resistance to teaching science. Project Live Wires became the channel for encouraging teachers to be competent and confident in entering, what was for us, the uncharted waters of hands-on science for everyone throughout the grade levels. It was based on the premise that a hands-on science curriculum would provide quality education that was accessible to all students. However, although teachers (myself included) might want to teach science, science instruction was often put on the back burner because of an already overcrowded classroom schedule. Even after the school day was over, there was never enough time to collect materials for a science demonstration, let alone enough materials that would allow for participation by all the students.

Then FOSS came along and opened up a whole new world of science exploration and discovery for students and teachers alike. Unlike some other programs, FOSS seemed more comprehensive in scope, developmentally appropriate in objectives, and complete in terms of the materials packaged in the kits. The FOSS activities proved engaging to all the students, including gifted and talented, at-risk, and limited English speakers. When the teachers used the FOSS kits in their classes they found that they could not only teach science, but they could manage it as well. For the students, FOSS demonstrated that science could be interesting, exciting, and full of discovery learning experiences.

But materials and money don't do it all. Throughout the project the threads that kept it all together were the constant encouragement of the staff, the support of parents, and help from the FOSS developers. Essential to our development was also the dispelling of the myth that any of us were experts. Indeed, all of us were learning together. And, of course, this exciting adventure would not have taken place without the extra efforts made by the teachers to grow, to take risks, to learn a new way to provide quality education for students. And the good news is that even though the project is over, the students and teachers at Sequoia are still "live wires" and are still turned on to science!

Caroline Yee *is a 2nd/3rd grade teacher at Sequoia School in Oakland, CA. She developed the idea for the Live Wires Project and secured a US Department of Education FIRST Grant to make it a reality.*

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FOSS in Bratislava

Teachers in Bratislava worked enthusiastically with FOSS materials

The story of FOSS in Central Europe continues. In the last issue of the FOSS Newsletter, we reported Larry Lowery's experience in Prague, introducing FOSS to Czech teachers. In December, 1993, Larry Malone and Linda De Lucchi packed their warm things and a few FOSS artifacts and headed out for a week in Bratislava, capital of the Slovak Republic. Phil Stockton at Encyclopaedia Britannica had arranged with Pavel Poliak of the Ministry of Education for a FOSS pilot in seven elementary schools in Bratislava. We welcomed the opportunity to get the project off to a good start.

Nine time zones later we were at the training site, the Iuventa, putting affairs in order in preparation for the training. The Iuventa is an institution that provides educational enrichment and specialization for students after regular school and on weekends. The facility provides opportunities for intensive work in the fine arts, performing arts, athletics, foreign language, trades, and much more.

Peter Gabris, director of the Iuventa, played a pivotal role in the success of the training—he provided all of the FOSS folios translated into Slovak. With the printed materials in the language of the teachers, we were confident that the teachers would be fully prepared to use the FOSS activities effectively in their classrooms with their students.

The next two days were spent introducing 20 primary teachers to four FOSS modules for early childhood: **Paper, Wood, Balance and Motion,** and **Air and Weather,** using kits shipped in for that purpose. The teachers listened patiently as the opening comments about the program were delivered through an interpreter. But once the talk was over, the teachers plunged into the hands-on work with typical enthusiasm. In the last two days of our visit we introduced 20 intermediate teachers to four more FOSS modules: **Measurement, Ideas and Inventions, Magnetism and Electricity,** and **Human Body,** and again the teachers engaged in the activities with great enthusiasm. Hands-on science is truly an international means of communication.

The Iuventa hosted the FOSS workshop

We are looking forward now to returning to Bratislava and Prague in April to visit teachers in their classrooms to see how the pilot is progressing in both countries. If all goes well, EBEC will soon be working with manufacturers in Central Europe to produce kits for use throughout the region.

Network Update

In the last newsletter, we suggested that students and teachers communicate with the FOSS developers if they had questions they couldn't answer or information they wanted to share via Internet. Ultimately, we'd like to have students communicating with us and each other (like penpals), but one step at a time!

