

SPECTRUM

THE JOURNAL OF THE ILLINOIS SCIENCE TEACHERS ASSOCIATION

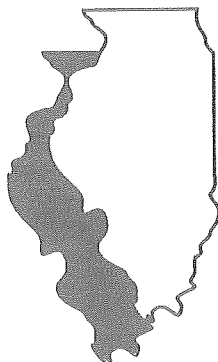
**“THE
FUTURE
IS
TODAY”**



**1993
ISTA
CONVENTION**



SPRING 1994



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ILLINOIS SCIENCE TEACHERS ASSOCIATION SPECTRUM

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ISTA NEWS



SPRING PRESIDENT'S LETTER

Fellow Science Teachers,

Is 1993 Really over already? How can it be that another entire year has flown by without the establishment of National Standards for Science Education? Surely the great minds of science have a clear picture of what classroom teachers must present to students in order to achieve a society of scientifically literate adults. Or do they?

Of course, I am being very facetious. We all know that to determine what essential science information children must be exposed to in the course of their education is no simple task. Many of you are being called upon by your respective schools to write appropriate science outcomes for your students and I suspect you have labored with this task. One thing I do know for sure is that we as advocates of science education must diligently work towards district outcomes that truly present to children the kinds of learning opportunities that we know are right! We cannot fall into a trap of building our schools curriculum around outcomes that we are led to believe will pass "Quality Review" or are easy to assess "two different ways".

There are no easy shortcuts to the determination of a school's curriculum. Much time and thought goes into a well articulated and coordinated educational plan. If we truly want the highest quality of school improvement, then educational decision makers at all levels are going to have to provide the necessary time and support teachers need to complete this difficult task. Those of us who are facilitating this process must not forget the importance of doing this task correctly for it is only the children who will lose.

The Illinois Science Teachers Association is trying to impact the decision makers and present to them our concerns. Let me suggest to you that if you feel that your school's science curriculum is suffering as the result of inappropriate

decisions regarding what should be taught in your schools, share your concerns with your administration. Challenge them to rise to the task of responsible school improvement. Remember ISTA is your organization; let us hear from you.

ISTA has been laboring with the issues of appropriate forms of science assessment and how to achieve them. We feel we have some workable solutions.

Next year the ISTA leadership conference at Pheasant Run in St. Charles will focus on national standards for science education and how they relate to Illinois science goals and local outcomes. We hope to have a complete perspective for you regarding what is being said across the state and nation regarding this important issue.

If your school has not had an opportunity to view the ISTA Performance Assessment Handbook I encourage you to contact your Educational Service Center for that information. If that is not feasible give me a call at (618) 692-3065.

Enough about science outcomes. I guess I just feel that if I talk about outcomes enough someday I might actually understand the difference between goals, objectives, and outcomes.

I am truly excited to share some important information with you. ISTA has an Executive Secretary, Diana Dummitt. All of you already know her as the Associate Editor of the *Spectrum* and no, she will not be leaving that job, but taking on some additional responsibilities. I'll let Diana tell you more about her new role later. For right now let me just wish her a real welcome to this new position and suggest that perhaps the Executive Secretary might write this column in the future.

As Always, Good Sciencing,

ISTA cordially invites all Illinois teachers attending the NSTA convention in Anaheim to a reception honoring you at the Anaheim Marriott. The reception will be held on April 1 from 7:30pm until 9:30 pm. See your convention brochure for the room number details. We hope to see you there!

Gwen Pollock
ISBE
100 N. First Street
Springfield, IL 62777

DID YOU KNOW...

...about these opportunities and materials, which may be very beneficial to your efforts as science teachers?

First, I strongly suggest that you acquire a copy of *Benchmarks for Science Literacy* from AAAS, Project 2061. It has just recently been released. It is invaluable as a guide to curriculum decision-makers, classroom teachers and school improvement committees and outlines the concepts of science which are considered on a national scale to be strategically important. Ideas from *Benchmarks* can be used to generate, modify or substantiate outcomes for science for improving your school. The address for ordering your copy is: Oxford University Press, Dept. EC, Madison Avenue, New York, NY 10016. Credit card orders call 1-800-230-3242. If you order immediately, you can receive a 20% discount.

I would also like to invite you to celebrate National Science and Technology Week, which is scheduled for April 24-30, 1994, with festivities in your own classroom, building, district or local levels. NSTW, in its tenth year now, is sponsored by the National Science Foundation.

Some ideas presented by the NSTW committee include:

Science Day—Plan a day of activities and demonstrations that promote the alliance of your school, club or group with others in your community.

PTA Workshops—A symposium on trends in science education and your science curriculum might be combined with demonstrations, and a program for families and the general public.

Exhibits—Prepare an exhibit presenting your group's or class' science awareness activities. Possible sites for your exhibit might include your school, library, museum or shopping mall.

Partnership Events—Form coalitions between your school/group and businesses in your area to organize and sponsor a community-wide event or contest. Possibilities include a paper airplane contest, a science trivia bowl, an invention challenge, engineering olympics, and essay and art projects. Consider including a special awards ceremony to recognize all of the participants.

Roving Scientists—Enlist volunteers from businesses and industries in your community to make a presentation to your students about science in their careers. Or, suggest to your students that they are science explorers and take them on a trip through the community to discover the science and technology in the everyday world around them.

Career Expo—Bring students and industry personnel together to highlight opportunities in mathematics, science and engineering fields. Invite parents and teachers and the general public to see the scope of 'real world' applications of science and technology.

The NSTW committee has prepared a booklet of ideas which may be very helpful in plans for this celebration. They are offering posters, parent materials and follow-up materials, in English and in Spanish. You may get a copy from: NSTW, NSF, Room 527, 1800 G Street, NW, Washington, DC 20550.

ISBE, Center on Scientific Literacy is planning a showcase of the Scientific Literacy grants sponsored this year at the State Capitol, during National Science and Technology Week. Present grantees should have already received an invitation to participate in this showcase. Please accept our invitation to visit with science/math teachers from all over Illinois, sharing the challenge of increasing scientific literacy for our students.

The Center on Scientific Literacy is also going to promote the publication of journal articles, required by the terms of our grants, in the state's professional journals, i.e., *SPECTRUM*, etc. Look for more of Illinois' own expertise in our common efforts in scientific literacy.

The 1995 Request for Proposals (RFP) for Scientific Literacy grants is planned to be sent to local school superintendents during the month of March. The opportunity for realizing the dreams that you have for improving the science and mathematics in your schools can be within your grasp. Joyce Krumtinger, Math Consultant; Penny Kelly, Technology Consultant; and myself, Gwen Pollock, Science Consultant can offer technical assistance for writing a Scientific Literacy Grant for your classes, school or district. The proposed timeline includes the application period ending in May with the selection and negotiation process completed in early July, pending legislative appropriation. Please call 217-782-2826 for information and assistance.

In early January, brochures advertising a summer STS (Science, Technology and Society) project were mailed to all public middle schools. This project will model STS strategies, use the expertise of the state agencies of Conservation, Energy and Natural Resources, Agriculture and Environmental Protection and complement the School Improvement process. The Science of Energy and Cycles, the Technology of Agriculture and the Impact of People on Illinois' natural and cultural resources are the main topics for teaching and learning. The target audience includes grades six through eight. For more information, prior to the application deadline of March 15, please call Gwen Pollock, 217/782-2826.

Advertising brochures for state-wide regional workshops on Chemical Safety were mailed in February. These workshops are scheduled for August, 1994. More information will be available in mid-March from my office.

.....
* **Attention! If you lost a bag of newly-** *
* **purchased items at the ISTA convention** *
* **in October, we want to talk to you.** *
* **Call Ann Scates at (618)692-3065 to** *
* **claim your stuff!** *
* *

Friday and Saturday, November 4 and 5, 1994

Join us at the ISTA Convention at the Pheasant Run Resort in St. Charles to meet our featured speakers...

BILL KURTIS

For Bill Kurtis, the world is his classroom. Not confined by studio walls or the printed page, he takes the show of science education on the road. Recognized in the Chicago area as nightly news anchor on WBBM-TV, Mr. Kurtis is producer and host of *The New Explorers*, a public television series that has carried millions of viewers from their homes and classrooms to the modern frontiers of science. Bill Kurtis has tracked the explorations of more than 40 remarkable scientists, explorers who have led him down to the bottom of the ocean, to mountaintops, into operating rooms, and many points beyond. Of all the travels of *The New Explorers*, Mr. Kurtis likes to say, perhaps the most important has been the one into the classroom. Through a unique partnership with the United States Department of Energy, Argonne National Laboratory, and museums, videotapes of *The New Explorers* and accompanying curriculum guides are made available to teachers across the nation.

CAROL VALENTA

Carol Valenta has entertained audiences across the nation, demonstrating the delights of science with a sense of humor and a warm reality for the classroom. Having served as a teacher, principal, and director of the Los Angeles District Science Centers, Ms. Valenta currently serves as Director of Education for the California Museum of Science and Industry in Los Angeles. Under her leadership, a delicious menu of innovative science activities pleasing to a diverse audience now captivate visitors. Carol Valenta starred in *Energize!*, a television series bringing the delights of science to youngsters in Los Angeles, and she is an author of the forthcoming, *Science AnyTime*, a new elementary science program from Harcourt Brace School Publishers.

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Share your ideas!

Join us at the 1994 ISTA Convention!



"The World is My Classroom!"

**Pheasant Run Resort – St. Charles, Illinois
November 4 & 5, 1994**



Share your great ideas with your colleagues. Present a workshop at this year's ISTA Convention. Elementary school teachers, high school teachers, everyone join in!

These are exciting times in education. Change is the name of the game. We are all looking for expanded and/or new ways of teaching. You can help by presenting a workshop to your colleagues on how YOU do it.



Invite a colleague to present!

Mail your presentation proposal to:

Phil Parfitt
The Chicago Academy of Sciences
2001 North Clark Street
Chicago, IL 60614

Submit a proposal today!
Use the attached form.

All participants, including presenters, are required to register for the conference. Non-commercial and commercial workshops are welcome. Space is limited.

1994 Convention
Illinois Science Teachers Association
Pheasant Run Resort, St. Charles, Illinois

**November
4 & 5, 1994**

Call for Workshops

Please complete a separate form for each workshop you would like to present. You may duplicate this form.
Due to limited space, presentations should be limited to 50 minutes.

Would you like to present your program on (please circle)

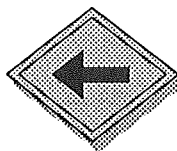
* Friday * Saturday * or either day?

Approximately how many participants do you want in your session? (please circle)

*10 *20 *30 *40 *50 *60 *70 *above

Please **attach** the title of your presentation. (10 word maximum)

Please **attach** a description of your program as you would like to see it in the program book. (25 word maximum)



Type of Session

- ☐ hands-on workshop
- ☐ demonstration
- ☐ contributed paper
- ☐ panel
- ☐ other _____

Intended Audience

- ☐ preschool
- ☐ elementary
- ☐ middle/jr. high
- ☐ high school
- ☐ college
- ☐ supervision
- ☐ general
- ☐ teacher preparation
- ☐ other _____

Subject Area

- ☐ astronomy
- ☐ biology
- ☐ chemistry
- ☐ earth science
- ☐ physics
- ☐ ecology/environment
- ☐ science/technology/society
- ☐ physical sciences
- ☐ math
- ☐ assessment
- ☐ other _____



Equipment Required

- ☐ overhead projector
- ☐ 35mm slide projector
- ☐ VCR/monitor

Please print or type:

Name

Day phone

Affiliation (School, Organization or Company)

Home phone

Address of above organization

Home address

City, State, Zip

City, State, Zip

As a non-profit organization, ISTA is unable to reimburse presenters for travel or other conference expenses.
All presenters are required to register for the conference.

Send to:

Phil Parfitt

The Chicago Academy of Sciences, 2001 North Clark Street, Chicago, IL 60614

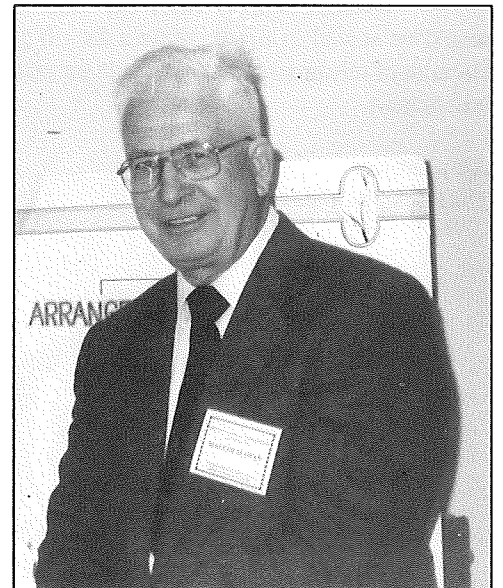
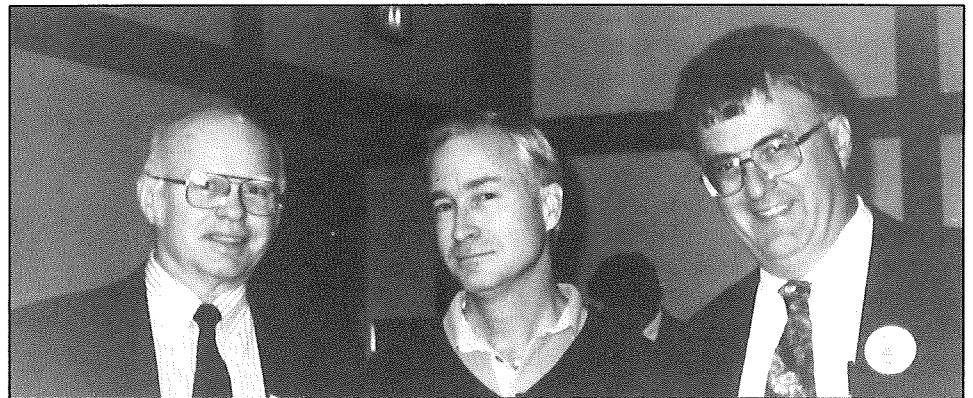
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ISTA CONVENTION 1993





**PHOTOS
COMPLIMENTS
OF ROSAMOND
HILTON**



ARTICLES

SCI-MAT FELLOWSHIPS

Many teachers have a career in education because of their personal love of learning. Often, elementary school teachers are too busy with elementary level lesson planning and other "details" of teaching to have time for research on their own. The chance to do in-depth study on a topic of their choosing is a nice thought, but not practical. And to be paid to research—a dream.

Sci-Mat fellowships help make this dream a reality. Rather than work another job during summer to supplement current teaching salaries, teachers can earn \$3,000 for completing a six week study of their own design. I enjoyed several independent study courses in college, so I gave the application a try. My project on bioregionalism was accepted.

I have been interested in bioregionalism for several years, but never had time to study it beyond the surface level. Through Sci-Mat, I put together a reading list, framed study questions, and found two mentors. I was able to travel to California to meet with an expert in bioregionalism and to see projects at work in San Francisco. For me, it was quite a luxury to have time to read and think.

Intellectual rejuvenation is only part of the goal of the fellowship. Projects must also work toward an increased connection of science and humanities. I am currently preparing classroom materials to be used in February with our ecology unit. I am working with colleagues in Social Studies and Language Arts to make connections so students can see that science and humanities are connected.

Without support from Sci-Mat, these ideas would've stayed in my mind as a far off possibility. Because of this program, my students for years to come will benefit.

Amy Brewer
1993 Sci-Mat Fellow



Fellow Illinois Science Teacher:

If you have ever considered applying for a SCI MAT fellowship, I **would highly recommend it**. I had a marvelous experience during my summer independent study program which involved Sand County Almanac and environmental ethics.

Frequently in science, we fall into the trap of presenting information in a neat little, sterile, self-contained packet. Unfortunately, that situation does not represent the real world. We miss many of the interconnections between science and society. Learning for me is a lifelong adventure and should be for our students. This project rekindled my feeling for the joy of learning and discovery and the importance of people.

I started the project in June with a seminary in Rocky Mountain National park. (What a great place to hike and discuss ethics!) Dr. Holmes Rolston, a leading writer in the field of environmental ethics, presented a weekend seminar on ethics. Even though Dr. Rolston is a philosopher by training, he is a botanist by avocation. Two of his books were on my reading list. In fact, he started me on the series of serendipitous interruptions. He augmented my original reading list by mailing me a huge collection of very pertinent articles. At the seminar, I met a retired engineer who volunteered in Colorado's National Forest. Using Ed McKinney as a model, I developed an activity entitled "Leopold's Legions."

In July, I had the opportunity to talk with Dr. James Curry who developed the matrix I used for developing learning activities. He was kind enough to review my material. Visiting the archives at the University of Wisconsin Memorial Library was fascinating. Some of the old photographs of Aldo Leopold, his friends and family gave new insight concerning the man and his life. It is a unique and humble feeling to put on little white gloves and view the fragile pictures. Dr. George Keiffer from the University of Illinois was most gracious in serving as my mentor. My travels even took me to Sheri Morkin's prairie garden at Oakland Elementary School in Bloomington. In addition, I had time to read some of the books that had been on my **must read list**. Although I didn't finish reading all the books, the books are now part of my school's library and are available to everyone.

Finally, I found this project to be a very personal reflection and journey as I discovered many parallels between the educated Leopold and my dad. I realized my dad, whose life work was spent improving a small West Central farm and surrounding community had developed a land ethic and love for the land similar to Leopold.

