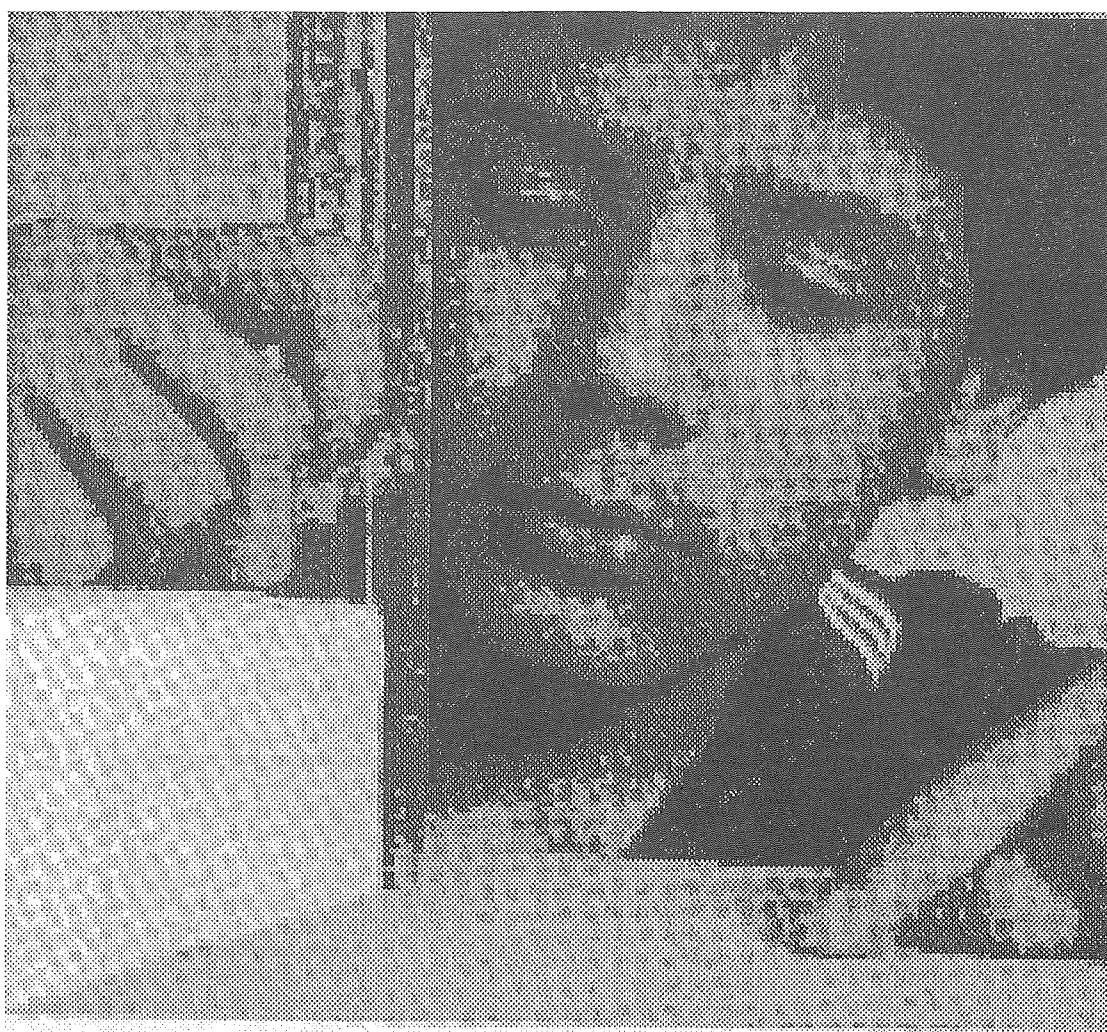

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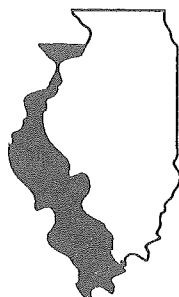
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ISTA NEWS

FALL PRESIDENT'S LETTER

Dear ISTA Colleague:

I hope you have had an exciting and rejuvenating summer. Since my last letter, I have attended two important meetings. The first was our own ISTA Summer Board Meeting held in June at the University of Illinois in Urbana/Champaign and the second was the NSTA Summer Board Meeting held in July on Paradise Island in the Bahamas. I will give you a brief overview of both meetings.

At the ISTA Summer Board Meeting, Treasurer Wayne Green reported that we are still in very good financial health. Although this year's operating expenses were in slight excess of our dues revenue, our reserve funds generated through conventions, commercial exhibits and miscellaneous other sources continue to provide a comfortable buffer. All of this translates into good news for our members in that we have not had a dues increase or raised convention registration fees for quite some time.

Doug Dirks, Chair of the 1992 Convention to be held on October 2 and 3 at Pheasant Run, reported that he had mailed advance publicity containing registration forms to members. By now you have received that information and I encourage you to attend what promises to be an outstanding program.

Membership Chairman George Zahrobky reported that we made a slight gain in membership bringing us near the 2,200 mark. With Pheasant Run as our 1992 convention site, we expect a larger growth in membership next year.

Much of the long-range planning this summer revolved around the demographics of ISTA regions and the role of the Regional Directors. The Regional Directors are taking an increasingly active role in the organization including convention planning and acting as trainers for performance-based student assessment seminars. Vice President Carol Van DeWalle will chair a meeting of the Regional Directors later this year to help clarify their evolving role.

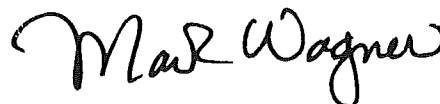
The second meeting I attended was the NSTA Summer Board Meeting to which representatives of state chapters and associated groups (CAGs) are invited. This summer I was one of over 60 such representatives participating. During the first day, we were split into working groups to discuss possible models for reorganizing the structure of the NSTA Board of Directors and Executive Committee. The goal of NSTA is to increase the amount of "grassroots" participation by members. The CAGs discussion groups reported back to the NSTA Board which in turn stimulated more discussion. Although the ultimate decision on reorganization will be made by the NSTA Board, I was encouraged to see that they valued input from state chapters such as ISTA. NSTA's District VIII (which includes Illinois) representative is Bob Burtch, a longtime ISTA member.

Other CAGs sessions at the NSTA meeting included seminars on Robert's Rules of Order; How to Run a Convention; Newsletter Production, Eisenhower Grants and several other topics. In addition, we heard reports on the work of the National Committee on Science Standards and Assessment and the National Board on Professional Teaching Standards. Overall the meeting was very informative and gave me many good ideas for our own association.

My son Max had a busy summer (unfortunately too busy to take a picture for the newsletter) and has just turned two. He attends a parent/toddler preschool class with my wife and absolutely loves "school." He's already shown an interest in science having become keenly interested in insects (especially lightning bugs) and in the variety of things he can do with water (including drenching our kitchen floor). He's looking forward to taking science classes so that he can get some answers to his many questions.

I hope you begin your school year by registering to attend the 1992 ISTA Convention in Pheasant Run on October 2 and 3. I look forward to seeing you there.

Sincerely,



Mark Wagner
President



FUTURE ISTA CONVENTIONS

1992 ISTA Convention

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Orrin Gould
Professor Emeritus
Science Education
University of Illinois
Chair, ISBE Science Assessment Advisory Committee



THE SCIENCE IGAP: THE PAST AND THE FUTURE (PROBABLY)

It was last April that Illinois students in grades 3, 6, 8 and 11 took the Science IGAP (Illinois Goal Assessment Program) test. That's the past. The Science IGAP future with respect to the grades for administration, and its form and purpose will likely be different than at the IGAPs first statewide use last April. That difference is expected to be in place by next March.

The purpose of this article is to review the past and to anticipate the future. "Anticipation" seems to be the right word by reason of newly emerging ISBE policy with respect to school recognition, and also because some of the expected changes are mandated by law. As of the date of this writing (July 24, 1992) changes in the law pertaining to IGAP have been passed by both houses of the State legislature, but the Governor has not yet signed the new legislation. It is expected that he will.

First, a review of the past:

The IGAP for the six fundamental areas of learning (science, mathematics, language arts, social studies, fine arts, and physical education and health) has its origins in the 1985 Education Reform Act. The ISTA endorsed the mandated statewide and local assessment with a position paper (*Spectrum*, Winter 87-88) which included the following beliefs:

—mandated assessment and public reporting will necessitate reflective thought, communication and understanding between and among professional educators, the public, and the political leadership about the goals and purposes for school science, those goals and purposes being much more broad, pervasive and complex than preparation for college or the next course.

—mandated assessment and public reporting at all grade levels will draw attention to the relative neglect of science as an integral part of schooling, particularly at the elementary level, where it presently is often non-existent or taught with inadequate time, resources or teacher qualification and support.

—assessment and public reporting in terms of State purposes and the FOUR MAJOR GOALS for science will "drive the curriculum" in the direction of giving increased overt emphasis in classroom practice to goals which extend beyond traditional "content" or finished and furnished textbook knowledge.

—assessment and public reporting has, as a primary aim, the generalized improvement of schools and schooling across the state, with an aim toward excellence; not minimums. Such an aim means that the primary unit of assessment is the school, not individuals, and the purposes are NOT to make comparisons, either of schools, communities, or individuals. When assessment points to quality that is less than "the best possible" ("best possible" does not mean "minimum competence"), the consequence is not punishment or shame, but rather action to remediate with the help and support of the local and State agencies, as well as the community by reason of its (presumed) understanding and stake in the local and State Goals for schooling.

While questions persist about whether the ISTA beliefs that were expressed in its position paper have been fully realized, the Science IGAP was administered for the first time at grades 3, 6, 8 and 11 last April.

Sadly, the form and purpose of the IGAP was often unknown or misunderstood by many teachers, particularly those at the grades affected. Such lack of information was unfortunate and avoidable because in February, 1992, the ISBE published and distributed a detailed and most instructive monograph regarding the Science IGAP to all buildings across the State. Discussions between teachers and ISBE staff and members of the Science Assessment Advisory Committee (SAAC) have shown that in many schools the monograph was NOT passed on to affected teachers by the person who initially received the monograph. Also, in many cases, it appears that the monograph was not even looked at by the person who initially received it.



The monograph which far too often stopped at the school building door is titled:

ILLINOIS GOAL ASSESSMENT PROGRAM
SAMPLE TESTS OF ILLINOIS GOALS IN SCIENCE
Grades 3, 6, 8, 11

1992 ILLINOIS STATE BOARD OF EDUCATION

The contents of the monograph are:

Chapter One: The Illinois Goal Assessment Program in Science

Chapter Two: Criteria for Test Format and Item Selection

Chapter Three The Four Goals in Science

Chapter Four: Sample IGAP Science Test: Grade 3

Chapter Five: Sample IGAP Science Test: Grade 6

Chapter Six: Sample IGAP Science Test: Grade 8

Chapter Seven: Sample IGAP Science Test, Grade 11

Appendix A: Answer Keys and Item Analysis

Appendix B: Illustration of the Productive Thinking Scale

Appendix C: How to Prepare Teacher and Students for the IGAP Science Test

Appendix D: ISBE Science Assessment Advisory Committee

Excerpts from the monograph which, had teachers seen and read the monograph, might have relieved some anxiety and frustration, include:

—The purposes of the IGAP science tests are to measure students' knowledge with respect to the state goals for learning; to provide descriptions, based on student test results, of how students, schools and districts are performing in science in comparison to the state and nation; to chart science progress of schools, districts and the state over time; and to generate information on science outcomes that can be used for accountability, policy making, and school improvement. As such, IGAP scores will be an essential part of the emerging school recognition program. IGAP, as a measure of student performance, links accountability to school improvement.

—The sample tests comprise items similar to those that will be used on the statewide assessment. The sample tests illustrate both the structure and content of the IGAP tests.

—IGAP science tests generate two types of scores for schools and districts at each grade level. All the science items in each test generate the overall IGAP scale score. A subset of items specific to each state goal (presented in Chapter Three) generates each goal score.

—Each district superintendent receives IGAP results in the fall. Each of the 18 Education Service Centers (ESC) located throughout the state sponsors workshops to answer questions and provide technical assistance in interpreting the scores for the districts in their areas. The School Report Card reports IGAP school scores for each learning area. Beginning in 1993, ISBE will report IGAP science scores for each student to the district. IGAP information coupled with information derived via each district's learning assessment plan serves as the foundation for local decision-making toward school improvement.

—The science test for each grade is a one-hour, single-right-answer, multiple choice test. Unlike other standardized tests, which tend to be primarily devoted to Goal 1 (vocabulary, concepts and applications), IGAP science tests devote only 25 percent of the items to Goal 1 at grades 6, 8 and 11, and only 33 percent at grade 3. In this regard, Illinois' goals for science and the IGAP science tests are distinctive.

—The education reform act mandates the assessment of what students should know and be able to do as an outcome of their schooling in science. With respect to student performance, ISBE distinguishes between performance literacy and performance skill. Performance literacy refers to what a student knows about performance; performance *skill* refers to what a student can do. At this time, the IGAP science tests do not measure performance *skill*. They do not contain manipulatives, incorporate laboratory exercises, or require performance skills activities. Rather, the tests assess students' knowledge of science and performance literacy with respect to all four goals.

—ISBE tests performance *literacy* at the state level and supports performance *skills* testing at the local level, where performance skills assessment is more contextual, feasible, timely and informative. This complementary approach helps to optimize the advantages and minimize the disadvantages of both types of assessment.

—The number of teachers who use performance skills-based instruction in their classrooms in Illinois and the nation is growing. These teachers seek valid and reliable performance skills assessment instruments which reflect their mode of instruction and which measure what students can do. In addressing these issues, ISBE has undertaken initiatives toward development of performance skills assessment in science which districts or schools may voluntarily adapt as part of their local learning assessment plans. ISBE encourages (but does not require) districts schools and teachers to develop their own performance skills instruments consistent with their local curricula, instruction and learning assessment plans. Districts now using only standardized pencil-paper science tests should consider a more balanced, dimensional approach to science assessment.

—ISBE staff, Illinois educators and Science Assessment Advisory Committee (SAAC) members select, edit and chose the items used in the science tests. Reviewers, including teachers from each of the four grades, screen each item for grade-level appropriateness, content validity, importance, accuracy of the four answer alternatives, readability, and clarity of graphics and vocabulary. The target for vocabulary is "at-grade-level." Reviewers usually omit items which are esoteric, IQ-like, trivial, puzzle-like, negatively worded, inaccurate, value-laden, or inappropriate to the goal.

—ISBE pilot-tests all items used in the science assessment. Hundreds of science items were pilot-tested in 1988, 1989, 1990, and 1991 at the four grades. These pilot tests generated a statistical profile for each item. Reviewers generally omit items which are too easy (80 percent or more correct) or too difficult (25 percent or less correct response).

—Once the ISBE staff assembles a test according to the above criteria, reviewers again examine the items to determine whether there is a reasonable distribution of items among major learning areas—earth science, physical science and life science. However, this criterion is secondary to the scientific thinking, conceptual level and statistical criteria described above. IGAP identifies a good item as one that is important, rich in content, unbiased, thoughtful and well written. It should match the goal it represents and discriminate between high and low ability students. As well, a good test should be statistically reliable. Each IGAP science test pilot-tested in 1991 demonstrated a high internal reliability.

—The state goals for science should be an integral part of a district's science program at all grades (kindergarten-12). Good preparation occurs when a district aligns its learning objectives in science with the state goals, its curriculum, its instruction, its tests and its remedial actions based on the testing results. Programs or curricula which provide students clear, stable and measurable targets; engage students in the state goals in science year-long at all grades; assess student progress routinely throughout the school year and make the mid-course adjustments needed to keep on course will provide students optimal opportunity to master the state goals for learning.

—The state goals in science, not the type of assessment instrument used, should be the motive for curricular development. Likewise, test results from a variety of sources, not the type of assessment instrument used, should be the basis for improved pedagogy. Given the depth and breadth of scientific knowledge, the items in any given IGAP science test, as well as the sample tests as a whole, represent a small sample of potential topics and questions.

The IGAP tests—as is true of any pencil-paper test—should supplement, not replace, the array of science assessment methods which schools and districts can use in their local assessment programs.

Even with the thought and attention to detail that went into developing the April, 1992 IGAP, as well as the very informative monograph which describes its form and function, the IGAP tests were certainly not perfect. It is a rare teacher, if any, who has not, after-the-fact, seen or been told of shortcomings in his or her tests, no matter the care and time that was given to the creation. The science IGAP is no exception. As a consequence, the ISBE has received a number of comments, suggestions and criticisms concerning the IGAP tests. ISBE's positive response to those concerns is illustrated by the following excerpts from a letter to a concerned teacher:

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I write to thank you for bringing these suggestions and criticisms to my attention. A member of the Science Assessment Advisory Committee, serving as science consultant to the State Board of Education, independently reviewed each of the suggestions and criticisms. I then reviewed them with our consultant in detail. In some instances, we agreed that the criticisms had merit and that the items should be edited or replaced. In other instances, we disagreed with the criticisms or otherwise found that they did not warrant making changes to the items. I will, of course, edit the test accordingly. The State Board of Education will release a new sample test booklet this year. Therefore, the critique of the items which you provided is most timely and welcome. As one in search of better, clearer, more informative science items, I again thank you for taking the time to share that list as well as express your concerns for the quality of IGAP. Please feel free to share this letter with others whom it may concern. If you have any questions, please do not hesitate to call (217/782-4823). Sincerely,

Richard Walker, Ph.D.
Science Assessment Consultant

With a review of the past at least partially in hand, let us turn to the (anticipated) future.

It is Illinois law that mandates that the IGAP tests for the fundamental areas of learning be given at grades 3, 6, 8 and 11. Accordingly, if there is to be a change in the grades for IGAP testing, the law must change. And such a change is in progress. Both houses of the legislature have passed, but the Governor has not yet signed (as of July 24, 1992), legislation which moves both the Science and social Studies IGAP from grades 3, 6, 8 and 11 to grades 4, 7 and 11. The mathematics, reading and writing IGAPs will remain at grades 3, 6, 8, and 11. This change, if signed by the Governor, will be in effect for the 1992-93 school year. Further, the science IGAP will be given at these new grade levels every year; not alternate years as was the called for in the old law.

In anticipation of the grade changes for the science IGAP, items for grades 4 and 7 were piloted last April. Two forms were given trial for each grade, with about 1,900 students taking each form at each grade level. The piloted items were essentially of the same form as for the 1992 science IGAP, but there is reason to hope that not too far down the road, the science IGAP will go beyond a pencil and paper, multiple choice format. That hope arises from the (pending) law extending the time allowed for the science IGAP from about 50 minutes, as was the case last April, to about 80 minutes. Most likely that 80 minutes will be divided into two 40 minute segments.



With regard to the reporting of science IGAP results to schools and buildings, scores will be provided for each student; not just building scores. Further, a total score will be provided as well as a score, in some form, for all four science goals.

With the likelihood that the law will be changed, the ISBE is presently developing a new monograph which will again describe and illuminate the modified form and function of the science IGAP. It is hoped that this monograph, which will be distributed to every building across the State, will reach the affected teachers. Be alert!

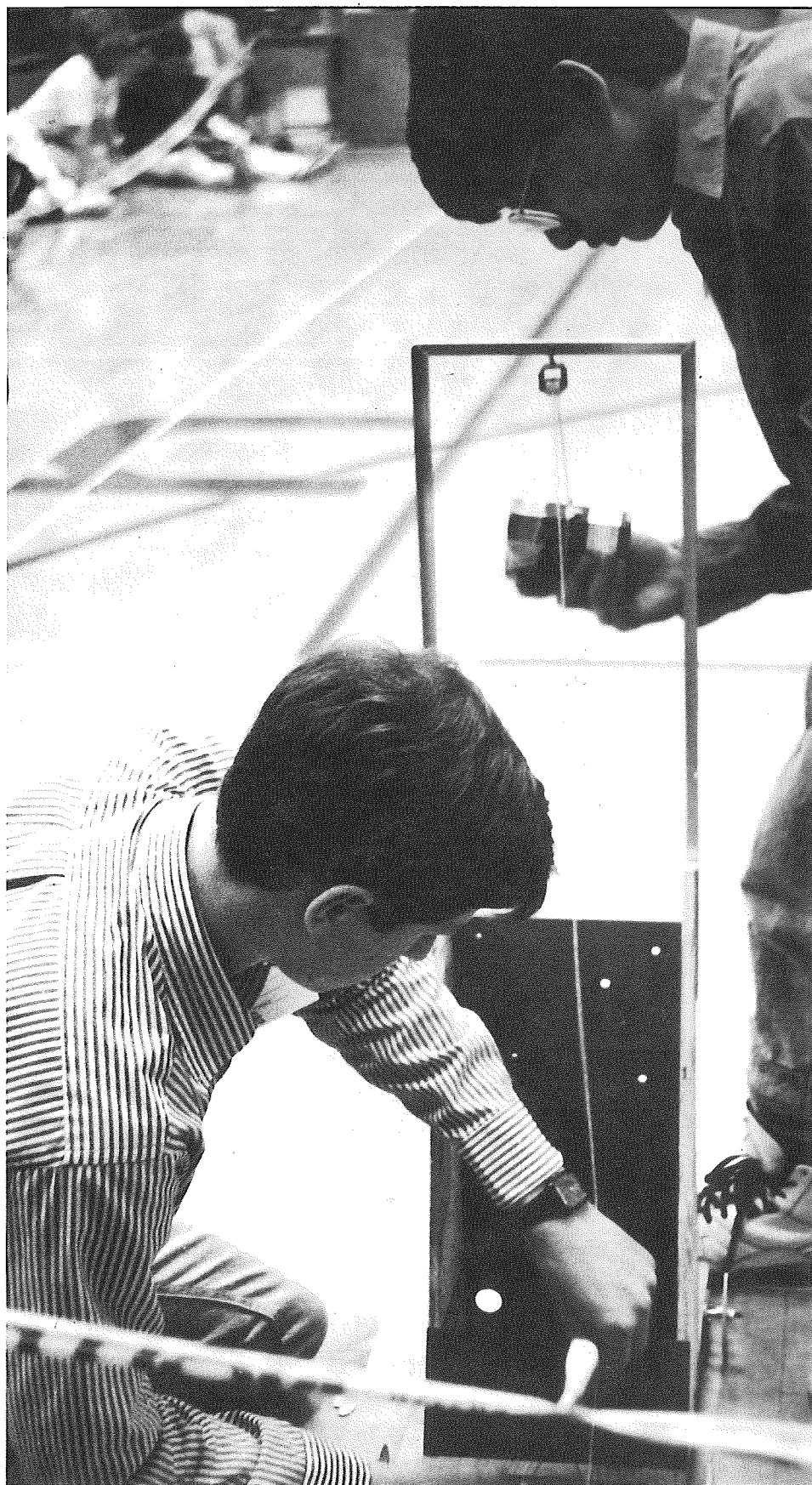
Other changes that are a mix of changes in the law and ISBE policy pertain to school recognition.

Part of the school recognition program calls for every building in the State to be visited by teams over the next 4 or 5 years, drawn together by ISBE. There are about 4,500 school buildings in the State, and it is expected that about 1,000 will be visited during the 1992-93 school year. The purpose of the visits is primarily that of looking at curriculum, instruction, and assessment, with school improvement being the motive. The purpose of this *first* visit is NOT related to questions about whether or not schools are accomplishing or failing to accomplish the State and local goals for learning.

Note that modes for student assessment will be one of the foci for study on the occasion of the site visits, and that, as already noted in the excerpts from the monograph for the 1992 science IGAP, schools are encouraged to implement a balanced, multi-dimensional approach to science assessment. This includes performance assessment, particularly since the 1985 Education Reform Act gives both knowing and *doing* as goals for science.

Following the initial visits by ISBE to all buildings; subsequent visits will be largely to buildings identified as in need of marked improvement in curriculum, instruction and student learning. It is expected that the IGAP test will be key as one of the indicators that improvement is needed. Importantly, the IGAP will be only a preliminary indicator. The site visit is equally important. It will be at that time that the nature of the curriculum, instruction and student learning can be accurately seen and evaluated. Certainly one of the elements for examination at the time of a site visit will be the multi-dimensional modes for student assessment, with the presumption that such assessment will be an integral and continuous part of local curriculum and instruction, and that curriculum and instruction will address both the State and the local goals for learning.

Still referring to modes of assessment as indicators of student learning, schools can tailor local assessment to their local needs, but with the provision that such assessment is done for at least two grade levels across grades K through 8, and for at least one grade level across grades 9-12. The buildings can choose the particular grade levels for such assessment.

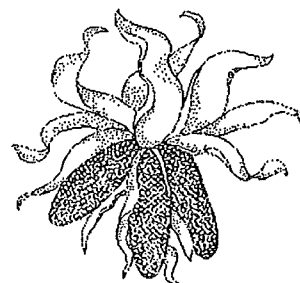


The final bit of news pertains to "definitions and standards" for school science. The ISBE School Recognition Program calls for the developing of such definitions and standards for each of the fundamental areas of learning. Mathematics, reading and writing have their standards and definitions in place. The establishment of definitions and standards for science is on the ISBE agenda for the fall and winter of the 1992-93 school year. Certainly teachers from across the State will be recruited to participate in this most important activity.

The task, with respect to definitions, includes a more clear explication of each of the four Goals for science than is presently found in the 1986 ISBE monograph titled *State Goals for Learning and Sample Learning Objectives, Biological and Physical Sciences*.

Regarding "standards," the task will be that of establishing criteria that will serve as an initial screen for determining whether or not a school fails to accomplish the outcomes for learning in science, accomplishes the outcomes, or markedly exceeds the expected outcomes. It seems likely that IGAP results will play a part in the identification of the "cutting points" which distinguish between "does not meet," "meets," and "exceeds." That these cutting points be established clearly and rationally is obviously of great importance because a building's IGAP "scores" will likely be factors for determining whether or not a building should be targeted for a "close look" by ISBE as called for in the School Recognition Program.

Look for further information regarding progress on the "standards and definitions" matter in future issues of the *Spectrum*.



"The Scrambler," Illinois Science Olympiad, Normal, April 4, 1992. Photo by Marlene Gregor.


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ON BEING INCLUSIVE

Science literacy is what Project 2061 is about. But what is science literacy about?

The Project 2061 answer to that question is spelled out in *Science For All Americans* (SFAA). Perhaps its most striking feature is that the SFAA portrayal of science literacy embraces natural *and* social science *and* mathematics *and* technology, *and* their interdependence, *and* their connections to other human concerns *and* interests, *and* contemporary *and* historical perspectives. Furthermore, SFAA casts science literacy in terms of understandings *and* ways of thinking *and* acting that serve both personal *and* social purposes *and* are justified on both utilitarian *and* philosophical grounds.

But if "less is more," as Project 2061 keeps claiming, why propose such an inclusive definition of science literacy? Why not settle for a definition of science literacy that simply calls for everyone to master the basics in biology, chemistry, physics, and earth science?

Let me suggest some reasons why not.

Reason 1. It is misleading. The "true story" of science is simply not captured in the bodies of systematic knowledge known as biology, chemistry, etc. Science as adventure, as invention, as productive thinking, as question-asking and problem-solving, as culture, as intellectual provocateur, as a Kaleidoscope of purposeful human activity is what gets bypassed when "science" is restricted to the content of a few major disciplines and mathematics and technology are excluded.