We received two messages. One was from David Allard, Professor of Biology, Texarkana College, who works with FOSS as a National Trial Center Coordinator. We hope to hear more from him and the teachers he works with in the near future. The other message came from Jeff Saslow, Science Coordinator for St. Louis Park elementary schools in Minnesota. He wrote to tell us that ALL of the students in St. Louis Park would soon have Internet addresses. We can't wait to hear from them!

By the way . . . did you know that when the big earthquake hit Los Angeles in January, the Internet lines continued to function? Folks were able to communicate by computer to check on friends and loved ones, even when other means of communication failed. Chalk one up for the information super foot path!

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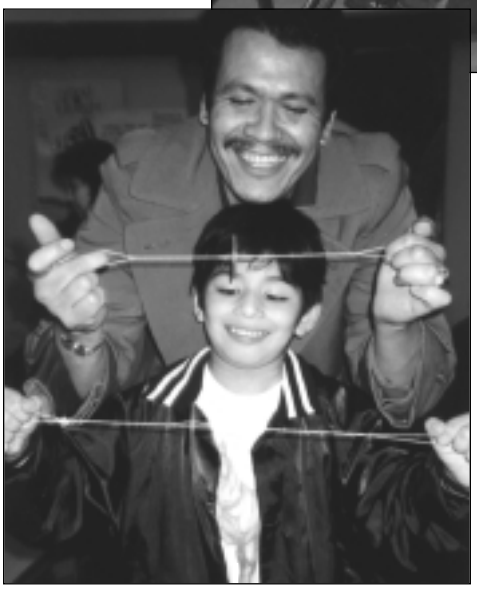
FOSS—In a Family Way

by Sara Sato

Families had great fun at Davidson School's FOSS Science Night featuring the **Balance and Motion Module.** The module's challenges were set up as eleven centers. Sara Sato, mentor teacher in science and math, was assisted by twelve dedicated teachers and parents who volunteered their time overseeing the centers.

The parents who have attended Davidson's near-monthly family activity nights have expressed their appreciation for and enjoyment of the events. Science was a big draw. Parents who came to Science Night also received a list of hands-on science resources for families in the Bay Area so that they could continue their family adventures in science on their own.

Davidson School is in Vallejo, CA. This year Davidson was named one of eight California Achieving Schools.



Index/Glossary Available

Want to know where in FOSS the concept of earth material is covered, or energy, or germination? Look it up in the new comprehensive index for the whole FOSS program that EBEC has just completed. In addition, all of the science words and phrases used in FOSS are listed and defined in the glossary section. And to make the document even more versatile, the glossary section is in Spanish, too. To get your copy simply call EBEC at the toll-free number and ask for it by name, the BSS Index/Glossary.

FOCUS ON CURRICULUM: Earth Science

In the next four issues of the FOSS newsletter, we will be focusing on one of the four strands of the FOSS program. These include the traditional earth, life, and physical science strands, and FOSS's unique Scientific Reasoning and Technology strand. In this section, we'll bring you updates, new extensions, more books, and tips from teachers and developers to help streamline and enrich your teaching of hands-on science. This issue focuses on EARTH SCIENCE.

The progression of concepts through the FOSS earth science modules is sequential and developmental, starting with foundation concepts about matter and advancing through ever greater levels of complexity and abstraction as students grow. Chart 1 below provides a graphic summary of the modules and the key concepts developed in each module.