If I can be of help to anyone who is interested in applying, please feel free to contact me at Riverside/Brookfield High School (708-442-7500) or at my home (708-897-3238). Good Luck!

Carl F. Koch

THE ZION-BENTON SCIENCE ETHICS PROJECT: A TOOL FOR CRITICAL THINKING

Zion-Benton Township High School in Zion, Illinois is a comprehensive high school serving an ethnically diverse community. Located halfway between Milwaukee and Chicago, Zion-Benton serves a mixed group of students, with 22 percent composed of ethnic minorities, mostly African-American and Hispanic. About 50 percent of our students go on to higher education, either at four-year or two-year institutions or through vocational training.

An important goal at Zion has been the development of critical thinking skills in our students. The IMPACT program has been a major tool for meeting this goal. IMPACT (Improving Minimal Proficiencies by Activating Critical Thinking) was developed by S. Lee Winocur for the Orange County Department of Education. The program incorporates the direct teaching of critical thinking into curricula, emphasizing such skills as comparing and contrasting, ordering, patterning, identifying relevant and irrelevant information and determining cause and effect relationships.

The science teachers and the library staff at the school identified three major skills that students would need to make reasonable, thoughtful decisions, both in the personal realm and in the area of public policy. These three skills included: how to acquire information, how to critically evaluate the information and how to use the information to develop group solutions to problems. These faculty members developed a proposal to meet these needs which combined IMPACT training and the teaching of library research skills. The proposal, The Zion-Benton Science Ethics Project was submitted to the Illinois State Board of Education's Scientific Literacy Program in June of 1991. The proposal received three years of funding.

The project was piloted in college prep biology classes during the 1991-92 school year and repeated in the 1992-93 school year. The target population consisted of college bound freshmen and sophomores. Science teachers, English teachers, librarians and community science and library professionals participated.

The teachers involved were trained by Rick Schmude, project director and district IMPACT trainer, and Leah Melnik of the Lake County Educational Service Center. Thirteen teachers participated in the training the first year, with six from the science department.

In November, one biology class was chosen at random to serve as the control group for the project. That class became the control group for the project, with the other classes forming the experimental group.

Both the control group and the experimental groups took the Cornell Critical Thinking Test, Level X in a pretest, posttest format on the same days. The control group then

continued with the normal college prep biology curriculum for the rest of the year and did not receive the IMPACT critical thinking training.

Four hypotheses were made prior to the start of the project that were intended to test its effect on students' critical thinking skills. The first stated that there will be no significant difference between the pretest means of the experimental group and of the control group. This hypothesis was made because students who participate in College Prep Biology have passed a placement test and would therefore be roughly equivalent.

The second hypothesis stated that the experimental group will have a higher posttest mean than the control group. This comparison was done to show that an increase did not occur in both groups due to an outside variable.

The third hypothesis stated that the control group will not show a significant change between the pretest and posttest means. This comparison was made to see if the students were receiving the direct teaching of critical thinking skills as a part of their regular curriculum.

The final hypothesis stated that there will be a significant increase in the experimental group's posttest mean as compared to the pretest mean. This comparison was made to show that the increase in scores was due to the independent variable, the IMPACT training.

The students in the experimental group were taught using lessons from the IMPACT training manual. These lessons ranged from 20-50 minutes, two to three times a week, for six weeks. The lessons centered around such critical thinking skills as comparing and contrasting, classifying, ordering, patterning, identifying relevant and irrelevant information and determining cause-effect relationships.

At the end of the training period, the students were required to develop a group product. The product centered upon the examination of an ethical issue in science. It required the students to research the elements surrounding the issue and then formulate a group response and recommendation(s) that addressed that issue. The response took the form of a group presentation, i.e., panel discussion, interactive video presentation, simulation, town meeting or any other format that was approved by the teacher.

Research was done in groups of three to four students based on their interest in a particular ethical issue. All research required the use of traditional library tools and the use of online databases such as Reader's Guide Abstracts and the Chicago Tribune Full-Text on CD ROM Books and periodical articles were loaned from other area libraries as needed. Students also contacted a number of area agencies for further information and opinion. These agencies included Midwestern Regional Medical Center, Abbott Laboratories, the Illinois Department of Conservation and the Lake County Health Department.

Students were given assistance by the library staff, who taught the use of online sources and provided a telephone and fax machine so that students could more easily communicate

Results Of The Project: Second Year

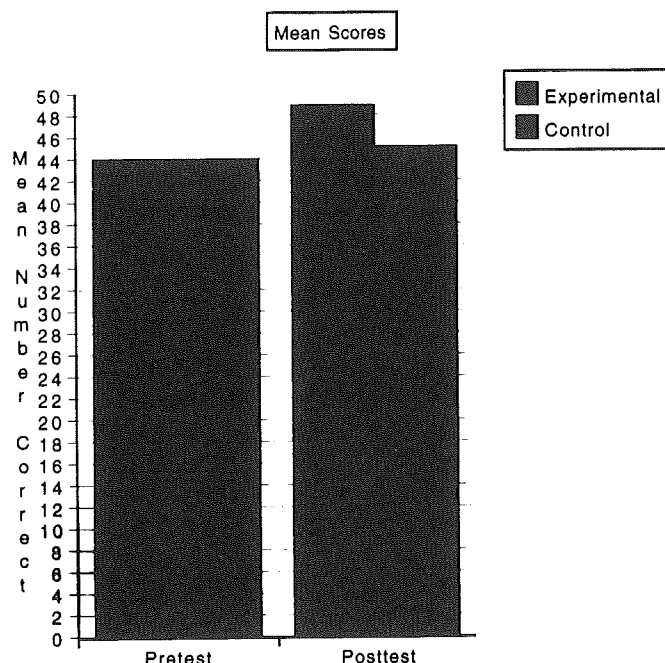
Again, the comparison of the pretest and posttest scores on the Cornell Test was significant. Table 2 shows that the pretest mean difference was 0.04 points between the control and the experimental groups. Inferential statistics performed on the two groups means, using the two sample *t*-test, resulted in *t* equals 0.03, which at infinite degrees of freedom is not significantly different at the 0.05 level of probability. The null hypothesis is therefore supported, indicating that the two groups are not significantly different due to a sampling error.

The second hypothesis stated that the experimental group will have posttest scores that are significantly higher than those of the control group. As seen in Table 2, the mean difference between the two groups was 3.83 points. Statistical analysis using the two sample *t*-test at infinite degrees of freedom shows that *t* equals 4.71, giving probability less than 0.05 and is therefore significantly different at that level. Again, the null hypothesis is rejected indicating that a significant difference in posttest scores did occur between the two groups.

Table 2
Comparison of the Pretest and Posttest Means For Both The Experimental and Control Groups (1992-1993)

	A	B	C
1	Mean Scores	Experimental	Control
2	Pretest	43.98	44.02
3	Posttest	48.83	45.01

Figure 2
Comparison of the Pretest and Posttest Means For Both The Experimental and Control Groups (1992-1993)



The third hypothesis, that the control group will not show a significant difference between pretest and posttest scores, was again supported in the second year results. As can be seen in Table 2, the mean difference was 0.98 points. By applying the Dunn multiple comparison *t*-test at infinite degrees of freedom, a *t* value of 0.77 is not significant at the 0.05 level. Therefore the mean scores are not significantly different and the null hypothesis is supported.

The final hypothesis stated that the experimental group will show a significant improvement between pre- and posttest scores due to participation in the project. As can be seen in Table 2, the mean increased 4.85 points on the posttest. The Dunn multiple comparison *t*-test gives a *t* value of 1.90 that is significant at the 0.01 level of probability. It can again be inferred that this degree of probability is the direct result of increased critical thinking skills obtained through participation in this project, since the control group did not show significant increases.

Additional Information

Although an individual analysis of each student was not included as part of this study, it was noted by the instructors that this project appeared to have the greatest success with students who did not normally have the top grades in the class. Students who had low pretest scores showed greater gains than the students with higher pretest scores. This could be explained by a ceiling effect that may not have allowed those students with high pretest scores to show very large increases in their posttest scores. The Cornell Critical Thinking Test, Level X, has 76 questions in which the questions increase in difficulty as the test proceeds. Our high score the second year was 64 on the posttest, which is only two points higher than the pretest score for the same individual. An individual that scored a 32 on the pretest scored a 61 on the posttest, an increase of 29 points. This very large increase is only possible with lower test scores on the pretest.

The Zion-Benton Science Ethics Project will be further developed this year and expanded to include College Prep Chemistry and College Prep Physics. It is a project which can be easily replicated and adapted, using locally available library resources and community agencies. IMPACT training is available throughout the country. Training schedules and more information about IMPACT may be obtained by contacting the Center for the Teaching of Thinking, 21412 Magnolia Street, Huntington Beach, California, 92546.

with local agencies. English teachers helped students in developing positions on the issues and taught outline and bibliography form.

Each group product was graded by the instructors and student peers on how well it fulfilled the following criteria: knowledge of the issues, organization, resourcefulness/creativity, presentation of the evidence and the practicality and viability of the solutions presented.

Results Of The Project: First Year

The comparison of the pretest and posttest scores on the Cornell Test was significant. Table 1 shows that the pretest mean difference was 0.26 points between the control and the experimental groups. The first hypothesis stated that there will be no significant difference between the pretest means of the control and experimental groups. Inferential statistics performed on the two group means, using the two sample *t*-test, resulted in *t* equals 0.7.5, which at infinite degrees of freedom is not significantly different at the 0.05 level of probability. The null hypothesis is therefore supported, indi-

cating that the two groups are not significantly different due to sampling error.

Students who participate in College Prep Biology at Zion-Benton Township High School must score at or higher than a set score on an achievement test. This "tracking" of students allows the computer to randomly create homogeneous populations in each classroom (see Fig. 1).

The second hypothesis was directional in stating that the experimental group will have posttest scores that are significantly higher than those of the control group. As seen in Table 1, the mean difference between the two groups was 5.36 points. Statistical analysis using the two sample *t*-test at infinite degrees of freedom shows that *t* equals 2.077, giving probability less than 0.05 and therefore significantly different at that level. The null hypothesis is therefore rejected, indicating that a significant difference in posttest scores did occur between the two groups (see Fig. 1).

The independent variable for this experiment was the IMPACT training. Every attempt was made by the teachers involved to keep all other factors constant. Project meetings conducted throughout the length of the experiment revealed no alterations in the design that were not done by all the teachers involved. It can therefore be inferred that the difference in scores that did occur was due to participation in the project and not to an outside variable.

The third hypothesis stated that the control group will not show a significant difference between pretest and posttest scores. As can be seen in Table I and in Figure 1, the mean difference was 0.11 points. By applying the Dunn multiple comparison *t*-test at infinite degrees of freedom, a *t* value of 0.04.5 is not significant at the 0.05 level. Therefore the mean scores are not significantly different and the null hypothesis is supported.

By showing no significant difference between pre- and posttest scores, it can then be inferred that the control group students did not develop critical thinking skills over the course of the experiment due to participation in the normal College Prep Biology curriculum or due to an outside source. This comparison serves as a check on the validity of the pre- and posttest results of the experimental group.

The final hypothesis stated that the experimental group will show a significant improvement between pre- and posttest scores due to participation in the project. As can be seen in Table 1, the mean increased 5.21 points on the posttest. The Dunn multiple comparison *t*-test gives a *t* value of 3.285 that is significant at the 0.01 level of probability.

It can be inferred that this high degree of probability is the direct result of increased critical thinking skills obtained through participation in this project, since the control group did not show significant increases.

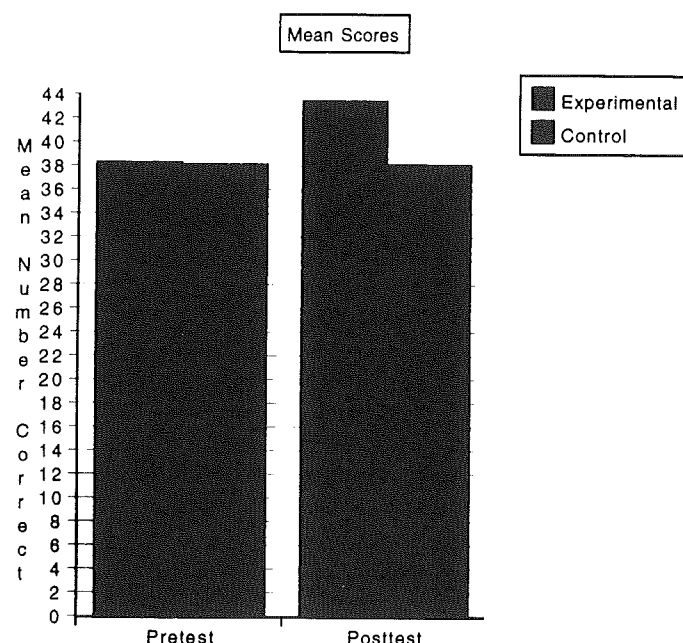
Table 1

Comparison of the Pretest and Posttest Means for Both The Experimental and Control Groups (1991-1992)

	A	B	C
1	Mean Scores	Experimental	Control
2	Pretest	38.37	38.11
3	Posttest	43.58	38.22

Figure 1

Comparison of the Pretest and Posttest Means for Both The Experimental and Control Groups (1991-1992)



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THE SCIENCE OLYMPIAD — WHAT IS IT?

Many science educators in Illinois will be receiving information sometime in May about participating in the 1994-1995 season of the Illinois Science Olympiad (ISO). This article was written to answer some common questions about the Olympiad, and to discuss its purpose, goals, and content.

The Science Olympiad (SO) is a national, non-profit organization that was created in 1982 to increase interest in science as an alternative to traditional science fairs and single-discipline tournaments (i.e., Chemistry or Social Studies Olympiads). The Olympiad is based on teamwork to accomplish scientific tasks in all areas of applied science (biology, chemistry, physics, earth sciences, and engineering).

Goals of the Olympiad

The Science Olympiad is devoted to improving the quality of science education, increasing student interest in science, and providing recognition for outstanding achievement in science education by both students and teachers. It is hoped that achieving these goals occurs through participation in classroom activities, tournaments, and summer training institutes for teachers. The Olympiad hopes to bring academic competition to the same level of recognition and praise that normally is reserved for athletic competitions in this country.

The Organization

The Science Olympiad is, as stated earlier, a national organization that sponsors a national competition in May to host the top teams in each state at a common site of competition. Teams of up to 15 students from a middle or high school prepare throughout the school year to compete in a regional tournament held in late winter. These students compete in 23 different events that encompass all areas of science. The events have different focuses to them that make certain ones appeal to different students. These include paper and pencil exam events, hands-on "lab practical" type events and design and construction events. This requires some students to learn scientific facts and concepts, while others learn science processes, skills, or applications that encourage students of different backgrounds to participate.

The events have scoring criteria that allow the students' performances to be evaluated at the end of competition. The top students in each event are awarded medals at an awards program at the end of the day. The rankings of each school in each event are totaled and the top schools in the region are invited to the state tournament held in April. The same scenario occurs there, and the top one or two teams in each division get invited to the national tournament held in May.

Divisions and Grade Levels

There are four divisions to the Science Olympiad. These divisions are: Division A1 (grades K-3), Division A2 (3-6), Division B (5-9), and Division C (9-12). A maximum of five ninth graders on a Division B team and seven twelfth graders on a Division C team is permitted.

Competition Sites

The Illinois Science Olympiad does not provide a tournament for the Division A levels. However, we do supply the manuals from the SO. The elementary Olympiad is often run within the classroom, school, or sometimes within the district as a mini-olympiad. If you are interested in finding out more about the elementary Olympiad, or have a colleague that might be, please have them contact the Director.

The ISO does provide, on a regional and state level, competition for the Division B and C schools. Starting with the 1994-95 Olympiad season, regional competitions will be determined by geographical boundaries. The site at which your school would compete will be listed in the May newsletter, along with the date of the tournament. The regionals will take place sometime in February or March. The state tournament is composed of the top teams from each regional and will be held sometime in April.

The 1993-94 competition sites were as follows: Buffalo Grove, Champaign, Edwardsville, Gurnee, Lisle, Macomb, and Vernon Hills. We hope to provide these sites in 1995 and will likely be adding a regional in Chicago and in the Peoria/Rockford area. We would like to add regionals in Springfield and Carbondale, but need your help in determining their feasibility both by telling us you would compete there and help run it. The official 1994-95 competition site and date list will be in the May newsletter.

Small School Policy

In an effort to get all schools to participate in the Olympiad, the SO has developed a policy for assisting small schools that may not have a large science-oriented population. If your school can find another small school to team up with, your schools may compete as one, provided the total enrollment in the divisional grades involved (6-9 or 9-12) is less than 300.

Elementary Olympiad

The elementary level of the Olympiad is designed to get elementary students interested in science using different techniques from those of the usual science texts. The activities in the elementary manuals are generally simpler versions of those found in the middle and high school manuals, but are different enough that if students stay with the Olympiad, they will not get bored with them later in their Olympiad careers.

These manuals provide an excellent, different way for classroom teachers to introduce science topics in a hands-on manner. Sample pages from the Fun Day (K-3) and Elementary (3-6) manuals are available upon request.

Membership Fees

The Olympiad does charge a fee for the manuals. There is an additional fee for Divisions B & C to cover competition expenses. The fees for the 1993-94 season were:

Fun Day (K-3)	\$15
Elementary (3-6)	\$20
Div. B & C	\$60
Competition	\$65

A small increase in the fee for the manuals is anticipated for the 1994-95 season. The fees will also be outlined in the May newsletter.