While science, mathematics, and technology differ from one another in important respects, they are increasingly interdependent. Indeed, much of the advancement of science occurs where the disciplines intrude on each other, shamelessly borrowing concepts and techniques; so too, much of the power of the scientific enterprise results from the combination of mathematics, technology, and science. Miss that story and you miss science.

Reason 2. It lacks fire power. Surely any science from anthropology to zoology is well worth studying for its own sake, as are any of

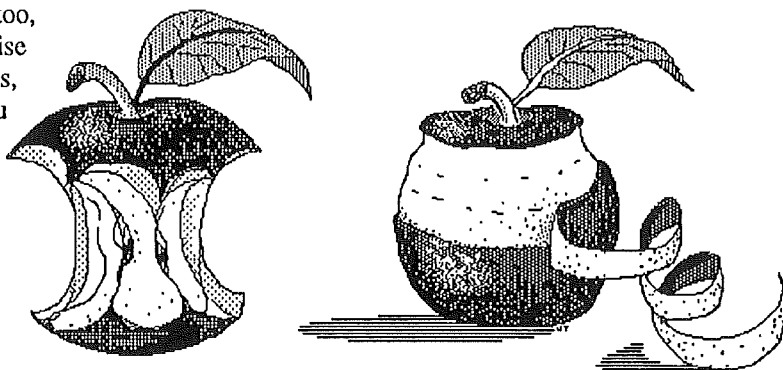
the arts or humanities. But knowledge of the science disciplines is simply not sufficient for everyday life in a democratic, technology-based society. Dealing effectively with issues of human concern—population, environment, health, energy, ethics, recreation, family and community relationships, and the like—depends more on having citizens who are generally science savvy than on having those whose knowledge is limited to one or more of the science disciplines. Citizens need to be familiar with how the enterprise of science works, what its strengths and limitations are, where it seems to be taking us, and where our points of control are.

For instance, engineering, with its emphasis on finding workable solutions for messy problems in the real world—and its concepts, such as "tradeoff," "feedback," and "cost-benefit," and its practical use of mathematics—may be more valuable for most of us than what typifies pure science and mathematics.

Reason 3. It is counterproductive. Describing science literacy in terms of its school disciplines—biology, chemistry, physics, and a pinch of geology and astronomy—has consequences quite the reverse of what we have in mind. Generations of students have left school feeling defeated by science because they were overwhelmed by the experience. And the situation worsens as the disciplines grow.

Wouldn't the outlook be even less encouraging by adding mathematics and technology to the mix? I think not.

Paradoxically, a definition of science literacy that is more sweeping than the conventional one brings relief to the problem of content selection. Not having to choose between "covering" the disciplines, curriculum designers can call on whatever content from the sciences, mathematics, and technology triad will best help students acquire scientific perspectives on the world, develop useful insights on how science works, and sharpen their thinking skills. Once students find that what is expected of them in the name of science is reasonable, is connected to the real world, and is personally useful, they might just decide to try some more.



Gwen Pollock
Glenwood H.S.
RR#1
Chatham, IL 62629



NOT JUST A CHEMISTRY LESSON

This is meant as just a touch of the flavor I was able to taste on my recent trip to Moscow. As I write there are so many fascinating bits of memories that come to mind....

First of all, I was one in a group of about 25 American teachers (the only one from Illinois) and ACS bigwigs who went to Moscow in November of 1991. We were chosen to share one of the newest ideas in teaching chemistry, Chemistry in the Community (CHEMCOM) and the use of microchemistry techniques. This philosophy of teaching the science seems to allow for real life to be explained...not just a series of memorized equations and formulas...it examines the real risks and advantages of having a nuclear power plant, landfill, industry or even a farm near you or your home. It is the chemistry that we should be able to understand when reading a newspaper article, advertisement or political promise.

There were 105 teachers from all over the former Soviet Union as it was crumbling; Latvia, Lithuania, Ukraine, Siberia. They were meeting Americans and each other for the first time. For some of the teachers the cost of the conference was equal to two month's salary. Generally, the monthly salaries of the teachers were about 500 rubles. At the rate of the day, that was equal to about \$15 per month. The teachers were wonderful—so kind and gracious—wanting to learn probably as much about our own personal lives as our chemistry. I began to realize that geography was about the only difference in our lives. And, of course, what a difference it made.

I would like to share a few of my memories with you now (and continue during a session at the ISTA convention). One was that our interpreters, young college chemistry majors, were very, very intelligent. And not just about the chemistry, but about their history, their heritage, the political climate that was enveloping their personal worlds. I'm not sure that any of us could even begin to compare our patriotism and cultural heritage to their expressed feelings. These feelings are shared with the young children—they still present programs to the war veterans each year—praising the war efforts, remembering the sacrifices that were made.

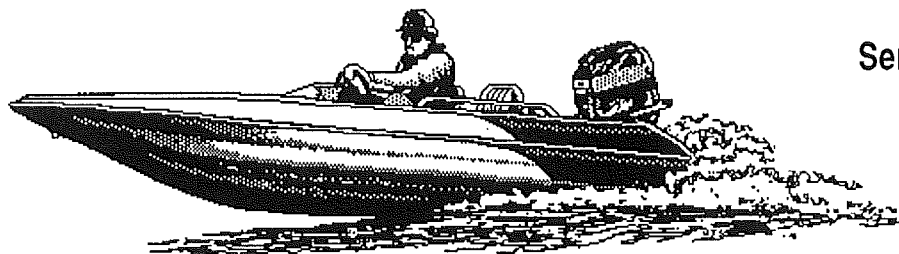
I also saw the food lines—just as we see on the news. On the other hand, I saw stores that had beautiful merchandise for quite reasonable prices, on the dollar exchange. I saw people wearing decent coats and boots. I heard of some families with four stocked refrigerators in anticipation of shortages. I ate in the home of two families hoping to emigrate to Israel, or the United States. One teacher told me that her dream was to eat a piece of American apple pie and drink a cup of black coffee.

I saw people who could enjoy themselves so thoroughly—singing their folk songs and dancing together with real joy. I was jealous that it seems that we don't play as well as they do. We have things to play with—TV, Walkman...They have each other and enjoy the pleasure of one another's company.

I have received Christmas cards and letters from my new friends in Russia. They wanted to know more about my life—as I want to know more about theirs. (I do have addresses of students and teachers, if the project sounds appealing.)

I enjoyed my visit there immensely. I was able to visit a home, to eat dinner with the family, to tour the Kremlin at night and to be stopped by the KGB, to shop on the Arbot and to buy a scarf with the money hidden in my glove for the transaction. I bought a blouse for about 35 cents and a leather wallet for about 16 cents in a state department store.

I saw a snowman built in front of an old Victorian-style house. It looked just like the snowman that my sons would create—just a matter of geography.



Send Address Changes to:
George Zahrobksy
Membership Chair
Glenbard West H. S.
670 Crescent Blvd.
Glen Ellyn, IL 60137

Hasta la Vista, Baby!

Don't Leave Your Spectrum Behind...

ISTA VICE PRESIDENT TESTIFIES BEFORE HOUSE SUBCOMMITTEE

On October 1-6, 1991 a week-long program was held in Washington, D.C. to recognize the 1991 Elementary Presidential Awardees in Science and Mathematics. During the week the awardees participated in professional seminars and workshops. Four awardees had the opportunity to testify before the House Subcommittee on Science, Space and Technology. Carol Van DeWalle, science awardee from Illinois, Vice President of ISTA, and CESI member, was one of the awardees selected to give testimony.

Here is part of the text of Carol's testimony:

"There are four issues facing science and mathematics educators that I would like to address. A national goal has been established which calls for literacy in mathematics, science and technology for all our nation's youth by the year 2000. In order to reach this goal, we at the elementary level desperately need financial resources. Many of us operate without "real" science equipment for our students. It is not just the big ticket items such as computers for which we lack funds. We do not have the funds for purchasing pipettes, petri dishes, stop watches and meter ticks. We have become master recyclers using baby food jars and vitamin droppers. Our students deserve better. They need the opportunities to become proficient in the use of "real equipment," the tools of science. *All schools, urban, rural, suburban, need to have equal access to these resources.*"

"Equalization of resources is an important issue. How can we justify the purchase of laserdiscs, computing equipment and even \$300.00 for hamster supplies in some classrooms while others have \$50.00-\$75.00 to spend on the purchase of supplies for *all* curricular areas? In the distribution of federal dollars, elementary education—especially science and mathematics—has been overlooked and regarded as unimportant. And yet in reality, it is in the elementary grades that the foundation and enthusiasm for advanced mathematics and science is fostered. Research shows that students who have developed positive attitudes towards mathematics and science in the elementary grades continue to enroll in these classes at the high school and college levels."

"Professionalism: Raising the standards of the profession is important. Recognition such as the Presidential Awards, now in its second year for elementary teachers, is a step in the right direction. Your concern and attention to our views is important! However, as long as salaries are low and teachers are spending their own money for student supplies, it will be difficult to attract the calibre of student needed into the profession. High school students look at our work load and salary, then choose the private sector. Positions in education are not considered prestigious and they are certainly not lucrative."

"Assessment: I believe that a national assessment in science would be devastating for science education. I have been involved in the Illinois Assessment process and am very *concerned* that we are moving toward a national assessment. Tests often drive the curriculum. Districts look at what is on the test and look for a text that covers that material. Filling the bubble testing is likely to drive the curriculum away from hands-on experiential learning. Instead districts will be overly concerned with the memorization of facts. Learning theories which state that young children learn best by 'doing' are likely to be disregarded. I fear that with a national assessment test scores may become more important than students."

"Federal funding: I would urge continued support for NSF. It is essential that money be available for projects which help develop leadership in elementary science and mathematics and for summer programs for teachers who wish to develop their knowledge and skills in teaching science and mathematics. Stipends are needed to help supplement salaries. Teachers should not have to work non-education related jobs after school out of economic necessity."

"NSF has played an important role in my professional growth. I write journal articles, edit books, develop curriculum and conduct inservice workshops. I've learned where to find grant information and how to write grants. I provide leadership in science organizations. NSF Institutes have been instrumental in helping me develop these skills."

"I would like to close with a Chinese Proverb:

I hear and I forget;

I see and I remember;

I do and I understand.

Perhaps the best way you can help us is to visit our classrooms. I encourage you to spend a day in the classrooms of teachers in your state. It is crucial that you come to *know and understand* education from our perspective. We would all welcome you!"



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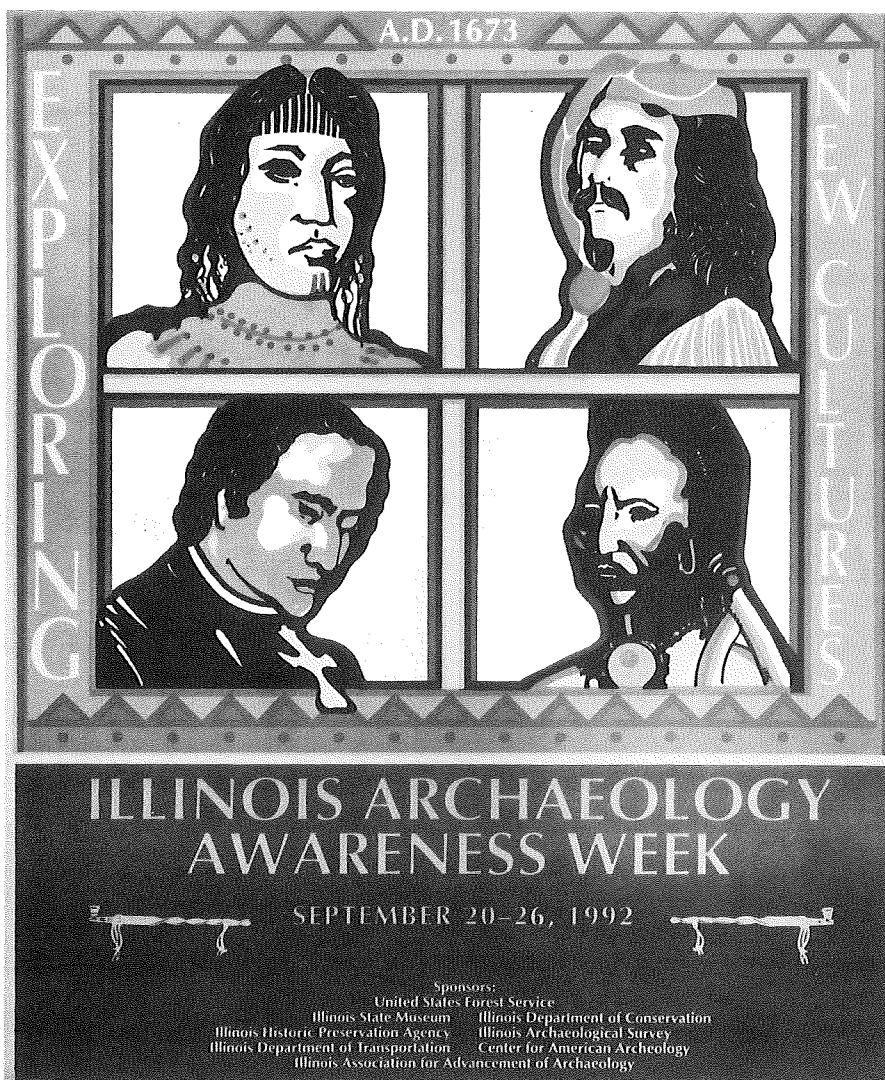
Sharron Santure
Illinois State Museum
Springfield, IL 62706
(217) 782-0061

ILLINOIS ARCHAEOLOGY AWARENESS WEEK: SEPTEMBER 20-26, 1992

The theme of this year's Illinois Archaeology Awareness Week is "Exploring New Cultures, A.D. 1673." The focus will be on the late 1600's and 1700's when French explorers encounter influenced the lives and education of all Americans.

Last year Illinois Archaeology Awareness Week involved approximately 115 organizations statewide. Over 200 educational programs were provided by museums, libraries, parks, and historical societies reached thousands of Illinois residents. Activities included archaeological site tours and excavations, lectures, children and adult workshops, films and videos, library book displays, a Native American pow-wow, craft demonstrations and artifact identifications.

Archaeology Awareness Week provides the student, teacher and family the opportunity to share in an educational adventure with the community in Illinois' archaeological history. Please help make this years' Archaeology Week a success by encouraging the attendance of teachers and students at archaeological programs offered by your local cultural institutions. For additional information and a calendar of events, write or phone above address.



The Chicago Academy of Sciences

2001 North Clark Street
Chicago, IL 60614



Miller, vice president for the Academy's International Center for the Advancement of Scientific Literacy (ICASL), conducts a survey every two years to measure scientific literacy among American adults. In his 1990 survey, he found that only 7 percent of adults are scientifically literate. What does that mean? According to Miller, a person who is scientifically literate should be able to:

- Understand basic terms and concepts such as atom, cell, gene, and gravity.
- Understand how science is conducted and know the difference between real science, such as astronomy, and phony science, such as astrology.
- Understand the impact of science and technology on society.

True or False? (answers below):

1. The oxygen we breathe comes from plants.
2. Lasers work by focusing sound waves.
3. Electrons are smaller than atoms.
4. Antibiotics kill viruses as well as bacteria.
5. The universe began with a huge explosion.
6. In the entire universe, there are thousands of planets like our own on which life could have developed.
7. The continents on which we live have been moving their location for millions of years and will continue to move in the future.
8. Human beings, as we know them today, developed from earlier species of animals.
9. The earliest humans lived at the same time as the dinosaurs.

Answers to Quiz. (followed by percentage of American adults who answered correctly in 1990 survey); 1. True (85%) 2. False (37%) 3. True (41%) 4. False (30%) 5. True (32%) 6. True (56%) 7. True (77%) 8. True (45%) 9. False (47%).

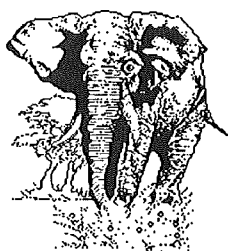
*It is said that we conserve only the things we
love;*

*We love only the things we
understand;*

*And, we only understand the
things we are taught.*

Baba Dioum

Senegalese Conservationist



TEACHER RECYCLING WORKSHOP GENERATES IDEAS FOR SAVING

As a result of a teacher workshop at McHenry County Schools and a brainstorming session led by Dave Zeiger, Lundahl Junior High Science teacher, the following suggestions were generated as to reducing waste in your classroom.

- Use paper on both sides before recycling.
- Resuse tests. Have students put answers on separate sheet.
- When doing cooperative groups, have only one recorder.
- Photocopy on both sides of the paper.
- Use an overhead for assignments, quizzes, etc.
- Have a "No Paper Day" or "One Page Day."
- Encourage teachers to reduce their use of paper by:

Counting the number of reams of used last year and try to reduce that number by a specific percentage.

Limiting the number of reams a teacher can use.

- When having locker clean-up, save the extra notebooks, pencils, etc. and use for students.

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David Powell
Jill Humphrey
Illinois JETS
207 Engineering Hall
1308 W. Green St.
Urbana, IL 61801
(800) 843-5410



ILLINOIS JETS

1992 was a banner year for the Illinois JETS TEAMS program! We set records for the number of students participating (6,092) and for the number of schools attending (414). The overall growth rate for students and schools was 5%. Looking at the competition by division of competition, we saw the following changes:

Division Schools Students

Div. I	+13%	+15.7%
Div. II	-18%	-3%
Div. III	+12%	+3%

Why the growth? We decided in the Fall of 1991 that we would advertise TEAMS to every high school in the state through a onetime mailing. It looks like it worked.

State winners in Illinois TEAMS were:

Division I - over 700 enrollment

- 1st place Adlai Stevenson
- 2nd place New Trier
- 3rd place Hinsdale Central
- 4th place O'Fallon

Division II - 300-700 enrollment

- 1st place Johnston City
- 2nd place Red Bud
- 3rd place Benton Consolidated
- 4th place Lemont

Division III - under 300 enrollment

- 1st place Oblong
- 2nd place Hancock Central
- 3rd place Keith Country
- 4th place Bismarck-Henning

Not only did our schools do well in Illinois competition, several of our schools excelled in the National TEAMS competition as well. The five schools in Illinois who were tops in their division at the state level, competed in the national level competition with the following national results:

- Lake Forest High School - Bill Conway - 3rd place
- Lake Forest Academy - Bill Wallace - 10th place
- Brimfield High School - Teri Brandt - Tied for 9th place
- Johnston City High School - Pete Moake - 9th place
- Niles North High School - Jackie Naughton - 3rd place

Another growth area for JETS is our Summer Program offerings. We have conducted the JETS and MITE 2 week summer programs for over 25 years. These identical programs are designed to provide information engineering related career information to high school students about to enter senior year. MITE (Minority Introduction to Engineering) is oriented to minority students interested in engineering careers.

Finally, JETS offers a series of Engineering Design Contests at colleges around the state. In Chicago, we host contests at Wright City College in November and at Chicago State University in the Spring. In October, Olivet Nazarene University, and Eastern Illinois University host competitions. Richland Community College offers the competition in the Spring. We are planning to bring the Engineering Design Contest to Illinois Central College in the Fall of 1992.

The Engineering Design contest is created as a tool for science teachers who wish to demonstrate some physical aspect of classroom theory. JETS offers design contests for toothpick bridges, balloon rockets, mouse-trap powered vehicles, paper towers, tennis ball launchers, etc. We will also use projects submitted by teachers.

These are just a few of the things that JETS offers to high school teachers as tools for maintaining interest in math and science as well as providing rewards for individuals and teams. If you're interested, please call or write us at the above address.



ESCONI FALL ROCK AUCTION AND FLEA MARKET

The Earth Science Club of Northern Illinois (ESCONI) will be holding a rock auction and flea market (fossils, Minerals, etc.) on Saturday, October 10, from 10:00 a.m. to 4:00 p.m. at the College of DuPage, Lambert Road and 22nd Street student Resource Center Room 1024A-B. Quality material will be sold at live and silent auction. Also, bulk material, fossils, minerals, crystals, mostly at ten cents each, used magazines, books will be sold. For additional information, call Don Auler (708)832-0479

Futures in Science and Technology

A Summer Program for High School Students

July 4-30, 1993

on the campus of the University of Illinois
at Urbana

When it comes to career choices, there are some difficult questions to be answered:

Teacher: HOW CAN I ENCOURAGE MY BEST MATH AND SCIENCE STUDENTS?

Student: WHAT MAJOR SHOULD I CHOOSE IN COLLEGE?

Parent: HOW CAN I HELP MY SON OR DAUGHTER REALIZE THEIR POTENTIAL?

Futures in Science and Technology is a program sponsored by the College of Engineering and the Department of Materials Science and Engineering. We think that it can suggest some answers by providing:

- . **A residential experience** - four weeks at one of the top three engineering campuses in the country
- . **Course selections** - ranging in scope from research to computer design with a strong emphasis on laboratory experiences
- . **Planning for College** - in depth sessions that cover academic, career and financial considerations
- . **Intramural sports and social activities** - designed to complement the classroom and laboratory sessions
- . **Field trips** - to national research laboratories and industrial centers

Students choose 4 special, college-level courses from a list of offerings created to provide an overview of major topics in science and technology. All students will take an interdisciplinary course in Materials for Engineering, which bridges the gap between the pure science approach of high school and the applied science reality of the professional world.

For more information contact:

David Powell
University Of Illinois
207 Engineering Hall
1308 W. Green St.
Urbana, IL 61801

(800) 843-5410

1992 ISTA Convention Information

Pheasant Run Resort St. Charles, Illinois October 2-3, 1992

Teachers, principals, supervisors, and others concerned with science education throughout the State are invited to attend the annual conference of the Illinois Science Teachers Association at Pheasant Run Resort in St. Charles, Illinois. The convention begins Thursday with a special leadership pre-conference on assessment. Convention sessions begin at 8:00 AM on Friday, October 2 and end on Saturday, October 3 at 2:30 PM. The exhibits will close at noon on Saturday.

Hundreds of exciting workshops, demonstrations and other sessions to motivate and educate are planned. The exhibit area, full of scientific teaching materials—from bones and books to the best in technology, will enable those concerned with science education to obtain the latest information on new science teaching equipment, textbooks, audiovisual aids, laboratory apparatus, computer programs, supplementary materials, and other services and facilities to help make teaching and learning more effective.

The role of science education in the future dominates the conference whose theme is **The Challenges of Change**. You will not want to miss keynote presentations by Robert Hazen (Friday), and Perry Reaves and Janie Wilson (Saturday). On the social side, throughout the convention, you will find numerous opportunities to discuss science teaching with other professionals from around the State. We hope you make new friends and share your ideas. We certainly hope that you'll take the fire of enthusiasm. Great times and great opportunities—you'll be sure to find them at the 1992 ISTA Convention! Home with you to share with your colleagues and students. Great times and great opportunities—you'll be sure to find them at the 1992 ISTA Convention!

Meeting Location

Convention registration, sessions and exhibits will be at Pheasant Run Resort, St. Charles, Illinois. St. Charles is located on Route 64 approximately 45 miles west of Chicago. Pheasant Run Resort is 3 miles east of St. Charles. See the map on page 6 of the Advance Program for travel instructions and a map of the facility.

Advance Registration and Fees

Registration is required for participation in all activities of the ISTA convention. The lapel badge issued to each registrant is the "ticket of admission" to all sessions, exhibits, and other activities except those for which a separate fee is stated.

An Advance Registration Form, including requests for field trips and paid workshops appears on page 9 of this insert. The deadline for Advance Registration is **September 24, 1992**. Any Advance Reg-

istration Forms received after that date cannot be processed; it will then be necessary to register on-site. Mail all registrations to:

Shelly Peretz
1992 ISTA Convention
7826 W. Arquilla Drive
Palos Heights IL 60463-2505

Registration Confirmation

If you register by the September 24 deadline, an advance registration confirmation card will be mailed to you. This card will list your registration category and any special events (field trips and paid workshops) for which an additional fee has been paid. This confirmation card will serve as your receipt. Please bring it with you to the Advance Registration counters at Pheasant Run where you can pick up your registration materials.

Registration Hours

Convention materials may be picked up at the Registration Area at Pheasant Run during the following hours:

Fri., Oct. 2	7 AM - 4 PM
Sat., Oct. 3	7 AM - 11 AM

Hotel Reservations

Approximately 450 hotel rooms are available at the Pheasant Run Resort. Reservations may be made by calling Pheasant Run at (708) 584-6300. In order to receive the special convention rate for rooms, you must state that you are attending the ISTA convention. The special room rates are

Standard Accommodations \$75 (single or double occupancy)

Tower Accommodations \$85 (single or double occupancy)

Transportation to Pheasant Run

Car: Pheasant Run is conveniently reached by automobile. Please refer to the map printed in this Advance Program to plan your best connecting road.

Parking: Free parking is available at Pheasant Run. Conventioneers will find ample parking in the lot near the MegaCenter.

Train: Commuters can take Metra from Chicago and the suburbs to the train station in Geneva. From there travel by cab to Pheasant Run. For more information about Metra call the Travel Information Center in Chicago at 1-800-972-7000.

Air: Pheasant Run is just 40 minutes from O'Hare International Airport. Van service is available to and from O'Hare for \$20 per person one way. Van service, which should be arranged 3 or more days in advance, can be ordered by calling Pheasant Run Resort (708) 584-6300. Ask for the Transportation Office.



Pheasant Run
RESORT • CONVENTION CENTER

4051 E. Main Street, St. Charles, Illinois 60174

Meals

Lunch: The Pheasant Run complex includes restaurants, lunch counters, and snack bars. Numerous fast food restaurants are within a few minutes of the Resort.

Dinner: A list of local restaurants featuring a variety of foods and prices will be available. Meals also will be available at resort restaurants.

Special Social Events

After the closing of the last session on Friday afternoon, join your colleagues to honor award recipients. Enjoy refreshments while you share experiences with other participants during this special event.

On Saturday morning, meet and talk to ISTA officers and regional directors while sharing complimentary coffee and rolls.

Exposition of Science Teaching Materials

The Exposition of Science Teaching Materials is an outstanding and integral feature of ISTA conventions. Its displays enable teachers, supervisors, and others concerned with science education to obtain the latest information on new science teaching equipment, textbooks, audiovisual aids, laboratory furniture, technology, supplementary materials, and other services and facilities available to make teaching and learning more effective. A comprehensive list of exhibitors will appear in the Final Convention Program. For your convenience, the Exposition, located in the St. Charles Ballroom, will be open for viewing during the following hours:

Fri., Oct. 2	8 AM - 5 PM
Sat., Oct. 3	8 AM - 12 PM

Hospitality

Enjoy complimentary coffee and rolls available each morning in the exhibit area. At the hospitality center, you'll find information on convention activities, local shopping, restaurants, sight-seeing, and entertainment in the St. Charles area.

Persons with Disabilities

ISTA wishes to make the convention accessible to all persons. If you need special services, check the appropriate box on the Advance Registration Form and explain the services you require.

Hometown Publicity Releases

Registrants are urged to help with publicity about science teaching by sending publicity releases to newspapers serving their home areas. News releases available for this purpose will be available at the convention.