FOSS K–6 EARTH SCIENCE STRAND ARTICULATION MATRIX

	MODULE	SCIENCE CONCEPTS	THINKING PROCESSES	MODULE OVERVIEW
Grades 5–6	**Landforms Module**	Contour, Erosion, Deposition, Elevation, Landform, Map, Model, Point of view, Slope, Topography	**Relating** Organizing Comparing Communicating Observing	Students test relationships (amount of water, steepness of slope) between flowing water and earth materials and determine the effects of erosion and deposition in the creation of landforms.
	Solar Energy Module	Absorb, Change, Energy transfer, Heat sink, Insulation, Orientation, Reflect, Shadow, Solar Energy, Surface Area		Students study the relationships between the position of a light source, such as the sun, and the shadows it casts. They set up experiments to discover cause-and-effect relationships that influence energy transfer, esp.the heating and cooling of air, water and earth materials.
Grades 3–4	**Earth Materials Module**	Earth material, Crystal, Geology, Mineral, Rock, Property	**Advanced Organizing** Comparing Communicating Observing	Students examine rocks in detail, discovering they are made up of various combinations of minerals. Rock and mineral properties are used to identify them by similarities and differences.
	Water Module	Change, Cycle, Condensation, Earth material, Evaporation, Liquid, Solid, Property, Surface tension		Students examine the properties of water in its various forms—solid, liquid, gaseous—and what happens to it as it is mixed with solid earth materials.
Grades 1–2	**Pebbles, Sand & Silt Module**	Earth material, Rock Mixture, Particles, Soil	**Beginning Organizing** Comparing Communicating Observing	Students study the properties of rocks and soil. They group and seriate rocks on the basis of single, observable properties, learning simple ways by which earth materials can be organized.
	Air and Weather Module	Air, Gas, Lift, Pressure, Propulsion, Temperature, Weather, Wind		Students study the properties of air. They examine its effects on other materials and use basic tools to gather information about air and weather.
Kindergarten	**Paper, Wood, and Fabric Modules**	Materials, Structures, Change	**Comparing** Communicating Observing	Students observe, compare, and describe a variety of materials on the basis of their properties (textures, shapes, color, etc.), thus setting a foundation for more advanced ideas.

CHART 1: THE LOGICAL PROGRESSION OF CONCEPTS THROUGH THE FOSS EARTH SCIENCE MODULES

☞ Managing equipment for hands-on science can be time consuming. If a teacher has to gather his or her own equipment, chances are there will be no hands-on science. One of the great advantages of using FOSS is that virtually all the equipment needed to teach the activities is in the kits. Even so, it still requires some planning and organization to manage the materials with confidence and efficiency. Here are some ideas to make it easier.

Tips for Earth Science Equipment Management

1. One Time Prep.
If you're the first teacher to use a brand new kit, there may be some prep you need to complete before the kit can be used for the first time. After the one-time prep has been completed, keep those pieces of equipment together, so the next teacher will need less prep time. If you get all the grade-level teachers who are going to be using the kit together to do this one-time prep, the time will be much less. In the earth science strand, these are the things you'll need to do for one-time prep:

Pebbles, Sand and Silt

- ☞ Obtain a large bag of sand
- ☞ Laminate *Sorting Mats* (optional)
- ☞ Tear sandpaper into small pieces
- ☞ Obtain small aluminum loaf pans
- ☞ Make a sample brick

Air and Weather

- ☞ Construct a homemade rain gauge
- ☞ Construct a class anemometer
- ☞ Cut black construction paper for a "cloud window"
- ☞ Construct a class wind vane

Water

- ☞ Obtain about 50 pennies

Earth Materials

- ☞ Put together a rock and mineral reference set
- ☞ Assemble sets of scratch tools

Landforms

- ☞ Mix diatomaceous earth and sand
- ☞ Write elevations on foam mountains
- ☞ Laminate topo maps (optional)

Solar Energy

- ☞ Number the thermometers in pairs
- ☞ Mark 4 cups with a 100-ml line
- ☞ Prepare solar collector sheets. Cut black and white plastic sheeting into round and rectangular pieces.
- ☞ Cut acetate sheets in thirds. Tape them to the unassembled solar houses to make "windows."
- ☞ Make an overhead transparency of the *Model Solar House Diagram* sheet (optional)

2. Organize Equipment by Activity.
You can use a large plastic bag to hold all of the equipment needed for one activity. Some equipment items will be used in more than one activity (e.g. cups and 1/4-liter containers). These items must be moved from one activity bag to the next as needed.

3. Repackage Items.
Some equipment items are not prepackaged in the kits (e.g. cups and 1/2-liter containers), and others arrive in plastic bags with twist ties. Transfer these items, (along with the labels from the old bags) to zip bags for more convenient storage.

4. Check Notes for Storing.
The *Inventory and Organization* sheets at the back of the teacher guide include a section called "Storing equipment." That section provides hints for storage and passing equipment on to the next teacher.