To help alleviate some of the financial apprehension felt by some school districts, the ISO hopes to provide a copy of a past year's Olympiad manual for a possible new coach to look at for a nominal fee. The manual will provide a good indication of what the Olympiad is before a large investment is made. If you wish to do this before the May newsletter, please contact the ISO office.

The ISO Board is planning to hold a few new coaches workshops in the Fall to assist coaches of schools that have never participated in the Olympiad in finding out some of the tricks of the trade and hints from experienced coaches and directors. Also, look for Olympiad workshops at the ISTA convention at Governor's State in the Fall.

Words from a New-comer

The following are portions of the most recent newsletter from the Science Olympiad. It is part of a letter from an Olympiad coach at Lawrence Middle School in New Jersey. Ms. Ferguson was a first time coach in 1992 and writes to say that even a new school can do well in the Olympiad...

We set up a Science Olympiad team in Lawrence Middle School to encourage students that science can be fun! Everything was totally new to us. The response was not overwhelming but the kids were dedicated and able to resist the peer pressure of being NERDS. We looked at one event each week as a group and the month before the state competition I allocated who was to do what events based on ability and desire. With only 8 students that meant each person had 4 or 5 events. The kids loved that because they could do different things.

We went to the state competition [New Jersey does not have regional competitions] wanting to do the best we could and have fun. I expected we would do well because the kids were very bright. I encouraged them to do their best and that was all I wanted. One kid asked where we go when we win for the National. I said I didn't know and would worry about that later. I never expected to win—especially when we arrived at Ryder College and saw that our team was half the size of the others and how many of the teams had drilled and worked hard for a LONG time on each event!

The day went on and the kids had a great time doing each competition. Even the video person we brought to film the

event had a great time, much to her surprise! It was so exciting when the medals were being handed out and we won some. At one point I realized that everyone on the team had a medal except one and I prayed that he would win one too. Yes, my prayers were answered. By the time all the awards were handed out, each person on my small team had at least one medal. Then came the overall placings. We just couldn't believe that we won! My little team of eight members that came to have fun! They were incredible. Next came the realization that we were going to the Nationals! To Colorado!

It took my team 2 weeks before I could scrape them off the ceiling long enough to begin to prepare for the Nationals. There were more events at the Nationals and we had to prepare for them. We also had to get money to go. We were lucky in that our school board funded everything for the competition. With the packets that the Nationals sent us were some things to do in the Pueblo, CO area while we were out there. We had one day free before the events so we chose to go white water rafting. This was the best thing we did. It showed all the other students that we may be nerds but nerds go white water rafting! Next year we have many more students that will join us on the team.

The opening ceremonies were awesome with the number of students participating filling the gymnasium, each state from Alaska to Wyoming marching in with a flag and banner from their school.

Saturday dawned beautiful as usual in Pueblo and the students came to compete. We hung out at a fountain where we had a precious few moments between events. They worked hard for so few of them. It was a long day.

It was neat walking around and seeing the different events — Pentathlon was on the lawn with water balloons as the item to pass, Get Your Bearing was around a fountain, constantly passing were musical instruments, tubular bells, xylophones, circular saw blades, flutes and drums.

I talked to other coaches and found that many teams had four coaches and worked with the kids for a year specializing in particular events. They had car washes and bake sales to raise money and parents (PTO) were an essential ingredient to back up the team.

The banquet was attended by most of the teams that evening followed by the awards ceremony. We sat under the New Jersey sign and waited for our name to be called. There was great cheering for each award as it was announced. We waited expectantly for anything. No, we didn't win anything. The kids were upset and sad as they had tried hard. I encouraged them — they were extremely bright and that is how they got to the Nationals and that was a great achievement! But to be a winner here, they now know what they have to do and that is to work on this all year and to study each event more. It is not enough just to be brilliant; you must work at it as well. I feel that is an important lesson in itself.

The experience was a good one and one to remember for a long time. My team is already planning for next year.

It is possible with a few dedicated students and coaches to win a state in the first year!

Directors

Jeremy Way is the State Director for the Illinois Science Olympiad. There is a Board of Directors that is made up of the Regional Directors and State Executive Committee. If you are interested in the Olympiad and would like further information about it, please contact your nearest Regional Director or the State Director.

Buffalo Grove	
Karin Schloegl	708-808-5878
Champaign	
Kevin Erlinger	217-384-3685
Edwardsville	
Pam Abbot	618-254-7578
Gurnee	
Jan Waarvik	708-662-1400 x22
Macomb	
Dr. Kevin Finson	309-298-1961
Vernon Hills	
Doug Shearer	708-367-3220
State Director	
Jeremy Way	217-337-6582

Address

The Illinois Science Olympiad office is located at the University of Illinois in Urbana. You may contact the ISO at the follow address:

Jeremy Way, Director
Illinois Science Olympiad
505 S. Mathews, Box 57-1
Urbana, IL 61801-3617
Phone & FAX: (217) 337-6582
e-mail: jjway@uxa.cso.uiuc.edu

The Science Olympiad, in addition to providing an excellent opportunity for teamwork and science education, fulfills part of the performance assessment for Illinois schools. The Science Olympiad allows students to work on more than one project at a time and provides a teamwork atmosphere. Many schools participate in both, while some find the Olympiad more rewarding for the students.

Consider participating in the Science Olympiad, I know you and your students won't regret it!



SPECIAL INTERESTS

Carl J. Wenning
Physics Dept. Planetarium
Illinois State University

DARKNESS AT MIDDAY ANNULAR ECLIPSE OF THE SUN MAY 10, 1994

The sun and moon will take center stage on Tuesday, May 10, 1994, when a 145-mile-wide strip of central Illinois will experience one of Mother Nature's rarest, most startling, and spectacular events — an annular eclipse of the sun.

If clear skies prevail at mid-eclipse time, the sun will appear as a dangerously bright ring of light. Some 94% of the sun's diameter and 89% of its light will be blocked from view by the moon.

The eclipse will begin at about 10:20 AM. At that time the moon will be observable in silhouette, entering the upper right limb of the sun. With the passage of time, the moon will move from west to east across the face of the sun. At the same time, the moon's shadow will sweep eastward across the face of the earth at about 850 miles per hour.

For up to six minutes, centered roughly on noon, the entire disk of the moon will be observable against the face of the sun. Beginning at about 11:56 PM and continuing to 12:02 PM, the sun will appear as an unbroken ring of light. After this display, the moon will exit the face of the sun with the final vestige of the moon disappearing from the sun's disk at approximately 1:47 PM. (For your event times, see table 1.)

Eclipses of the sun occur whenever the moon's orbital motion carries it across the face of the sun as seen from Earth. If the centers of the sun and moon align with an observer, the observer may see a total solar eclipse. The sun's bright disk will then be entirely hidden from view by the moon. However, this is not always the case.

Because the moon's orbit is non-circular, it is alternately nearer to and farther from the Earth. Because this year's eclipse occurs near the time when the moon is farthest from the Earth, the moon does not appear large enough in the sky to totally cover the face of the sun. Hence, when the centers of the sun and moon align with central Illinois on Tuesday, May 10, the sun will shine forth at mid-eclipse as a bright ring or annulus of light.

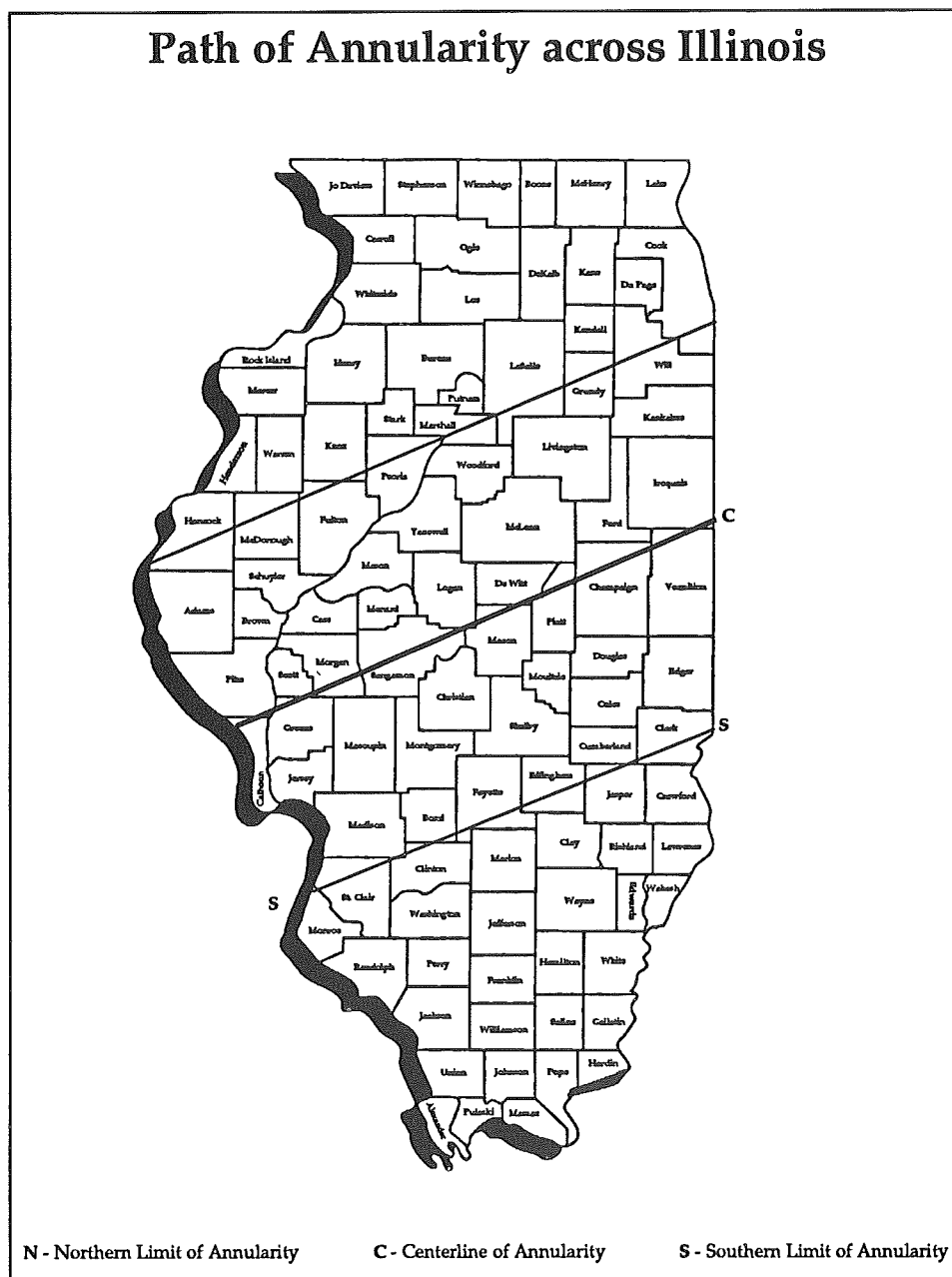
Table 1 EVENT TIMES FOR THE MAY 10, 1994 ANNULAR/PARTIAL SOLAR ECLIPSE FOR VARIOUS ILLINOIS LOCATIONS

Town	Begins	Max. Eclipse	Ends	Type Annularity
Alton	10:15 AM	11:54 AM	1:42 PM	annular 5.0 minutes
Aurora	10:23 AM	12:02 PM	1:48 PM	partial
Bloomington	10:20 AM	11:59 AM	1:47 PM	annular 5.6 minutes
Carbondale	10:12 AM	11:55 AM	1:45 PM	partial
Champaign	10:20 AM	12:00 PM	1:48 PM	annular 6.1 minutes
Chicago	10:24 AM	12:04 PM	1:50 PM	partial
Danville	10:22 AM	12:01 PM	1:49 PM	annular 5.9 minutes
Decatur	10:18 AM	11:58 AM	1:46 PM	annular 6.1 minutes
DeKalb	10:24 AM	12:01 PM	1:47 PM	partial
East St. Louis	10:14 AM	11:54 AM	1:43 PM	annular 3.5 minutes
Elgin	10:24 AM	12:03 PM	1:49 PM	partial
Freeport	10:22 AM	12:00 PM	1:45 PM	partial
Galesburg	10:18 AM	11:57 AM	1:43 PM	partial
Jacksonville	10:16 AM	11:56 PM	1:44 PM	annular 6.1 minutes
Joliet	10:23 AM	12:03 PM	1:49 PM	partial
Kankakee	10:24 AM	12:02 PM	1:49 PM	annular 4.8 minutes
Mattoon	10:20 AM	11:59 PM	1:47 PM	annular 4.9 minutes
Ottawa	10:21 AM	12:00 PM	1:48 PM	partial
Peoria	10:19 AM	11:58 AM	1:45 PM	annular 3.7 minutes
Quincy	10:14 AM	11:54 AM	1:39 PM	annular 4.8 minutes
Rantoul	10:21 AM	12:00 PM	1:48 PM	annular 6.2 minutes
River Grove	10:24 AM	12:03 PM	1:50 PM	partial
Rock Island	10:18 AM	11:57 AM	1:43 PM	partial
Rockford	10:23 AM	12:01 PM	1:47 PM	partial
Springfield	10:17 AM	11:57 AM	1:45 PM	annular 6.2 minutes

Such methods merely reduce the intensity of the sun's light while transmitting dangerous amounts of ultraviolet and infrared radiation. This radiation is invisible to the human eye and can cause serious and irreparable eye damage without the observer feeling any sensation. Solar filters which screw into the eyepieces of toy telescopes are also unsafe to use. Telescopes and binoculars concentrate rays of light. Eyepiece filters that intercept this intense beam of sunlight can overheat. When they do, they can explosively shatter and expose the observer to a blazing beam of sunlight. This beam can seriously damage the eye before the observer has time to react. The safest and simplest way to observe this solar eclipse on your own is through the use of pinhole projection. A pinhole in one piece of cardboard serves to project an image of the sun on a second piece of cardboard which is held in the shadow of the first.

**ECLIPSE
MATERIALS
AVAILABLE**

The staff of the Illinois State University Planetarium has prepared a 16-page eclipse booklet designed for educators. THE GREAT ECLIPSE contains numerous diagrams, eclipse maps, fact sheets, safety guidelines, 25 pre-eclipse and eclipse-day activities, and much, much more. To obtain your copy of THE GREAT ECLIPSE, send a \$7.00 check made payable to "ISU Foundation" to: THE GREAT ECLIPSE Physics Dept. Planetarium Illinois State University Campus Box 4560 Normal, IL 61790-4560 Additionally, a set of two dozen copy masters designed to complement THE GREAT ECLIPSE are also available. The copy masters can be used for the creation of a press release, overhead transparencies, student worksheets, observing contracts, and other handouts. Enclose an additional \$5.00 to obtain the set. Purchase both and receive a free Solar Screen eclipse viewer.