Field Trips and Paid

Workshops

A variety of field trips and paid workshops are scheduled during the convention. Buses for field trips will depart from the main entrance. To register, please complete the "Field Trip" and "Paid Workshop" requests on the Advance Registration Form or sign up at the convention in the registration area. Field trips and paid workshops are filled on a first-come, first-served basis. Tickets purchased on the Advance Registration Form will be included in the materials packet that you pick up at the Registration Area.

Convention Committee

Douglas L. Dirks, Conference Chair
West 40 ESC #5
1st Avenue & Ridgewood
Riverside IL 60546
(708) 447-6070

Raymond J. Dagenais, Program Chair
Illinois Mathematics and Science Academy
1500 West Sullivan Road
Aurora IL 60506
(708) 801-6990

Gerry Zeller, Program
Math/Technology Consultant
West 40 ESC #5
1st Avenue & Ridgewood
Riverside IL 60546

John Kent, Exhibits Coordinator
Chicago Board of Education
Chicago IL
(708) 354-3289

Shelly Peretz, Registration & Publications
Thornridge High School
15000 S. Cottage Grove
Dolton IL 60419-2799
(708) 841-5180 x2585

Fred Tarnow, Pre-Conference Chair
North Cook ESC
2701 Central Road
Glenview IL 60025

Barbara Sandall, Pre-Conference
Academy for Math and Science Teachers
10 W. 35th Street
Chicago IL 60616

Robbin Rietveld, Pre-Conference
South Cook ESC #7
800 Governors Highway, Box 69
Flossmoor IL 60422

Gerald W. Foster, Pre-Conference
DePaul University
School of Education
2323 Seminary Avenue
Chicago IL 60614

Gretchen Alexander, Field Trips
West 40 ESC #5
1st Avenue & Ridgewood
Riverside IL 60546

Dottie Krett, Convention Secretary
Illinois Math and Science Academy
1500 West Sullivan Road
Aurora IL 60506

Keynote Sessions

The Challenges of Scientific Literacy

Friday, October 2
General Session 1
12:30 - 1:15 PM

Robert Hazen, co-author of *Science Matters: Achieving Scientific Literacy*, is a research scientist at the Carnegie Institution of Washington's Geophysical Laboratory and Robinson Professor of Earth Science at George Mason University. Hazen, a professional musician, teaches courses on interdisciplinary studies; his current interests focus on the unity of the sciences. He is currently working with WNET on a video series that explains his ideas. Dr. Hazen will speak on scientific literacy—what it means, why our educational system doesn't provide it, and how we can change things.

The Challenges of Laserdisc Technology

Saturday, October 3
General Session 2
10:30 - 11:30 AM

Perry Reeves and **Janie Wilson** are national presenters from Pioneer Communications, Long Beach, California. Reeves, Director of Educational Marketing Support, has been in the educational technology field for over 15 years. He is recognized as the founder of educational technology using laserdisc technology. Reeves and Wilson will demonstrate the most recent and exciting laserdisc applications for use in the science classroom. Their presentation will highlight ways that laser barcoding can be used to integrate laserdiscs with science instruction.

Featured Sessions



Professor Gizmo - Science, Humor and Discrepant Events

Friday, October 2
2:30 - 4:15 PM

Gary Krueger has taught science at Wilson Junior High School in Appleton Wisconsin for twenty-four years. In 1985 Gary received the Wisconsin D.P.I. Award of Excellence for District Middle School Teacher of the Year and in 1987 received the Appleton Area School District Mielke Award for Secondary Educator of the Year. "Professor Gizmo" will illustrate how to actively involve students in demonstrations to pique the student's natural curiosity to solve seemingly discrepant events. No expensive equipment is used as all activities, projects and demos incorporate common everyday items to illustrate scientific principles.

Update on the IGAP Science Tests

Friday, October 2
9:30 - 10:15 AM

Saturday, October 3
9:30 - 10:15 AM

Richard Walker, consultant for the Student Assessment Section of the Illinois State Board of Education, will present the results of the 1992 IGAP science tests. Discussion about changes in the program and the meaningful use of results will be encouraged. Dr. Walker's presentation at last year's Illinois Council of Teachers of Mathematics Annual Conference drew standing room only crowds. Come to hear the latest information on where our students stand in science education.

Communications: Building Rapport

Saturday, October 3
11:45 AM - 1:30 PM

Wavelength is an improvisational acting troupe from Chicago. Conceived in 1979 by a former high school teacher, Wavelength's goal is to provide a humorous perspective to issues and challenges in education. The group has been featured on CBS and ABC-TV and in numerous articles throughout the country. Wavelength will work with participants using specific techniques to improve communication skills with students, parents and other educators. This presentation includes improvisational exercises that build verbal and non-verbal skills, a demonstration of how good improvisation equals good communication and participants role-playing 5-6 key positions.

Chem Tech/Physics Tech - An Integration Strategy for Science Education

Saturday, October 3
8:30 - 9:15 AM

Science for All Americans - Project 2061 Update

Saturday, October 3
9:30 - 10:15 AM

Robert Gauger is the Technology Department Head at Oak Park River Forest High School and a member of The National Council on Science and Technology Education Project 2061, an initiative of the AAAS. Bob will discuss how technology can be integrated into science programs. He will also give a status report on Science for All Americans - Project 2061.

SCIENCE LEADERSHIP PRE-CONFERENCE ON ASSESSMENT

Thursday, October 1, 1992

Pheasant Run Resort, St. Charles, IL

Are you responsible for science in your district, building, or department? Are you looking for ways to assess your science program and its effects on students? Do you need to know what changes are occurring with IGAP and how these changes may affect you and your students? Are you wondering about the statewide results of the 1992 IGAP and how 1993 will be different? Would you like the opportunity to meet and talk to other leaders in science from across the State? If the answer to any or all of these questions is "yes," then this is the event to put on your priority list. **Attendance is limited to 200. The cost of the Pre-Conference, including lunch is \$45.00.** To register, check the box on the enclosed Advanced Registration form.

PRE-CONFERENCE SCHEDULE

8:00 - 9:00	Registration
9:00 - 10:20	General Session: <i>IGAP: From There to Here and Where Are We for 1993?</i> Thomas Kerins/Richard Walker
10:20 - 10:45	Break
10:45 - 12:00	Breakout Sessions Methods of Evaluating Process Teaching, Developing Alternate Assessments for Science in Illinois Schools, Primary H.O.T.S., Alternate Assessment in Biology, Developing Quality Science Performance Assessments, Developing Hands-on Science Tasks for the National Assessment of Educational Process.
12:00 - 12:45	Lunch
12:45 - 2:00	Breakout Sessions What Are the Differences Between Portfolios, Laboratory Notebooks and Student Folders?, A District-wide, Interdisciplinary Performance Assessment System, Elementary H.O.T.S., Why Not Include Student Attitude Questions in Your Local Assessment?, Assessment and Systemic Change at the State and Local Levels, Science Achievement in Illinois: Initial IGAP Data and What It Means to You
2:15 - 3:30	Breakout Sessions Performance Assessment: A Limited Trial at 4th and 5th Grade Levels, A District-Wide, Interdisciplinary Performance Assessment System, Middle Grades/Junior High School Assessment, Performance Skills Assessment in the Science Laboratory, Methods of Evaluating Process Teaching, Performance Assessment: An International Experiment in Science and Mathematics

PARTIAL LIST OF PRESENTERS

Marcelline Baron • Educational Testing Service • Jenny Grogg • Mary Kelly • Tom Kerins • Michael Palmisano • Carol Perlman • Larry Small • Richard Walker • David Winnett

St. Charles and Surrounding Area

Pheasant Run Resort is a vacation spot for people from all over the Midwest. The resort boasts an 18-hole golf course, indoor and outdoor tennis courts, racquetball, swimming pools, health spa, three restaurants, a deli, a dinner theatre, and a comedy club. Major entertainment acts are booked throughout the year, although October bookings are not available at press time. For decades, Pheasant Run has been known as a place to relax and unwind.

The area around Pheasant Run Resort—the communities of St. Charles and Geneva—supports the resort mentality. The communities hold a variety of festivals throughout the year that attract people from the Chicago area. Interesting and unusual shops are located in Geneva—St. Charles is known for its many antique shops. Both communities are located on the Fox River and an extensive network of bicycle paths winds along the banks of the river and extends into adjoining communities. Fox River Valley Mall as well as four major shopping malls are located within 45 minutes driving time of St. Charles. A new mall in St. Charles is within walking distance of Pheasant Run.

Finally, St. Charles is the home of the Kane County Flea Market—an extravaganza held the first weekend of each month. The flea market, held at the Kane County fairground, attracts people from Illinois and surrounding states. Crafts, collectibles, Victorian antiques, and junk are displayed for purchase. Saturday afternoon or Sunday following the convention will be a great time to look for those treasures to decorate your home or extend your collection.

A Final Note

The ISTA convention programs are getting larger and richer in variety each year, and this year is no exception. We are excited about the 1992 edition. No doubt you find more sessions of interest on the program than you will be able to attend. Occasionally, you will arrive at a popular session too late to get a chair. So plan your schedule carefully in order to enjoy the experience to the maximum and get the most out of this year's convention.

Please note that this program is subject to change. Final programs will be available to all registrants at the convention.

1992 ISTA Convention

Presentations

"Toying" Around With Elastic Energy
Gerald W. Foster, Carole P. Mitchener, DePaul University, Chicago

A - Z Science

Sharon Hagge, North Elementary School, Crystal Lake
Darlene McIntyre, Sleepy Hollow School Dist.#300, Sleepy Hollow

A Dual Approach To Data Analysis

Michael Sloan, Charles Hamberg, Illinois Mathematics and Science Academy, Aurora

A History Of Evolution - The One Constant

Harlan Wentzel, Maryville School, Maryville

A Kaleidoscope Of "LIGHT" And Colorful Ideas

Ruth Wills, Marybeth Saigh, McCarty Elementary School - Indian Prairie #204, Aurora

A Look At Chem Com: Should I Be Teaching This?

Frank Cardulla, Niles North High School, Skokie.

A Safety Primer For Science Teachers

Raymond A. Davidson, Illinois State University, Normal

A World Of Science

Ann Rubino, Custer Park School, Wilmington

Accelerating Science!

David Abler, Kristin Ciesemier, Robin Dombeck, Susan Dahl, Fermi National Accelerator Laboratory, Batavia

Active Elementary Science

Barbara Q. Weil, College of DuPage, Glen Ellyn

Adventures With The Genecon

Jan Waarvik, Steven Isoye, Warren Township High School, Gurnee

Air is Amazing

Harriet Kmet, St. Walter School, Roselle

Alternate Assessment Methods

Linda Bailey, Illinois Council of Teachers of Mathematics, Schaumburg

Alternative Assessment: It Can Be Alive And Well In Your Classroom!

Kevin D. Finson, John B. Beaver, Western Illinois University, Macomb

An Early Look At The TIMS K-6 Curriculum

Marty Gartzman, UIC, Chicago
Joan Bieler, Institute for Mathematics and Science Education, Chicago

An Indispensable Teacher Tool: The Electronic Gradebook

Steve Sample, Sandburg Junior High, Elmhurst

An Introduction To AIMS

Elizabeth Hammerman, AIMS Education Foundation, Monroe Center

Animal Kingdom: New Resources At The Field Museum

John A. Wagner, Field Museum of Natural History, Chicago

Are You In Control? (Answers Will Vary)

MaryBeth Frankel, Cassie Brooks, Nancy Abbott, Joyce Stemp, Discovery Center School, Wheeling

Art Of Inquiry In Science

R. Thomas Dewing, Ranch View School, Naperville

Arts + Science = Excitement

Pam Smith, Susan Rees, Walnut Community Consolidated Grade S.D.#285, Walnut

Atoms And Particles (For Intermediate Grades)

Robin Dombeck, Fermi National Accelerator Laboratory, Batavia

Beginning Batteries And Bulbs

P. Diane Chambers, Brook Forest School, Oak Brook

Beyond Process Science: A Pilot Inservice Project

Carole P. Mitchener, Gerald W. Foster, DePaul University, Chicago
Larry Small, Carmein Blasucci, Sandy Dumich, Schaumburg S.D.#54, Schaumburg

Biotechnology And Telecommunications: A Pilot Project For Sixth Grade

Carol Van DeWalle, Alwood Elementary, Alpha
Peggy Ma, Edison Junior High, Macomb

Biotechnology/Genetic Engineering

George Kieffer, University of Illinois, Urbana

Bridging The Gap Between Lecture And Lab - Use Of Gowin's Vee

Laine Gurley-Dilger, Rolling Meadows High School #214, Rolling Meadows

Bringing Clinical Laboratory Science To Your Classroom

Janice M. Kinsinger, Illinois Medical Technology Association, Morton

Career Vision: A Satellite TV Link To Science Careers For Junior High Students

Kevin D. Finson, John B. Beaver, Western Illinois University, Macomb

CEPUP Chemical Education For Public Understanding Program

Gary J. Morrissey, Fort Dearborn Elementary, Chicago
Harry Hasegawa, Lawndale Community Academy, Chicago
Fred H. Pannell, Burbank Comprehensive Gifted, Chicago

Chem Tech/Physics Tech - An Integration Strategy For Science Education

Robert Gauger, American Assoc. for Advancement of Science, Washington, DC.

Classroom Alternatives To Evaluating Students

Patricia Kritzman, Katie Kaufman, South Junior High, Arlington Heights

Classroom Animals: Earthworms

Gerry D. Haukoos, *Illinois State University, Normal*

Climatize And Enviromentize Your Classroom

R. Craig Kelley, Bob Hoffman, *Aledo High School, Aledo*

Communications: Building Rapport Wavelength**Concrete Via The Senses - Primary Grade Science Kit**

Billie G. Snell, *Aunt Jane's Early Childhood, Edwardsville*

Jill E. Mitchell, *Southern Illinois University - Edwardsville*

Connecting Experiences With Curriculum: A Powerful Model For Student Learning

Deb Chapman, Linda Ramey-Gassert, *Chicago Botanical Garden, Glencoe*

Connections: Libraries And The Science Student

Deborah Mason, *Chicago Public Library, Chicago*

Constructing A Topographic Map Landform Model

Robert Kozurek, *Morton West High School, Berwyn*

Constructions With Straws

John Davison, *Oak Park-River Forest High School, Oak Park*

Cooperative Chemistry

Steven Isoye, Linda Mruz, *Warren Township High School, Gurnee*

Coral Reefs: Kingdoms Of The Sea

Judith McKee, Pamela S. McNish, *Wilmette Public Schools, Wilmette*

Creating Thematic Interdisciplinary Units For A District's Science Curriculum

Roseann Feldmann, *Northern Illinois University, DeKalb*

Jody Clark, Andrea Isom, Linda Friedrich, Gayle Dirksen, Jan Freund, Judy Spellacy, Cindy Plumbroeck, Julie Seicke, Eileen Palsgrove, Betty Trummel, *Crystal Lake Community Consolidated S.D.#47, Crystal Lake*

Creative Nutrition/Health Activities For Your Classroom

Kathleen A. Mead, Susan DuPraw, *Dairy Council of Wisconsin, Inc., Westmont*

Crime Lab Science

Maurice Kellogg, *Western Illinois University, Macomb*

Cultivating Kids' Curiosity: The C.O.R.E. Plant Science Model

Jim Vear, *Chicago Botanical Garden, Glencoe*

Cut It To The Core!

Jan Haake, *Educational Service Center #9, Ottawa*

Amy Hamilton, *LaSalle County Soil & Water Conservation District, Ottawa*

Dinos And Dino-Notes

Peter H. Laraba, *Field Museum of Natural History, Chicago*

Do You See What I See?

Richard Hedke, *Dist. #54 Gifted Program, Schaumburg*

Earth Explorers

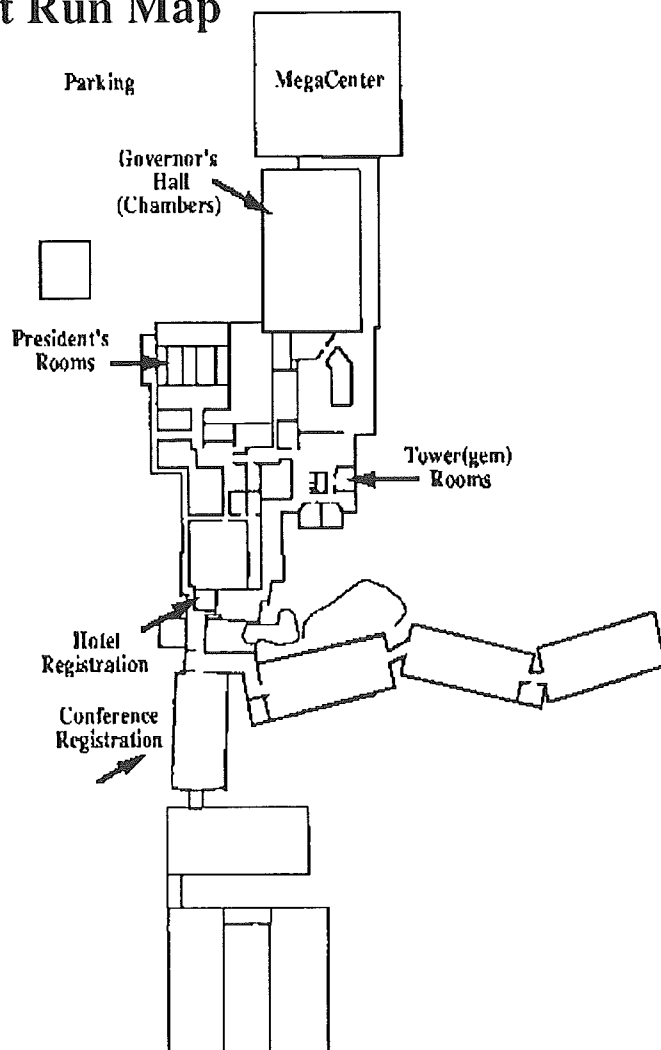
Meg M. Peterson, *Chicago Academy of Sciences, Chicago*

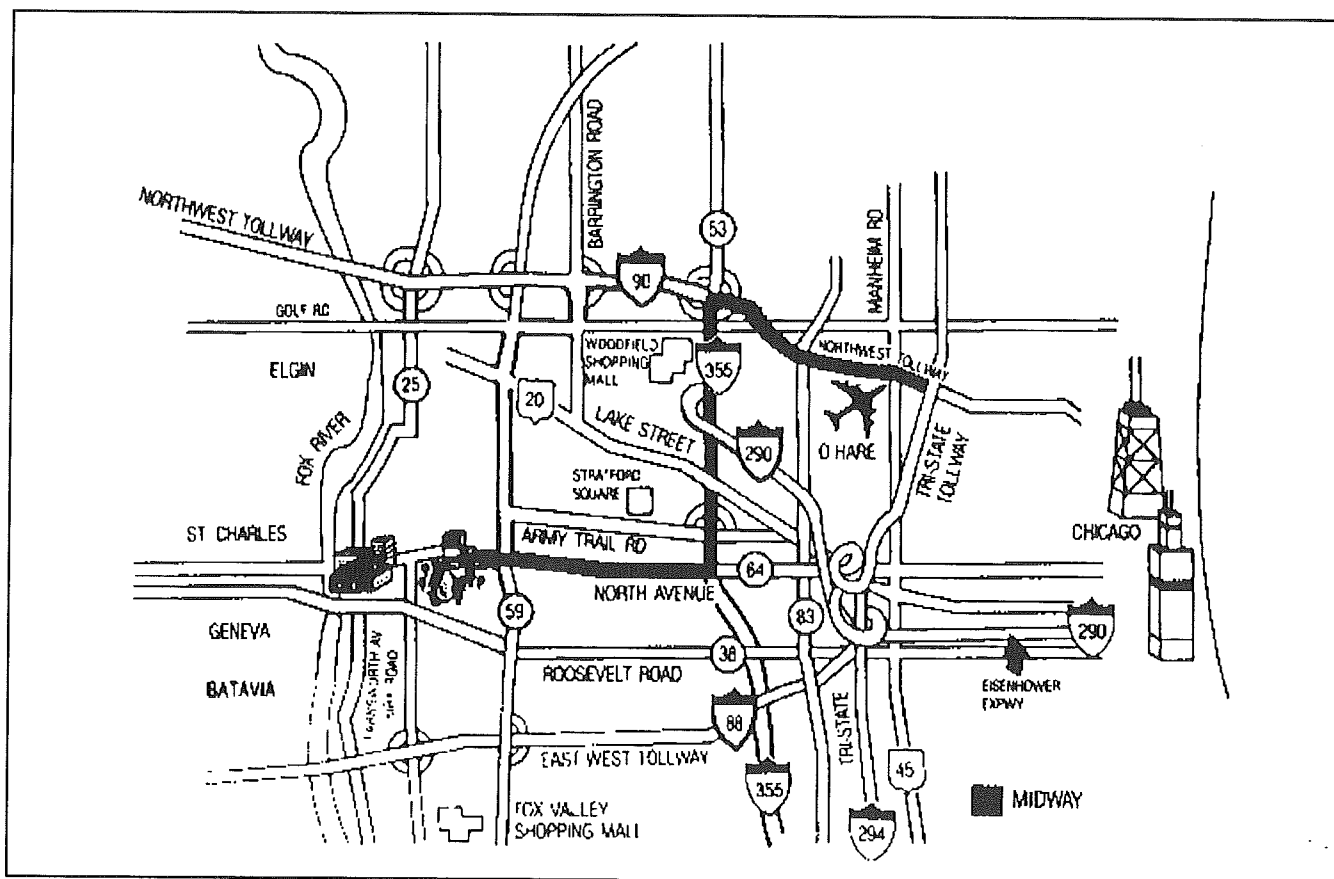
Earth Matters: Hands-On Population And Environmental Activities

Yvonne Johnson, *Sycamore C.U.S.D.-West, Sycamore*

Earthquake Locations And Plate Boundaries

Peter H. Laraba, *Field Museum of Natural History, Chicago*

Pheasant Run Map



PHEASANT RUN RESORT is just 40 minutes from O'Hare International Airport. Take the Northwest Tollway to Route 355. Continue south on Route 355 to North Avenue (Route 64). Go west on North Avenue approximately 12 miles (3 miles west of Route 59 on North Avenue, Route 64).

Easy Activities To Make Meteorology Fun

Steven Galligan, Wilmette Junior High School, Wilmette

Enhancing Classroom Demonstrations And Laboratory Activities Using Computer Interfacing

Steve Sample, Sandburg Junior High, Elmhurst

Ethanol - Moonshining With A Bang!

Brian Poelker, Midwest Central Junior High, Manito

Doug Kuban, Pecatonica Grade School, Pecatonica

Everyday Sky Projects

Vivian Hoette, Hufford Junior High School, Joliet

Exploring Science Process Skills Through Children's Literature

Beth Wiegmann, Northern Illinois University

Field Biology In High School - An Everglades Experience

Bobby Hattaway, Illinois Math & Science Academy, Aurora

Food Chemistry

Branson Lawrence, Phyllis Kraemer, West Aurora High School, Aurora

Food for Chemistry

Jane A. Russell, Leyden High School, Franklin Park

Dalia Zygas, West Leyden High School, Northlake

Food For Thought!

Clare A. Kaelin, Immaculate Heart of Mary High School, Westchester

Forensic Laboratory Science And Detective Mystery Writing

Gary E Schiltz, Glenbard West High School, Glen Ellyn

Foss - Full Option Science System

Michael Dellefield, Encyclopedia Britannica Educational Corporation, Chicago

Free Educational Materials For Teaching Science

Elizabeth Jill Wamble

Funniest Physics Videos

Judie Elenbaas, Naperville North High School, Naperville

GEMS (Great Explorations In Math & Science) Workshop Integrated Hands-On Math & Science

Kevin D. Finson, Don Powers, Don Nelson, John B. Beaver, Western Illinois University, Macomb

General Science Activities And Experiments That Motivate An Work

Joseph John Urbelis, Minooka High School, Minooka

Germies Goo and You Can Too!

Judith Longfield, National Diffusion Network, Bolingbrook

Hands On Workshop In Acid-Base Chemistry

Ann Levinson, Niles West High School, Skokie

Hands-On Science For The Elementary School

Richard Moyer, University of Michigan/ School of Education, Dearborn, MI.

Have You Hugged A Herp Today?

Susan Haddick, Glencoe School, Glencoe

ISTA General Membership Meeting

Saturday, October 3
General Session 3, 1:45 PM

This session of the Convention affords the members of the Illinois Science Teachers Association to express their ideas, concerns, and suggestions to the Board, regarding the future directions of the Association. **ALL MEMBERS** (including those who have just joined at this Convention) should plan to attend. Be sure to turn in your Convention Evaluations to qualify for the drawing of prizes donated by the Exhibitors.



Benefits and Activities for ISTA Members

SPECTRUM—*Spectrum* is the quarterly ISTA newsletter. Articles, teaching techniques, exciting ideas and information regarding upcoming meetings, conferences and educational opportunities are featured in each issue.

THE ISTA CONVENTION—For over twenty years this annual conference has brought together educators and administrators throughout the state. Major speakers, group sessions, hands-on workshops, micro-computer labs, and extensive commercial exhibits are a few highlights of this outstanding program of renewal for science teachers.

LEGISLATIVE REPRESENTATION FOR SCIENCE EDUCATION—This function provides a direct line of communication science educators to state officials. It voices concerns and recommends programs and funding for science education.

ISTA HIGH SCHOOL AWARDS—This honor is awarded annually to high school students who excel in science. Awards are available to all public and non-public high schools.

SEARCH FOR EXCELLENCE—ISTA participates in the NSTA Program designed to identify and recognize exemplary science education programs at all levels.

Enjoy a Wonderful Dinner

And the Pleasure of the Company of
Some of the Finest Educators in the State

Join us for the ISTA Awards Dinner

Fermi Lab

October 2, 1992

7:00 p.m.

Bus shuttle service may be available from Pheasant Run (about 20 minutes away). Cost is \$20 per person. Awards to Presidential Awards of Excellence Nominees and the ISTA Awards of Excellence, and Distinguished Service Awards will be presented. Invited guests include winners and guests, state legislators and the governor—not as speaking engagements—but as a listening engagement—to hear about the great things our teachers are doing for our youth. Spouses/guests welcome!

Tear off the bottom of this page, enclose check and send to:

Gwen Pollock
401 S. Cass
Virginia, IL 62691
Deadline: September 15

Name _____

Number of Tickets _____

Total amount _____

Oh Deer! An STS Ecology Unit

James Shellard, Glenbrook South High School, Glenview

Particle Theory For Little Kids

Paul H. Zingg, School District 108, Highland Park

Planet Earth: Can Other Planets Tell us Where We're Going?

Gerald Adams, Abour Cherif, Columbia College Chicago/Science/Math Depart, Chicago

Plashes & Phun - Physical Science Demonstrations

Jan Waarvik, Steven Isoye, Warren Township High School, Gurnee

Plastic, Insects, Soil And Embryology: Hands-On

Jim Guilinger, Facilitating Coordination in Agricultural Education, Rantoul

Prairie Gardening On Your Schoolgrounds

Lynn Hyndman, Dawes Elementary, Evanston

Presidential Awards Of Excellence - Our Winners And How To Win

Gwen Pollock, Glenwood High School, Chatham

Primary Science Olympiad Fun Day

Sandy Spivey, Dianne Andrews, Alwood Elementary School, Alpha

Processing Science

Fredric Tarnow, North Cook ESC, Glenview

Professional Development Activities In Science, Mathematics And Technology Education

Raymond Dagenais, Ann Hanson, Illinois Mathematics and Science Academy, Aurora

Professor Gizmo-Science, Humor And Discrepant Events

Gary Krueger, Wilson Junior High School, Appleton, WI.