5. Get Students Involved.
Assign a different group each week to be in charge of the equipment kit. Their job is to keep equipment cleaned, inventoried, and stacked neatly back in the kit so it is ready for the next use. When students take ownership of the kit, their respect and caring for materials increases.

The Scoop on Diatomaceous Earth

Diatomaceous earth is a naturally occurring form of non-crystalline silca (silicon dioxide, SiO2) composed of the skeletons of microscopic marine plants. It is a colorless to gray, odorless powder. It may also be called diatomite or diatomaceous silica.

Diatomaceous earth is available commercially as the filtering agent in swimming pool filters.

In FOSS, diatomaceous earth is used in two modules. In the **Mixtures and Solutions Module,** diatomaceous earth is the white powder that doesn't dissolve in water. In the **Landforms Module,** diatomaceous earth is mixed with fine sand for use as the earth material in the stream tables.

Some FOSS users have expressed concern that diatomaceous earth may be a health hazard or even a carcinogen. The FOSS staff has checked several publications and with the National Institute for Occupational Safety and Health (NIOSH) for information which is summarized here.

When used according to the

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Integrating the Earth Science Curriculum

One of the hottest trends in elementary education appears to be integrated units. And why not? When subjects are taught in a coordinated fashion, students get a more holistic picture of learning; they are better able to make connections between their school experience and the world around them.

FOSS earth science modules make it easy to integrate the curriculum. Each of the six teacher guides provides a wealth of suggestions for weaving language, math, social studies, art, and physical education throughout the activities. As you prepare to teach a FOSS earth science module for grades 3–6, refer to the matrix on pages 10 and 11 of the Overview folio. Many interdisciplinary opportunities are summarized.

Elaine Davidson, a 5th grade teacher from Grand View School in Dinuba, CA, shared her wonderful experience.

"Currently I am teaching the **Landforms Module.** My students had just finished making a geography pictionary of landform terms for social studies when the landforms kit arrived. What a super coincidence! As we were doing stream table investigations, students began shouting, Look! We have a canyon! or There's a meander or Now it's making a delta! Now we have finished Scott O'Dell's Island of the Blue Dolphins and are making our own islands in small groups. It is wonderful to see several students using their pictionaries and knowledge of landform terms to describe the topography of their islands. As a culminating activity, I have ordered a video entitled Grand Canyon Suite, which features beautiful scenes of the Grand Canyon being described by this famous piece of orchestral music."

HOMEWORK . . . JUST FOR FUN!

"Homework" is one of the most dreaded words of elementary school students and their parents. Often homework means endless sheets of math problems, spelling words to write, or definitions to copy. To break the tedious cycle, use FOSS activity extension ideas as springboards for homework that students will enjoy so much, they'll beg for more!

For example, have students working with the **Pebbles, Sand, and Silt** or **Earth Materials** modules find rocks to bring in for a class rock museum. For homework the students write riddles that describe the rocks in detail without actually naming them. Collect the riddles and read them throughout the next day or two to see if the students can guess which rocks go with which riddles.

Send home the *Human Shadow Path Puzzle* for **Solar Energy Module** homework. If possible, have the students make shadow observations with a parent—standing under a light source, walking a particular pattern, and graphing the result. Have the students put the walking patterns and the graphs on separate pieces of paper and see if the class can determine which graph goes with which path.

Doing the **Water Module**? Demonstrate a trick with surface tension that students will love to try with their parents. Fill a large glass with water so that the surface of the water is exactly level with the top of the glass. Ask students (parents) to guess how many small paper clips you can put into the brim-full glass before the water spills over. Students can compare this experience to the one they had when they put drops of water onto pennies.

Want to see your name in print? The Fall 1994 issue will focus on the physical science modules. Send your ideas for prepping and enriching those modules to FOSS Newsletter, CML/Lawrence Hall of Science, University of California, Berkeley, CA 94720.

Diatomaceous Earth continued

instructions given in the FOSS activity folios, you should have no problem with the use of diatomaceous earth with most students. Here is a list of further precautions to take to limit most problems that may occur.