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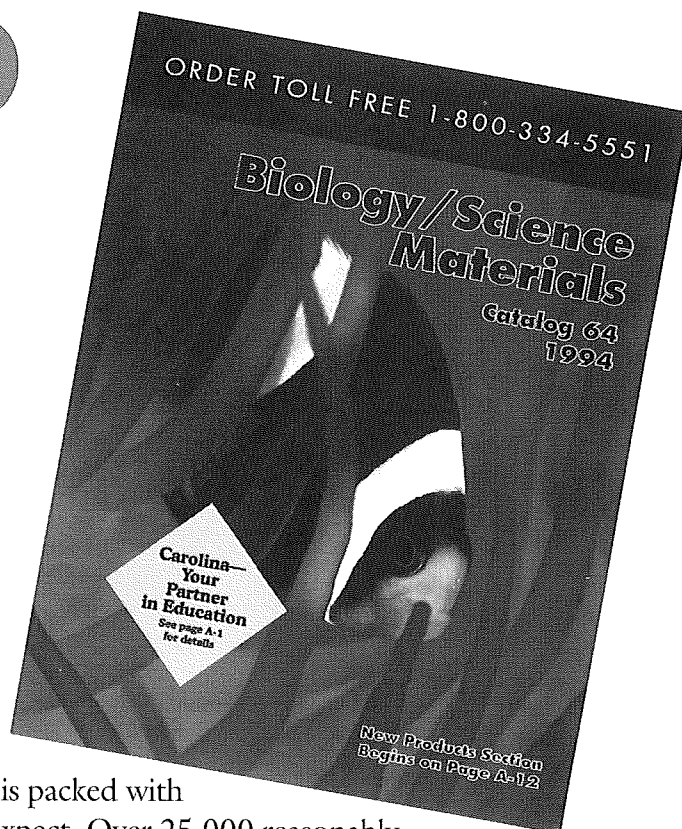
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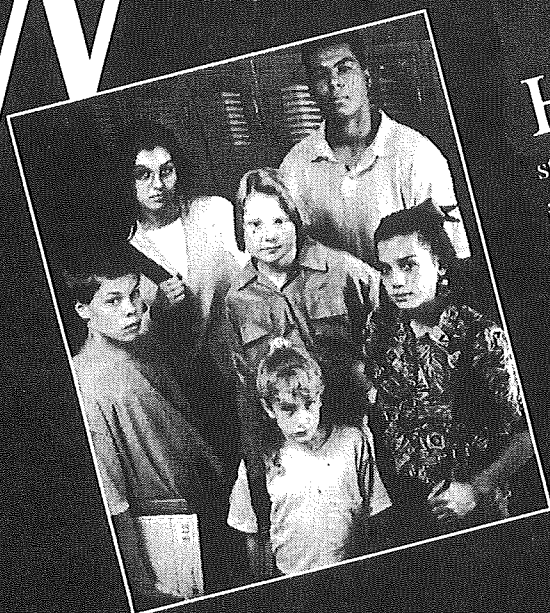


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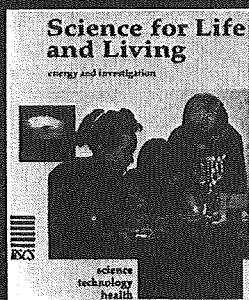
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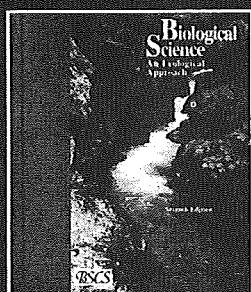
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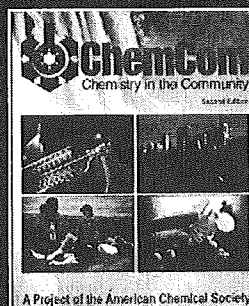
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Orlando, FL

July 11, 1994-July 15, 1994

Loyola University of Chicago
Chicago, IL

July 18, 1994-July 22, 1994

BSCS
Colorado Springs, CO

July 25, 1994-July 29, 1994

BSCS
Colorado Springs, CO

August 1, 1994-August 5, 1994

Boston University
Boston, MA

August 8, 1994-August 12, 1994

BSCS
Colorado Springs, CO

Middle School Life Science

July 6, 1994-July 13, 1994

Colorado School of Mines
Golden, CO

Middle School Science and Technology

June 21, 1994-June 24, 1994

BSCS
Colorado Springs, CO
Loyola University of Chicago
Chicago, IL

June 27, 1994-July 1, 1994

July 18, 1994-July 22, 1994

McCord Middle School
Columbus, OH

August 2, 1994-August 5, 1994

BSCS
Colorado Springs, CO

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June 20, 1994-June 24, 1994

University of North Carolina
Charlotte, NC

June 27, 1994-July 1, 1994

July 25, 1994-July 19, 1994

Colorado College
Colorado Springs, CO
San Jose State University
San Jose, CA

Global Science

June 20, 1994-June 24, 1994

Keystone Area Science Center
Copper Mountain, CO

Chemcom

July 11, 1994-July 15, 1994

Loyola University of Chicago
Chicago, IL

July 11, 1994-July 15, 1994

San Jose State University
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GREAT LAKES COMMISSION'S RECOMMENDATIONS FOR GROUNDWATER EDUCATION

In 1990, the Great Lakes Commission (with Kellogg Foundation funding) started the Groundwater Education Strategy project. Members of the task force came from nine states and provinces and numerous federal agencies. Round table meetings were held during November of 1991. A Groundwater Education Summit in Chicago in May of 1992 brought the project to a conclusion. The results and input received during the meetings were developed into a workbook and strategy. Six hundred people were involved in this project. Below is a summary of the results.

Program Development and Teacher Training

- Institutionalize groundwater education via educational objectives.
- Infuse groundwater education into existing training and programs.
- Develop support systems for classroom teachers and non-formal educators.

Network/Coalition Building

- Identify lead institutions at jurisdictional level to promote, build and maintain coalitions to advance groundwater education and encourage full implementation.
- Ensure that every state and provincial groundwater management plan includes an education component and identifies the coalitions necessary to effectively implement it.
- Make professional associations aware of groundwater education needs and assist their members in addressing them.
- Inform federal, state and provincial legislators of groundwater education needs, and encourage appropriate legislative, policy and program actions.
- Build public/private partnerships to enhance technology transfer and promote pollution prevention through education initiatives and the marketing of practices, products and services.

Information Dissemination and Public Involvement

- Establish a computerized groundwater education clearinghouse to provide centralized access to bibliographic information concerning curriculum materials, publications, videos, and other relevant resources related to groundwater education that are available regionally and nationally.
- Identify education needs (classroom and non-formal) of target groups and establish programs to meet those needs.

Funding

- Identify and cultivate opportunities to link funding organizations/agencies (sources) with recipient groups.
- Identify and cultivate new sources of funding to support groundwater education over both the short term and long term, including nontraditional, innovative approaches.
- Advocate long-term, reliable funding for state, provincial or federal agency implementation of mandated education functions.

Publicity and Promotion

- Designate a Groundwater Education Day or Week in Great Lakes jurisdictions and pursue national designation(s) in the United States and Canada.
- Establish awards programs to recognize contributions to groundwater education.
- Promote media campaign to raise awareness of groundwater issues.
- Include groundwater quantity/quality protection information in economic development materials.
- Promote voluntary groundwater pollution risk assessments for farmers, urban and rural residents to identify pollution risks and voluntary actions that can be taken to protect groundwater, minimize liability and protect property values.
- Promote the development and placement of groundwater exhibits in high traffic areas such as museums.

This twenty-page publication provides a very detailed action plan, category by category for implementing the 19 recommendations which were developed and adopted as a consensus by the eight member states of the Great

Lakes Commission. The Commission urges "all readers to identify one or more recommendations in which they can assume a lead or support role." The Commission further encourages people to keep them informed of their efforts. (Source: *Groundwater Education Strategy: A Framework to Promote Groundwater Education Programs in the Great Lakes Region* published by the Great Lakes Commission, August 1993.)

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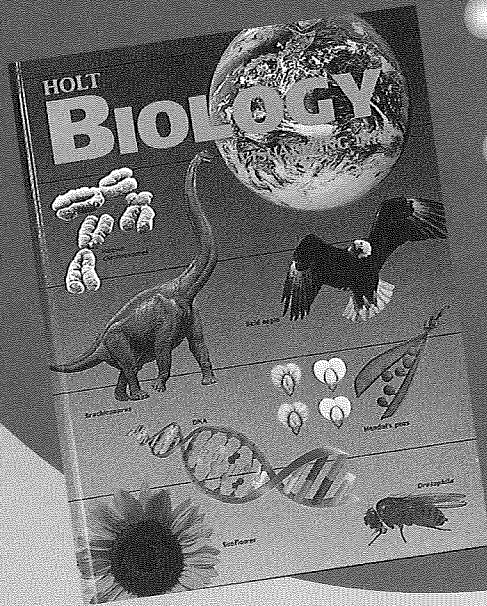
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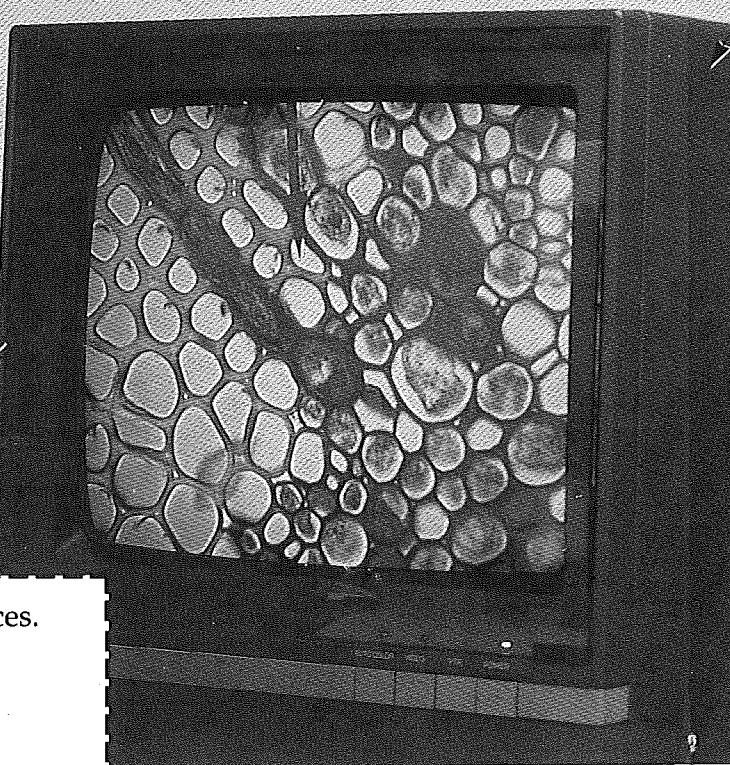
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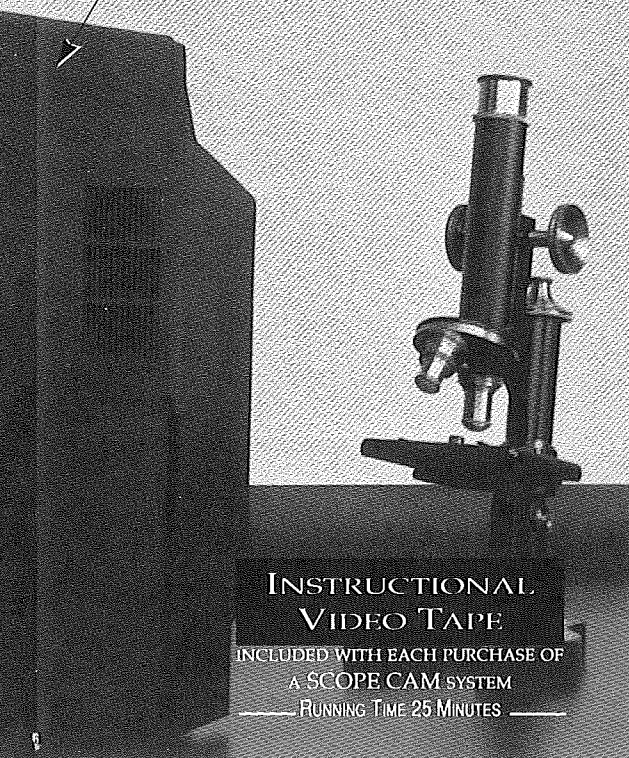
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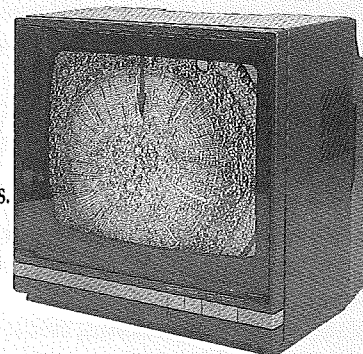
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MINI IDEAS



Lonnie Pithan
Educational Service District 198
Mount Vernon, WA
Reprinted from *Washington Science Teachers Journal*

BATTER UP

It's that time of year again! America's favorite past time, baseball, is about to begin its season.

This mini-unit, Batter Up, has been especially designed for students in grades 6-8 but could easily be adapted for younger or older students with lesson modifications and/or additions.

Students will investigate baseball bats, especially the products they are made from. White ash has been the wood of choice for many years...why? What properties or characteristics does it have that make it perfect for use as a baseball bat? **Lesson Objective:** To determine the characteristics of white ash wood that make it the desirable material for major league bats. Students will compare white ash wood with other types of wood using density, weight, strength, availability, and cost.

Process Skills Emphasized: Observation, measurement inferring, formulating and testing hypotheses, collecting and interpreting data, drawing conclusions.

Lesson Description: Students will be engaged in activities that include library research which will lead them to conclusions about the suitability of white ash wood in the manufacturing of baseball bats.

Materials: Balance (low or triple beam); metric ruler; wood block set of 4" x 1" x 1" samples of white ash, pine, mahogany, fir, oak, cedar, balsa, cherry, and any other wood samples you can find; string; pound weight; and 3' x 1" strips of each wood type.

Lesson Evaluation: Students will explain, using their supporting data, why white ash wood has been selected as the material best suited for making baseball bats.

Begin this mini-unit with a discussion of the steps a batter goes through before, during and after a ball has been pitched. Think of this process in slow motion. Why do batters swing several bats before selecting only one to use? What about their stance? Talk about the follow-through of the bat and body. Where is the most desirable place for the ball to meet the bat?

The opening awareness discussion should raise many questions in the minds of your students. Take the opportunity to list these questions on the board. Several of them will no doubt be answered as the activities outlined below are encountered but there will also be several directions that can be launched into to extend this mini-unit.

Activity One - Weight comparison

Weigh each wood sample (4" x 1" x 1"). Record the weights on the accompanying chart. Rank order the samples for lightest to heaviest on another list.

Activity Two - Density Comparison

Calculate the density of each wood sample. Record the results on the graph and rank order from least dense to most dense on the second list.

Compare your results in the weight and density activities; draw a conclusion. Investigate the use of various woods in manufacturing; what characteristics are sought after?

Activity Three - Strength Comparison

To determine the strength of each wood, lay a 3' x 1" strip on a table edge so that approximately 2' are hanging over the edge. Secure the one foot section on the table with a pile of books or your hand. Hang a weight off the other end and measure the angle of drop for each wood.

Activity Four - Availability of Wood

Which woods are grown commercially in the United States? Which are imported? Compare the costs of each wood. Rank order the wood from most available to least available, then rank them by cost.

Activity Five - Comparison of Woods

Find out as much as you can about white ash wood and at least one other type of wood investigated in this series of activities. Are they hardwoods or softwoods? Can they easily be cut? What are the main uses of each wood? If white ash weren't available, what would be the next best substitute for the production of baseball bats?

Extensions

Select characteristics not studied in this series and run a test of comparison.

Reference

The Science Teacher, June 1985; **Newton at the Bat: The Science in Sports**, order from Book Service, Science 84, 1401 Vermont Avenue, N.W., Washington, DC 120005 (\$14.95 plus \$1.75 for postage and handling).

EXAMPLES OF DATA SHEETS WHICH MIGHT BE USED IN THESE ACTIVITIES.

Data Record Sheet

WOODS	WEIGHT	DENSITY	STRENGTH	COSTS	AVAILABILITY	
White Ash						

Rank Order Listing

WORM RECYCLED NEWSPAPER

Marla Wolf

Aledo ISD,

310 Willow Crest Dr

Weatherford, TX 76087.

Reprinted from *Texas Science Teacher*

1 wooden box (plywood 2'x2'x8") with holes drilled in bottom for air circulation

1 piece window screen to be placed on bottom of box

1 black trash bag

700-800 earthworms

5-6 lbs. newspaper (no colored newsprint)

1. After completing worm box, place window screen across the bottom.

2. Tear newspaper into 1-2 inch strips and save.

3. Purchase worms from a worm farm. It will be cheaper than a bait shop.

4. Soak newspaper in sink and wring out before arranging in box. Place moist paper as evenly as possible in the box, leaving 2-3 inches from the top.

5. Add worms and cover loosely with black trash bag. This will prevent the light from entering the box and help keep the paper moist.

6. Feed worms with food scraps every 7-10 days. Bury the scraps about an inch or so from the top. Never feed them chicken or meat. They love coffee grinds, pizza crust, pancakes, and most vegetables. Be very careful with fruit peelings because of fruit flies.

7. Sprinkle paper with water as it begins to dry out, especially around the edges.

After three months, my classes had more castings than newspaper. We had a fun time watching and learning. A box 1'x1' or even 18"x18" would be sufficient, and would also cost less. Remember that in the beginning, the worms will reproduce very rapidly. As the newspaper begins to decrease and you see more and more castings, the population will begin to decrease. At this time you could harvest the worms and start a new box.

Resource: *Worms Eat My Garbage*, Appelhof, Mary, 1982.

Patty Vaughan, Teacher
Forks High School
Forks, Washington 98331
Reprinted from *Washington Science Teachers' Journal*
Sept. 1992

SCI SPY LOTTERY

At the beginning of the 1991-92 school year, I was faced with teaching three general science classes that contained 15 students who were mainstreamed special ed kids, two non-English speaking students, and a large group of students who read below grade level. The past year was a very discouraging one, because my general science students refused to do homework. These students were simply not intrinsically motivated by grades. So I decided that I must create a program that would provide a positive incentive for students to read and do homework.

I developed a program called Sci Spy Lottery to address the problems that I faced. Students in eighth grade science were rewarded with tokens when they completed assignments on time, so I decided to provide a positive reward by allowing students to put their name in a drawing if they read science related material outside of class, did homework on time, or watched a science related video on television (see fig. 1). I approached local businesses to provide prizes that would be drawn for every Friday. The local bakery, Jodie's Ice Cream and Cookie Shop, donated day-old donuts, the three video rental places each donated one video per week (see fig. 2) and Sunset Lanes donated three free games of bowling per week. In addition, I donated a free homework assignment for each class per week. The winner could then turn in the slip in lieu of doing one homework assignment (this student received a zero out of zero scoring on that assignment and no more than two could be used per quarter) (see fig. 3). The students were given ground rules and parent permission slips were sent home in order to minimize cheating (see fig. 4).

As the year has progressed, I've added other prizes such as NASA posters that I received for free, one free pizza per month donated by Pacific Pizza, ink pens donated by Hyatt, and grand prizes at the end of the semester. The Seattle Seahawks donated several posters and two Seahawk baseball caps, SeaFirst Bank donated two Seattle SuperSonics sports bags, flashlights, and a frisbee. Peninsula Bottling Company, the local Pepsi dealer, supplied two bike bags, a "Home Alone" video and some cups. Daishowa America paper mill donated \$250. Don James donated two autographed National Championship Husky baseball caps, which will be a tremendous grand prize! My kids are really motivated to READ!

The response has been tremendous. During the first semester, nearly 500 entries were turned in. The students were checking out magazines and bringing in newspaper articles about science. Encyclopedias were dusted off at home and the kids got excited!