Project Inspire, VLF Transmissions, and Spercies (Whistlers)

James Stankevitz, Marist High School, Chicago

Reading The Night Sky

Harvey Hensley, University of Wisconsin, Platteville

Reduce, Reuse, Recycle

Kathy Engelson, Illinois Department of Energy and Natural Resources, Springfield

Rehash The Trash

Joan A. Jeschke, Robert F. Ostrowski, Mary M. Pinski, Herrick Junior High School, Downers Grove

Revitalize Your Biological/Physical Science Curriculum: Hands-On And Applied

Jim Guilinger, Facilitating Coordination in Agricultural Education, Rantoul

Rudy - Toot - Toot

Nanette Cassettari, James Giles Junior High, Norridge

Sand County Almanac Workshop

*Bob Andrini, Mark Pritchard, Addison Trail High School, Addison
Gary Kupkowski, Willowbrook High School, Villa Park*

Schoolyard Laboratory

Shari Morkin, Oakland School, Bloomington

Science Across The Curriculum - An Interdisciplinary Approach To Science Projects

Mary Lou Lipscomb, Gregory Middle School, Naperville

Science Activities - Potpourri, Grade 6th-8th

*Charles Baum, Bond County Unit, Poeshantas
Frank Evans, Pocahontas Center, Pocahontas*

Science And Engineering Kits For Junior High, A Regional Program

Virginia R. Bryan, Southern Illinois University, Edwardsville

Science And The Humanities: Integrating The Science Curriculum

Robert Kapheim, York High School, Elmhurst

Science Beginnings

Ann Scates, Southern Illinois University-Edwardsville, Edwardsville,

Science Can Be A Growing Experience!

Judith Longfield, National Diffusion Network, Bolingbrook

Science For All Americans - Project 2061 Update

Robert Gauger, American Assoc. for Advancement of Science, Washington, DC.

Science Isn't Separate: Hands-On For K-3

Sylvia Gilbert, Duke Ellington Branch, Chicago

Sciencing With SCIS 3 - Overview And Activities

Tom Fitch, Illinois State University, Normal

Sciwrite: The Passion Behind The Person

Gene Kunz, David Ennis

Self-Esteem For The Science Classroom

Judith K. Tammi, Shelley M. Castans, Conant High School, Hoffman Estates

SLATE (Scientific Literacy Activities Teaching Everyone) An I.S.B.E Pilot Program

Dwayne Wallace, Helen Smith, Walnut Community Consolidated Grade S.D.#285, Walnut

Small Group Process And The Learning Cycle, A Hands-On Approach

Thomas Dilley, Southern Illinois University

Snails And Other Critters

Gertrude C. Johnson, Oak Park Board of Ed, Oak Park

So You Want To Be A Paleontologist / Archaeologist?

Tim Brinker, Westfield School, Glenn Ellyn

Some Performance Assessment Ideas For The Elementary Grades

Ray Boehmer, University of Illinois, Champaign

Space Mission Training Academy

Barbara Janes, Barbara Sims, Central School, Glencoe

Status Of Prairie In The Prairie State

Jack Shouba, Lyons Township High School, Western Springs

Storyboarding: A Cooperative Learning Activity That's A Sure Hit!

Sally Berman, Palatine High School, Palatine

- Hear Ye, Hear Ye, Sound Experiments For The Elementary Classroom**
Don Powers, Western Illinois University, Macomb
- Hot & Cold: Exploring The Concept Of Heat In The Primary Grades**
Don Nelson, Western Illinois University, Macomb
- How Can We Get Them To Do Hands-on**
William Myers, Discovery Center School, Wheeling
- How Heavy Is It?**
Barbara Janes, Central School, Glencoe
- How To Create An Outdoor Study Area At Your School**
Vivian Hoette, Hufford Junior High School, Joliet
- How To Maximize The Learning Productivity Of Role-Playing In Classroom Teaching**
About Cherif, Columbia College Chicago/Science/Math Depart, Chicago
- IABT presents...**
Sherry Yarema, Naperville Central High School, Naperville
- ICIS: Developing Theories And Experimenting In Middle/High School Science**
Maria Varelas, University of Illinois-Chicago, Student
- Igniting, Exciting, and Inviting Student Thinking**
Robert S. Darnell, Buffalo Grove High School, Buffalo Grove
- Illinois Groundwater Program: Activities And Action Possibilities**
Marylin Lisowski, Eastern Illinois University, Charleston
- Impact Of Science Education In Service Programs: Do They Work?**
Hae-Ae Seo, Gerry D. Haukoos, Illinois State University, Normal
- In's And Out's Of Presenting A Science Fair**
Annette Schmit, Jane Brown, Summit Hill Junior High, Frankfort
- Inclusion - A Conceptual Reality**
Laura Browder, Stan Cisler, Roxana High School District 1, Roxana
- Infusing Technology Into An Elementary Science Education Methods Course**
Thomas Thompson, Beth Wiegmann, Northern Illinois University, Student
- INQUIRY: A Rewarding Approach For Conceptual Change**
About Cherif, Columbia College Chicago/Science/Math Depart, Chicago
- Integrating Academic Science With Applied, Hands-On Science**
Jim Gullinger, Facilitating Coordination in Agricultural Education, Rantoul
- Integrating Math, Science, And Technology using Solar Energy Activities**
Marli Camp, LaVerna Jackson, Barbara Marks, Chippewa School, Bensenville
- Introducing "Hands On" Science Activities In An Early Childhood Environment**
Adele Lessmeister, Cheron Lessmeister, Elmhurst College, Elmhurst
- Investigate The Amazing World Of Telecommunications**
Louis Harnisch, Tom Butler, Argonne National Laboratory, Argonne
- Kaleidoscoping**
Gerald W. Foster, DePaul University, Chicago
- Kids For Conservation - Children And Our Natural Resources**
Kathleen M. Andrews, Phil Wilson, IL Department of Conservation - Kids for Conserv., Springfield
- Learning How To Learn: Concept Mapping - Get Students To Take Responsibility For Their Own Learning**
Laine Gurley-Dilger, Rolling Meadows High School #214, Rolling Meadows
- Leopold Education Project**
Bob Andrini, Mark Pritchard, Addison Trail High School, Addison
Gary Kupkowski, Willowbrook High School, Villa Park
- Love A Leech**
Gail L. Truho, Rolling Acres Middle School, Peoria
- Magnetic Levitated Transportation**
Mary M. Cunningham, Argo Community High School, Summit
Thomas Buller, Argonne National Laboratory, Argonne
Shirley Krause, Morrow High School, Chicago
Mark Hess, St. Paul's Lutheran, Chicago
- Make Paper...Save A Tree!**
Jeannine Perez, Metcalf Lab School, Normal
- Making Environmental Connections**
G. Dennis Campbell, Earth Information Center, Springfield
- Making Technology Transparent**
John Davison, Oak Park-River Forest High School, Oak Park
- Making The Connection - An Integrated Scientific Literacy Model**
Shirley Splittstoesser, Wiley Elementary School, Urbana
Barbara Gillespie
- Methods In Chemical Research—For Gifted High School Students**
Charles E. Cannon, Illinois Mathematics and Science Academy, Aurora
- Model Rocketry Workshop**
David Lippold, Haines Junior High School, St. Charles
- Molecular Kinetic Theory...Or Squeeze Me And I Get Hot!!!**
Ed Guzdzioł, Worth Junior High, Worth
Ann Marie Min, North Junior High, Crystal Lake
- Mt. St. Helen Update**
Harlan Wentzel, Maryville School, Maryville
- Naturally - Native Americans**
Carol Young, Chicago Teacher's Center - N.I.U., Western Springs
- New Computer Interface And Dynamics System From Pasco Scientific**
Charles Witsch, Pasco Scientific Corp., Roseville, CA.

ILLINOIS ASSOCIATION OF SCIENCE/MATH MATERIALS CENTER

Pre-Conference

Sponsored by:

Jane Hetherington, St. Charles District 303
Mary Kelly, Hinsdale School District 181
Mike Schneider, ESC 16 Belleville
Marilyn Sinclair, Champaign Public Schools
Larry Small, School District 54, Schaumburg
Bob Williams, SIU, Edwardsville
Dave Winnett, SIU, Edwardsville

The 1992 annual meeting of IASMC is scheduled for the afternoon of October 1 from 3:30 p.m. to 6:00 p.m. This year's gathering will begin at the Pheasant Run Resort with a brief business meeting and a light refreshment hour. The remaining time will be devoted to a review of the St. Charles District 303 elementary science program and a special tour of District 303's science center. A materials center is defined as a district based facility specializing in the development and maintenance of hands-on curriculum packages that are distributed to classroom teachers.

All school administrators, supervisors, teachers, and science warehouse clerks are invited to participate. To register send a check for \$5.00 along with the following registration form.

Detach and return to:

**MAKE CHECKS PAYABLE TO: Larry Small
Schaumburg School District 54**

School District 54
524 Eash Schaumburg Road
Schaumburg IL 60194

NAME _____ TITLE _____ PHONE _____

ADDRESS _____

SCHOOL _____

Straw Strategies

*Barbara Detwiler, Gurrie Junior High, LaGrange
Helen DeWitt, Kennedy Upper Grade, Kankakee*

Stretching Classroom Interest In Science And Math With Inquiry Activities

Evan McFee, Tom Hayes, Bowling Green State University, Bowling Green, OH.

Taking Phenomenological Episodes Apart And Then Into Pictures And Words

Fred R. Wilkin, Evanston

Teachers As Leaders: A Working Model For Presenting Hands-On Activities

Zelda Tetenbaum, Argonne National Laboratory, Argonne

Teaching Integrated Math And Science (TIMS) Through Demonstration And Participation

*John F. Miller, James Shields Elementary School, Chicago
Vernon Thompson, Shields Elementary School, Chicago*

Teaching Science In A MIDE Classroom

Jim Frazier, James B. Conant High School

Teaching Science From A Tub!

*Marilyn Sinclair, Franklin Science Center, Champaign
Debora White, Ralph Leffler, Carrie Busey Elementary School, Champaign
Katie Hercik, Unit #4 Schools - Kenwood School, Champaign*

Teaching Statistics With AIMS Activities

Judy Ball, School District U-46, Elgin

The District 15 K-8 Science Curriculum Development Project

Bill Conrad, Community Consolidated School, Palatine

The Feeder School Science Competition As A Public Relations Tool

Vincent Zerante

The Great Lakes Study: An STS Interdisciplinary Curriculum

*Jane Freisema, Bill Munroe, Mary Brady, Avoca School District #37, Wilmette
David Goodspeed, Marie Murphy School, Wilmette*

The Importance Of Science And Mathematics To Art And Communication Students: Students' Perspective

Abour Cherif, Stefanos Gialamas, Columbia College Chicago/Science/Math Depart, Chicago

EDUCATIONAL TOURS

The ISTA Convention Committee has scheduled an outstanding selection of tours for this 1992 Convention. **All tours are on Friday, October 2, 1992.** Choose from indoor and outdoor activities described below. Space is limited; purchase your tour tickets early. Tours are filled on a first-come, first-served basis. Tickets will be sold well in advance of departure time at the Registration Area. If you registered by mail, you can pick them up with your materials packet at the Registration Area. You should meet your tour leader 15 minutes before departure time at the bus departure area.

Morton Arboretum

T-1 8:30 AM - 12:30 PM Cost: \$12

Visit the world renowned Morton Arboretum in Lisle. Explore a variety of habitats that feature trees and woody shrubs from around the world. You will tour the arboretum's educational facilities, chat with volunteers, and take a hike among exotic tree species. Dress for the weather; be sure to wear comfortable shoes.

Crabtree Nature Center

T-2 8:30 AM - 12:30 PM Cost: \$12

Take a morning bird walk in the Crabtree Nature Center, one of the teaching centers for the Cook County Forest Preserve District. Crabtree has one of the largest reconstructed prairies in the state. Its lake is a stopping point in the fall migration of sandhill cranes, Canada geese, and many other water fowl. Tour the nature center building and talk with the Rangers. Dress for the weather; be sure to wear comfortable shoes.

Hager Pottery

T-3 8:30 AM - 12:30 PM Cost: \$20

Tour this remarkable factory where artisans and high technology produce some of America's finest pottery. Follow the process from raw clay through to finished piece. Watch award-winning potters demonstrate their skills at the wheel, with slip molds, and in the delicate process of applying glazes. You will have time to browse in the factory shop. A box lunch will be served on the bus.

Motorola Museum

T-4 1:30 PM - 5:30 PM Cost: \$12

Motorola's corporate headquarters is the setting for the new Motorola Museum of Technology. This contemporary, hands-on museum traces the development of electronic technology and its impact on business, industry, and personal lives. Learn about Motorola's quest for excellence and corporate commitment to the "Six Sigma" goal. Tour the state-of-the-art Galvin Center for adult learning and learn how continuous learning is a key factor in Motorola's success.

Fermi National Accelerator Laboratory

T-5 1:30 PM - 5:30 PM Cost: \$20

Visit the world-famous Fermi National Laboratory in Batavia. Tour some of the laboratories and learn about past and current projects. You will have an opportunity to learn about education programs Fermi offers for teachers, school-aged children, and

the general public. You may even glimpse buffalo at home on the restored prairie in the center of the accelerator. A box lunch will be served on the bus.

Waubensee Valley High School Planetarium

T-6 1:30 PM - 5:30 PM Cost: \$12

During your visit to this planetarium in a nearby high school you will view a planetarium show, explore the range of courses that can be offered with such a facility, and learn about the logistics and cost of establishing a school planetarium.

PAID WORKSHOPS

The ISTA Convention Committee has arranged 3 paid workshops, including the Science Leadership Pre-Conference on Assessment, for you to choose from. A fee is required to attend each of these workshops to cover the cost of materials.

Since space is limited, and popular workshops fill quickly, we urge you to sign up early. Workshop tickets will be sold for W-2 and W-3—well in advance of the workshop—at the Registra-

Science Leadership Pre-Conference on Assessment

W-1 Thursday, 8:00 AM - 3:30 PM Cost: \$45

Are you responsible for science in your district, building, or department? Are you looking for ways to assess your science program and its effects on students? Do you need to know what changes are occurring with IGAP and how these changes may affect you and your students? Are you wondering about the statewide results of the 1992 IGAP and how 1993 will be different? Would you like the opportunity to meet and talk to other leaders in science from across the State? If the answer to any or all of these questions is "yes," then this is the event to put on your priority list. Includes lunch.

Informational Science Study: Science Toy Safari

W-2 Saturday, 8:00 AM - 11:30 AM Cost: \$12

Verne Kelly, National Diffusion Network, Algonquin
Informational Science Study materials are modular, supplementary materials which vary in difficulty. Both simple and complex activities are promoted so that materials can be used with a wide range of students. This workshop will focus on common toys used to introduce motion concepts in grade 5-9 classrooms.

Fishbanks, Ltd.

W-3 Saturday, 8:00 AM - 11:30 AM Cost: \$5

Judith Longfield, National Diffusion Network, Bolingbrook

Form your own fishing company and expand your fleet during this fun-filled, informative workshop. Fishbanks, a role-playing simulation, can be used to show cause-effect results of biological, political and economic factors on renewable resources. To conduct the game session, you need effectively trained teacher(s), a game kit and one PC computer. This session will allow participants to play the game. Information on purchasing the game kit will be available at the workshop.

ILLINOIS SCIENCE TEACHERS ASSOCIATION

1992 CONVENTION REGISTRATION

The Challenges of Change

Pheasant Run Resort, St. Charles, Illinois

October 2-3, 1992

PLEASE FILL OUT FORM COMPLETELY (Each participant should use a separate form.)

Name _____ Spouse's Name (if attending) _____

Home Address _____ Home Phone (____) ____ - ____

City/State/Zip _____

Affiliation (school, college or organization) _____

Business address _____ Business Phone (____) ____ - ____

City/State/Zip _____

_____ CHECK HERE IF YOU NEED SPECIAL ASSISTANCE DUE TO HANDICAP

To become an ISTA member for the 1992-93 School Year:

_____ ISTA Membership Dues (through 9/93) \$20.00 _____

To register for the convention, CHOOSE ONE:

_____ Member Registration (dues paid through 9/93) \$20.00 _____

_____ Member Registration, One Day Only: (Circle One) Friday Saturday \$15.00 _____

_____ Non-Member Registration \$40.00 _____

_____ Non-Member Registration, One Day Only: (Circle One) Friday Saturday \$30.00 _____

_____ Full Time Student (Includes Membership) \$10.00 _____

_____ Non-Teaching Spouse \$8.00 _____

PRE-CONFERENCE

_____ Science Leadership Pre-Conference on Assessment \$45.00 _____

PAID WORKSHOPS - Fee Covers Cost Of Materials

Workshop #	Workshop Title	Fee
_____	_____	_____

EDUCATIONAL TOURS - Fee Includes Transportation

Tour #	Tour Name	Fee
_____	_____	_____
_____	_____	_____

TOTAL \$ _____

PRE-REGISTRATION DEADLINE: Advanced registration must be received no later than **September 24, 1992** to ensure processing before the convention.

Make checks payable to: **ISTA 1992 Convention**. Send registration form and check to:

Shelly Peretz
7826 W. Arquilla Drive
Palos Heights IL 60463-2505

BY ACTION OF THE ISTA BOARD OF DIRECTORS, REGISTRATION IS REQUIRED FOR PARTICIPATION IN ALL ACTIVITIES OF THE CONVENTION. THE BADGE ISSUED TO EACH REGISTRANT IS THE TICKET OF ADMISSION TO ALL SESSIONS, EXHIBITS, AND ALL OTHER ACTIVITIES.

ISTA REGIONAL DIRECTORS

REGION I

Maureen Jamrock
Coolidge Jr. High School
155th and 7th Avenue
Phoenix, IL 60426
(708) 339-5300

Barbara R. Sandall
Teachers Academy for
Math and Science
10W 35th Street
Chicago, IL 60616
(312) 808-0100

REGION II

Karen Meyer
Thomas Jefferson School
1307 West 4th Street
Milan, IL 61264
(309) 793-5985

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



REGION III

Gail Trujo
Rolling Acres M.S.
5617 N. Merrimac
Peoria, IL 61614
(309) 693-4422

John B. Beaver
Western Illinois University
47 Horrabin Hall
Macomb, IL 61455
(309) 298-2065

REGION IV

Marilyn Sinclair
Franklin M.S.
817 N. Harris
Champaign, IL 61820
(217) 351-3709

Gary Butler
Sangamon State University
Biology Program
Springfield, IL 62794
(217) 786-6630

REGION V

Rion Turley
O'Fallon Twsp. H.S.
600 Smiley Street
O'Fallon, IL
(618) 632-3507

Paulette Burns
Pontiac Jr. H.S.
400 Ashland Dr.
Fairview Heights, IL 62208
(618) 233-6004

REGION VI

Wes Heyduck
Fairfield H.S.
300 W. King
Fairfield, IL 62837
(618) 842-2649

Max A. Reed
Hutsonville H.S.
West Clover St.
Hutsonville, IL 62433
(618) 563-4913

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

Safety: Proper care should be taken when using the hot glue gun. Step A can be done by the teacher prior to class. Caution should be taken when inserting the dowel rods into the tubing as to avoid splinters.

Extensions: Elementary/Remedial: You can use one or two beams instead of four beams. The math can be eliminated. The students could then generalize that the heavier object must be closer to the suspending string.

Whole Language/Cooperative Education: This activity is extremely effective in combining science with math and art. Other areas such as language arts and social studies can also be incorporated. This year I asked teachers to judge the mobiles for artistic qualities. The top three from each class received ribbons and were displayed in the school art fair.

Senior High/Gifted: Advanced applications to the project include original student designs and calculation of the significance of the length of the outside extension of the dowel rod.



DIAGRAM B

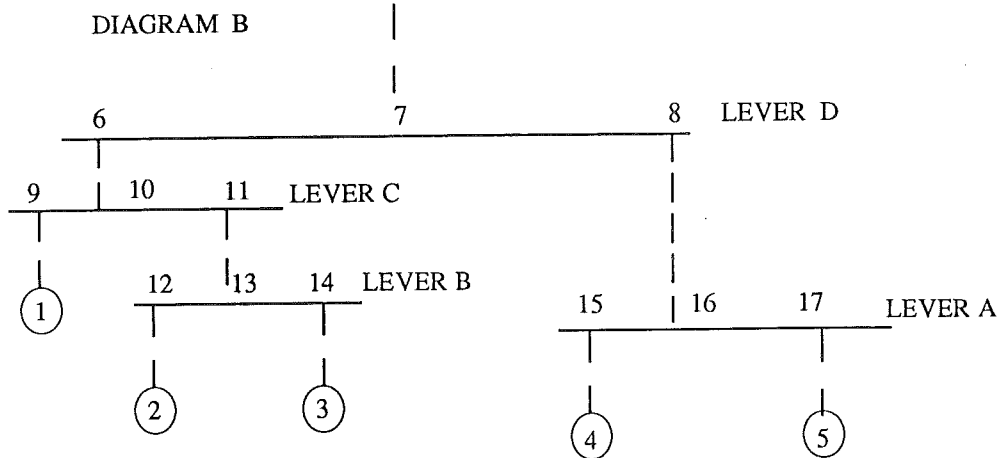


CHART A
Description Weight

Lever A	15 cm. dowel	
Lever B	15 cm. dowel	
Lever C	20 cm. dowel	
Lever D	40 cm. dowel	
Object 1		
Object 2		
Object 3		
Object 4		
Object 5		

Dashed line ---: string
Solid line —: dowel rod
Circles : objects

Chart C

	Length of Effort Arm	Effort Force (Weight)	Product (length x weight)	Length of Resistance Arm	Resistance Force (Weight)	Product (length x weight)
Lever D	Point 6 to Point 7	$b+c+1+2+3$		Point 7 to Point 8	$A+4+5$	
Lever C	Point 9 to 10	Object 1		Point 10 to 11	$B+2+3$	
Lever B	Point 12 to 13	Object 2		Point 13 to 14	Object 3	
Lever A	Point 15 to 16	Object 4		Point 16 to 17	Object 5	

AWARDS AND RECOGNITION

Mrs. Gwen Pollock
c/o Glenwood High School
RR #1
Chatham, IL 62629 (217-483-2424)
401 S. Cass
Virginia, IL 62691
(217-452-3209)

1992 PRESIDENTIAL AWARDS FOR EXCELLENCE IN SECONDARY SCIENCE TEACHING

The Presidential Awards for Excellence in Science and Mathematics Teaching is a program which seeks to recognize and award outstanding public and private teachers of elementary, junior/middle school and secondary science and mathematics. It is administered for the White House by NSF. Professional organizations cooperating in the program are the NSTA, NCTM, AAPT, ACE, AGI, CSSS, FASEB, MAA, NABT, NAGT and NESTA. The program is also supported by the National Academy of Sciences.

The award, which is made to four teachers from each state, the District of Columbia, and Puerto Rico, includes a \$7500 NSF grant to the awardees' schools to be spent under the awardees' direction over a two-year period to improve school mathematics and science programs, an all expense-paid trip for the awardees and guests to Washington, D.C., and many generous gifts to the awardees and their schools from donors in the private sector. There were three nominees chosen to represent Illinois from each of the four fields: elementary science, elementary math, secondary science, secondary math.

During January, nomination forms were circulated throughout the state. To be considered for the science award, nominees had to meet the following criteria for secondary science application:

1. Five or more years of teaching science.
2. Teach science at least halftime during the current year assignment at the middle/junior or senior high school level. (Teachers currently on sabbatical were eligible if they fit the criteria last year.)

About 190 secondary and about 160 elementary nominations were received by the Illinois Selection committee chairperson and nominees were mailed application packets. In addition to providing educational and professional background information and letters of recommendation, candidates were asked to write essays on "The Nature and Experience of Teaching," including personal outstanding qualities, personal rewards and personal beliefs about teaching. They were also asked to describe one of their most successful original or adapted units, including evidence of student work, photographs, etc.

About 80 nominees completed and returned the application packets. The selection committees met in late April early May which was composed of science educators with a variety of backgrounds rated the candidates in such areas as background and experience, understanding of how students learn science, evidence of classroom success, current thinking in the field, and letters of support addressing the teacher's effectiveness. The quality of the nomination packets was overwhelming and the selection of awardees was unbelievably difficult and exciting.

Three National Finalists in both Elementary and Secondary were selected to be forwarded to the National Selection Committee. The National Selection Committee will announce the Illinois secondary and elementary winners in mid-September. Seven additional teachers have been selected as ISTA Award of Excellence winners.

Congratulations to these outstanding science teachers and the other fine nominees!



1992 PRESIDENTIAL AWARDS OF EXCELLENCE IN ELEMENTARY SCIENCE EDUCATION

Mary E. (Sue) Kerr, Washington School, 400 S. Charles Street, Belleville, 62220 Kindergarten
Marion Lardner, Earl Hanson Elementary, 4000 9th St., Rock Island, 61201 Kindergarten
Elizabeth Trummel, Husmann School, 131 Paddock, Crystal Lake, 60014 Fourth Grade

ISTA AWARDS OF EXCELLENCE IN ELEMENTARY SCIENCE EDUCATION

Sharon Morkin, Oakland School, 1605 E. Oakland Ave., Bloomington, 61701, Second Grade
Wayne R. Wittenberg, Benjamin Franklin School, 350 Bryant Ave., Glen Ellyn, 60137, Fifth Grade
Carole Ann Smith, Reddick School, Main Street, PO 67, Reddick, 60961, Fourth Grade
Janaan W. Muntean, Ranch View School, 1651 Ranchview Drive, Naperville, 60565, Kindergarten
Sylvia Gilbert, Edward Kennedy Duke Ellington Branch, 241 N. Central, Chicago, 60644, Computer Lab, Science, K-1-2
Louise T. Huffman, Steeple Run School, 6 S 151 Steeple Run Drive, Naperville, 60540, Fourth Grade
Janice Haake, Leland Community Unit School District #1, 370 Main, Leland, 60531, ESC Science Literacy Pilot Master Teacher

1992 PRESIDENTIAL AWARDS OF EXCELLENCE IN SECONDARY SCIENCE TEACHING

Doug Kuban, Pecatonica Grade School, Reed Street,
Pecatonica 61063, Middle School Sciences
Patrick LaMaster, IMSA, 1500 W. Sullivan Road, Aurora,
60506, Physics
James Stankevitz, Marist High School, 4200 W. 115th St.,
Chicago, 60655, Physics

ISTA AWARDS OF EXCELLENCE IN SECONDARY SCIENCE TEACHING

Glenn Lid, Proviso East High School, 807 South First Ave.,
Maywood 60153, Chemistry
Kenneth Spengler, Palatine High School, 1111 N. Rohlwing
Road, Palatine, 60067, Chemistry
Gene Kunz, Roxana Junior High School, 401 Chaffer Ave.,
Roxana, 62084, Middle School Sciences
Michael A. Wietlispach, Hoffman Estates High School,
1100 W. Higgins, Hoffman Estates, 60195, Biology, Phys.
Sc.
Terrence Mondy, Wheeling High School, 900 S. Elmhurst,
Wheeling 60090, Biology, Physical Science
Kathy Costello, St. John the Baptist Catholic School, 519
Hazel, Red Bud, 62278, Science Lead Teacher, 5-8
Sally Berman, Palatine High School, 111 N. Rohlwing
Road, Palatine, 60067, Chemistry

1993 PRESIDENTIAL AWARDS OF EXCELLENCE IN SCIENCE AND MATH TEACHING

NSTA/NSF Timetable

August, 1992—Brochures will be sent, explaining program
and inviting nominations

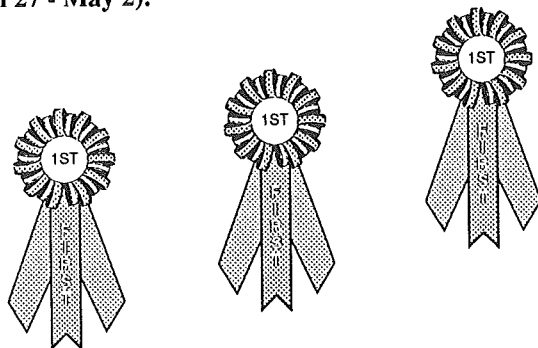
December 1, 1992—Deadline for receiving nominations

February 15, 1993—Deadline for receiving applications

ISTA SELECTION COMMITTEE

April 1, 1993—Deadline for Selection Committee decisions
April 10, 1993—Receipt of Nominees packets in Washing-
ton

The '92 winners will be announced in mid-September, as
usual. The '92 winners will go to Washington in the
Spring of '93. (Secondary—March 8-15 and elementary
April 27 - May 2).