1. Problems can occur when large quantities of the dry diatomaceous "dust" are inhaled. It is recommended that mixing the earth material for the stream table be done in a closed zip bag by an adult or with adult supervision. Adding water to the material in the bag cuts down on flying dust particles. Diatomaceous earth should be damp when used by the students. If dust is a problem for some students, we recommend providing disposable masks for them to use during the activity.
2. Contact lens wearers should remove their lenses before mixing the earth material. Airborne particles of diatomaceous earth may get lodged behind the lens and result in scratched corneas. If eye contact occurs, immediately flush the open eye with lukewarm, gently flowing water for at least 10 minutes. If irritation continues, seek medical attention. Safety glasses may be used for dust protection.
3. Some students may experience mild, temporary skin irritation when handling diatomaceous earth, especially if humidity is particularly low in your area. They should rinse with plenty of clear water and limit their handling of the material. Disposable plastic gloves could be provided.
4. There may be mild, temporary irritation should one of your students ingest some of the material. Drinking plenty of water should help reduce these effects.
5. To clean up, do not dry-sweep diatomaceous earth. To cut down on the amount of airborne dust, sweep up the material when damp or spray lightly with water before you sweep.

For more information about diatomaceous earth and other chemicals, you can contact the National Institute for Occupational Safety and Health (NIOSH) Hotline at 1-800-35-NIOSH.

Assessment in the Earth Science Strand

Assess student understanding as you progress through the module. This way, you can keep tabs on what concepts and processes each student has learned. Each teacher guide for grades 3 through 6 contains a section with assessments in three formats: hands-on, pictorial, and reflective questions. Although the assessments appear at the end of the teacher guide, they are meant to be used throughout the teaching of the module. When you are doing your initial prep, read the assessment section carefully as you read the activity folios. Think about how you will integrate the assessments in with the instruction. Use these assessments as needed to help make the decisions necessary to guide all your students to understanding. FOSS assessments allow you to adjust your instruction to see that all students "get an A."

Chart 2 shows one way to integrate the assessment items provided with the **Earth Materials Module** into the teaching sequence. The two columns show the activities and the assessment activities that might be used with them.

Although there are no formal assessments developed for K-2 modules, there are many embedded assessments and tools provided to track the progress of your students. One way to keep anecdotal records is to carry around a clip board with student names on mailing labels. As you see things happen that show evidence of a particular student's progress, jot it down on one of the labels. At the end of the day or week you can remove the labels and place them in each of the students' individual files.

Many of the Home and School Extensions for K–2 serve as activities you can use for assessment. Those that are appropriate for use as embedded assessment activities have been identified in the activity folios and are discussed in the assessment folio at the end of the teacher guide.

Portfolio Assessment

Portfolios are collections of student work that serve as evidence that a student is proficient at something or has made progress toward some goal. Ideally, a student's portfolio would follow him or her throughout the grades; a comprehensive story of learning over time. If you haven't tried portfolios yet, science may be a good place for you to start. Here are some guidelines for FOSS portfolios.

- Begin with a cumulative folder for each student. Each student keeps all of his or her work from the module in this personal folder. As the unit progresses (or at the end of the module), you can help students select work to put in their assessment portfolios.
- It is important for students to assemble their own portfolios, but at first they will need some guidance. For example, a "teacher directed/student selected" checklist for a portfolio for the **Air and Weather Module** might look like this.

Include evidence in your portfolio that demonstrates the following:

_____1. You can name two weather instruments and how they are used to measure the weather.
_____2. Shows something you learned about the properties of air.
_____3. Shows how air interacts with objects.
_____4. Shows that you know how to organize scientific data (charts, graphs, etc.).
_____5. A piece of writing—edited and published—that tells something about air or weather.
_____6. Something that shows your best work.

(You may also want to include a Portfolio Project that allows students to show off what they have learned throughout the module and how they can apply that knowledge to the real world.)

- Include a variety of evidence to show not only a student's best work, but also how he or she has improved. Some suggestions for different types of evidence include: student sheets, drawings, tape recordings, early drafts, lab notebooks (journals), video tapes, photographs, and written teacher observations. The only limits are the size of the portfolio and keeping the collection organized and cohesive so that it tells the story of the student's learning.
- Students should write (or dictate) a few sentences about each of the entries telling why the entry was chosen and how it adds to the story of progress.