The amazing statistic involved the amount of homework done this year compared to last. Last year I was very discouraged, because my students refused to do homework. I started out assigning one homework assignment per week. By the fourth quarter, I assigned only three homework assignments for the entire quarter. In spite of this, in one class only three students did all three assignments!

If you notice the graph in fig. 5, I used the term relative effort to compare last year with this year. This year's students were assigned eight homework assignments per quarter and performed more relative effort than last year's students, and thus the standard score is based on 100% effort or eight out of eight assignments done by the whole class. What an amazing improvement! My students are positive about reading and watching science related shows on television. More materials are checked out of the library and from my classroom. Si Spy Lottery can be used to get your students excited about reading, too!

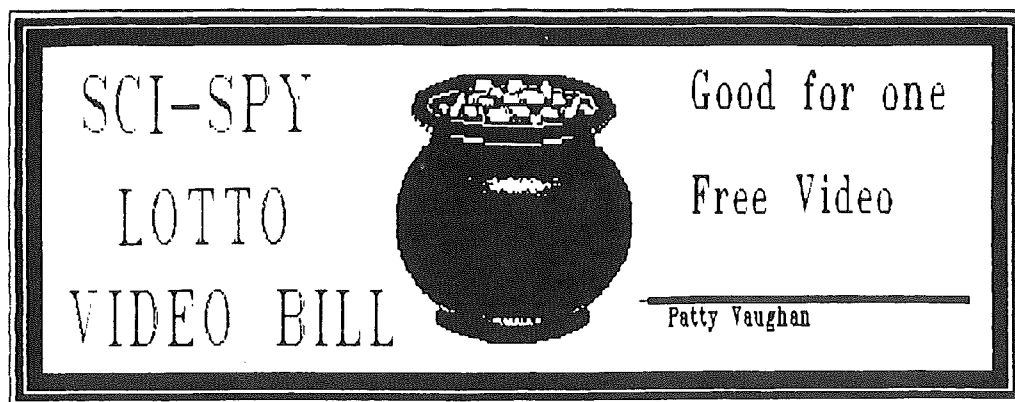


Figure 2

Figure 4

To: The Parent/guardian of
From: Mrs. Patty Vaughan, General Science Teacher, Forks High School
Subject: SCI-SPY Lottery

This memorandum is asking you to support you son or daughter in general science this year. In order to improve science literacy, I have instituted a fun program called Sci-Spy Lottery. The student is encouraged to read an article in a newspaper, magazine, or reference book about science, watch a television show about science, or complete a science homework assignment on time. The student will then fill out both sides of the attached form and have you sign it, thus verifying that the student actually did the work. The student will turn in the form to me. A box for each period will be in the room and a drawing for prizes will be held every Friday. Attached you will find a Sci-Spy form and rules for playing the game. All participation is optional and failure to participate will not affect a student's grade.

If you have any questions or if you are willing to assist in the purchase of prizes, please contact me at Forks High School 374-6116 or at home 374-9003. Thank you for supporting your child.

SCI-SPY RULES

1. Every Friday prizes will be awarded by a random drawing of entries for that week.
2. Prizes will include gift certificates, school supplies, video rentals, food, and others as they are donated.
3. Each student is limited to 5 slips per week.
4. At the end of the semester, there will be a grand prize drawing from entires for the entire semester.
5. Anyone who is caught cheating will be disqualified from further participation in the Sci-Spy game.



DATE:---



Figure 3

SCI-SPY LOTTERY

NAME:

PERIOD:

DATE:

PROJECT TITLE::

(Parent/Guardian/Teacher)

The articl, television show, or homework assignment that I worked on was about:

- ☐ Biology
- ☐ Computers
- ☐ Geology
- ☐ Science Careers
- ☐ Astronomy

- ☐ Aeronautics
- ☐ Physics
- ☐ Medicine
- ☐ Meterology

- ☐ Chemistry
- ☐ Oceanography
- ☐ Environmental Science
- ☐ Engineering

Figure 1

Sci-Spy

Increased Student Accomplishment

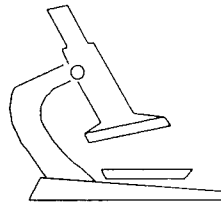
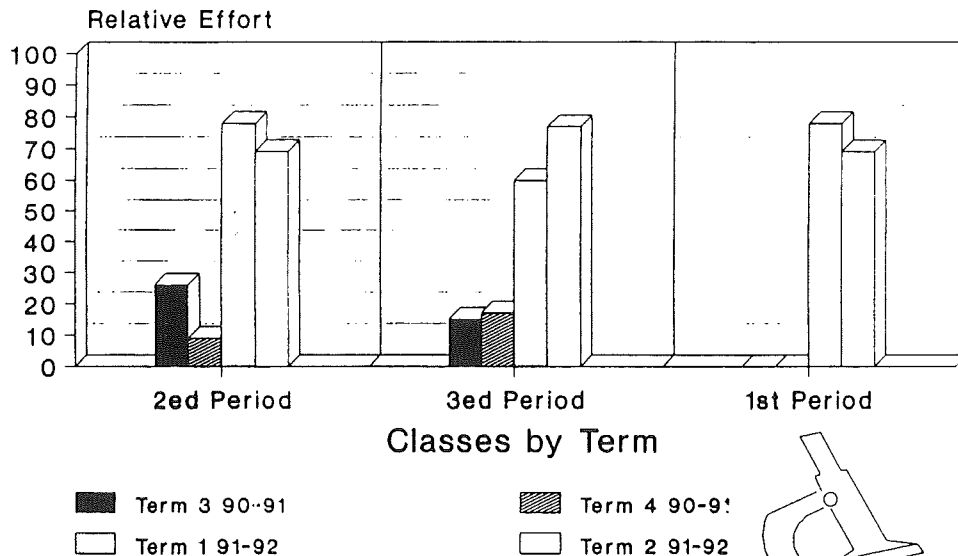
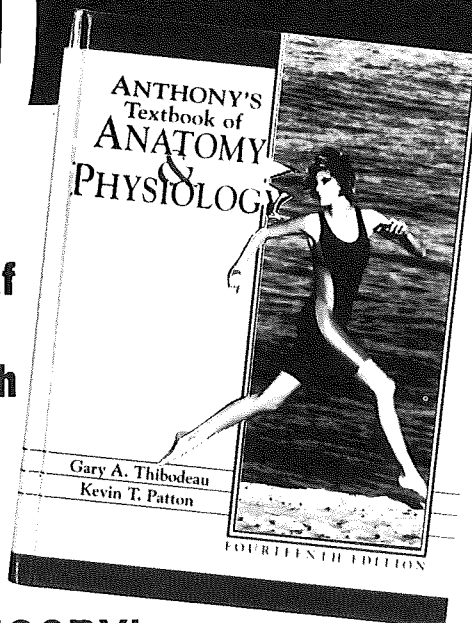


Figure 5

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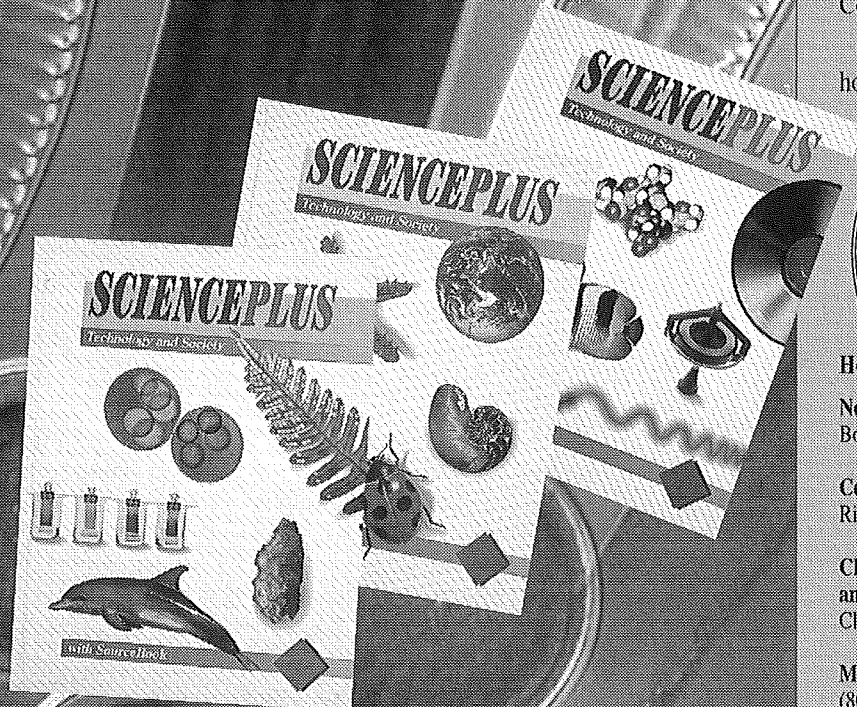
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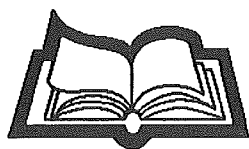
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REVIEWS

David M. Stone
University High School
1212 W. Springfield Ave.
Urbana, IL 61801
dstone@ncsa.uiuc.edu



The Encyclopedia of Genetic Disorders and Birth Defects, James Wynbrandt and Mark D. Ludman, MD, Facts on file, Inc., New York, New York, 1991, 426 pages. ISBN #0-8160-1926-6.

I recently had the opportunity to attend the week long Human Genome Project: Genetics Education Workshop for Secondary Science Teachers Workshop sponsored by the University of Kansas Medical Center. Each participant received a copy of *The Encyclopedia of Genetic Disorders and Birth Defects*, a book that is truly an asset to any practicing life science or biology teacher. This book is clearly one of the most complete works I've encountered in my search for current information regarding genetic maladies. Each condition is dealt with historically, prognoses are presented and availability of prenatal detection tests and biochemical/molecular bases of each condition are discussed. Also included are full sections detailing current diagnostic and screening technique as well as data on specific risk groups and known mutagenic agents.

As a teaching resource, this book is certainly superior to any university level human genetics book I've found. Typically, I will look up a certain term or syndrome in this source and find more information than expected. For example, the section dealing with chromosome abnormalities explains how these abnormalities arise as well as discussing aneuploidy, triploidy, tetraploidy and monosomy. Frequencies of Down syndrome, Patau syndrome and Edward syndrome for the past forty years are presented. Finally, the last four pages of the chromosome abnormalities section is devoted to chromosome syndromes associated with thirteen different chromosomes. This reference has allowed me to give students up to date information such as probability of cleft palate and cleft lip risk in families with individuals already exhibiting this condition, as well as information regarding national support groups for people with various genetic abnormalities such as Osteogenesis imperfecta. Crossreferencing throughout this encyclopedia is outstanding.

A quick browse through the genetic conditions typically encountered in a standard biology book shows that much of textbook information is erroneous at best. This book serves as an excellent source for us to clear up many of the common misconceptions we were taught, enabling us to produce a better informed, better educated generation.

Marilyn Sinclair
Science Specialist
University of Illinois, U-C



Bosak, Susan K., Science IS... A source book of fascinating facts, projects and activities. Copyright 1991 -Scholastic Canada LTD.-The Communication Project.

There are a number of good science teaching resource books available for the elementary and middle school teacher, but this book measures up to the best of them. In fact, there are features of this book which can make it a book of choice for the beginning and experienced teacher.

Science Is... provides a full spectrum of carefully constructed science activities for the classroom; they require a minimum of materials and are easily organized and carried out by the students and teachers. Many of the activities are replays of ones most of us have seen, but there are also many new ideas. The activities are presented with the accepted precepts of "how children learn" in mind; in addition to direct involvement with the materials of the activities, opportunities are provided for the students to consider open-ended questions, they are expected to communicate their ideas in some way. (Incidentally, there are no worksheets to be filled out!)

Included with each activity is a short, readable and interesting explanation of the phenomena manifested in the activity. The information may or may not be used with the students, but it almost always provides the teacher with an understandable idea of the concepts behind the observations. This is enough to endear the book to elementary teachers (and some students) who feel the need to know what is happening.

The organization of the book provides the teacher with the opportunity to choose and use activities to fit their curriculum in a number of ways. The activities are divided according to how long it takes to do them, ranging from (1) "Quickies" which can be done on the spur of the moment, or as a means to introduce an idea, to (2) "Make Time" activities which take at least 30 minutes and require some planning, and finally (3) "One Leads to Another" activities which are presented as sets within a particular subject area.

The activities are also organized according to ten subject areas (discovering science, matter and energy, plants, applying science, etc.), also into forty topics (i.e., air, birds, chemical reactions, magnets, problem solving, soil, sound). They are then cross-referenced for incorporation into the existing curriculum.

Another important resource provided within the book is eighteen pages of selected "Other Resources" believed by the author to be useful to those wishing further information in certain areas of science learning and teaching.

I find this a valuable book for teachers (and parents) who wish to make learning about the world an eventful time for kids. It is not a cheap publication (suggested retail price of \$29.95), but one which will be dog-eared by use for years.

WIU SCIENCE EDUCATION CENTER

ANNUAL K-8 SCIENCE UPDATE

APRIL 22, 1994

HORRABIN HALL

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SPONSORING AGENCIES: W. I. U. ELEMENTARY EDUCATION & READING DEPARTMENT
Educational Service Centers 8, 11, and 12.
ILLINOIS SCIENCE TEACHERS ASSOCIATION
NATIONAL SCIENCE TEACHERS ASSOCIATION

SELECTED PRESENTERS (MOSTLY CLASSROOM TEACHERS) WITH ENTHUSIASM AND EXPERIENCE FOR TEACHING ELEMENTARY SCIENCE HAVE BEEN INVITED TO MAKE PRESENTATIONS.

HANDS ON SCIENCE ACTIVITIES

TEXTBOOK DISPLAYS

CURRICULUM RESOURCE DISPLAYS

SCIENCE TRADE BOOK DISPLAYS

ACTIVITIES REPRESENTING NEW SCIENCE CURRICULUM PROGRAMS

- Activities that Integrate Math and Science (AIMS)
- Great Explorations in Math and Science (GEMS)
- Windows on Science (K-3)
- National Wildlife Federation's Naturescope
- Operation Physics (OP) (4-8)
- Chemical Education for Public Understanding Program (CEPUP)

- Big Books
- Delta Science
- Macdonald Educational
- Insights
- U of W FAST Plants

SCIENCE UPDATE CONFERENCE REGISTRATION FORM

(Register soon - limited Enrollment!)

NAME _____ SCHOOL _____ DIST# _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

SCHOOL PHONE _____

Registration Fee - \$ 14.00

Confirmations will be returned, if received by April 9th,
with a campus map and parking information.

Circle One: Payment Enclosed

Pay upon arrival

RETURN TO:

Dr. John B. Beaver, Director
Science Education Center
47 Horrabin Hall
Western Illinois University
Macomb, IL 61455
309/298-2065 or 298-1777

Checks should be made out to:
Western Illinois University

Registration fee covers refreshments, lunch, and handouts.

OPPORTUNITIES

RIVERS CURRICULUM PROJECT SUMMER TRAINING SESSION

The National Science Foundation funded **Rivers Curriculum Project** is recruiting high school teachers to field-test a new rivers curriculum. The curricula consists of five, one-month-long units in: chemistry, biology, earth science, geography, and language arts. A sixth unit, mathematics, is being written, but is not ready for field-testing.

Participating teachers will attend a training session held from August 8-12, 1994, in Edwardsville, Illinois. Meals, lodging, transportation, a \$60/day stipend, and curriculum materials for classroom testing will be provided. For graduate, teachers must agree to return to their school and field-test the curriculum during the 1994-1995 school year.

Preference will be given to applications from teachers who can attend the training as part of an interdisciplinary team from the same school (i.e., at least one science teacher and one social studies or language arts teacher).

For more information, or to apply, contact **Dr. Robert Williams, Project Director, Rivers Curriculum Project, SIUE, Box 2222, Edwardsville, IL 62026-2222; 618-692-3788, FAX: 618-692-3359, Internet address, rwilliams@eville.uiuc.fred.org.**

WISCONSIN SOCIETY OF SCIENCE TEACHERS

On behalf of the Wisconsin Society of Science Teachers and the Convention '94 Committee, we would like to extend an invitation to all Illinois science teachers to attend the WSST State Science Teacher Convention to be held April 21-23, 1994, in LaCrosse, WI. There will be a short opening social and fieldtrips to the UW-LaCrosse Archeology Center and Planetarium on Thursday evening. Breakout sessions, general sessions, fieldtrips and workshops will be held on "Friday from 8:00 - 5:00, and on Saturday morning from 8:00 - 12:00. Friday evening there will be a banquet with Dr. Bob Ballard as the keynoter. Saturday at 1:00 PM Dr. Henry Lee will be the keynoter. He is a world renowned criminologist from Connecticut. We are also hoping to have some integrated math/science sessions during the convention. This convention is to meet the needs of science teachers K - post secondary. A "Call for Presenter" form is available. We look forward to seeing many Illinois teachers at our convention.

We believe we have a wide variety of activities available for all science teachers. If you have any questions concerning the convention, please call me, Dorrie Tonniss at my home phone (608-781-2385 on Fridays) or my graduate school phone (608-233-0684 Monday - Thursday AM).

HELPFUL INFORMATION ON ANIMAL TRACKS ENVIRONMENTAL EDUCATION PROGRAM

Animal Tracks, Inc. is a 501(c)3 non-profit environmental education foundation whose goal is to raise the level of our citizens' awareness of environmental problems and the things that they can do to help through environmental education oriented toward school children in grades K-9. The Animal Tracks program uses art, poetry, and solid information to get its message across. As an added incentive, the program offers a reward system to teachers and their students for completing projects that relate to the environmental problems outlined in each chapter of the Animal Tracks book. Animal Tracks is presently being used in classrooms across the nation.