1993 PRESIDENTIAL AWARDS PROGRAM OPEN FOR NOMINATIONS

The National Science Foundation is pleased to announce that the 1993 program to grant **PRESIDENTIAL AWARDS FOR EXCELLENCE IN SCIENCE AND MATHEMATICS TEACHING** to elementary, middle/junior high, and high school teachers will accept nomination beginning immediately through December 1, 1992. (As of this printing, the new categories of college and specifically middle school have not been clarified. As new information is received, it will be disseminated among the membership of ISTA as soon as possible).

Nominations are being sought for elementary and secondary teachers who spend half time or more in the classroom. The Presidential Awards criteria are designed to give equal opportunity to both specialists and self-contained classroom teachers.

State committees sponsored by ISTA will select three elementary and three secondary science teachers by April, 1993. From this group of state-level awardees, one elementary and one secondary teacher will then be named as Presidential Awardees the following September. Awardees are selected from each state, the District of Columbia, Puerto Rico, Department of Defense Dependents Schools, and US Territories. In addition to the Presidential Award, honorees receive a trip to Washington, DC, a \$7,500 NSF grant for their school and generous gifts from business and industry.

The deadline for postmark of nominations will be **December 1, 1992**. Submission of applications is required by **February 15, 1993**. If you do not receive a nomination brochure through your ISTA membership address or through your science/math department chairperson routing, please contact Gwen Pollock at the above address.

Ray Bruzan, chemistry teacher at Lanphier High School, Springfield, is the 1992 recipient of the **Davidson Award**. The award is presented jointly by the Chemical Industry Council of Illinois (CICI) and the Chicago Drug and Chemical Association. Bruzan was honored on May 14th at the 35th Annual Scholarship Luncheon held at the O'Hare Marriott Hotel in Chicago. He received a plaque and \$2,000. Lanphier High School received a traveling trophy to put on display during the 1992-93 school year.

For more information, contact:

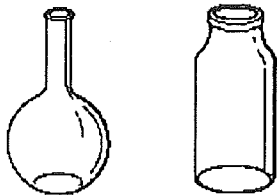
Delbert K. Johnson
Chairman, Education Committee
Chemical Industry Council of Illinois
9801 West Higgins Road
Suite 480
Rosemont, IL 60018
(708) 823-4020

P. Diane Chambers, an Elementary Science teacher for Brook Forest School in Oak Brook, has been chosen to participate in NASA's 1992 NEWEST workshop at Lewis Research Center in Cleveland, Ohio. Diane is one of 22 teachers from 10 states that will be participating in this exciting NASA program for 2 weeks in July. During this workshop, participating teachers will explore aeronautics, Space Station Freedom, planetary exploration, manned space flight, and the space shuttle.

Since 1985, Lewis has been developing the power systems for the Space Station Freedom. This project is a joint venture between the United States (NASA), the European Space Agency, Canada, and Japan. Lewis is one of nine major centers of the National Aeronautics and Space Administration (NASA). Lewis Research Center occupies 360 acres of land and employs over 4000 men and women. It is a lead center for NASA research, technology, and development in aircraft propulsion, space propulsion, structures, space power, and satellite communication. Lewis is the home of the Microgravity Materials Science Laboratory, zero gravity drop tower, wind tunnels, space environment tanks, chemical rocket thrust stands, and chambers for testing jet engine efficiency and noise.

Diane, a resident of Westmont, was selected from more than 1,000 teacher applicants. She looks forward to returning to her Science Lab and her community this fall with new information and exciting space activities for her students.

Patricia Sokoloff
(202) 887-1223
2501 M Street NW
Washington, DC 20037
202/887-1100



The **Catalyst Awards** honors individuals that have the ability to inspire students toward careers in chemistry and science-related fields, through their excellent teaching ability in and out of the classroom. The Awards also seek to draw public attention to the importance of quality chemistry and science teaching at the undergraduate level.

Since its inception, these goals have remained clear according to Robert Roland, president of CMA. "We strive to recognize exceptional teachers who not only can convey scientific concepts to young people, but also have the ability to get them excited about those concepts."

To date, 412 teachers of science, chemistry and chemical engineering have been honored. Winners are selected from a wide range of nominations submitted by colleagues, friends and administrators. All pre-high school, high school, two- and four-year college or university teachers from the United States and Canada are eligible.

Each award winner will be presented with a medal and citation. National award winners will receive \$5,000; regional award winners receive \$2,500.

ANNOUNCING A SEARCH FOR ILLINOIS' OUTSTANDING HIGH SCHOOL PHYSICS TEACHER



The search is on for the 1992 Illinois Outstanding High School Physics Teacher of the Year. This award, sponsored by the Illinois Section of the American Association of Physics Teachers, is given annually to recognize the efforts of one outstanding High School Physics Teacher.

Do you know this person? We would like to hear about him or her. Please send a brief letter of nomination to the following address. This is your chance to help bring recognition to a colleague who places a high value on the physics education of Illinois students.

Send Letters of Nomination **POSTMARKED BY DECEMBER 19, 1992** to:

Robert D. Grimm
ISAPT Awards Committee Chairman
814 South Dunton Avenue
Arlington Heights, IL 60004

The Chicago Academy of Sciences
2001 North Clark Street
Chicago, Illinois 60614
(312) 549-0607

THE CHICAGO ACADEMY OF SCIENCES RECEIVES "OUTSTANDING SERVICE TO CHILDREN" AWARD

The Chicago Academy of Sciences was recently chosen by the Chicago Association for the Education of Young Children (Chicago AEYC) as this year's recipient of its "Outstanding Service to Children" award.

Chicago AEYC is a professional organization for teachers and caregivers of young children ages newborn through 8. It is part of the National Association for the Education of Young Children. Each year, Chicago AEYC awards one organization and one individual for recognition of service and attention to young children.

The Academy's many teacher-training workshops and professional conferences give elementary-school teachers new ideas, activities, and attitudes about teaching science. Teachers participate in science activities such as dissecting an owl pellet, conducting a chemistry experiment, or examining a fossil. They can take many of these activities back to the classroom, helping them gain confidence about teaching science and generate excitement about science in their students. For more information on our programs, call or write us at the above address.

FLINN SCIENTIFIC ANNOUNCES CHEMISTRY DEMONSTRATION AWARD

Flinn Scientific: *Your safer source for science supplies*
PO. Box 219 Batavia, Illinois 60510
708/879-6900

The Flinn Chemistry Demonstration Award is a monetary award presented to a selected science teacher who develops or redesigns an existing chemistry demonstration to help students better understand a topic (or topics) in chemistry. Each proposal must include a detailed description of the following:

- Chemistry topic(s) the demonstration illustrates
- Materials needed, including chemicals, to perform the demonstration. Include preparation instructions for any unique solutions or equipment.
- Step-by-step procedure
- How and why the demonstration works
- Safety requirements and precautions for performing the demonstration

- What inspired the instructor to develop this "new demo"
- References, where applicable

- Any other data the instructor feels are pertinent

Each proposal must be original in some manner. A completely new demonstration or an old one which the individual submitting the proposal has altered or added to in some way to improve the results or level of understanding.

Proposals will be evaluated using the following criteria:

- Originality
- Drama
- Safety
- Availability of materials required
- Effectiveness of improved understanding of topic discussed

Value of Award: \$400.00

Application for this award is restricted to ISTA members currently teaching in the state of Illinois. Flinn Scientific, Inc. reserves the right to reprint, circulate and edit any and all entries. Authors of entries selected for reprinting will be acknowledged on any circulated materials. Entries will not be returned.

**1992 Flinn Chemistry
Demonstration Award Winner:**
Dr. John Davison
Chemistry Teacher
Oak Park and River Forest High School
Oak Park, IL
Demonstration Title:
Oxidation State and Manganese

DURACELL NSTA SCHOLARSHIP COMPETITION

WHAT IT IS: Students design and build working devices powered by *Duracell* batteries.

WHO IS ELIGIBLE: Students in grades 9-12 residing in the United States or U.S. Territories.

HOW AND WHEN TO ENTER:

1. Obtain Official Entry Form and rules from your science teacher, or write to NSTA at the address below.
2. Design and build a device which runs on batteries.
3. Write a two-page description (*in English*) describing the device and its uses.
4. Draw a schematic (*wiring diagram*) of the device.
5. Photograph the device.
6. Mail Official Entry Form, typewritten description, schematic, and photos (**DO NOT SEND THE ACTUAL DEVICE AT THIS TIME**) by the entry deadline to:

Duracell/NSTA Scholarship Competition
1742 Connecticut Ave., NW
Washington, DC 20009

7. The 100 top finalists will be notified to send in their actual devices for the final judging.

ENTRY DEADLINE: January 22, 1993

AWARDS GIVEN:

Scholarships: First Place (1) \$10,000

Second Place (5) \$ 3,000

Third Place (10) \$ 500

Cash Prizes: Fourth Place (25) \$ 100

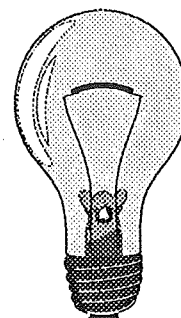
Trips: The top six winners, their parents and teacher/sponsors will be flown to Kansas City, Missouri for an Awards Banquet held during the 41st NSTA National Convention in April.

Computers: Teachers of the six top winners will receive personal computers.

Personalized Award Certificates: For the top 100 finalists.

Entry Prize: Everyone who enters will receive a gift and a certificate.

SPONSORED BY: Duracell USA
(administered by the National Science Teachers Association).



GOLDEN APPLE AWARDS

Ten outstanding Chicago-area high school teachers have been selected from 900 nominations for the prestigious 1992 Golden Apple Awards for excellence in classroom teaching. Each will receive a cash stipend, a paid sabbatical to study tuition-free and other benefits, including membership in the Golden Apple Academy.

These exceptional teachers were announced by the Golden Apple Foundation, a Chicago non-profit organization dedicated to the recognition, renewal and recruitment of outstanding teachers. The 10 winners were chosen from among 31 finalists announced in February.

Throughout February, finalists were visited in their classrooms by volunteer observers from the foundation's 80-member selection committee, which is composed of Chicago-area educators. At that time committee members also interviewed the candidates, their peers, administrators and students.

Each winner received a stipend of \$2,500, a paid fall-term sabbatical to study tuition-free at Northwestern University and an IBM computer, printer and networking services to communicate with past and present winners. Winners will also participate in a series of professional development seminars and join the prestigious Golden Apple Academy, an active "think tank" composed of past Golden Apple winners and dedicated to renewing teachers' professional interest and enthusiasm.

The Golden Apple Foundation was established in 1985, in partnership with WTTW/Channel 11 and Northwestern University, to develop programs to enhance the image of teaching and to attract new and dedicated talent to the profession.

Including the current winners, 70 teachers have received awards, which rotate among the grade levels. In 1993 Golden Apple recipients will be 6th, 7th and 8th grade teachers. Members of the public will be asked to nominate outstanding full-time teachers in any public or non-public school in Cook, Lake or DuPage County.

1992 Golden Apple Award Science Winners

Michael Bachrodt

William Fremd High School in Palatine 60067
708-358-6222 x274

Teaches chemistry and physical science

James Effinger

Naperville North High School in Naperville 60563
708-420-6480

Teaches biology

Emiel Hamberlin

DuSable High School in Chicago (Grand Boulevard) 60615
312-535-1100

Teaches biology and horticulture

John Lewis

Glenbrook South High School in Glenview 60025
708-729-2000

Teaches physics

NSTA

National Science Teachers Association

1742 Connecticut Ave. NW

Washington, DC 20009

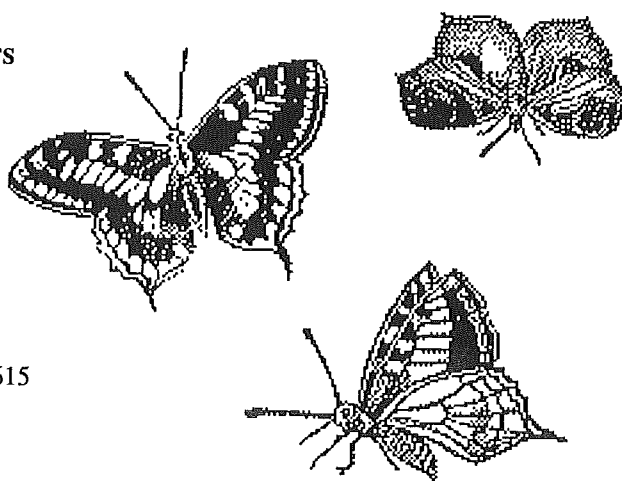
ILLINOIS SCIENCE TEACHER WINS TOP PHOTO AWARD

The National Science Teachers Association (NSTA) recently honored Shari Morkin, second-grade teacher at Oakland School in Bloomington, Illinois, with the 1992 Jack Fishleder Photography Award, sponsored by Creative Dimensions. At its 40th National Convention in Boston, NSTA announced that Morkin will receive \$750 for submitting the best illustration of exemplary science instruction and learning. Her collage of photographs, titled "An Environmental Oasis," captures rare moments of students discovering beauty in science.

Morkin's photographs show students exploring a butterfly garden, where students learn about, care for, and then set free monarch butterflies. In one picture, a child overcoming her fear of bees by closely observing a bumblebee collecting pollen and nectar from one of the garden's many native prairie plants. In another picture, a boy who cared for the smallest caterpillar in the garden, finally watches his pet hatch into a butterfly. Still another photograph captures moments at the end of the butterfly garden project, when children must let their monarchs go.

Founded in 1944, the National Science Teachers Association is the world's largest organization committed to improving science education at all levels—preschool through college. NSTA's current membership of approximately 48,000 includes science teachers, science supervisors, administrators, scientists, business and industry representatives and others involved in science education.

See the Summer 1990 issue of the Spectrum for Shari's original article and photos on butterfly gardening.



**NABT (NATIONAL ASSOCIATION OF
BIOLOGY TEACHERS)
OBTA (OUTSTANDING BIOLOGY
TEACHER AWARD)
1991/92**

AURELIA MNISZEWSKI-WILK
Gage Park High School
5630 S. Rockwell
Chicago, IL 60629

In addition to being recognized as the 1991/92 OBTA from Illinois, Mrs. Mniszewski-Wilk's credentials include the following:

Secretary MAHTA

Curriculum Development, Chicago Agricultural Science School

Competency Based Curriculum Instruction, Flower Arranging, published DAVEA, 1981/82

"Implementing the Illinois Plan for Industrial Ed. in Chicago"; Second Phase of Adapting Curriculum, participant and contributor

\$1000 Federal Grant Incentive Award Proposal and Winner Co-author, Gage Park Handbook, 1984 State Visitation, Vocational Education Program

University of Southern Illinois, A Statewide Horticulture Guide, 1981, Landscaping Section, published with Western Illinois Publishing Service

Advisory Panel for Teachers Conference/Workshop, BioTech, Dr. D Murray, UIC Chicago, (Fast Plants)

\$4000 Federal Grant Vocational Education proposal winner FCAE \$1,600 Proposal School Site Development Winner Nominated for Foundation for Excellence in Teaching, 1985 Outstanding Teacher of the Year, Gage Park H. S. PTA, 1978 Museum of Science and Industry Vocation and Career Education Exhibition, exhibitor and winner 1977 - 1989, Grand Award Winner 1985 and 1988

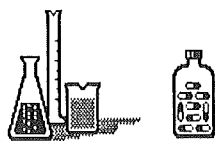
CBS-TV program: "It's Worth Knowing," Student Publicity for Vocation Education Exhibits, participant 1981 and 1985 MAHTA Scholastic Competitions and Floral Design Contests: participant 1984 - 1989, First place floral design - 1988, Second place scholastic - 1988.

\$4000 Chicago Board of Education Prism Grant Impact II Dissiminator Minigrant

IATVAT Workshop Presenter, Illinois State University, 1992

If you would like an application for the 1992/93 OBTA Award from Illinois, contact:

Mrs. JoAnne Edwards
OBTA Illinois State Director
Wheeling High School
900 S. Elmhurst Rd.
Wheeling, IL 60090

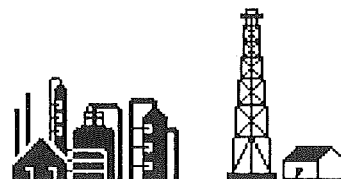


Applications will be available after January 1, 1993. The deadline for receiving applications is March 15, 1993.

**1991-92 TEACHER OF THE YEAR
FINALISTS IN SCIENCE**

Carmen Allen, Grades 6-8 Science, Blue Mound Elementary School, Blue Mound-Boody Community Unit School District #10

Donald Perry, Grades 7-8 Science/Math, Genoa Middle School, Genoa-Kingston School District #424



**ILLINOIS DISTINGUISHED
EDUCATOR AWARD—IDEA**

Nine teachers and three principals from across Illinois are the recipients of the fourth annual Illinois Distinguished Educator Awards (IDEA) and \$25,000 each.

Cosponsored by the Illinois State Board of Education and the Milken Family Foundation based in Sherman Oaks, California, IDEA publicly and financially rewards outstanding educators for their extraordinary efforts and personal commitment to the State's public and private schools.

These 12 individuals exemplify the best in the education profession in Illinois. They represent the thousands of others just like them in schools all across the state," Leininger said. "Outstanding teachers and principals deserve our gratitude and respect. Through programs like the Illinois Distinguished Educator Awards, we cannot only express our thanks, but we can tangibly reward their efforts on behalf of our children.

"The State Board of Education hopes that citizens and parents in all Illinois communities feel as proud of their outstanding teachers and principals as the State Board feels about these 12 who represent them."

More than 500 teachers and principals who had been recognized by their peers, colleagues and communities comprised the pool of IDEA candidates. Written materials documenting how well the candidates met the program criteria were evaluated and scored by a screening committee.

The IDEA Selection Committee was comprised of local school administrators, parents, school board members, the dean of a college of education and teachers and principals from among the 1968, 1989 and 1990 IDEA winners. The committee's recommendations were submitted to the State Superintendent who selected 12 winners from among the group of finalists.

1991 IDEA RECIPIENT IN SCIENCE

Bernard F. Bradley, K-8 Science, Newberry Mathematics and Science Academy, Chicago School District #299

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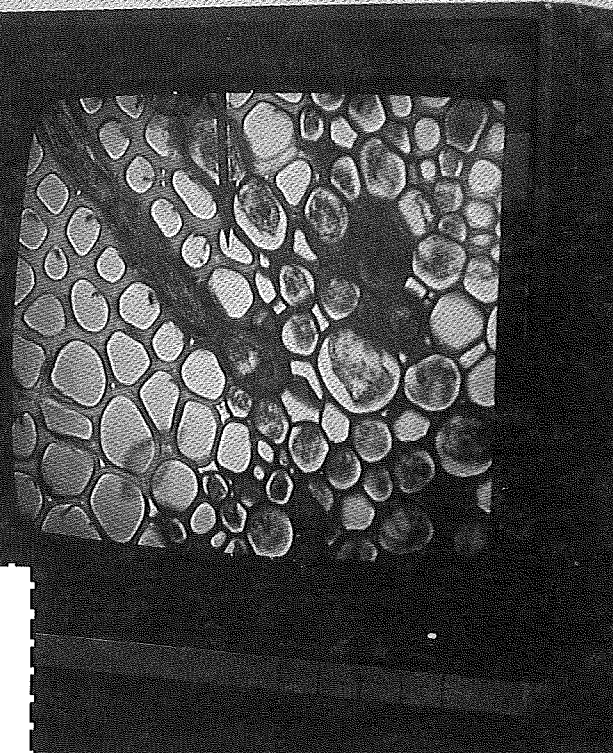
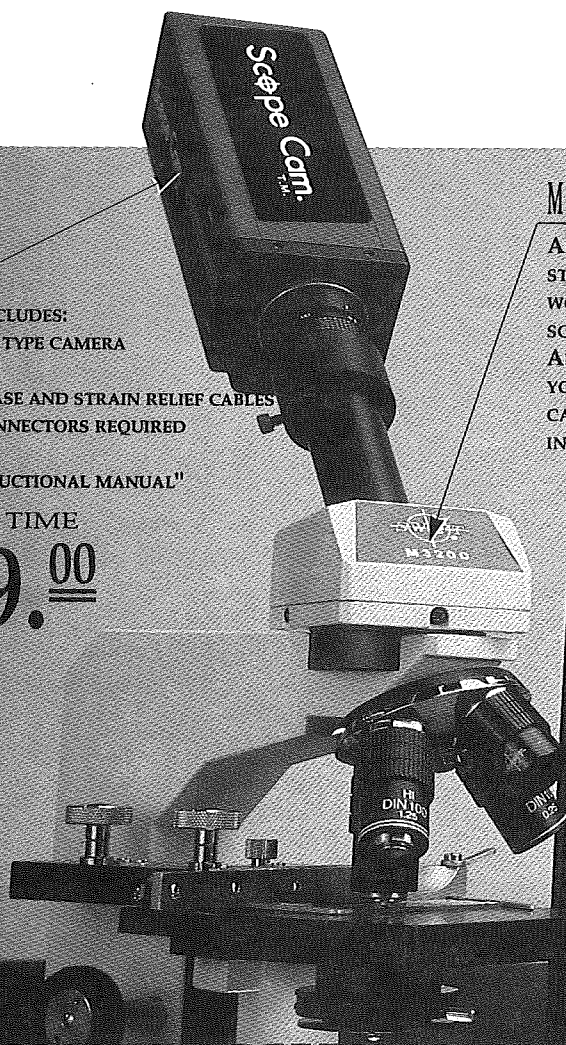
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- 1 Microphone for Audio Dubbing

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State-of-the-art electronics and ease of use make the Scope Cam a most useful, creative and innovative tool for today's science education laboratory.

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Scope Cam

The SCOPE CAM System includes a light weight state-of-the-art chip type, high resolution color camera with the Scope Shoppe's exclusive quick-release power supply and strain relief connectors. The camera comes complete with lens and adapter designed to fit most student microscopes with standard wide field eyepieces. The SCOPE CAM is configured to adapt to almost any composite color monitor and will be delivered to you hard-wired with all cables ready to connect to your microscope and monitor.

SC9201.....~~\$1,450.00~~ **\$1,299.00**

Microscopes

Swift M3200 Series: Din 4x-10x-40xR (retractable) objectives 10x wide field eyepiece with the exclusive pointmaster measuring pointer, inclined 360° rotating head, built in 30 watt tungsten illuminator with 3-wire cord. 3021-1.....~~\$460.00~~ **\$350.00**

Same as above but also; Din 4x-10x-40xR-100xR (retractable objectives, 1.25 spiral Abbe condenser, iris diaphragm, and mechanical stage.

3021-2MS.....~~\$838.00~~ **\$650.00**

Leica Series 160: American made, proven durability with excellent optics. Equipped with a 10x wide field eyepiece with pointer, 4x-10x-43x objectives, inclined head, disc diaphragm, and built-in 15 watt tungsten illuminator.

3024-1.....~~\$748.00~~ **\$727.00**

Same as above but also; 4x-10x-43x-100x objectives, Abbe condenser, iris diaphragm, and graduated mechanical stage.

3024-2~~\$1,297.00~~ **\$1,327.00**

Monitors

A professional quality, high resolution monitor, equipped with the inputs and outputs to meet today's video applications. (VCR's, video disc players, etc.)

SC1371-A (13" +/- 420 lines)
.....~~\$510.00~~ **\$449.00**

SC2071-A (20" +/- 450 lines)
.....~~\$640.00~~ **\$599.00**

SC3171-A (31" +/- 600 lines).....~~\$1,254.00~~ **\$1,149.00**

SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

OPPORTUNITIES

Barbara Sandall
Special Program Coordinator
Teachers Academy for Mathematics and Science in Chicago,
10 W. 35th St.
Chicago, IL 60616
312-808-0100

TEACHERS ACADEMY FOR MATHEMATICS AND SCIENCE

The Teachers Academy for Mathematics and Science in Chicago was created from the Chicago School Reform movement, in the summer of 1990. It was developed under the leadership of Nobel Prize winning Physicist Dr. Leon Lederman. The Teachers Academy's goal is to restructure school learning environments through mathematics and science education. The unique structure of the Academy was conceived by a working group of school reform advocates, from the scientific community, community organizations, area universities, the corporate world and highly talented classroom teachers. With the continued support from universities, museums, national laboratories, and corporate research centers, the Academy has been able to link these extensive educational and scientific resources with Chicago's inner city school system and all metropolitan area schools.

Mission Statement:

In partnership with school communities, the Teachers Academy's mission is to restructure the total learning environment of each school, to transform the instructional system, and to energize the faculty. To accomplish this, the Academy will:

1. Focus on teachers, K-12, as the key to such improvements.
2. Further involve parents and community leaders in the educational process.
3. Enhance the capabilities of teachers to deliver state-of-the-art mathematics and science instruction to all students.
4. Marshall the vast resources of the City, its universities, museums, national laboratories, and private sector and link these resources to the needs of the schools.

A REQUEST

Addison-Wesley Publishing Company has requested information and resources to improve their textbooks and/or to help elementary teachers make science more accessible to disabled students. They are also interested in information on disabled persons working in scientific careers. Send any information to Susan Burgenbauch at Addison-Wesley, 2725 Sand Hill Rd., Menlo Park, CA 94025 or call 415-854-0300.