Yes, it does take time, but the rewards in terms of what you learn about your students and the students' increase in self-esteem and improved quality of work are worth the extra time and effort.

ACTIVITY	ASSESSMENTS AND EXTENSIONS
1 Mock Rocks	Pictorial Assessment: Sorting Rocks (No. 3 of 5) Use Math Extension: Weigh It Before and After. (Make cookies, take apart, weigh whole and parts, and discuss similarities between ingredients in cookies vs. minerals in rocks.)
2 Scratch Test	Hands-on Assessment: Scratch Test (No. 1 of 5), or Pictorial Assessment: Scratch Test (No. 4 of 5) Use Math Extension: Seriation. Assess students understanding of the process of seriation. Weigh rocks, measure circumference or diameters of a collection of rocks, then seriate them.
3 Calcite Quest	Hands-on Assessment: Vinegar Test (No. 2 of 5)
4 Take It For Granite	Reflective Questions Assessment: (No. 5 of 5)

CHART 2: INTEGRATING ASSESSMENTS INTO THE EARTH MATERIALS MODULE TEACHING SEQUENCE

Coupons for Living Organisms Available from EBEC

Four FOSS modules require living animals: **Animals Two by Two, Insects, Structures of Life,** and **Environments.** We have tried to use animals that are easily obtained from local sources around the country, but sometimes that won't work. Coupons are now available.

Here's how it works. If you are going to teach **Structures of Life,** and you can't find a local source of crayfish, you can purchase a **Structures of Life** coupon from EBEC. When you are ready for your crayfish, you write your proof-of-purchase number and the date you want the crayfish delivered on the coupon and send it (or FAX it) to the address (number) on the coupon. If you are doing the **Insects Module** you might have six different coupons that you will send in one or two at a time as you get ready for each different insect. Keep a photocopy of the coupon in case you want to call the vendor to confirm the delivery date.

Dangerous Discharge!

Rechargeable batteries may be unsafe to use in the classroom. Several schools have reported that if the students create any kind of a short circuit while they are creating various circuits, or if they leave the circuit for the electromagnet closed, the batteries, and particularly the wires, get very hot, and may potentially burn students. At this time FOSS suggests that you do NOT use rechargeable batteries for this module. While we are concerned about the environment, our primary concern is for the safety of your students.

Acid Test Syringes

The large syringes used in the Acid Test activity in the **Food and Nutrition Module** are not performing satisfactorily due to a design change initiated by the manufacturer. A similar syringe produced by a different manufacturer has been substituted for the old one. We are confident that this vexing problem has been corrected.

If the plungers of your Acid Test syringes stick in the barrels and cannot be induced to slide smoothly even with the use of the silicone lubricant, send them to the address below for replacement at no cost.

HINT: When using the acid test syringe and bottle setup, shake the system gently to insure complete reaction, and tap the plunger gently on top to prevent it from sticking. These tricks should keep things running smoothly.

FOSS, Lawrence Hall of Science, University of California, Berkeley, CA 94720, 510.642.8941

Air and Weather Syringes

Check the syringes before you use them with your class. Because there are no modifications made to the syringes before they are shipped to you, the little caps that cover the tips of the syringes may still be in place. You need to remove these caps before using the syringes in Activity 2, Air Explorations. The caps can be discarded.

New from the Wordsmiths

There are many good books to include as reading resources after your students have participated in activities from the FOSS earth science strand. Several of the books are included in the BSS Reading Resource package that were either too new or simply eluded us when the module FACTs were being developed. These books are described in the following annotations.

From Cement to Bridge

By Ali Mitgutsch. Carolrhoda Books, Inc. (A Start to Finish book), Minneapolis, MN, 1981. **(Pebbles, Sand and Silt Module)**

Follows limestone from the quarry to the factory where it eventually is formed into cement and ultimately becomes concrete and is made into a bridge. This book was originally published in Germany in 1979 under the title VOM ZEMENT ZUR BRÜCKE.