Animal Tracks is in the process of establishing a wilderness encampment in order to provide inner-city children and exceptional "Trackers" the opportunity to directly experience the wilderness that they are being taught to save.

Animal Tracks is striving to become the national education program for the environment. If you would like more information about our programs, please contact us at:

Animal Tracks

26 W. Center Street, Suite 203

Fayetteville, AR 72701

(501)444-0901

We look forward to working with you to make our world a better place to live!

Dr. Raymond Dagenais
Illinois Mathematics and Science Academy
1500 West Sullivan Road
Aurora, IL 60506-1000
(708)801-6000 Tel (708)801-6976 Fax

IMSA TO COMPILE TEXTBOOK LIST

For a number of years, IMSA has been receiving requests from individuals and schools for titles of science textbooks that are being used in Illinois Schools. Such as listing will be kept by the Illinois Mathematics and Science Academy. ISTA members are invited to submit pertinent information including title, author, copyright date, grade level and annotated information concerning the strengths and weaknesses of the text. Contributed information should be sent to Dr. Ray Dagenais at the above address.

The Rivers Curriculum Project
Zebra Mussel Watch
Southern Illinois University, Box 2222
Edwardsville, IL 62026
Phone: 618-692-3788 or fax: 618-692-3595

ZEBRA MUSSELS: CASE STUDY AND MONITORING DEVICES

The Rivers Curriculum Project, Southern Illinois University at Edwardsville, announces a Zebra Mussel case study for high schools. The case study is based on an issue analysis investigation developed by Harold Hungerford, Professor, Southern Illinois University at Carbondale. Four goal levels are addressed by the students. The following is a short summary of each goal:

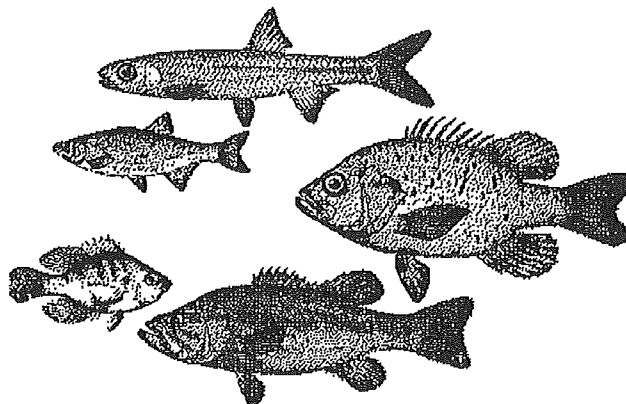
1. Introduction to exotic species and their impacts. Topics include well known examples of biological invaders and supplemental reading from popular science periodicals.
2. Detailed consideration of the Zebra Mussel, including life cycle, feeding habits, economic and ecological effects, and control and preventive measures.
3. Classroom activities, involving plotting the spread of Zebra Mussels, a decision making simulation game, and identification of probable ecological inter-relationships associated with the mussel.
4. Data collection activities including surveying, interviewing, and conducting an action plan to educate the local community about Zebra Mussels and other exotic species.

In conjunction with the case study, a one day training session is planned. Teachers will be instructed by Rivers Project teachers who have piloted the case study. The training session will be open to high school science and social studies teachers, plus interested junior high teachers.

Tracking the Zebra Mussel

The Rivers Curriculum Project, funded by the National Science Foundation, has undertaken a cooperative effort with the Illinois Natural History Survey (INHS) and the Water Resources Center at the University of Illinois to help track the Zebra Mussel as it enters the Midwest. Sightings of the mollusc have been reported in the Illinois, Ohio and Mississippi Rivers. Through a grant from the Illinois-Indiana Sea-Grant Program, the teachers of the Rivers Project were given monitoring devices to be placed at their schools' river observation sites. The schools will use the project's telecommunications system (SOILED NET) to send their mussel sightings to INHS, which coordinates the effort. If anyone wishes information on the Zebra Mussel incursion into the Midwest or wishes to place detection devices in their own water monitoring site, the Illinois Rivers Project has both information and devices. The devices cost \$12.00, and include complete instructions.

If interested in the case study, training, or the monitoring device, contact us at the above address.



CLEAN WATER CELEBRATION PLANNED

High school students participating in the Illinois River Project and area agencies and organizations will share their research with each other at a Clean Water Celebration at the Peoria Civic Center planned for Monday, March 21 from 9:00 a.m. to 3:00 p.m. The public and schools not participating in the River Project are also invited to attend the seminars and to view the exhibits. Learning objectives for each presentation will be distributed to teachers in advance.

Funded by the National Science Foundation the River Project is designed to teach science literacy through an interdisciplinary, hands-on approach that involves the students in collection, analysis and reporting of the quality of ground water, rivers and streams in their areas.

Of the 250 high schools in the country that participate in this program, 125 are in Illinois. The research gathered by the students has become so important that it is being used by the Illinois Environmental Protection Agency and the U.S. Fish and Wildlife Service in Wisconsin. In recognition of this project's value, Governor Jim Edgar is scheduled to address the students.

The Clean Water Celebration presents an opportunity for partnership in education as students, teachers, scientists, artists and the public come together to learn and share ideas. It will also be a festive event with performers, games, artwork and a discovery room for fifth and sixth graders. Volunteers are needed to set up exhibits, answer visitor questions and direct them to various locations, help tear down exhibits, be facilitators at the seminars, and a host of other duties.

A committee of representatives from organizations, schools and businesses is coordinating the planning for the day's events. For more information or to volunteer contact the Sun Foundation at 309/246-8403

*ENR will have Geog. Info System work station to demonstrate computer mapping capabilities; stream table, to demonstrate stream bank erosion problem and management; and groundwater protection model and model waterwell. Other agencies and utilities will also be exhibitors.

Gwen Pollock
ISBE (N-242)
100 North First Street
Springfield, IL 62777

ILLINOIS STUDENT SERVICE TRAINING PROGRAMS

Center for American Archaeology Education Program Residential

DESCRIPTION: Trains students in excavation and analysis by working with professional archaeologists as individual mentors to design and conduct individual research projects in bioanthropology, geology, botany, etc. ENROLLMENT: 30. GRADE(S): 9-12. QUALIFIERS: recommendation. DATES: 1-5 weeks (June-Aug.) EST. COST: \$450-\$1,750 tuition; some food costs. SCHOLARSHIPS: partial: National Science Foundation. APPLICATION DEADLINE: rolling admissions; early enrollment advised. CONTACT: Harry Murphy, Dir. of Education, Center for American Archaeology, Kampsville Archaeology Center, P.O. Box 366, Kampsville, IL 62053 (618/653-4316).

Chicago State University Pre-Freshman Program in Engineering and Science. Commuter

DESCRIPTION: Features academic courses, technical writing, engineering projects, computer program class, industrial site visits, engineering seminars, study skill workshops, academic competitions, and motivational speakers. ENROLLMENT: unknown. GRADE(S): 7-10. QUALIFIERS: demonstrated proficiency in math/science: Interview: must be from group underrepresented in engineering. DATES: 6/27-7/29 EST. COST: unknown. SCHOLARSHIPS: possible small supend for transportation, lunch. APPLICATION DEADLINE: 5/27. CONTACT: Teri Young, Office of Engineering Studies, Chicago State U., 129 Harold Washington Hall, 9501 S. King Drive, Chicago, IL 60628-1598 (312/995-2357)

Loyola University at Chicago Loyola/Aspira Summer Science Camp Commuter

DESCRIPTION: Features a bilingual program that introduces basic computer architecture. Students assemble IBM-compatible microcomputers for use in program. Offers labs in digital electronics, engineering design @ control and computer science programming. Includes career-oriented field trips. ENROLLMENT: 54. GRADE(S): 7-9. QUALIFIERS: high potential/low opportunity Latino students. DATES: 6 weeks (6/27-8/2): academic year followup. EST. COST: none. SCHOLARSHIPS: \$120 sdpend. APPLICATION DEADLINE: 4/15. CONTACT: Dale F. Reed, Loyola U. at Chicago, Dept of Math. Sciences, 6525 N. Sheridan Rd., Chicago, IL 60626 (312/508-3567).

Northwestern University National High School Institute, Engineering and Science Division Residential

DESCRIPTION: Offers research and courses in mathematics, chemistry, physics, biology, engineering, biomedical engineering, and computer science. ENROLLMENT: 80. GRADE(S): 12. QUALIFIERS: gifted with high P/SAT or ACT scores; high class rank; recommendations. DATES: 5 weeks (6/26-7/29). EST. COST: \$2,400. SCHOLARSHIPS: partial; based on need. APPLICATION DEADLINE: 5/1. CONTACT: Ms. Lynn Goodnight, Northwestern U., Nat'l High School Institute, 2299 N. Campus Dr., Evanston, IL 60208 (708/491-3028; 800/662-6474).

Northwestern University Academy Program Commuter or Residential

DESCRIPTION: Intensive, fast-paced course in biology, chemistry, human evolution, and material sciences develop the academic potential of young students. ENROLLMENT: 600; 300/session. GRADE(S): 10-12. QUALIFIERS: test scores; early application, plus deposit; DATES: 7/24-8/13. EST. COST: \$1,590 tuition (residential); \$825

tuition (commuter). SCHOLARSHIPS: financial aid available. APPLICATION DEADLINE: 5/31. CONTACT: Barry Grant, Ph.D., Center for Talent Dev., Northwestern U., 617 Dartmouth Place, Evanston, IL 60208 (708/491-3782).

Northwestern University Center for Talent Development (CTD) Apogee Program Commuter or Residential

DESCRIPTION: Students take one three-week course in mathematics, computers, drama, literature, philosophy, foreign language, or hands-on science. ENROLLMENT: 14-16. GRADE(S): 5/6. QUALIFIERS: PLUS (new test administered by ETS through regional talent searches) or SSAT scores (score reqms vary with course). DATES: Session I (6/26-7/16); Session II (7/24-8/13). EST. COST: \$1,490 (residential): \$745 (commuter). SCHOLARSHIPS: financial aid available. APPLICATION DEADLINE: 5/31. CONTACT: Barry Grant, Ph.D., Ctr. for Talent Dev., Northwestern U., 617 Dartmouth Pl., Evanston, IL 60208 (708/491-3782).

Northwestern University Center for Talent Development (CTD) Spectrum Program Commuter or Residential.

DESCRIPTION: Students take one intensive, fast-paced course in precalculus, mathematics, statistics and probability, biology, chemistry, human evolution, topics in physics, Latin, literary analysis, nonfiction writing, creative writing, computer science, American economic behavior, introduction to philosophy, and others. Classes meet five hours per day, five days per week. Daily study hall is required. ENROLLMENT: 15-20. GRADE(S): 7-9. QUALIFIERS: PLUS scores (new test administered by ETS through regional talent search) or SSAT scores. DATES: Session I (6/26-7/16); Session II (7/24-8/13). EST. COST: \$1,490 (residential): \$743 (commuter). SCHOLARSHIPS: financial aid available. APPLICATION DEADLINE: 5/31. CONTACT: Barry Grant, Ph.D., Center for Talent Development, Northwestern U., 617 Dartmouth Pl., Evanston, IL 60208 (708/491-3782).

Northwestern University
Equinox Program
Commuter or Residential.

DESCRIPTION: Offers an invigorating mix of challenging coursework, social activities, and cultural enrichment. Encourages self-governance in the classroom and dormitory. Offers courses in AP English Literature, AP Language and Composition, AP European History, Mathematics, and Science. **ENROLLMENT:** 15/class. **GRADE(S):** 11/12. **QUALIFIERS:** SAT or ACT (score requirements vary with course). **DATES:** 6/26-7/16. **EST. COST:** \$1,550 (residential); \$800 (commuter). **SCHOLARSHIPS:** financial aid available. **APPLICATION DEADLINE:** 5/31. **CONTACT:** Barry Grant, Ph.D., Center for Talent Development, Northwestern U., 617 Dartmouth Place, Evanston, IL 60208 (708/491-3782).

Northwestern University
Solstice Program
Commuter or Residential

DESCRIPTION: Academically talented students take one of three courses in mathematics, science, and the humanities. Classes are supplemented by interdisciplinary seminars and cultural activities. Fosters close relationships among students and staff, who live on campus with students. Students are given the autonomy and expected to accept the responsibilities of college-aged adults. **ENROLLMENT:** 16/class. **GRADE(S):** 10-12. **QUALIFIERS:** SAT or ACT; score requirements vary with course. **DATES:** 7/24-8/13. **EST. COST:** \$1,590 (residential); \$825 (commuter). **SCHOLARSHIPS:** financial aid available. **APPLICATION DEADLINE:** 5/31. **CONTACT:** Barry Grant, Ph.D., Center for Talent Development, Northwestern U., 617 Dartmouth Place, Evanston, IL 60208 (708/491-3782).

Parks College of St. Louis University
Careers in Aerospace Summer Camp
Residential

DESCRIPTION: Investigates all aspects of the aerospace industry. **ENROLLMENT:** 30/session. **GRADE(S):** 10-12. **QUALIFIERS:** GPA only. **DATES:** two 1-week sessions (6/18-6/23; 7/19-7/24). **EST. COST:** \$375 (includes room & board). **SCHOLARSHIPS:** none. **APPLICATION DEADLINE:** 6/1. **CONTACT:** Paul McLaughlin, Director, Summer Aerospace Camp, Parks College of St. Louis U., Cahokia, IL 62206 (618/337-7575, ext. 364).

University of Illinois, U-C
Futures in Science and Technology
Residential

DESCRIPTION: Focuses on applied science projects, courses, and seminars & counseling sessions on career guidance. **ENROLLMENT:** 50. **GRADE(S):** 11/12. **QUALIFIERS:** underrepresented minorities encouraged to apply; GPA; class rank; P/SAT, ACT scores; strong math and science skills; interest in science career. **DATES:** 4 weeks (7/4-7/29). **EST. COST:** \$1,700 tuition; \$500 room & board. **SCHOLARSHIPS:** partial; based on need, academic achievement. **APPLICATION DEADLINE:** 4/15. **CONTACT:** David L. Powell, College of Engineering, U. of Illinois, 1308 W. Green St., Rm. 207, Urbana, IL 61801-2982 (800/843-5410).

University of Illinois, U-C
Illinois Aerospace Institute
Residential

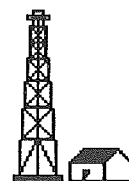
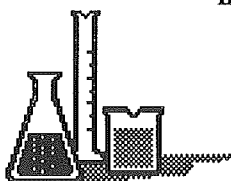
DESCRIPTION: Explores aeronautical and astronautical applications, including theory of flight, aerodynamics. **DATES:** 1 week (6/10-6/16). **EST. COST:** \$650. **SCHOLARSHIPS:** based on need. **APPLICATION DEADLINE:** 4/15. **CONTACT:** David L. Powell, College of Engineering, U. of Illinois, 1308 W. Green St., Rm. 207, Urbana, IL 61801-2982 (800/843-5410)

University of Illinois, U-C
Jr. Engineering Technical Society (JETS) Summer Program in Engr.
Residential

DESCRIPTION: Introduces engineering curricula, emphasizing lab and team problem-solving. Includes college planning, study habits, computer-aided design, and roundtables with undergraduate/graduate students and professional engineers. **ENROLLMENT:** 50. **GRADE(S):** 12. **QUALIFIERS:** completion of geometry, chemistry, and trigonometry; class rank; essay; P/SAT or ACT scores; two recommendations. **DATES:** 2 weeks (6/19-7/1). **EST. COST:** \$400 room & board. **SCHOLARSHIPS:** full, partial; based on need. **APPLICATION DEADLINE:** 5/1. **CONTACT:** David L. Powell, College of Engineering, U. of Illinois, 1308 W. Green St., Rm. 207, Urbana, IL 61801-2982 (800/843-5410).

University of Illinois, U-C
Minority Introduction to Engineering (MITE).
Residential

DESCRIPTION: Introduces engineering curricula, emphasizing lab & team problem-solving. Schedule includes planning for college, study habits, computer-aided design and roundtables with undergrad/graduate students and professional engineers. **ENROLLMENT:** 50. **GRADE(S):** 12. **QUALIFIERS:** African American, Hispanic, and American Indian students only; completion of geometry, chemistry, trigonometry; class rank; essay; P/SAT or ACT scores; two recommendations. **DATES:** 2 weeks (7/10-7/22). **EST. COST:** \$25 administrative fee. **SCHOLARSHIPS:** none. **APPLICATION DEADLINE:** 5/1. **CONTACT:** David L. Powell, College of Engineering, U. of Illinois, 1308 W. Green St., Rm. 207, Urbana, IL 61801-2982 (800/843-5410).



Dr. Emmett L. Wright
237 Bluemont Hall
1100 Mid-Campus Drive
Kansas State University
Manhattan, KS 66506-5310
913-532-7684 or 91333-532-7838 FAX 913-532-7304.
Internet: BIRDHUNT@KSUVM.KSU.EDU



RUSSIAN - AMERICAN EDUCATORS INTERNATIONAL SYMPOSIUM

**Kansas State University
Manhattan, Kansas
24 - 26 April 1994**

To promote educational change and international cooperation between Russian and American science, environmental, mathematics, and technology educators, a symposium will be held on the campus of Kansas State University. In small groups, 30 Russian educators from the region of Voronezh will share their ideas and perspectives about the Russian Education System with their American counterparts. To facilitate the discussions and exchange of ideas the American participants, limited to 60 participants will, in turn, present their ideas in roundtable discussions and seminars. Up to 2 hours of graduate coursework are available from Kansas State University for those desiring the credit.