Format:

There are three distinct parts to the Teachers Academy Model. The Intensive Staff Development Program, Special Programs, and the Resource Center. In the Intensive Program, Chicago Public School teachers currently come to the Academy 2 days a week every other week for training in Teaching Integrated Math and Science, Math Tools, or Integrated Science, Math, and Technology. During the time that the teachers are going through the training the Teachers Academy provides an Academy Cooperating Teacher to replace the classroom teacher. The following semester the Teachers Academy will provide and implement specialists to each school to help get the programs started in the schools. Special Programs are open to all Chicago area teachers (public, private, urban and suburban). The Special Programs are 1/2 day, 1 day, 2-3 week workshops on special topics. The Resource Center will be open to all teachers in the Chicago area. There will be books, audio visual, computer, kits, etc. for teachers to come in and preview and seminars and short courses offered on a first come, first serve basis.

Since fall of 1990 the Teachers Academy has had approximately 800 teachers through the intensive training program and 3,000 in special workshops, joint projects with other local museums, national laboratories, the Chicago Board of Education, Archdiocese of Chicago, universities and other local and area institutions.

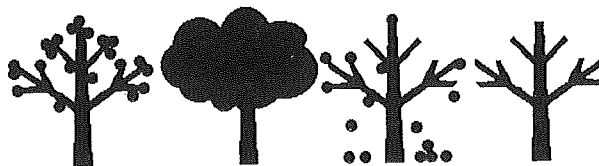
Our Special Focus Workshops are open to any public and private school teachers interested in learning new approaches to teaching integrated science, mathematics, and technology. For information on the Teachers Academy or our summer programs please contact me at the address given above.

IMPACT II

Mini adaptor grants of \$200, \$750, and \$1000 are available to public school K-12 teachers who want to adapt a teaching ideas from the 1992 IMPACT II Catalog of Creative Teaching Ideas from Illinois Mathematics and Science Teachers. The catalog and application will be available in early October and the application deadline is December 15, 1992.

In addition, mini grants of \$500, \$1800, and \$2500 are available to public school K-12 teachers who have new, creative and innovative teaching ideas in mathematics and/or science. The applications will be available in mid December and the application deadline is **March 15, 1993**. The grant of \$500 is for an individual teacher while the \$1800 grant is for three teachers from the same school and the \$2500 grant is for four teachers from more than one school. IMPACT II is funded by the Illinois State Board of Education through the Scientific Literacy Grant initiative. For Further information, contact Ann Hanson, (708)801-6101 or write the Illinois Mathematics and Academy, 1500 Sullivan Road, Aurora, IL 60506-1039.

Gary Kupkowski, Facilitator
Urban Forestry Research Project
USDA Forest Service Grant
Urban Vegetation Laboratory
The Morton Arboretum
Lisle, IL (708)719-2415



THE URBAN FORESTRY PROJECT

The Urban Forestry Project provides teacher workshops to learn to use the recently developed Urban Forestry Laboratory Kits. The project is looking for five (5) elementary, five middle and five high schools in the area of **The Morton Arboretum** to pilot an **Urban Forestry Program** at their schools. This program is designed as a resource to be used with existing curricula programs. The kits will include all the necessary hardware for the gathering of data and the lesson plans to support the students work. Skills for these laboratory exercises will be keyed to the state learning objectives for science.

Workshops to familiarize the teachers with the equipment will be held at **The Morton Arboretum** during November of 1992. At the workshops teachers will use the kits for their level, that have been developed and field tested. The kits are designed to look like a **Foresters Trunk** full of field equipment, and career information.

In this first year, of this project, there will be three data collecting laboratory exercises that any class, at a particular level will be able to conduct at their school site. All of the necessary laboratory hardware will be made available to each school for two weeks at a time. The class material will be organized for gathering and then analyzing data with a computer, either at your site or ours. Actual data collecting labs that can be done with a class, working in cooperative teams, will be presented. The gathered data will be accumulated for five years at each site and this data related back to the schools. These exercises will be done on your own site or with a field trip to a local urban forested area.

The second part of the program will involve the development of an urban forested area at each school site. To further the long range thinking of a forestry career, schools that participate will be requested to sign-up for a five year program run, during which two or three different tree species, of landscape value, will be planted by your students at your site yearly. Planting directions and site selection will be part of this section. The long term data gathering possibilities of this type of exercise will further expand the students' appreciation for science and forestry. Further information can be received by writing or calling the above address.

FIELD TRIPS



EXPEDITION TO THE EXOTIC!

The unique richness that once spawned the ideas of evolution in young Charles Darwin is still resplendent and can be experienced by you if you participate in the **GALAPAGOS EXPEDITION AND EDUCATION INSTITUTE**. This special excursion will take place December 22, 1992-January 1, 1993 and is sponsored by the conservation organization, Sobek-Mountain Travel and led by Dr. Marylin Lisowski of Eastern Illinois University and Dr. Robert Williams of Southern Illinois University. The Galapagos islands are made up of 13 major and six smaller islands which straddle the Equator. These islands will be explored via **The SAMOA**, a 1986 vessel that is 65 feet in length and has up-to-date navigation equipment. An educational program will be offered by the trip leader as well as by the local bilingual naturalist and guide. The trip includes all scheduled international and land transport, all meals and accommodations during the program, all scheduled transfers, portages, and service charges and taxes (except airport departure taxes), and guides. The cost, based on a minimum of 11 passengers, is \$2175. Graduate credit will also be available if requested. If you would like more information about this fantastic excursion and would like to see a detailed program, call Sobek-Mountain Travel at 1-800-227-2384 or Dr. Marylin Lisowski at 217-581-5728 at Eastern Illinois University or Dr. Robert Williams at 618-692-3788.

JETS and MITE Summer PROGRAMS

1993

Summer programs for
prospective

high school seniors

The JETS and MITE programs are identical programs aimed at providing an overview of careers in engineering to qualified young men and women who will be seniors in the Fall of 1993. Both programs have been in existence for over 25 years and serve 50 students each summer.

OUTLINE OF THE PROGRAM:

Research - A certain number of students volunteer and are accepted as research assistants during their stay on campus. They will work with a faculty member and assist with current research.

Laboratories - Most of the engineering departments provide labs experiences designed to be indicative of first year freshmen labs.

Seminars - Informal gatherings of faculty, undergraduate students, graduate assistants, and professional engineers are arranged to give participants an insight into the field that they may be considering.

Computer Aided Design (CAD) - A series of labs offered to each student and sponsored by the General Engineering Department.

Sports and Social Activities - Students will, with the help of live-in counselors, plan their own intra-mural sports program and social activities such as picnics and dances.

SOME INFORMATION FOR PARENTS AND GUARDIANS:

HEALTH AND WELFARE: Your parents and guardians will be glad to know that you will be covered in the case of accident. Live-in counselors will be on the floor of the residence hall from 7 pm to 7 am daily.

THE COLLEGE STUDENT TOUCH: For all practical purposes your son or daughter will be a "U of I" student for the week. He/she will have an ID card giving access to the university library, check cashing services, swimming pools, the Intramural and Physical Education facility (IMPE), campus buses, etc.

COST: \$400.00 (includes tuition, room and board for two weeks)

DATES:

JETS - June 20 - July 2, 1993

MITE - July 11 - 23, 1993

For more information, call:

David Powell
Jill Humphrey
Illinois JETS
University of Illinois
207 Engineering Hall
1308 W. Green St.
Urbana, IL 61801
(800) 843-5410


REVIEWS

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

COMPUTER SOFTWARE SIMULATIONS WITH GREAT POTENTIAL FOR EARTH SCIENCE AND LIFE SCIENCE CLASSROOMS

Three computer simulations, produced by Maxis, have a great deal of potential for incorporation into science classrooms. These simulations, SimEarth™, SimAnt™ and SimLife™ differ significantly in format and topic coverage, though all are excellent catalysts for class discussion and all invite the students to be active participants, rather than passive observers in the learning process.

SimEarth™, a planet simulator based on the Gaia theory proposed by James Lovelock, allows the participant to develop their own planet. According to the Gaia theory, the organisms and their material environment constitute a system which is able to self-regulate climate and atmospheric composition. The student is provided with a set of rules and a basic set of tools that describe, create and control the planet. From this point he can physically modify the landscape of the planet and trigger events ranging from hurricanes to volcanic eruptions to meteor strikes. The user has the capability to place various biomes and life forms anywhere on the planet. Once the user has established the planet, he manages it to the best of his abilities based on the provided rules. A major limitation of the simulation is the fact that evolution closely follows that of the Earth with a minimal variation. The evolution component is weak and aimed largely at the development of a single sentient species, which then develops civilizations, cities and technologies just as we see today, there is limited room for creativity. There are seven actual scenario planets in SimEarth™, 1) Aquarium, in which you develop your own land masses and work from that point, 2) Stag Nation, which begins at the Stone Age, 3) Earth, during the Cambrian Era (550 million years ago), 4) Modern Day Earth (1990), 5) Mars, 6) Venus and 7) Daisyworld, a simplified simulation with eight differently shaded daisies which gives a visual demonstration of the concept of Gaia and of life on Earth as a self-regulating whole. Each of the planet scenarios presents its own set of beginning environmental conditions and life establishment/continuity problems. Each scenario planet can be worked with through either an experimental mode or can be played as a game at one of three difficulty levels. At the most difficult level of each scenario



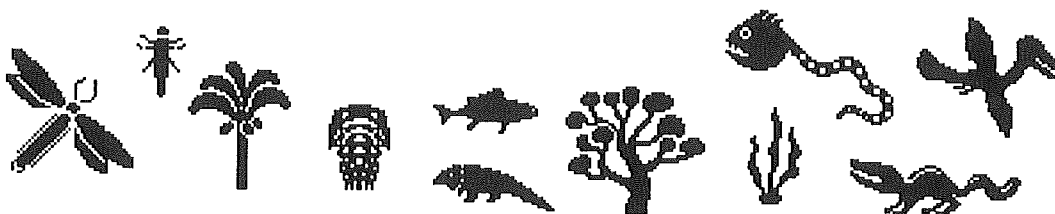
Gaia's self-regulation is disabled, you are in total control of your planet. One of the strengths of SimEarth is the accompanying manual: it teaches the reader how to effectively work within the simulation as well as introduces the reader to the basics of earth science. Its main weaknesses for classroom

use are 1) the complexity of the simulation, 2) user dependence on the manual regardless of their background knowledge and prior experience with the simulation, 3) its very definite steep learning curve and 4) the time required to work through an actual simulation. I recommend that general science, earth science and life science/biology instructors examine this software package. Because of the fact that SimEarth™ encompasses such a broad number of areas, without allowing for detailed examination of any particular characteristic, teachers will need to be somewhat creative in the way that they integrate this software package into their classroom.



SimAnt™, introduced in 1991, is clearly the easiest simulation to understand and is an excellent introduction to the world of arthropod biology, ecology and the concept of sociobiology. In SimAnt™, you are in charge of an ant colony. As in a real ant colony, deaths of individual workers will not significantly affect your colony, all ants are working for the common good of the colony. The goal is to nourish and protect your queen as well as expand the colony. Students can actually manipulate individuals of the various castes as the kings and queens (the reproductives) and the workers and soldiers (the sterile castes) play their vital roles in establishment, growth and expansion of their colonies. This simulation allows students to view the ant world visually (as a human) as well as chemically, as is the primary means of perception in ants. Use of alarm pheromone, trail pheromone and a nest pheromone are incorporated into this simulation. The program has pre-established (default) settings which designate amount of energy allocated to activities such as foraging, digging and nursing. Students who are familiar with the simulation can modify these settings as they like. As in the real world, there is direct and indirect competition from a neighboring red colony of ants and voracious predators such as ant lions and spiders. Once the colony reaches a certain size, winged males and new queens are produced allowing for formation of additional colonies in adjoining areas. In addition to an on-screen tutorial, there are three modes. "Quick Game" allows you to work toward establishing a colony and taking over a single patch of ground by out-competing and overrunning the adjoining red ant colony -

there is a fair bit of biological strategy involved. The "Full Game" requires your colony to take over an entire yard and house, again biological knowledge and common sense are required. The "Experimental Mode" allows you to use different tools and chemicals to see how ants behave in various situations. These "tools" include barriers, a dig/fill tool, the capability of adding ants of either type, food, various pheromones and insecticides. An Information Window provides a series of electronic index cards giving additional information regarding other social insects, anatomy, life cycles, castes, social behavior, common ant species, ant trivia and SimAnt™ strategy. A real strength regarding SimAnt's™ potential for incorporation in the classroom is the extensive supplementary coverage (over 75 pages) of ant biology information. This section is well written and organized with very effective use of graphics. In fact, it's difficult to stop reading once you've begun. The strengths of SimAnt™ are 1) the well-written manual, 2) the fact that it can be used with a small amount of background preparation and 3) the ability to use this simulation at various grade levels (probably 3rd grade through high school), 4) the option for quick simulations and 5) the demonstration potential of the Experimental Mode in the single computer classroom using an LCD panel. The major weakness of SimAnt™ is the fact that its ease of use and lack of manual requirement for use at the beginning levels may prevent students from getting as much out of the simulation if they play SimAnt™ strictly as a computer game.



SimLife™, which should be available at the start of the upcoming school year, is an artificial life laboratory which gives the student opportunity to create and modify plants and animals at the genetic level, design environments and ecosystems and simulate/control evolution. I've had opportunity to examine a beta (as yet unfinished format) copy of the software and found it to be fascinating. I did not have access to a complete manual, preventing me from fully examining its power and potential. SimLife™, like SimEarth™ is a very complex simulation and requires considerable manual familiarity prior to effective use. This simulation is aimed at an audience ranging from high school to adult. I was particularly pleased to have opportunity to examine a rough draft of the SimLife™ Teacher's Guide. The guide provides a number of computer based activities aimed at better understanding the scientific method and problem solving. Topics include 1) abiotic influences on the environment, 2) balancing an ecosystem, 3) food chains and food webs, 4) the effect of disasters on an ecosystem, 5) genetic variations and 6) adaptation and evolutionary changes. Additionally, the teacher's guide suggests a number of different ways to implement this simulation into single computer classrooms, as well as those classrooms with access to several computers or a computer lab. The guide is aimed at an audience ranging from ninth grade through college level. Maxis is asking actual classroom teachers to examine these rough drafts prior to its publication!!! This is certainly a step forward! The actual, final draft of the SimLife™ Teacher's Guide should be available this Fall. SimLife™ appears to have many of the virtues as well as the drawbacks of the complex earth science simulation, SimEarth. Its potential for incorporation into the biology classroom is significantly increased by availability of the SimLife™ Teacher's Guide and I recommend introductory biology, advanced biology and junior college introductory biology/ecology/evolution instructors examine a copy of this software package in combination with its teacher's guide. In summary, all of these simulations have great potential for incorporation into classrooms, though each requires extensive teacher preparation regarding the specific manner in which they can be incorporated and integrated into the existing curriculum or program. SimEarth™ and SimAnt™ are available in Macintosh, DOS and Windows formats and may be obtained from mail order vendors for \$30 to \$40. Though SimLife™ is not yet available, it will be soon be available from the same sources in Macintosh and DOS formats. Unfortunately, none of these simulations are available in an Apple II format, nor does Maxis have any future plans to produce Apple II versions of their simulations. Teacher guides will be available for SimEarth and SimAnt early this Fall and can be obtained for \$10 each by calling 1-800-333-MAXIS. Commercial availability of the teacher guide for SimLife™ is scheduled shortly afterward. I'm curious to find how others teachers are incorporating these and other science simulations into their classrooms and would like to hear from those involved of you regarding successes and "nonsuccesses." I can be contacted at the address above.

READ ANY GOOD BOOKS LATELY? SEEN ANY GOOD VIDEOS?

SHARE YOUR IMPRESSIONS WITH YOUR COLLEAGUES!

SEND THEM TO: SPECTRUM, 1310 S. SIXTH STREET, CHAMPAIGN IL 61820

ATTN: REVIEWS

Stewart E. Brekke
Northern Illinois University

NOT KNOT. VHS. approximately 20 min. The Geometry Center, University of Minnesota. Distributed by Jones and Bartlett Publishers. Approximately \$25.00

This is a videotape primarily designed for mathematics classes to give students, even in middle school, an overview of knot theory. At this time knot theory is a part of topology. According to the supplement that comes with the videotape, knot theory, more or less, was begun by Lord Kelvin who conjectured in his vortex theory of matter when he said that different physical elements corresponded to different knots tied in the vortices. Knot theory today deals in part with the properties of objects that are not changed by stretching and deforming. Recently, Bill Thurston made important discoveries about knot complements which is the subject matter of the video.

While mainly a mathematical film easily understood by younger students in part, high school science students would be interested in the film because of its reference to hyperbolic spaces which is involved in cosmology, for example. Other aspects of the video deal with mirror images and infinite spaces as well as symmetry. The different kinds of spaces, mirror images and symmetries are good viewing for physics classes and physical sciences classes since these topics are dealt with in optics and relativity, though briefly.

As the video states one must view the tape at least twice to really get some understanding of the subject matter. Science teachers, students and even practicing physicists could learn something from this video which will make them all aware of what kind of mathematics is being developed at this time, which may ultimately provide a tool for understanding some physical or biological phenomena. As most physics and physical science teachers know, the mathematics of today may be part of physical theory tomorrow. I would recommend this video for all science teachers simply for keeping abreast with current work in spaces, and mathematics. A lesson on different types of spaces, geodesics, and cosmology from middle to high school could use this type of supplement as well.

Stewart E. Brekke
Northern Illinois University

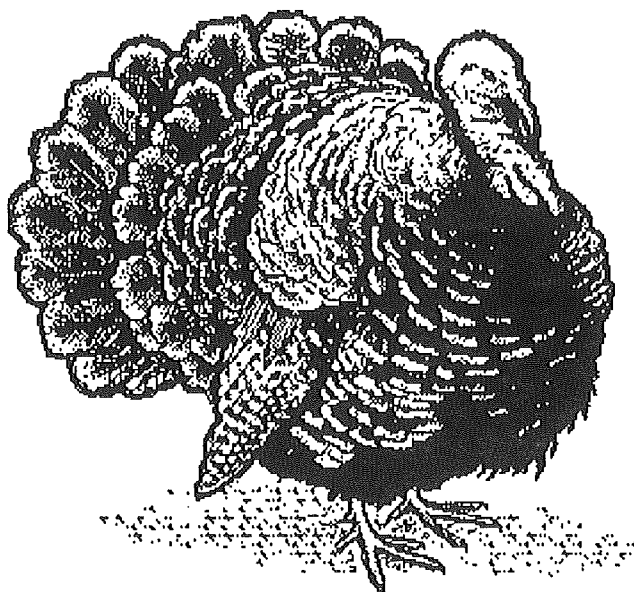
Physics in the High Schools: 1986 Nationwide Survey of Secondary School Teachers of Physics Michael Neuschatz and Maude Covalt, The American Institute of Physics, New York, N Y, November, 1988.

This is a 66 page report based on a sample of about 3,000 school representing a total estimated U.S. high school number of 21,700. The report gives an overview of secondary instruction such as frequency of high school physics offerings, number of students taking regular, honors and AP physics, proportion of schools offering physics and even numbers of majority and minority students taking high school physics. Other chapters deal with the characteristics of high school physics teachers, and statistics on public and private school physics.

Startling figures show that approximately 623,000 high school students are taking physics in the United States. This represents only twenty percent of all high school students. Ninety-six percent of all high school students are in a school where physics is offered. Schools in the Northeastern part of the country offer more physics and have more physics students. In the South physics is not taken by as many students nor offered as much as in the Northeast. Approximately one-third of high school physics teachers' could be described as having their main specialty in physics and one third began their physics teaching careers in other fields, but now teach physics regularly. Most teachers appear to stress basics in their high school physics classes and develop general problem solving abilities. Women physics teachers earn about one-fourth less than their male counterparts in high school physics teaching and women physics teachers are less likely to have a degree in physics. All of these elements of the high school physics scene in the United States and more are in this

little book. It is essential reading to all interested not only in high school physics teaching, but in the total science program of American high school students. TEACHER, science department heads and administrators should have this book handy for reference.

Since high school physics is a vital part of a sound science background, it is important that improvements in the high school physics situation be made. This book will provide much needed data to better science education in the United States.



ILLINOIS AEROSPACE INSTITUTE

July 12-17, 1993

A one week summer program for
high school freshmen through seniors

Held on the campus of the University of Illinois at Urbana

A brief overview of activities:

- o Study and experiment in Aeronautical engineering laboratories
- o Talk with Illinois graduates who are NASA astronauts and engineering specialists in the nation's aerospace program
- o Visit an FAA control tower and learn about aircraft navigation during flights at the University's Institute of Aviation
- o Build and fly model airplanes and rockets
- o Receive NASA jackets and other space souvenirs

Some other aspects of the program:

THE DESIGN TEAM: You will be assigned to a design team with the task of choosing and designing a program oriented to the long-term goals of the U.S. aerospace program.

RESIDENCE HALL LIVING: You will stay the week at a University approved residence hall, eating your meals with your team members and supervised by live-in counselors. You will be a short walk from class rooms and laboratories - and campustown movies and restaurants.

THE COLLEGE STUDENT TOUCH: For all practical purposes you will be a "U of I" student for the week. You will have an ID card giving you access to the university library, check cashing services, campus buses, etc.

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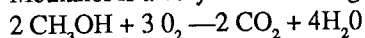
MINI IDEAS

Brian Poelker
Midwest Central Junior High School
Manito, Illinois

DITTO DEMOS: CONTROLLED CLASSROOM EXPLOSIONS

Science teachers are always on the search for activities and demonstrations that are safe, quick, easy to set up, inexpensive and effective (even spectacular). During the summers at ISU's Honors Science Teachers Project, Ed Guzdziol and I shared several ideas we gained from attending workshops and our own creative efforts. Using ditto fluid, methyl alcohol, as a combustible material in a variety of containers meets all of the criteria listed above. It can be used as an introduction to combustion, to demonstrate the workings of the internal combustion engine, or how a rocket works. It can also be used to show that flame temperatures vary and the importance of catalysts.

Methanol is a very clean burning fuel.



It burns with a rather cool, for fire, blue flame.

CAUTION: As with all demonstrations that deal with combustible materials, have fire extinguishing equipment on hand. This may include a fire extinguisher, fire blanket, sand and a large damp cloth. Goggles are required and a safety shield is recommended for some demos. Keep the audience well back from the demonstration stage.

THE DEMONSTRATIONS

The Methanol Bomb

The methanol bomb mimics the workings of the internal combustion engine. We will use a polyethylene bottle, two cork stoppers, two nails, 10 mL methanol, and a tesla coil. The tesla coil produces a high voltage spark. They can be purchased from most scientific supply houses. This one was purchased through Flinn Scientific.

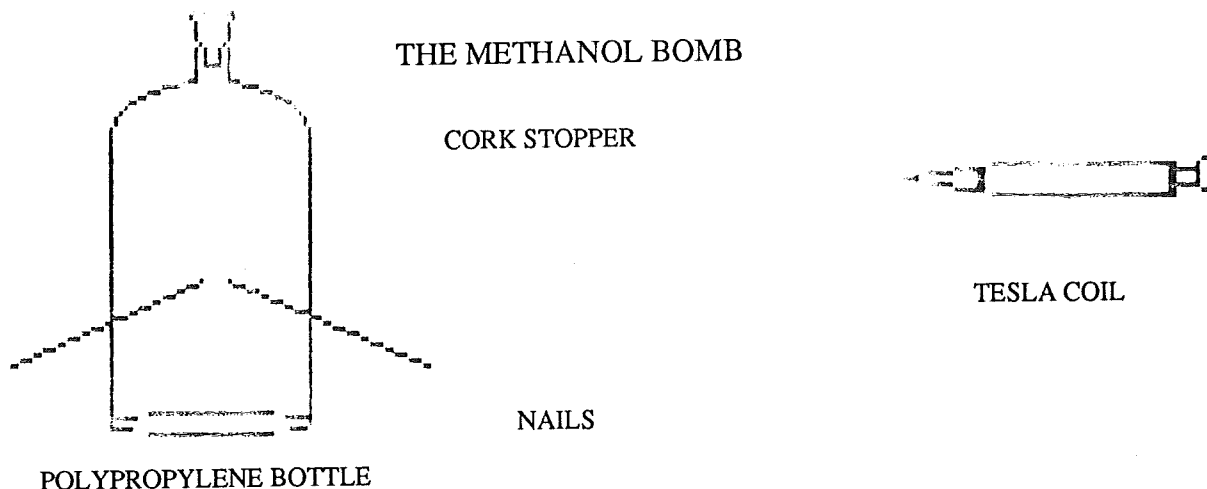
To prepare the chamber heat the ends of the nails and push them through the bottle. The gap between the nails will allow the electrical spark to jump to the other nail igniting the methanol.

SAFETY: Wear goggles, use protective screen, do not use pure oxygen, set the bottle upright on a table, do not have a volunteer hold it!

The bottle is a closed container with a constriction at the top. Since the gases are forced out of the smaller opening an explosion will occur. This is essentially the same reaction that occurs inside an internal combustion engine.

ADDITIONAL ACTIVITY:

After the explosion, immediately replace the cork and reignite. Nothing happens! Student observations? (Lack of oxygen.) Wave the bottle in the air and reignite. Explosion reoccurs. Student observations? (Replenished oxygen supply.) Caution: Sometimes enough oxygen enters the container as backdraft from the explosion. The bottle may explode a second time, but rarely a third. This leads to additional student discussion.





With their parents away, the young dragons would stay up late lighting their sneezes.

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The Dancing Flame (Dragon's Breath)

This demonstration uses a five-gallon plastic water bottle, like Hinckley and Schmidt. An excess of methanol is poured into the water bottle and swirled to promote vaporization. After a couple of minutes the excess is poured out. Save the excess, it can be used in the other combustion experiments.

CAUTION: Wear goggles, have a fire blanket nearby, do not look over the top of the bottle during ignition, have the students well back from the demonstration area.

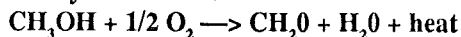
Light the top of the container with a butane charcoal starter. A large flame shoots out of the top like rocket exhaust (about 2 meters high). Then a smaller blue flame remains in the bottle, dancing up and down in the center of the bottle. This is the result of oxygen entering the bottle from the top and combining with methanol.

The demonstration can be used to discuss rocket thrust. Students must also be very observant to see the "dancing flame" without teacher intervention. The top of the container will be quite warm after the flame dies out. Turn the bottle upside down for a few minutes to allow the heavier carbon dioxide to escape and the bottle is ready again. Chemistry teachers can discuss the need for this in relation to the density of CO_2 .

A Repetitive Explosion

This demonstration was presented by Drs. Rubin Battino and John Fortman at ChemEd '91 at the University of Wisconsin-Oshkosh. The explosion is caused by the exothermic combustion of the alcohol vapor by heated platinum metal. The platinum is a catalyst in the oxidation of the ditto fluid. The initial catalytic reaction occurs on the wire, heating it. When the wire is hot enough it causes the combustion of the rest of the vapor in the flask.