From Clay to Bricks

By Ali Mitgutsch. Carolrhoda Books, Inc. (A Start to Finish book), Minneapolis, MN, 1981. **(Pebbles, Sand and Silt Module)**

Highlights the step-by-step process of digging clay and forming it into bricks. This book was originally published in Germany in 1975 under the title VOM LEHM ZUM ZIEGEL.

Where Does Water Come From?

By C. Vance Cast. Barron's Education Series, Inc., Hauppauge, NY, 1992. Illustrated by Sue Wilkinson. **(Water Module)**

Clever Calvin answers the title question with a number of answers, such as rain, reservoirs, aquifers, and wells. He also discusses the water cycle and water treatment and describes a water condensation experiment.

Paddle-to-the-Sea

By Holling Clancy Holling. Houghton Mifflin, Boston, 1941. A Caldecott Honor Book. **(Landforms Module)**

A Native American boy carves a wooden figure in a canoe. He sets it afloat near the headwaters of a river north of the Great Lakes. This book describes the canoe's three-year journey from Lake Superior along the Saint Lawrence Seaway to the Atlantic Ocean.

The Way to Start the Day

By Byrd Baylor. Macmillan, New York, 1986. Illustrated by Peter Parnall. A Caldecott Honor Book. **(Solar Energy Module)**

The peoples of the world have celebrated the dawn in many ways and this book describes a number of these activities, from chants, ringing bells, and beating drums to giving gifts of gold or flowers.

Calendar of Events

1994 FOSS Leadership Institutes Schedule

This spring and summer, EBEC will be hosting a number of FOSS Leadership Institutes and other informational events across the country. The purpose of the Leadership Institutes is to prepare resource educators to implement FOSS and BSS in their schools or districts. Participants are responsible for their own travel and housing expenses. EBEC will provide meals, the professional development institute, and a variety of FOSS Program materials.

Other events include one-day introductory workshops (see Special National-Conference Activities) and FOSS users conferences. The users conferences are organized so that people who have been using FOSS for a while can meet other users to share information, solve problems, learn new ways to extend the FOSS experience, and a whole lot more.

March 28-29	**Anaheim, CA (two 1-day workshops)** Holiday Inn – Maingate Anaheim
Mar. 30–April 2	**National Science Teachers Association Convention** Anaheim Convention Center, CA
June 16-18	**Berkeley Leadership Institute** Lawrence Hall of Science
June 21–22	**Washington DC Leadership Institute** Location to be announced
June 24–25	**Richmond, VA Leadership Institute** Location to be announced
July 7–9	**Chicago Leadership Institute** Encyclopaedia Britannica Building

Special National – Conference Activities in Anaheim

EBEC will be offering two 1-day introductory FOSS K–6 workshops on the two days preceeding the conference. The workshops will be a chance for educators unfamiliar with FOSS to get a quick overview of the program presented by four FOSS developers.

AND, on the evening of Thursday, April 1, (no foolin') at 7:30, EBEC is hosting a reception for all the friends of FOSS at the convention. Stop by for a beverage and some snacks, and bring a friend. Be part of the inFOSStation!

❑ **Yes! I'm interested in attending a FOSS Leadership Institute.** **Date** _____

Location _____

Yes! I'd like to be informed of special events coordinated with the NSTA Area conventions this fall.

❑ Portland, Oct. 13-15 ❑ Minneapolis, Nov. 3-5 ❑ Las Vegas, Dec. 15-17

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.

Mail form to: Mary McDonald, EBEC - 6th Floor, 310 South Michigan Avenue, Chicago, IL 60604-9839

About This Newsletter . . .

The intent of the FOSS newsletter is to help FOSS and BSS users develop a network of support across the country. EBEC 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 BSS or would like to submit an article about management, exciting school programs, etc., please send them to FOSS NEWSLETTER, Lawrence Hall of Science, University of California, Berkeley, CA 94720. We'll be waiting to hear from you!

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For information about purchasing FOSS and BSS products or for the phone number of your regional representative, call EBEC Toll Free at: 800.554.9862

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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!

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