RUSSIAN - AMERICAN EDUCATORS 2ND INTERNATIONAL EDUCATION Symposium in Voronezh, Russia 24 July - 05 August 1994

Science, environmental, mathematics, and technology educators are invited to attend the 2nd International Education Symposium scheduled to take place between 24 July - 05 August 1994, in Voronezh, Russia. The symposium will promote quality education through the exchange of instruction and curriculum ideas between American and Russian pre-school through college educators. In addition, Americans will be culturally immersed in Russia through visits to schools, museums, villages, churches, festivals, and historical sites in Moscow and Voronezh; also, Russian language instruction will be offered.

An extended trip between 05 - 15 August 1994 will provide additional experiences in Central Asia and St. Petersburg for participants who have the interest and time. The program is co-sponsored by the Voronezh Regional Education and Research Council, Kansas State University, Hunter College, Global Research for Innovative Development, Inc., and the International Association for the Development and Integration of Educational Systems. Up to six hours of graduate coursework are available from Kansas State University for those desiring credit.

For information concerning either of these programs contact Dr. Emmett Wright at the above address.

Harry Hendrickson
Groundwater Section
IL Dept. of Energy & Natural Resources
325 W. Adams
Springfield, IL 62704-1892
217-785-8677

FUND RAISING BY SELLING WATER AND ENERGY CONSERVING SHOWERHEADS

Are you interested in raising funds for a school project? Are you fed up with pizza, candy and magazine sales? Would you like to offer a product that will save the purchaser energy and water in a demonstrable way? If your answer to these questions is yes, consider the following...

- A water saver kit including a toilet bag, brass water saving showerhead, and brochure can be purchased in quantity for about \$3.

- This kit can be sold for \$10 (store prices for the showerhead alone are about \$9)).

- Energy savings from the showerhead alone for most families will be in the \$20 to \$200/year range (depending on energy costs, family size, shower length, and shower frequency).

- A worksheet is available so students can calculate the annual energy savings as part of their sales pitch.

- Installation of the showerheads and toilet bags is easy and usually requires only two tools.

- **Winners include:**

- The purchaser-2 to 10 times return on investment in the first year

- The student-learn about energy conservation and an entrepreneurial spirit

- The teacher/organization advisor - raises funds for the school project or organization in an environmentally positive method

The attached showerhead worksheet was developed by the Illinois Department of Energy and Natural Resources. It will probably create a great deal of interest in families, as the shower habits of family members often vary considerably. Some entrepreneurial students have suggested linking their weekly allowances with energy savings.

In addition to the energy cost savings calculated with the worksheet, additional savings may be realized, including:

- water bill savings

- sewer bill savings (often ties to the water bill)

- heating and air conditioning savings (under certain conditions)

For more information on ordering products or worksheets, contact Harry Hendrickson at the above address.

Dr. Ernest Malamud
Executive Director
SCITECH
Science and Technology Interactive Center
18 West Benton
Aurora, IL 60506
(708)859-3434

The Dinosaur Society
200 Carleton Ave.
East Islip, NY 11730
516/277-7855.

DINOSAUR SOCIETY

The Dinosaur Society is an invaluable resource for teachers. The Society has a unique role in bringing together scientists and educators to provide current and accurate information about dinosaurs. The monthly newspaper *Dino Times* helps students understand current insights of this quickly changing science and includes activities and answers letters from students. The quarterly *Dinosaur Report* gives teachers a perspective of what's current and changing in dinosaur science. The Society's catalog includes a recommended reading list (\$2.50). A \$40.00 Educator Membership includes *The Dinosaur Report* and 12 monthly issues of *Dino Times*.

SCITECH OFFERS FACT SHEETS TO TEACHERS

(1) Discover and Explore Mathematics and Science (D&E). This 4th - 6th grade outreach program was started under pilot program grants from ISBE and is currently a fee-based program. Schools buy it from us, so we need to market it. This program, now in its 5th year, has reached 218 schools to date. This month we received notice that the U.S. Department of Energy will pay 50% of the cost of this program for 100 schools in low income areas.

(2) A new enhanced version of D&E with emphasis on teacher training in inquiry based learning.

(3) Think Like a Scientist, a 2nd - 3rd grade outreach program. This year the program delivery costs are entirely covered by ISBE. Starting in the fall of 1994, we will be marketing it to schools.

(4) Illinois' Wild Weather, a new grant from ISBE for a collaborative of 5 science centers, led by SciTech, to develop new sets of traveling exhibits to serve 4th - 8th graders in schools throughout Illinois.

To order these Fact Sheets or to get more information on SciTech, contact Dr. Ernest Malamud at the above address.

CASL, Inc. Presents

Quizzle

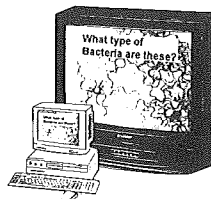
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Why write on the chalkboard when there's an easier and more effective way to teach!

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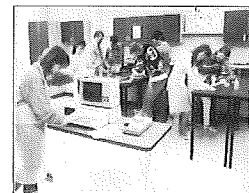
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- Integrate computer technology into your current science program
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- Increase student success in the laboratory
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America's #1 elementary science publisher offers great ways to fill your science class with wonder

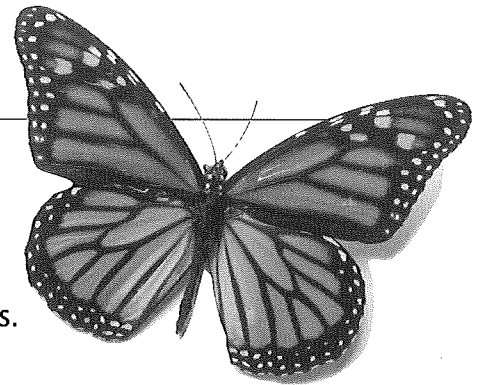
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This amazing new program invites kids to discover that *science is all around us!* And it delivers a solid understanding of both science processes and concepts.

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for '94**

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Helps children understand how their bodies are put together, how their body systems work, and how good nutrition keeps their bodies working properly. Interactive, hands-on activities encourage students to learn by doing.

For information, contact your
ScottForesman representative:

- Les Cleveland (309) 936-7736
- John Hazalik (708) 367-8337
- Tracy Johnson (217) 395-4178
- Gerry Torrence (312) 488-9061
- Janet Wright (708) 339-5729

Judy Baechle, Consultant, Leslie New, Consultant
Akemi Haynie, Consultant **1-800-554-4411**



ScottForesman

AWARDS AND RECOGNITION

GEORGE ZAHROBSKY NAMED HONORARY MEMBER OF THE NATIONAL ASSOCIATION OF BIOLOGY TEACHERS

On November 20, 1993, George was honored at the NABT Convention in Boston. George is only the second high school classroom teacher to receive this honor. The list of recipients includes Hermann Muller, Roger Tory Peterson, George Beadle, Garrett Hardin, Paul DeHart Hurd, and Bob Yager. Although NABT was founded in 1938, the Honorary Membership Award was first given in 1964.

The text of his award certificate is reprinted here:

George S. Zahrobsky is a high school biology teacher at Glenbard West High School, Glen Ellyn, Illinois, where he has taught for 33 years and served as department chair for 25 years. George has truly dedicated his life to providing quality education and an in-depth understanding of biology to all of his many students. He has also created many opportunities for students and teachers to participate in real science activities.

While rather quiet and humble, George has an enormous heart and is always willing to take on a worthy cause. Some examples include the following:

Leader of the Fermilab Summer Science Institute—Biology Section for many years. Dr. Gunter Albrecht-Buehler said, "I knew him as the initiator, organizer, and the soul of this valuable opportunity for teachers. It was amazing to watch George steer me away from areas that might reduce the enthusiasm of participants in the most subtle and diplomatic ways. I have the greatest respect for George as a person and a most gifted teacher."

Advocate of professional involvement. Sherry Yarema writes, "George inspired us to look beyond our classrooms and school situation to the science teaching profession as a whole. Because of his support and mentoring, I have gone on to become President of the Illinois Association of Biology Teachers." Michael O'Hare said, "George has been the backbone of IABT. George has actively participated in the development of the Leon Lederman Science Education Center, a facility dedicated to science programs for K-12 teachers and students."

Leader of NABT. George has served NABT in many ways over many years. A strong advocate at the state level, George is primarily responsible for making the Illinois Association of Biology Teachers a strong, active affiliate. On the national level, George served as Secretary-Treasurer, Vice President, President, and Past President. He also worked on the NABT-NSTA Biology Test Development Committee.

George sets a noble example of an untiring, caring teacher, who models and exemplifies what it means to be professional. NABT is proud to honor him with this special recognition for all that he has given to the biology teaching profession.



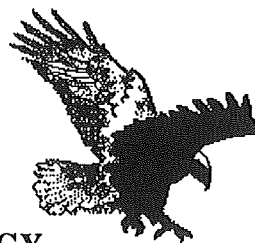
Congratulations, George!

1993 PRESIDENTIAL AWARDS OF EXCELLENCE

The White House finally announced the winners of the 1993 Presidential Awards of Excellence in Science Teaching. The secondary winner is Mike Offutt who teaches chemistry at Barrington High School, Barrington. The elementary winner is Carolyn Riley, who teaches first grade at Ridge Circle School in Streamwood. Our most sincere congratulations go to these outstanding teachers. They will be invited to a week-long series of special events with the winners from other states in Washington, D. C. this spring. They will be awarded a \$7500 grant for improving science education in their own schools.

Nearly 500 teachers from Illinois have been nominated for the 1994 Presidential Awards for Excellence in Science Teaching so far. If you know a teacher who has been nominated, congratulate him/her and consider offering to photograph special times in classrooms or writing a letter of recommendation. The application process is quite intensive and time-consuming. The deadline for receipt of application packets was February 21 for this year. The Illinois portion of the selection process will be completed by early April.

If you have questions about any portion of the nomination, application, selection or recognition phases in the Illinois search, please call Gwen Pollock at 217/782-2826 during the day or at 217/452-3209 in the evenings.



SCHOLARSHIP AUDUBON ECOLOGY WORKSHOP

A scholarship will be awarded to a teacher in elementary or secondary schools serving the Thorn Creek Audubon Society membership area, which encompasses the far south suburbs of Chicago, south to Beecher and west to Joliet. The scholarship will pay tuition to a one-week Ecology Workshop for Educators in Greenwich, Connecticut this summer or to a comparable college credit course, with any remaining funds up to a limit of \$700.00 to be used to defray travel expenses. The deadline for applications is April 1, 1994. Contact Marianne Hahn, Scholarship Chairman, at 18429 Gottschalk, Homewood, IL 60430, (708)799-0249 for further information or application forms.

MEETINGS AND CONFERENCES

INSECT EXPO!

Explore the world of insects at the "Insect Expo" Thursday, March 17, at the Hilton from 8am-2pm. Cheer on the cockroach races and learn about the locomotions of insects first-hand. Visit the World of Insects display or partake in an insect race for humans. Live insects ranging from tiny to tremendous, from all ends of the Earth, will be available for holding, at the petting zoo. Interactive exhibits and displays, all staffed by scientists from the Entomological Society of America, will allow you to take a hands on approach to entomology. For information on Insect Expo and to schedule a visit by your class Contact: Dr. Linda J. Mason Department of Entomology Purdue University West Lafayette, IN (317) 494-4586.

INSECTS, INSECTS, AND MORE INSECTS!

The North Central Branch of the Entomological Society of America, in conjunction with its annual meeting this year at the Springfield, IL, Hilton Hotel on March 12-17, 1994 will hold several events that should be of particular interest to K-12 science teachers.

Presenting Entomology to Children: Strategies and Techniques

The Entomological Society of America will present a symposium on techniques and strategies to present entomology to children. Presenters from across the nation will discuss diverse topics on developing units on insects and using live insects in the classroom. The symposium is from 9-11:30 am Wednesday, March 16, at the Springfield Hilton.

Insects in the Classroom; Teachers Talking to Teachers

In cooperation with Champaign Unit Community Schools District #4 and the Illinois Natural History Survey, an informal workshop focusing on the use of insects in the classroom will be held on Wednesday, March 16, from 1.-5 pm in the Sangamon Room of the Hilton. Teachers from Champaign schools will occupy booths and describe educational activities with insects that they have developed. Although no formal presentations will be made, each participant will be available to discuss the particulars of each classroom-tested activity or set of activities and will provide a detailed procedure for interested teachers. This teacher-to-teacher interaction will present a unique opportunity for the transfer of useful information and techniques regarding the use of insects in science education.

The activities to be featured include butterfly gardening, from garden development to use in an elementary school curriculum, scientific illustration of insects by middle school students, the study of Insect biology using everything from hornworms to ants, and setting up model ecosystems using plastic soda bottles. Included will be a booth featuring activities on insects developed by the Natural History Survey for middle and high school teachers. The topics range from insect population dynamics simulation to risk assessment model-

ing. No preregistration is required so come join us and learn more about using insects in your classroom! For more information contact:

Dr. Michael Jeffords
Illinois Natural History Survey
607 East Peabody
Champaign, IL 61820



MIDWEST ENVIRONMENTAL EDUCATION CONFERENCE PLANS PROGRESSING

Plans for the Midwest Environmental Education Conference to be held October 27-29, 1994 at Eagle Ridge Resort and Inn, Galena, are progressing. The Midwest Environmental Education Consortium includes the states of Illinois, Iowa, Wisconsin, and Minnesota.

The tentative conference schedule reveals update workshops on Project Wild, Illinois Groundwater, Project Learning Tree, CLASS Project, Project AIR, and Project WET to be held Thursday morning and afternoon. Thursday afternoon will also include a workshop by Joseph Bruchac, co-author of *Keepers of the Animals* and *Keepers of the Earth*. At the present time approximately 75 concurrent sessions are being planned. On Friday, concurrent sessions will be held from 8 am-12 pm and 3pm-5pm. The keynote address, following the noon luncheon, will be delivered by Joseph Bruchac. Friday evening will also feature dinner, entertainment by Jim Post, singer and storyteller, and the annual auction. Saturday will have concurrent sessions during the morning hours. Throughout the conference a variety of field trips are being planned as well as exhibits by both public and private enterprises and agencies.

Registration for the conference is \$50 for EEAI members and \$60 for non-members. One-day registration is \$30 for members and \$40 for non-members. Registration for students and spouses are \$20 or \$10 for one day. Exhibitors cost for space and registration is \$175 for commercial exhibitors and \$100 for noncommercial exhibitors.

If you would like more information about the Midwest Environmental Education Conference contact:

Don Nelson
Midwest Environmental Education Conference
Science Education Center
Western Illinois University
Macomb, IL 61455
or phone the WIU Science Education Center at (309)298-1777; or 298-1411 or 298-1258.

FIELD TRIPS AND WORKSHOPS

Melanie Magisos

CIPE

5343 Pima Road, Suite 2

Tucson, AZ 85712-3657

602/322-0118

CIPE ANNOUNCES 1994 SUMMER WORKSHOPS

The Center for Image Processing in Education is again offering summer workshops to introduce teachers to the powerful technology of digital image processing.

Location	Dates
Tucson, AZ	June 27-July 1
San Diego, CA	July 11-15
Albuquerque, NM	July 25-29
New Brunswick, NJ	August 1-5

The five-day Workshop provides a hands-on mixture of theory, technique, and application. Teachers learn to enable students to create, display, enhance, and analyze digital images using state-of-the-art tools and data sets.

Each participant receives a notebook and CD-ROM filled with ready-to-use activities, software, documentation, and a collection of scientific images. Participants should have color Macintosh computers in their schools, either in the classroom or a lab setting, and are responsible for bringing their own computers to the workshop. (We can arrange for rental of the necessary equipment at the participant's expense—\$200 for five days.)

The Workshop fee of \$1,000 includes instruction, materials, lodging for six nights, and follow-up support via electronic mail and toll-free telephone. Participants are responsible for their own travel expenses and meals. A \$50 discount is offered to participants who register before March 15, 1994. Call about additional discounts for participants not requiring lodging.

Graduate credit and Continuing Education Units from the University of Arizona may be available for workshop participants. For more information, contact Melanie Magisos or Debbie Sather at the address above.

TRAVEL/STUDY TOURS TO THE NEW WORLD TROPICS SPONSORED BY THE NATIONAL SCIENCE TEACHERS ASSOCIATION

THE NATURAL RICHES OF COSTA RICA JULY 2-15, 1994

Explore the forests, mountains and beaches of Costa Rica for 14 days/13 nights. Visit Carara Wildlife Refuge, Arenal Volcano, historical San Jose and spend three days in the Caribbean lowland rainforest, three days in the Monteverde Cloud Forest Reserve, two days in the Pacific coastal forests and on the beaches of Manuel Antonio National Park, and two days in Tortuguero National Park observing nesting sea turtles.

The cost of \$1,985 is per person, double occupancy, Miami departure and is all-inclusive except items of a personal nature. Group size is limited to 16 persons. The trip will be led by Chris Migliaccio, Assistant Professor, Natural Science Department of Miami-Dade Community College/Wolfson Campus.

For a detailed itinerary and registration information, contact Chris Migliaccio, 18710 Belmont Drive, Miami, FL 33157 (305) 238-5770.