Catalytic reaction:

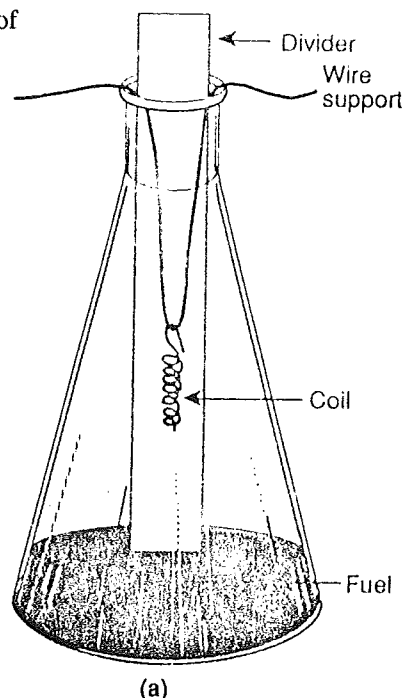


I use 20 gauge platinum wire (palladium will also work). This rather thin wire heats rapidly producing an explosion about every ten seconds, about the average attention span of the typical eighth grader. Variations in the period of the explosion will occur with a thicker wire, different alcohol, or lower temperatures. Other materials pictured include a 500 mL or 1 L Erlenmeyer flask, a galvanized steel divider (baffle) and a support wire. The set up apparatus is shown.

The ditto fluid must be heated to boiling before adding it to the flask. Pour about 75 mL into a 500 mL flask, double that amount for a 1 L flask. Place the divider into the flask and heat the platinum wire. It must be red hot when placed into the flask.

CAUTION: When the red hot wire is introduced into the flask an initial explosion will sometimes occur. Be sure to wear safety goggles and keep your face away from the opening of the flask. Have a damp cloth on hand to put out possible fires on the top of the flask. The damp cloth will also be needed for handling the flask as the neck becomes quite hot during the demonstration.

The divider will allow fresh air to enter the flask after the hot exhaust is expelled during the explosion. This, in turn, will provide the oxygen needed for the catalytic combustion of the alcohol. The reaction will continue until all of the alcohol is used up or the platinum wire is removed. The loudness of the "bang" is related to the size of the flask. Attempts with flasks larger than 1 L have been unsuccessful. This demonstration is useful for illustrating the principles of combustion and catalysts, or just getting students to say "Wow!"



(a)

Money to Burn

In the morning before school mix a 50% solution of methanol and water, usually 250ml of solution will be plenty. Have an unsuspecting principal visit your room just as you ask for a volunteer. "I need a twenty." (\$50 or \$100 bills are better but usually not available). After you have the bill safely in hand explain to the class that the lesson deals with the temperature of flames and plunk the \$20 into the alcohol/water solution. If your principal is not available use money from a student. They are much more interested in the results with their own money at stake.

Before setting the money on fire remind the students that you said "I need a twenty." not "May I borrow a twenty." There was no mention made of giving the money back, just in case it gets too crispy! Suspense builds.

Turn out the lights in the room. Hold the bill with a tongs and light it. The bill will be enveloped in a blue alcohol flame. The water in the solution will evaporate as the temperature increases taking heat away from the system. The temperature of the bill does not reach its kindling point so the paper does not burn! After the flame dies down dry the bill off with a paper towel and give the "cleaned" bill back to the owner.



These demos have produced lively discussions in the classroom. Students have built launch pads and decorated rockets for classroom launches. Students are instructed that only adults are to light the rockets. If they ask how they can get the alcohol I tell them I buy it from a chemical supply company that sells only to schools. So I supply the fuel and we will do all of the testing at school under supervision. The success of the demos has been outstanding. Students are always ready to ditto the demo again!

FOR ANOTHER "EXPLOSIVE" ACTIVITY
SEE THE SUMMER 1990 ISSUE OF SPECTRUM
FOR GUDZIOL'S "FIRE SOUNDTUBE."

Bibliography and resources:

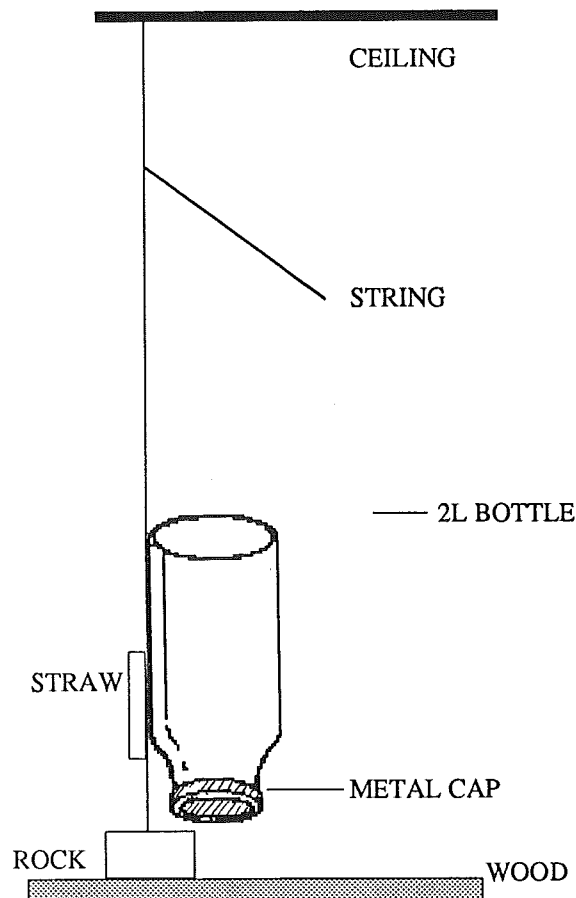
Battino, Rubin, T. L. Letcher and D.E.A. Rivett, *Delayed and Repetitive Explosions.*, *The Journal of Chemical Education* "in press," The American Chemical Society, 1992.
Feynman, Richard. *What Do You Care What Other People Think?* Norton and Co., pp. 255. 1988. ISBN 0-393-02659-0.
Guzdziol, Ed. *The Amazing Fire Sound Tube.*, *SPECTRUM* Illinois Science Teachers Association, pp. 28-29, Summer 1990.
Lang, C. Marvin and Don Showalter. *Yes Virginia,...Learning Chemistry Can Be Fun*, Presentation for Decatur-Springfield Section ACS, 1990.

The Methanol Rocket

This demonstration uses a two liter plastic pop bottle with a metal cap. It produces exhaust like the dancing flame, but in this case the exhaust is directed downward. This forces the rocket up into the air! A straw is securely taped to the side of the bottle and will be used to guide the rocket. Use a large nail to make a hole in the center of the metal cap. Run a string from the top of the room to the floor, a thicker string works better. A thin string causes the straw to get stuck. Use a block of wood or some other fire retardant material to protect the floor from the initial burn.

Pour a few milliliters of ditto fluid into the bottle and swirl to vaporize the fuel. Pour the excess out and recap. Save the excess for future flights. Slide the string through the rocket's straw, this will guide the rocket upward. Ignite the opening of the cap with a butane charcoal lighter. The rocket will fly upward and probably strike the top of the ceiling. Because the bottle has low mass, little momentum is built up so the rocket simply hits the roof and falls back to the floor.

After the cap is used a couple of times a hole usually develops in the side and the rocket will stall out on the launch pad or halfway up the string. Relationships can be made with the cap blowout and the *Challenger* disaster. An excellent readable resource relating to the *Challenger* accident is Richard Feynman's book *What Do You Care What Other People Think?*



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Rockford, IL 61111



MORE THAN RED CABBAGE JUICE

Indicators are substances which turn different colors in acidic and basic solutions. Indicators can be dissolved in either water or alcohol and used in the liquid form. Or absorbant paper such as filter paper or coffee filters can be soaked in the indicator, dried, and then the indicator may be used in the paper form. Litmus is probably the most common laboratory indicator that comes as a paper. Litmus paper will turn red in acids and blue in bases. But some indicators such as phenolphthalein, which is colorless in acid and pink in base, is more commonly used as a liquid.

Many teachers have discovered that boiled and strained red cabbage juice is an acid-base indicator. It turns red in acid, purple in neutral, green in weak base, and yellow in strong base solutions. The juice can be added to different household substances like vinegar, ammonia, lemon juice, baking soda, detergent, soda pop, and antacids to determine whether they are acidic, basic or neutral. However there are many other common substances which are also acid-base indicators and turn a variety of interesting colors.

Phenolphthalein indicators can be made from most common laxatives. The plain kind (without the colors and flavors) works best. Just crush one tablet (making sure it says phenolphthalein on the label as the active ingredient) and dissolve in alcohol. You can dilute this quite a bit, one tablet will easily make 100-200 ml of solution. This solution can be used directly, by adding a drop or two to the solution you wish to test. Or coffee filters can be soaked in this solution and then dried. When the filter is cut into pieces it can be used just like litmus paper. The colors will however be different since phenolphthalein is colorless in acid and pink in base.

Another totally different indicator can be made from turmeric from the spice section of the grocery store. Dissolve a pinch in alcohol. This is quite strongly colored and can be diluted with 100 to 200 ml of rubbing alcohol. Turmeric is yellow in acid and red-orange in base. It can be used in a liquid form or soaked on coffee filters, dried and cut into strips.

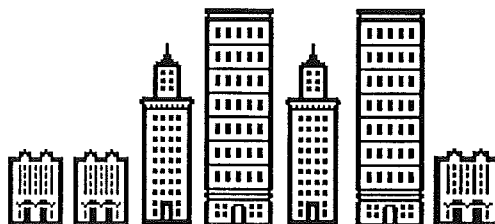
Both phenolphthalein and turmeric in the paper form store well and can be kept indefinitely. This is an advantage over red cabbage juice which spoils in a matter of days even when refrigerated.

There are other types of fruits, vegetables, and flowers which are also acid-base indicators. I have been successful with certain kinds of grapes, berries, and flower petals (even some that were originally white). It would be an interesting activity to have students bring in different materials, boil them in water to remove the dye, strain and test with an acid like vinegar and a base like ammonia to see if they turned different colors.

These activities are directed at the physical characteristics of a city block. By interviewing residents of a city block students will be better able to understand the human side of their block. Interviews should include concerns, interests, skills, jobs and complaints of residents.

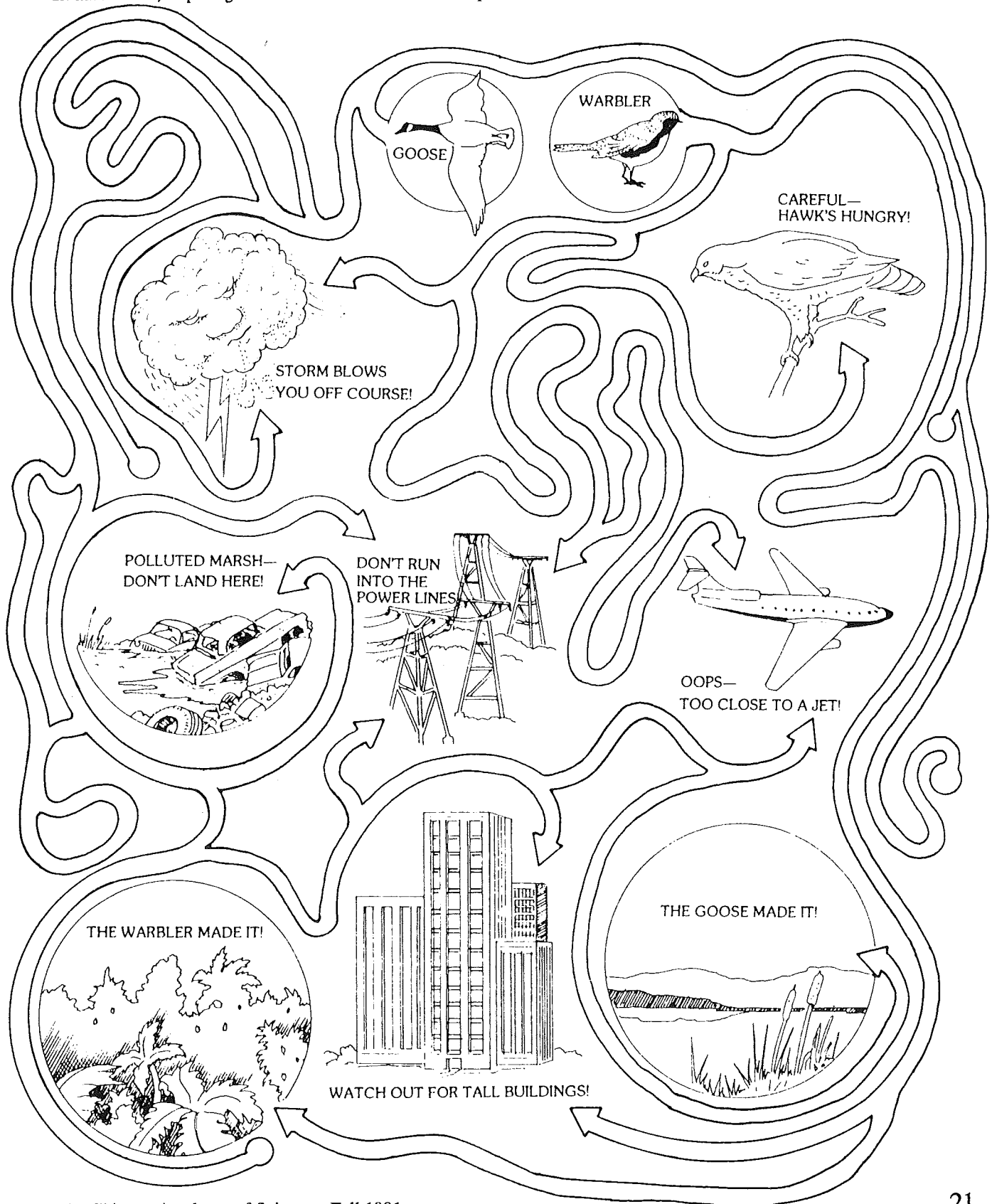
CITY BLOCK ACTIVITIES

1. Count total number of houses.
2. How many are abandoned?
3. List environmental problems (broken windows, needs paint, etc.)
4. Interview residents - prepare exact questions in class.
5. Count number of windows. Average per house.
6. Find width of house. Distance between windows.
7. Estimate height of house. How?
8. Width of street?
9. Length of street?
10. Width of sidewalk? Length? Number of cracks?
11. Distance between cracks?
12. Perimeter of sidewalk block? Area?
13. Number of telephone poles?
14. Number of fire hydrants? Exact location of each?
15. Measure shadows at different times of the day.
16. Examine one brick. Length? Width? Cost?
17. One foot = bricks; One yard = bricks
18. Width of house = bricks; Length of house = bricks. After finding the cost of one brick, estimate total cost of all bricks used in house. Don't forget to subtract the window and door space.
19. Measure windows. Find length, width.
20. Perimeter of window? Area of window?
21. Measure door. Find length, width.
22. Perimeter of door? Area of door?
23. Find number of sewers on street. Location of each? (example - north east corner)
24. Is there a stop sign? Traffic light? One way sign?
25. What are the parking regulations on this street?
26. How many street lights? Do they all work?
27. Are there abandoned cars on this street? If yes, give location.
28. What action can be taken to have the abandoned cars removed?



Migration Maze

Fall is the time when many birds fly south to their winter homes. Some birds travel very long distances during their migration. The Arctic tern, for example, flies 11,000 miles south for the winter! Scientists know some things about migration, but there are still many mysteries. We do know that most birds fly at night. But how do they know when and where to go each year? How do they navigate in the sky? In the maze below, help the goose and the warbler find the safest paths to their winter homes.



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TIE-DYE UNIT

The chemistry teachers at Naperville Central along with art education student Meghan Aspinall have developed a tie dying project to be used in the organic chemistry unit. This unit is taught in the spring when the weather is nice and the students do their dying outside. At the end of the day, the campus is filled with the colorful tee-shirts laying in the sun to dry. Not only is this activity fun for the chemistry students, but it also attracts the attention of next year's potential students.

The first year we tried this project with only a few classes and the second year we expanded the project to include all of the chemistry classes.

The students provide their own tee-shirts. Each class appoints a committee which collects money and purchases the dye. Ms. Aspinall provided instructions, examples of five designs, and patterns for each. Students were encouraged to come up with additional ideas. The project successfully ties chemistry with art, and is a fun activity for those last few days of school when everyone would rather be outside than in the classroom.

Studio Art Objectives:

1. Students learn how to apply special techniques to achieve desired results.
2. The students learn how to manipulate the materials to make different patterns.

Art History:

1. The students learn that the appearance of art works is affected by where and when they were produced.
2. The students learn that tie dyeing techniques may vary in different cultures.

Two of the diagrams are given which can be used when teaching the technique of tie dyeing. They can also be used in an art history lesson or compared to tie dyes from different cultures. Pattern #2 can be compared to the Japanese shibori, the technique is different but the appearance of the final product is similar. Pattern #1 can be related as a popular American design used extensively on tie dyes in the last thirty years. Information for an art history lesson and for tie dyeing techniques can be found in the following books.

A History of Dyed Textiles, Robert Stuart, W&J Mackay & Co. Ltd., Chatham. 1969.

Tie Dyed Shirts and Stuff, Richman's Printing, Fargo, ND. 1988

More Tie Dyed Shirts and Stuff, Richman's Printing, Fargo, ND. 1988

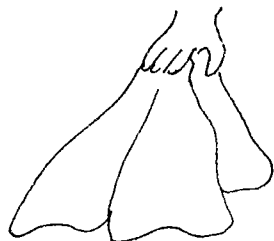
Japanese Costume and Textile Arts, Seiroku Noma, New York: Weatherhill. 1974.

Instructional Resource Overview

Tie-Dyeing Diagrams

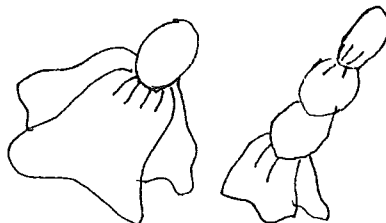
Meghan Aspinall

Tie-dyeing diagrams: These are diagrams which can be placed at the front of a classroom or put up on the walls around the room to be referred to when doing the tie dyeing process. There are also worksheets with the diagrams on them so that the student can refer to them at a later time. These diagrams can be used for junior high and high school students. The diagrams are step by step instructions on how to do four different tie dyeing patterns.

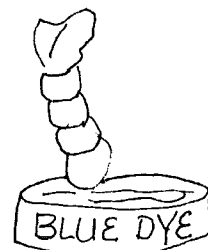


1. GATHER CENTER
OF MATERIAL

DIAGRAM #1



2. TIE RUBBER BANDS ON
TO CREATE SECTIONS



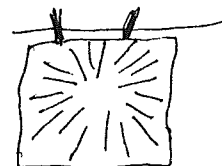
3. DIP FIRST SECTION
IN FIRST COLOR OF DYE



4. SQUEEZE OUT EXCESS
RINSE SECTION IN WATER

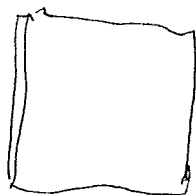


5. REPEAT STEPS 4-6 WITH
EACH INDIVIDUAL SECTION.
AFTER LAST SECTION HAS
BEEN RINSED, RINSE THE WHOLE
PIECE.

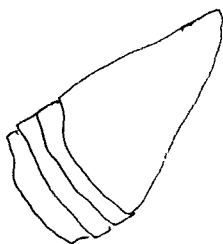


6. TAKE TIES OFF
RINSE WHOLE
PIECE IN WATER
HANG TO DRY

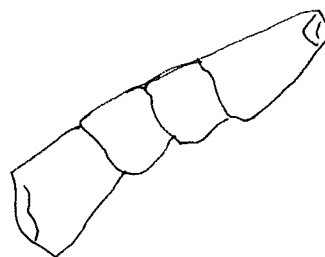
DIAGRAM #2



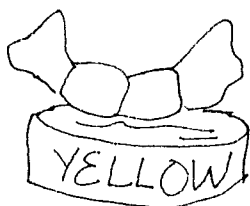
1. FOLD CLOTH IN HALF



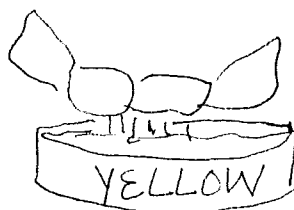
2. FOLD INTO THICK PLEATS



3. USE THREE RUBBER BANDS
AND DIVIDE CLOTH INTO
SECTIONS



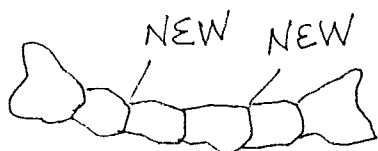
4. DIP TWO MIDDLE SECTIONS
IN FIRST COLORS



5. SQUEEZE OUT EXCESS DYE



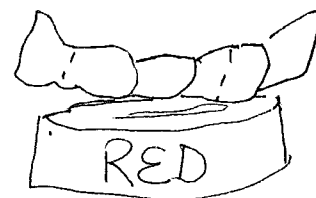
6. RINSE SECTION IN WATER



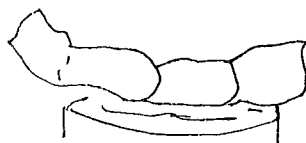
7. ADD NEW RUBBER
BANDS BETWEEN FIRST
RUBBER BANDS



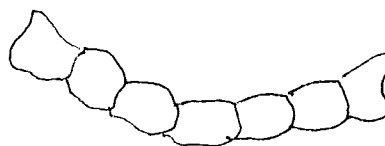
8. TAKE OUT TWO OF THE FIRST
THREE RUBBER BANDS



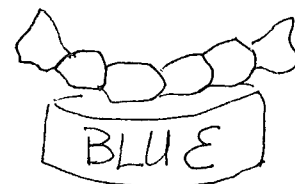
9. DIP IN SECOND DYE



10. RINSE IN WATER



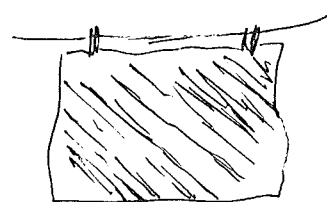
11. ADD MORE RUBBER BANDS



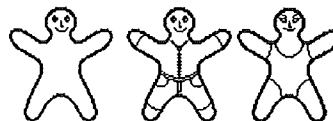
12. IMMERSE IN LAST COLOR



13. RINSE IN WATER



14. HANG TO DRY



BALANCING ACT: CONSTRUCTING MOBILES TO UNDERSTAND BALANCED LEVERS

Level: 6-9 grade

Concept: When a lever is balanced, the following relationship exists: resistance force times resistance arm is equal to effort force times effort arm.

Question: How can objects of different weights be positioned on a lever so the lever will be balanced?

Background: This is a high interest activity illustrating a principle of simple machines. The principle of balancing levers can be used in the construction of a mobile. Each of the dowel rods used in the mobile acts as a lever. The point where each string supports a dowel rod is the fulcrum of the lever. The weights of the objects hung from the dowel rods to keep the lever in balance act as effort forces and resistance forces. The distance between where the weights are hung and the fulcrum correspond to the effort arm and the resistance arm of the balanced lever.

The use of the rubber tubing to attach the objects to the dowel is the key to the success of this activity. If the students simply tie the objects to the dowel, it will slip changing the lever arm distance and causing the mobile to become unbalanced. If students attempt to secure the string with tape or glue, the weight will change also causing the mobile to become unbalanced. Using the rubber tubing will not only attach the objects securely and neatly but also allow the distance between the fulcrum and the weight to be changed easily and accurately.

Students especially enjoy this activity if they are instructed to choose a theme for their mobile. The students have constructed creative mobiles such as "Candy", "Time", "Merry Christmas" and of course "Da Bears". Encourage the students to bring in 8-10 objects so they can select the best objects suited to their mobile theme and design. The finished products can be proudly displayed by hanging them from the classroom ceiling.

Materials:

hot glue gun
glue sticks

Per group of 3:

3/16" dowel rod cut into 1 40 cm. piece, 1 20 cm. piece and 2 15 cm. pieces

16 cm. of 3/16" bore rubber tubing cut into 8 2 cm. lengths

9 pieces of string 8"-12" each

1 metric ruler

1 spring scale (calibrated in newtons)

5 objects of different weights

calculator (optional)

Time: 2 sessions



Rubber
Tubing

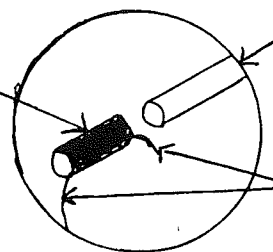
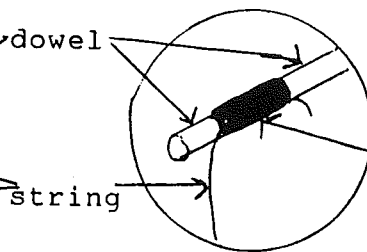


DIAGRAM C



Rubber
Tubing

Procedure:

A. Tie a piece of string to the center of each piece of dowel rod. Use hot glue to secure the string.

B. Attach a string neatly and securely to each object.

C. Weigh the objects and dowel rods and record in Chart A.

D. Construct a mobile (See Diagram B) according to the following procedure:

1. Attach object 4 & 5 to Lever A by using the rubber tubing to attach the string to the dowel (as illustrated in Diagram C). Put the end of the string through the rubber tubing. Slip the tubing over the dowel. Make sure the object is hanging toward the outside of the dowel.

2. Move the position of the hanging object by sliding the tubing until the lever is balanced.

3. Measure the distance between the fulcrum (center) string and each of the hanging objects.

4. Record the measurements in Chart C.

5. Calculate the resistance force x resistance arm. Record in Chart C.

6. Calculate the effort force x effort arm. Record in Chart C.

7. Repeat steps 1-6 to balance objects 2 & 3 on Levers B.

8. Repeat steps 1-6 to balance Lever B and object 1 on Lever C.

9. Repeat steps 1-6 to balance Lever C and Lever B on Lever D.

You should now have a completed balanced mobile!

What can you conclude about the relationship between the resistance arm times the resistance force and the effort force times the effort arm?

EDUCATIONAL MATERIALS

1992 INTERNATIONAL SPACE YEAR: RESOURCE COMPENDIUM FOR EDUCATORS

This compendium, created by the National Science Teachers Association - Space, Science, and Technology Division and the PBS Elementary/Secondary Service, is designed to help educators serving grades K-12 kick off the 1992 International Space Year. It is also designed to help educators and students investigate and celebrate space exploration for many years to come. The comprehensive compendium lists hundreds of classroom resources, including: videos, books, research reports, posters, computer software, space societies, teacher training workshops, music, and more! To order the guide, send a check or money order (only) for \$10.00 to:

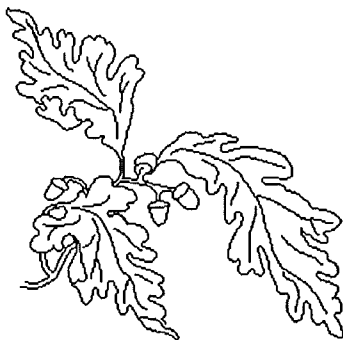
1992-ISY, PBS Elementary/Secondary Service, 1320 Braddock Place,
Alexandria, Virginia 22314 (Available fall 1991)

RESOURCES...RESOURCES

The National Science Foundation has produced (October, 1990) a report: *National Science Foundation Task Force on Persons with Disabilities*. To get a copy of the report contact Jeff Fenstermacher, 1800 G Street, Room 525, NSF, Washington, DC 20550, 202-357-9482.

Booklet: *Reaching out to all people with Disabilities: A Guide for Consumer and Provider Organizations*, (41 pages) by Edwards and Livingston of the Knowledge Utilization Program, Institute for the Visually Impaired, Pennsylvania College of Optometry, 1200 West Godfrey Avenue, Philadelphia, PA 19141.

Dr. Harry Lang has recently had published *Technical Signs Manual* for science terminology. The manual is available for purchase from Captioned Films for the Deaf, Modern Talking Picture Service, 5000 park Street No., St. Petersburg, FL 33709-9989, (800) 237-6213, V/TDD. It is also available from the bookstores at Rochester Institute of Technology and Gallaudet University. Video tapes for these signs are available for loan from Captioned Films.



AMERICAN GEOLOGICAL INSTITUTE
4220 King Street
Alexandria, VA
22302-1507

NEW! NEW! NEW! NEW!

Earth Science Content Guidelines K-12

Item no. 329; paperback; 8-1/2" x 11"; 80 pp.; \$15.00; published Aug., 1991.

This report is a set of questions to guide the inclusion of earth science content into the K-12 curriculum. The questions are organized by content area: Solid Earth, Water, Air, Ice, Life, and Earth in Space; and by grade level: K-3, 3-6, 6-9, and 9-12. Corresponding key ideas and student activities are given for each content area and grade level.

Earth Science Education for the 21st Century: A Planning Guide

Item no. 327; paperback; 8" x 9"; 40 pp.; \$10.00; published Feb., 1991.

Volume discounts are available for each publication:

1-4 copies	No discount
5-10 copies	30% discount
11 or more	50% discount

(Prices do not include shipping and handling charges.)

To order, contact

AGI Publications Center

P.O. Box 2010

Annapolis Junction, MD 20701

Phone: (301) 953-1744



GOVERNMENT OFFERS FREE BOOKLET

To encourage parents of elementary-school students to develop regular activities that teach their children valuable science skills, the Department of Education is offering a colorful free booklet, *Helping Your Child Learn Science*. For a copy, write to Consumer Information Center, Dept. 45, Pueblo, Colo. 81009.

The six-page booklet includes 16 simple experiments with fun titles, such as "Celery Stalks at Midnight" and "Attack of the Straws." There's also a checklist telling parents how to participate in science programs in the schools and a listing of science activities available in most communities.

James H. Kessler
American Chemical Society
Department of Academic Programs
1155 Sixteenth Street, N.W.
Washington, D.C. 20036

The American Chemical Society "Tracing the Path—African American Contributions to Chemistry in the Life Sciences."

"Tracing the Path" is an 18-minute video that traces selected scientific contributions by pre-colonial Africans in Africa, by African Americans in the late 1800s and early to mid 1900s in the United States, and by modern African Americans to the field of chemistry as it relates to the life sciences.

The video comes with an extensive teacher guide featuring hands-on activities for students, along with suggested discussion questions, and teacher demonstrations that relate to information in the video.

The purpose of this non-profit educational program is to show students that people of African heritage have had a long history of significant achievement in important scientific fields and that work in science is an exciting and realistic option in their future.

Science teachers throughout your state can use the "Tracing the Path" video and teacher's guide to help African American students see themselves as scientists and to help all students realize the multicultural history of science and technology.

The video could also be used by teachers and administrators to supplement talks or workshops in schools, science museums, community centers, universities, and other educational settings on the subject of multicultural education.

"Tracing the Path" has been reviewed by teachers from elementary school through middle and high school and by educators involved in the development of multicultural curricula and has been enthusiastically received.

We are also interested in developing a list of institutions and individuals who should be aware of the "Tracing the Path" video. If you know of people or organizations who you believe could benefit from access to this type of video, we would appreciate hearing from you at your convenience.

This new 18-minute video and teacher's guide produced by the American Chemical Society includes:

- Introductory overview of historic African science and technology with an emphasis on traditional African healing.
- Ground-breaking biochemical research by Ernest Just, Percy Julian, and Charles Drew.
- Contemporary African American scientists in microbiology and neurochemistry.
- High school students working in a summer science internship program and on an in-school advanced science project.
- Twelve-page teacher's guide featuring hands-on student activities, discussion topics, and teacher demonstrations.

ACS booklets are available, written for the non-scientist in clear language that explain basic concepts involving chemistry and society. They are: *Biotechnology*; *Chemical Risk: A Primer*; *Chemical Risk: Personal Decisions*; *Ground Water*; *Hazardous Waste Management*; *Pesticides*; *Global Climate Change*; and *Acid Rain*. You can get single free copies of any of these booklets from the American Chemical Society, P.O. Box 57136, West End Station, Washington, DC 20037. Include a self-addressed mailing label. For information on multiple copies call 202-872-4476.

The ACS also has an interesting and inexpensive new magazine for elementary school students, 4th through 6th graders. Called *WonderScience* the magazine comes out 8 times a year. It is in colorful comic book format and costs \$5. a year (plus \$2.50 handling) for 8 issues. For more information, a sample copy or a subscription write to American Chemical Society, *WonderScience Magazine*, P.O. Box 57136, Washington, DC 20037.

Still another good source for reliable information about chemicals and the environment is the 16-page magazine *CHEMECOLOGY*, published by the Chemical Manufacturers Association. Critics, of course, will say this is a biased source since it is supported by industry dollars. I have found it more reliable in its science than similar publications put out by many of the more radical environmental groups. It is not often realized that environmental groups also have a bias—an often extreme no-holds-barred effort to get media attention in order to get new members and new dollars. You can get a free subscription to the monthly *CHEMECOLOGY* by writing to the Chemical Manufacturers Association, 2501 M St., N.W., Washington, DC 20037. Classroom quantities are also available free of charge.

LHS GEMS
Lawrence Hall of Science
University of California
Berkeley, CA 94720
or call (415) 642.7771



WHAT IS GEMS AND HOW CAN I TAKE PART?

GEMS is a growing series of science and math activities developed at the Lawrence Hall of Science, then extensively tested nationwide, modified for classroom use, and published in teacher's guide format. Presentation of GEMS activities does not require special training in math or science. Materials are easy to obtain. Fun and excitement are combined with opportunities for mastering key content and process skills. There are now 29 GEMS Teacher's Guides, ranging from 2 to 15 class sessions each, and from kindergarten to 10th grade. Assembly Presenter's and Exhibit Guides are also available.

For a publication brochure or leadership information please write to the above address.

Flinn Scientific, Incorporated
P.O. Box 219
Batavia, Illinois 60510 U.S.A.
708/879-6900

FREE CHEMICAL HYGIENE PLAN

Flinn Scientific Inc., a national leader in school laboratory safety, has developed a generic chemical hygiene plan for junior and senior high school laboratories. The Flinn Generic Chemical Hygiene Plan is intended to provide some basic guidelines on how to comply with the Occupational Safety and Health Administration's (OSHA) Laboratory Standard.

Over thirty (30) states have adopted this "Laboratory Standard" as law. We expect the remaining states to adopt the Laboratory Standard soon. Consult the 1992 Flinn Chemical Catalog/Reference Manual (pages 532-537) to confirm your state has already adopted the Laboratory Standard.

The Laboratory Standard ensures that employees who work in a laboratory setting will be protected from any chemical exposure that exceeds permissible exposure limits and that employees be educated as to the hazardous nature of the chemicals they use in the laboratory. To achieve this goal, the Laboratory Standard requires the school district to appoint a chemical hygiene officer to develop, implement, and monitor a chemical hygiene plan. The goal of the Flinn Chemical Hygiene Plan is to save you time by providing a generic plan to use as a guide in developing your districts' chemical hygiene plan.

The Flinn Generic Chemical Hygiene Plan is FREE to science teachers! If you would like to receive a free copy of the Flinn Scientific Inc. Generic Chemical Hygiene Plan, please write to:

Free Chemical Hygiene Plan
Flinn Scientific Inc.
P.O. Box 219
Batavia, IL 60510

This resource can only be sent to teachers at school addresses.



RECYCLE

How to set up a School Recycling Program is a step-by-step guide developed by the Council for Solid Waste Solutions for grades 7-12. It includes case studies of successful school recycling programs. Also available is a 12 minute videotape on plastics recycling. One free guide and video will be sent to interested schools with students in grades 7-12. Call 1-800-243-5790 or write the Council at 1275 K Street NW, #400, Washington, DC 2005

INSTITUTE FOR CHEMICAL EDUCATION PUBLICATIONS

Guidebook of K-12 activities, "Fun with Chemistry," \$17.50.

Memory metal. Includes about two feet of memory metal wire in the form of the letters ICE and a four-page description of the chemistry responsible for the shape-memory retention. Experiment by deforming the wire and heating to above 80°C to observe the recovery. \$10.00; Order No. 91-011.

ICE Picks: Recommended Books of Science Activities. An annotated bibliography listing those references that ICE believes should be in the library of every elementary and middle school - and a few that should not. Forty publications that provide information on hands-on science activities and demonstrations were reviewed by teams of teachers and rated for their usefulness in primary science education. \$5.00 each; Order No. 90-001.

Optical Transform Kit: Simulating Diffraction Experiments in Introductory Courses. Experiments involving the diffraction of X-ray, electron, and neutron beams have played a critical role in determining the atomic structures of molecules. This kit provides a safe means for you and your students to simulate diffraction experiments using a laser as a source of visible light and eight different arrays of dots on a photographic slide. The kit includes instructions for use as a classroom demonstration and as a laboratory exercise, two 35-mm slides, and a battery-operated hand-held laser ($\leq 5\text{mW}$, class IIIA) with a lifetime manufacturer's warranty. (The laser makes a great pointer!) \$100 with a laser (battery included); Order No. 90-002L; \$6.00 without laser; Order No. 90-002. A set of 10 additional slides may be purchased for student use for \$5.00, order No. 90-002S.

Please send orders with payment to: Institute for Chemical Education, University of Wisconsin-Madison, 1101 University Ave., Madison, WI 53706-1396.

NEW BOOK PROVIDES BIOLOGY LABS FOR HIGH SCHOOL TEACHERS

From Huntington's disease to dichotomous keys, DNA fingerprinting to schooling behavior and fish, the new monograph, *Favorite Labs from Outstanding Teachers*, bridges a wide range of life sciences topics for high school classrooms. The 25 recipients of the Outstanding Biology Teacher Award (OBTA) offer teaching techniques, labs and topical ideas to enhance classroom experience.

The monograph is available for \$12 to members and \$15 for nonmembers plus \$2 for shipping and handling. Checks should be mailed to NABT, 11250 Roger Bacon Dr. #19, Reston, VA 22090. For bulk orders, call NABT at 703-471-1134.

KIDS FOR CONSERVATION TODAY & TOMORROW KIDS FOR CONSERVATION PRESENTS "KIDS FOR TREES"

Once again, Illinois teachers will be able to treat their classes to an exciting learning excursion, absolutely free of cost. The Illinois Department of Conservation's KIDS FOR CONSERVATION Education Program is introducing a new education kit called "*Kids for Trees*."

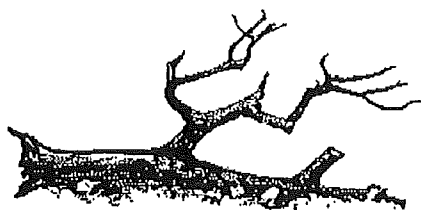
This multifaceted kit was made available at public and private elementary schools throughout Illinois beginning April 1, 1992. The kit comes complete with lesson plans, activities, posters, audiotapes and closed-captioned videotapes. It is primarily geared toward students in grades K-3; however, many lesson plans and activities can be adapted for use in grades 4-6, or in special needs classes.

This program absolutely free of charge. With these education kits, everything needed is right there at their fingertips. Minimal preparation time is required before presenting it to students.

"*Kids for Trees*," the second in a series of education kits (the first was "*Wild Mammals of Illinois*") was developed by the KIDS FOR CONSERVATION Education Program. The purpose of KIDS FOR CONSERVATION is to build children's conservation awareness level about Illinois' natural resources. The first component of the program began with an at-home conservation club which includes periodic newsletters. Unfortunately newsletters can only reach a limited number of children. The plan with the "*Kids for Trees*" education kit is twofold. By putting the kit in the classroom, many more children can be reached with the conservation/natural resource education message. Secondly, the kit will provide educators with a fun, easy way to incorporate natural resource education into all curriculum areas.

Because of the benefit to both teachers and students, the Illinois State Board of Education has encouraged KIDS FOR CONSERVATION to continue its efforts to bring these programs to Illinois schools. Future kits planned for distribution to Illinois elementary schools include "Illinois Birds," "Aquatic Resources" and "Resource Conservation."

One copy of the "*Kids for Trees*" education kit will be mailed to the school administrator in every private and public elementary school registered with the Illinois State Board of Education. Any teacher interested in using the program should contact his or her administrator. In addition, copies of the kit are being distributed to all Educational Service Centers in the state, and may be available to educators on a short-term loan basis.



Kids for Conservation also is making available a separate educational supplement, a 48-page booklet titled "Living with Wildlife." Published in cooperation with the U.S. Fish and Wildlife Service, it combines Illinois-specific information with material produced by the National Institute for Urban Wildlife to educate students in grades 6-8 about animals' habitat requirements in rural and urban settings.

The "Living with Wildlife" supplement will assist teachers in meeting State Goals for Learning in biological and physical sciences. Teachers wanting to request a copy for their classrooms can contact Kids for Conservation, Department of Conservation, 524 S. Second St., Springfield, Ill. 62701-1787, or phone (217) 524-4126.

Kids for Conservation began as a free, at-home club in 1988. Now, more than 139,000 Illinois families with children ages 5-13 receive colorful magazines containing conservation-related stories, activities and puzzles. In addition to producing "*Wild Mammals of Illinois*" in 1991 and "*Kids for Trees*" this year, Kids for Conservation plans to produce educational kits for classroom use on birds, aquatic resources and resource conservation. The program is supported by state general revenue funds and by private donations.

ANIMAL PROTECTION INSTITUTE OF AMERICA
2831 FRUITRIDGE ROAD
P.O. BOX 22505
SACRAMENTO, CALIFORNIA 95822
(916)731-5521

REVISED PRODUCT TESTING BROCHURE AND CRUELTY-FREE PRODUCTS LIST



An entirely new format with significantly updated information is included in API's revised brochure, "*Product Testing: A Way Without Animals*."

Few humane campaigns have been as successful as the campaign to persuade household and cosmetic manufacturers from a misguided reliance on outdated product safety tests on live animals to alternative tests. Nearly every day we learn of more companies who have gone "cruelty-free," but there is still a long way to go to end all such tests.

"*Product Testing: A Way Without Animals*" uncovers the source of confusion as to what is required and what is not required to validate product safety prior to marketing new or "improved" cosmetics and cleansers. The 4-page publication describes two of the most widely used tests, the Lethal Dose, 50 percent (LD₅₀) and the Draize Eye and Skin Irritancy tests. It also explores the expanding availability of humane alternatives and discusses the problems associated with the validation process.

For those who wish to support compassionate product lines with their shopping dollars, API maintains an updated list of manufacturers and also offers a handy checkbook-sized shopper's guide.

ADDITIONAL RESOURCES

Vital Connections: Children, Science, and Books, Wendy Saul and Sybille A. Jagusch, editors. papers from a symposium with the same title. Library of Congress. \$13. Mention stock number 030-000-002270-0. Write check to Superintendent of Documents, US Government Printing Office, Washington, DC 20402, or charge to credit card at (202) 783-3238. (*NEA Today*, March '92)

Where do you turn if students question you about such things as buckyballs, cold fusion, and acid rain?

The Idaho National Engineering Laboratory (INEL) Query Line - or the IQ Line - is now available to secondary teachers and students nationwide who have science- or math-related questions. The IQ Line connects teachers with a coordinator who will then locate an INEL scientist or other professional in the appropriate field. The expert will return the call to answer the questions.

This Department of Energy-funded service is designed to give teachers up-to-date information on new developments in science. INEL professionals have expertise in such disciplines as engineering, computer science, physics, chemistry, mathematics, biological sciences, environmental science, materials technology, and geosciences.

To reach the IQ Line coordinator, Carol Cole, call (208) 526-6572. If resource material is available on specific topics, she will mail it to callers.

Plantwords, Karen Shanberg and Stan Tekiela, is a wild plant cookbook, field guide and activity book for the novice and experienced naturalist. *Plantworks* will help people notice and appreciate the "weeds" that are often found in backyards or a near-by woods or swamp. Every plant from those in the tropical rain forests to those in our backyards are part of our ecological system and deserves our attention, care and respect. *Plantwords* is a tool to achieve this. It is written with field guide quality in one easy to follow style and focuses on only 15 plants. Softcover \$12.95. Review copies are available upon request from Adventure Publications, Inc., PO Box 269, Cambridge, MN 55008; (800) 678-7006. (*MSTA Newsletter*, Spring '92)

Night-Life: Science in the Dark. After years of research, a unique bioluminescence science kit demonstrates light produced by living microalgae. The kit is for hands-on science involving a variety of biologic and physical phenomena. Individual kit: \$12.95 plus \$5 S&H; teacher's kits: available for 5, 10 and 25 students. Units: The kits contain an Owner's Manual and tips and suggests for science experiments and projects. Contact: Protein Solutions, Inc., 390 Wakara Way, Room 63, University of Utah Research Park, Salt Lake City, UT 84108; (801) 585-3128.

FREE - "In the Middle of Science" newsletter, 3x/yr, for middle school teachers. Teaching tips, demos, books, lab ideas. Send your name, school address, school phone num-

ber, and courses you teach to Mary Harris, Editor, John Burroughs School, 755 South Price Rd., St. Louis, MO 63124.

The U.S. Environmental Protection Agency (EPA) is publishing a new quarterly, *Earth Notes*, to provide a forum for exchanging ideas in elementary environmental education. For more information write: Earth Notes, EPA, 401 M St., SW, A-107, Washington, DC 20460.

The American Fiber Manufacturers Association educational tape is available at \$10, P&H included. Contact: American Fiber Manufacturers Association, Inc., 1150 17th St., NW, Suite 310, Washington, DC 20036, attn: Special High School Offer.

Reusable lunch bags, to encourage children to conserve natural resources. Durable, washable, nonshrink nylon bags are \$4.50 each. To have school logo printed on bags, send camera-ready art and a one-time screen setup fee of \$30. Order from Vicki Currie, Naturesaver, PO Box 2834, LaJolla, CA 92038; (619) 459-7819.



STC UPDATE



The recent NSTA Convention in Boston was a great forum for the NSRC's Science and Technology for Children project. It drew record numbers of elementary school teachers interested in hands-on science materials.

At NSTA, STC and Carolina Biological Supply Co. (CBS) offered 10 workshops on 10 units. STC unit developers Wendy Binder and Debby Deal also presented a session on integrating language arts and math with science instruction. STC units offer many opportunities for integrating language skills, including whole class and team discussions and notebooks of science results. STC units also offer bibliographies of children science books, many of which are available through CBS.

New unit development and production continues to move ahead. Soon to be available from CBS are *The Life Cycle of Butterflies* (grade 2) and *Experiments with Plants* (6). Available now are *Plant Growth and Development* (3), *Electric Circuits* (4), *Microworlds* (5), and *Magnets and Motors* (6). Projected for availability in the fall of 1992 are *Food Chemistry* (5) and *Time* (6).

Meanwhile, the following units have been field-tested: *Weather and Me* (grade 1) and *Sounds* (3). And *Comparing and Measuring* (1), *Chemical Tests* (3), *Ecosystems* (5), *Animal Studies* (4), and *Floating and Sinking* (4) are being field tested now or will be in the fall. School systems that participate in field testing are often those that have participated in the NSRC's Elementary Science Leadership Institutes.

If you are interested in ordering STC units, call or write David Middendorf at CBS, 2700 York Rd., Burlington, NC 27215, (919) 584-0381.

INTERESTED IN CONTRIBUTING TO THE ISTA SPECTRUM?

SPECTRUM welcomes contributions from its readers. Won't **YOU** submit some of your **GOOD IDEAS** for one or more sections of the **SPECTRUM**?

ARTICLES

- Thought provoking ideas or commentary about science or science education
- Original research/curriculum development
- Reports of relevant personal experiences

IN FOCUS

IN FOCUS appears in every third issue of **SPECTRUM**. Topic is chosen by the editorial staff. Submissions are invited.

SPECIAL INTEREST

- Important news for specific audiences
- News from other science organizations

MINI IDEAS

- Instructional pieces
- Demonstrations
- Lab activities
- "Grabbers"

OPPORTUNITIES

Activities for professional and/or student involvement

REVIEWS

Your reaction to science-related books, films, audio-visuals, computer programs, curriculum materials, etc.

MEETINGS

Business and pleasure gatherings for science educators

AWARDS/RECOGNITION

Any legitimate honor bestowed upon educators or students of science

POTPOURRI

FIELD TRIPS/WORKSHOPS

Any relevant offerings by not-for-profit organizations

EDUCATIONAL MATERIALS

Free or inexpensive items offered by not-for-profit organizations

SUBMISSION DEADLINES

Fall	June 1 (to members in September)
Winter	September 1 (to members in December)
Spring	December 1 (to members in March)
Summer	March 1 (to members in June)

GUIDELINES FOR SUBMISSIONS

- Copy should be typed or word processed in double-space format. **SPECTRUM** accepts word processed submissions on disk in either, Macintosh, or IBM format. All submissions on disk should be accompanied by a printed copy.
- Line drawings, glossy black and white photos and/or computer generated graphics are welcome. Receipt of all submissions to **ARTICLES**, **IN FOCUS**, **MINI IDEAS**, **REVIEWS** and **POTPOURRI** will be acknowledged by the associate editor.
- Submitted items, including computer disks, will not be returned unless accompanied by a self-addressed, stamped envelope.

YES, I WOULD LIKE TO CONTRIBUTE TO THE ISTA SPECTRUM

I have a good idea that I'd like to share!

Name: _____

School or (name) _____

Business: (address) _____

(city, state, ZIP) _____

(telephone) (____) _____

Home: (address) _____

(city, state, ZIP) _____

(telephone) (____) _____

Title of Contribution: _____

I would like my article to appear in:

___ARTICLES

___IN FOCUS

___SPECIAL INTERESTS

___MINI IDEAS

___REVIEWS

___POTPOURRI

___OPPORTUNITIES

___MEETINGS

___AWARDS/RECOGNITION

___FIELDTRIPS/WORKSHOPS

___EDUCATIONAL MATERIALS

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

___Fall (due June 1)

___Winter (due September 1)

___Spring (due December 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 REGIONS

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Thomas Jefferson School
1307 West 4th Street
Milan, IL 61264
(309) 793-5985

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

REGION III

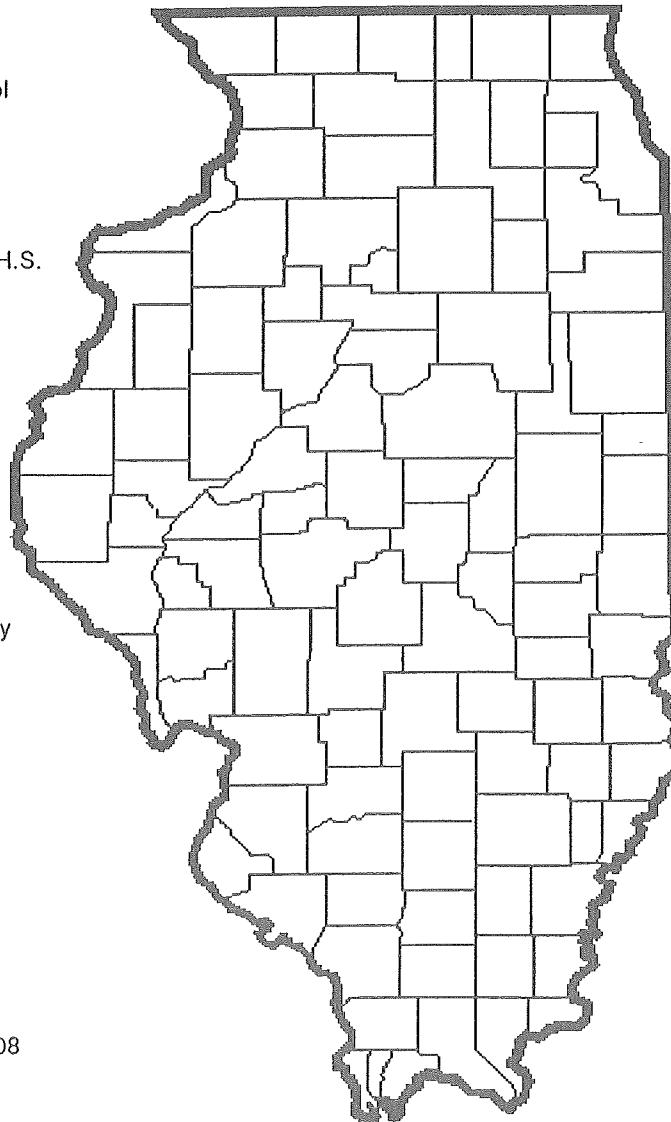
Gail Trujo
Rolling Acres M.S.
5617 N. Merrimac
Peoria, IL 61614
(309) 693-4422

John B. Beaver
Western Illinois University
47 Horrabin Hall
Macomb, IL 61455
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600 Smiley Street
O'Fallon, IL
(618)632-3507

Paulette Burns
Pontiac Jr. H.S.
400 Ashland Dr.
Fairview Heights, IL 62208
(618) 233-6004



REGION I

Maureen Jamrock
Coolidge Jr. High School
155th and 7th Avenue
Phoenix, IL 60426
(708) 339-5300

Barbara R. Sandall
Teachers Academy for
Math and Science
10W 35th Street
Chicago, IL 60616
(312) 808-0100

REGION IV

Marilyn Sinclair
Franklin M.S.
817 N. Harris
Champaign, IL 61820
(217) 351-3709

Gary Butler
Sangamon State University
Biology Program
Springfield, IL 62794
(217) 786-6630

REGION VI

Wes Heyduck
Fairfield H.S.
300 W. King
Fairfield, IL 62837
(618) 842-2649

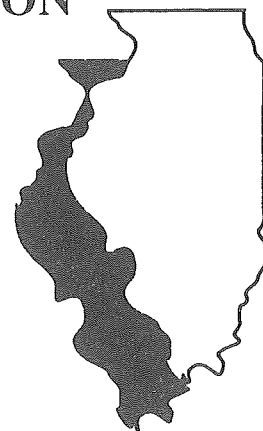
Max A. Reed
Hutsonville H.S.
West Clover St.
Hutsonville, IL 62433
(618) 563-4913

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

MEMBERSHIP APPLICATION



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LAST FIRST

DATE _____ REGION (SEE MAP) _____

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CITY STATE ZIPCODE

EMPLOYER ADDRESS _____
STREET
CITY STATE ZIPCODE

(HOME ADDRESS WILL BE USED UNLESS OTHERWISE SPECIFIED)

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COLLEGE _____ OTHER _____

REGULAR MEMBERSHIP \$20.00
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SEND FORM WITH CHECK OR MONEY ORDER TO:
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GLEN ELLYN, IL 60137

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FALL 1992