THE MAGIC OF HONDURAS July 2-13, 1994

Visit La Tigra Cloud Forest with its lush vegetation and birdlife; the historical museums, homes and churches of the capital city, Tegucigalpa; participate in hands-on activities at the Agricultural College of Zamorano (one of Central America's most advanced research institutions); walk through Taulabe Cave with its beautiful collection of stalagmites and stalactites; visit the 700 foot tall Morazan Dam; swim in natural pools at the base of Pulhapanzak Falls amidst the tropical forest.

Enjoy two days of guided activities at the 74,000 acre Copan Archaeological Park where the Mayan civilization flourished and left a rich legacy. Visit the 2500 acre Lancetilla Botanical Gar-

dens with its large collection of economically valuable tropical plants and the Cuero y Salado Wildlife Reserve on the Caribbean coast protecting endangered animals such as crocodiles, howler monkeys, and manatees.

The tour cost of \$1,857 is based on 15 passengers and one group leader, is all inclusive except items of a personal nature and is based upon Miami departure with double occupancy in all accommodations. The trip will be led by Wil Gilbert, Professor of Biology, Miami-Dade Community College/Medical Center Campus.

For a detailed itinerary and registration information, contact Wil Gilbert, 18921 NW 11th Ave. Miami, FL 33169; (305) 653-1139.

HIGHLIGHTS OF ECUADOR August 7-18, 1994

Explore the rich natural and cultural history of mainland Ecuador in this 12 day/11 night program led by Chris Migliaccio, Natural Science Department of Miami-Dade C.C. Professor Migliaccio's fifth NSTA trip to Ecuador includes the best of this small but beautiful Andean nation. Visit Cotopaxi National park, with the world's tallest active volcano; the world famous indigenous markets and villages of the Otavalo region known for wood carvings, leather goods, bread dough sculpture and textiles; the Pacific coastal forests in the Santo Domingo area that are a bird and plant watcher's delights; the historic city of Quito with its many churches and museums that date back to the 1500's; and Amazonian rainforests of the Oriente Province, including primary forest trails of the Jantun Sacha Biological Station and in the Arajuno River area.

Tour costs \$1,879 based on 15 persons and one group leader, is all inclusive except for personal items and is based upon Miami departure with double occupancy in all accommodations.

For a detailed itinerary and registration information, contact Chris Migliaccio, 18710 Belmont Drive, Miami, FL 33157; (305) 238-5770.

PHYSICS WORKSHOP FOR CENTRAL ILLINOIS TEACHERS

•The Physics Department at the University of Illinois in Urbana-Champaign is pleased to announce a one day workshop on **Saturday, April 23, 1994**, on the University of Illinois campus. All level school teachers interested in enhancing physics education are invited to register. Organizers and consultants are the Physics Department, the National Center for Supercomputer Applications and elementary and secondary school teachers and administrators.

•**The workshop program :**

A Particle Physics Lecture(k-12) for all participants, followed by the choice of **hands-on** workshops: Physics Van (k-12), a mobile physics demos the Logowriter Robotics(k-7), : Lego + computer system in teaching physics; Operation Physics: Energy (4-7), a national program of master teachers teaching how to teach physics; Scientific Visualization and Simulation(9-12) NCSA Education group, physics software and other uses of computers; Modern Physics Lab Experiments (9-12) participants will do experiments such as: CCD Camera, Microwaves, Chaotic Pendulum, Superconductivity.

The number of participants for hands-on workshops is limited. The workshops will be filled in the order we receive the registration forms, so please respond promptly. The Physics Department will sponsor most of the expenses. Parking is free on weekends at the very large Physics Department lot.

QUESTIONS: Dr Inga Karlner, email: karlner@uiuc.edu, (217) 333 9358

WORKSHOP SCHEDULE

April 23, 1994, Urbana, Illinois 8:00am -4:00 pm

Title	grades	Time	Location
1. Particle Physics Lecture	k-12	8:30 - 9:30	Illini Union room 407
Coffee Break		9:30 -10.00	1401 W Green Street,Urbana.
2. Physics Van Experiments	k-12	2 sessions (24 spaces /session)	
		2A:11 :30 -12:30	Physics Dept room 234
		2B: 2 :30 - 3:30	1110 W Green Street, Urbana
3. Lego Robotics	k-7	4 sessions (24 spaces/session)	
		3A:10 :30 -11:30	Physics Dept. room 32
		3B: 11:30 -12:30	"
		3C: 1 :30 - 2:30	"
		3D: 2 :30 - 3:30	"
4. Operation Physics : Energy	4-7	2 parts (24 spaces)	Physics Dept. room 64
		10:30 -12:30 and 1:30-4:00	
5. Scientific Visualization and Simulation	9-12	2 sessions (22 spaces/session)	
		5A:10:30 -12:30	/Comp Applic Bldg room 169
		5B: 1:30 - 3:30	605 E.Springfield, Champaign
6. Modern Physics Lab Demos	9-12	2 sessions (20 spaces/session)	
		6A:10:30 -12:30	Physics Dept
		6B: 1:30 - 3:30	rooms 332 & 364

REGISTRATION FORM

Mail to : Dr I.Karlner, Physics Dept, U of Illinois, 1110 W Green Street, Urbana,IL 61801

Name: _____

Address: _____

Phone number including area code: _____

Requested Hands-on Workshops / Sessions. Circle the ones you are interested in:

am:	2A	3A	3B	4(am+pm)	5A	6A
pm:	2B	3C	3D		5B	6B

A registration fee of \$5 is required to cover the refreshments and mailing expenses. Checks should be written to Physics Dept, U of Illinois.

EDUCATIONAL MATERIALS

Charlotte Hickman
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PO Box 329
Chestertown, Maryland 21620
410-778-3100

WATER QUALITY MONITORING HANDBOOK

The LaMotte Monitor's Handbook provides guidance for doing watershed surveys, site location, sample collection and for choosing appropriate methods and equipment. The 8 1/2" x 11", 72 page handbook includes charts, drawings and references, and describes the physical, chemical and biological factors of water quality and procedures for measuring them. Significant levels for each factor are listed, along with potential causes of higher or lower levels.

LaMotte Company specializes in the development and manufacturing of self-contained, portable test kits and electronic instruments widely used by educators, professional, and volunteer water quality monitors.

Copies of the Monitor's Handbook can be ordered, postage paid, by remitting \$5.95 for each to LaMotte Company, P.O. Box 329, Chestertown, MD 21620 along with mailing instructions.



ENR PROVIDES INSTRUCTIONAL MATERIALS ON THE 3 R'S

Single copies of these materials are available free of charge. When you have finished using the materials, please share them with another teacher.

Materials:

Actions Speak! - This curriculum guide offers middle-grade students opportunities to explore the relationship between science, technology, and society (S/T/S) in solid waste management by using news articles and role-playing (6-8).

All "Trashed" Out - These "hands-on" activities integrate reducing, reusing, and recycling solid waste into areas of math, science and social studies (K-3).

Clip Art Book - This 24-page booklet contains a collection of waste reduction and recycling graphics for teachers.

Plastics in Perspective - These materials will help high school chemistry students learn how to identify plastics in the lab and explore the factors that cause degradable plastics to break down in the environment (9-12).

Recycle Our Available Resources (R.O.A.R.) - This packet includes puppet shows and songs to teach children about recycling (4-8).

Solid Waste Activity Packet for Teachers - This 200-page packet includes classroom activities on reducing, reusing, recycling, landfilling, and incinerating solid waste (K-8).

Solid Waste: From Problems to Solutions, A Teacher's Handbook - This 16-page handbook provides background information and classroom activities on solid waste management (K-8).

Investigation Recycle! - This workbook includes a trivia game and coloring activities on recycling and waste reduction (K-6).

Waste Reduction Guide for Illinois Schools - This guide outlines 10 steps to establish a school recycling program (K-12).

Textbook Reuse and Recycling Guide - This guide contains reuse ideas and recycling directory for used textbooks.

Audio-Visuals Available on a Free Loan Basis: Recycle This! - This amusing 45-minute video produced by Dow demonstrates how recycling saves energy, reduces waste, and conserves resources. The video targets high school audiences and imitates well-known actors and the "Jeopardy!" game show (6-12). Contact ENR or Dow at 1-800-441-4369 for your own copy.

Reduce, Reuse, Recycle: It's Elementary - This 20-minute video accompanies the "Waste Reduction Guide for Illinois Schools" and highlights Illinois student recycling activities (K-6).

The Rotten Truth - This 30-minute video produced by 3-2-1 Contact Extra provides an entertaining overview of the solid waste problem. The elementary-student narrator visits a landfill, a recycling center, and demonstrates over-packaging of products, while providing facts, music and fun (K-6).

Thermodynamics and the Environment - This slide show presentation and guide is designed for physics, chemistry, or biology classes. The basic concepts of thermodynamics as they relate to solid waste issues are introduced (9-12).

The Wonderful World of Recycling - This 13-minute video shows primary-grade students how new products are made from recycled items (K-3).

For Classroom Materials and Audio-Visuals...Call the ENR Clearinghouse at (800)252-8955. For the hearing impaired, call the Illinois Relay Center at (800)526-0844

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Send \$2.00 for Estes, MRC, & Custom Rocket Company Catalogs

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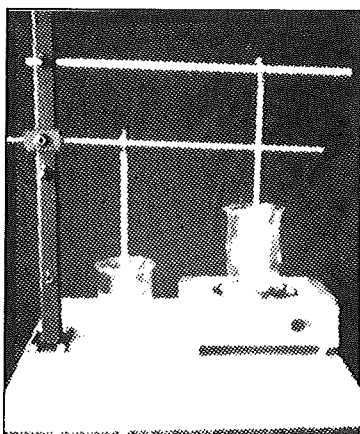
1827 North Charles St. • Belleville, IL 62221-4025
618•234•5989 FAX•618•234•9202 (24 hours)

Women Inventors Poster Set Issued

A multicultural display set of twelve posters honoring women inventors has just been issued by the National Women's History Project. "Inventive Women" demonstrates the creative genius of women, providing the definitive answer for a frequently heard, puzzling question, "But, weren't there any *women* inventors?"

Each of the eleven women whose full-color portraits are featured on the posters holds U.S. patents for her inventions: Ellen Ochoa, Harriet Williams Strong, Sally Vreseis Fox, Marjorie Joyner, Beulah Louise Henry, Helen Augusta Blanchard, Ann Tsukamoto, Mary Florence Potts, Mary Engle Pennington, Gertrude B. Elion, and Valerie Thomas. Each poster includes illustrations of the woman's unique works, a biographical statement, and her registered patents. At the bottom of each poster is a multicultural list of five other women whose inventions (with patent numbers cited) relate thematically: agricultural, medical, domestic, scientific, technical, and business.

The first poster of the set is an illustrated essay about the hidden history of American women inventors. Post it as the introductory panel for a beautiful, unique display. The 11"x17" set of twelve "Inventive Women" posters is printed in full-color on heavy paper, packed in a sturdy plastic zip-lock bag. \$24, plus \$4.50 s/h. Credit cards and purchase orders accepted. This is one of many math/science items available from the National Women's History Project, 7738 Bell Road, Dept. P, Windsor, CA 95472. (707)838-6000.



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ILLINOIS AEROSPACE INSTITUTE

PROGRAM DATES: July 10-16, 1994

WHERE: University of Illinois at Urbana-Champaign

PARTICIPANTS: Students who will enter 9th, 10th, 11th or 12th grade in the Fall of 1994

PROGRAM DESCRIPTION:

Explore the areas of aeronautical and astronautical engineering, propulsion and aviation technology. Activities include:

- Study and experiment in Depart. of Aeronautical and Astronautical Engineering labs and computer simulators.
- Talk with NASA astronauts and aerospace engineering specialists.
- Visit an FAA control tower and learn about aircraft navigation during flights at University Institute of Aviation.
- Design, build and fly a model airplane and a model rocket.
- "Fly" in a flight simulator.

CONTACT PERSONS:

Diane Jeffers, Dept. of Aero/Astro Engineering, 308 Talbot Lab, 104 S. Wright St., Urbana, IL 61801
Phone: 217/244-8048


David Powell, Illinois Jets, 207 Engineering Hall, 1308 W. Green St., Urbana, IL 61801
Phone: 800/843-5410

SPONSORS: UIUC Dept. of Aero/Astro Engineering & Aerospace Illinois Space Grant Consortium

APPLICATION DEADLINE: April 15, 1994

COST: Approximately \$650. **FINANCIAL AID AVAILABLE BASED ON NEED.**

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And at the end, there's an extra special bonus. A test (another idea given to us by teachers!!) You will be able to evaluate what they have just learned right off the video.

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Please print my contribution in the following issue(s):

___Fall (due June 1)

___Spring (due December 1)

___Winter (due September 1)

___Summer (due March 1)

SPECTRUM welcomes black and white glossy photographs. We can sometimes use color pictures but they must be sharp with high contrast. Please enclose a stamped self-addressed envelope if you want your photos returned.

ISTA REGIONAL DIRECTORS

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(309)793-5980

John Carleton
Hononegah Community H.S.
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Rockton, IL 61072
(815) 624-8951 Ext 52

REGION III

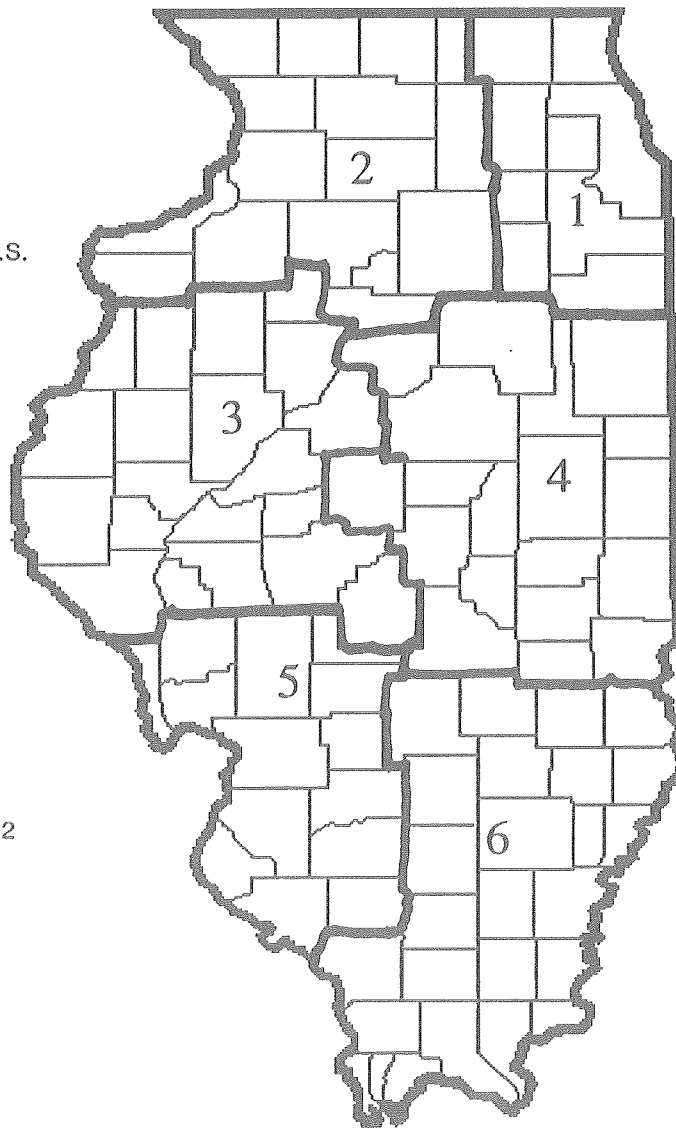
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(618)476-1681



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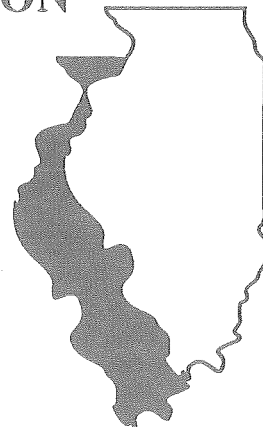
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Listing of Counties Comprising Each ISTA Region

Region I	McHenry, Lake, Kane, Cook, DuPage, Kendall, Will, Grundy, Kankakee
Region II	Jo Daviess, Stephenson, Winnebago, Boone, Carroll, Ogle, DeKalb, Whiteside, Lee, Rock Island, Henry, Bureau, LaSalle, Putnam, Marshall
Region III	Henderson, Warren, Knox, Stark, Peoria, Hancock, McDonough, Fulton, Tazewell, Schuyler, Mason, Adams, Brown, Cass, Menard, Pike, Scott, Morgan, Sangamon
Region IV	Woodford, Livingston, Ford, Iroquois, McLean, Logan, DeWitt, Piatt, Champaign, Vermillion, Macon, Shelby, Moultrie, Douglas, Edgar, Coles, Cumberland, Clark
Region V	Calhoun, Greene, Macoupin, Montgomery, Madison, Bond, St. Clair, Clinton, Monroe, Washington, Randolph, Perry
Region VI	Fayette, Effingham, Jasper, Crawford, Marion, Clay, Richland, Lawrence, Wayne, Edwards, Wabash, Jefferson, Franklin, Hamilton, White, Jackson, Williamson, Saline, Gallatin, Union, Johnston, Pope, Madison, Alexander, Pulaski, Massac

ILLINOIS SCIENCE TEACHERS ASSOCIATION

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