Logo*Update*

The Logo Foundation Newsletter ▲ Volume 1, Number 1 - Spring 1993

In this issue...

Welcome to Logo *Update* and the Logo Foundation

by Michael Tempel

In the lead article of this newsletter, Seymour Papert refers to the time around 1980 when Logo moved out into "the real world of schools." I remember that time well. I was an elementary school teacher and it was my world that Logo was coming into.

There was an air of excitement then. *Mindstorms* had just been published. New versions of Logo were being developed for small computers that were finding their way into classrooms.

Now, 13 years later, there is a similar excitement in the Logo world. Again, a new book by Seymour Papert is on the verge of publication. In this issue of Logo *Update*, Carol Sperry reviews *The Children's Machine* and also looks back at *Mindstorms*.

A flurry of activity from Logo software developers has resulted in the recent release of several new versions of Logo. More are on the way. Beginning on page 4 you fill find descriptions of the Logo products offered by six companies.

There are three Logo Conferences being held this summer. The annual *EuroLogo Conference* will be in Athens in August.

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Where's the Elephant?

by Seymour Papert

Logo is about 25 years old and was therefore approximately half-way through its lifetime (so far) when it moved out of a sheltered childhood in the laboratory to become an adult actor in the real world of schools. The first version to achieve any significant circulation was implemented on the TI 99/4, whose 32 spritely turtles allowed far more dynamic displays than is possible even today on any of the mainstream school computers. But despite its relatively klutzy graphics and limited computational power, the Apple was the platform on which Logo was elevated to a social scale, both in terms of numbers of users — in the tens of millions of children — and in terms of its role in the development of educational computing as a profession and an intellectual discipline. A 1986 bibliography already listed over five hundred publications explicitly about Logo and this was only a small fraction of publications that discussed it under other headings. Along with many strengths, this literature has a weakness that I shall be trying to remedy in these columns. Most writing in praise or in criticism of Logo takes a particular form of it as given; my intention here is to adopt what one would call a developmental approach if one were talking about children.

Approaching Logo as an idea in development rather than a fixed thing to be judged has placed me in a third position in relation to debates between people who think Logo is great and those who think it has "failed." Just as Logo encourages children to see bugs as positive things to think about, so I have taken weaknesses in the nature and the uses of Logo as rich sources of ideas about where to go next.*

A 1980 Logo teacher looking at a version from thirteen years earlier and one from thirteen years later might recognize neither as "Logo." The former because it had no turtle. How could it be Logo? The latter — for example the LCSI computational construction system called MicroWorlds — because it has the very features that have come to be seen in debates about educational computing as "the opposite of Logo." LogoWriter had already shifted the terms of one such debate from "should we do Logo *or* should we do word processing" to consideration of how word processing should be integrated into a computational environment. What seemed to be a problem to be *solved* by making a choice was *dissolved* when it became possible to have both. MicroWorlds Logo goes much further by bringing into a Logo environment many more features that have been poles of attraction away from Logo. Among these are drawing in the style of KidPix, buttons in the style of Hypercard, and the multi-processing that is exploited when spreadsheets are used as tools for wider uses than financial planning.

Increasing the speed and memory size of affordable computers allowed a dramatic expansion of what could be done with Logo. But is this trend simply one of throwing in the kitchen sink, or is there also a systematic development of ideas and perspectives?

Some years ago I addressed a similar problem by using a well-known story of three blind men and an elephant as a parable for the multiplicity of facets of computers in general and Logo in particular. Here I shall use a new twist on the story to address the question: Was the direction of Logo's growth governed by rational considerations or the whim of designers?

You probably know the original story: One of the blind men touched the ear and said an elephant is a curtain; the second touched the leg and announced that an elephant is a huge pillar; and the third touched the tail and said, "No, no, it's a small snake."

The story allows us to cast the question about the integrity of Logo as: Where's the elephant? As teachers we might well worry: in our desire to show children many ways to use the computer are we missing the wood for the trees? A hunch about how to pin down my thoughts about this dilemma led me to browse at a number of books. Some were

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* I am sometimes introduced as "the father of Logo." The aspect of parenthood of which I am really proud is not conceiving the idea in the first place, but staying with Logo and participating supportively in its development — as a father should.

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The Logo Foundation is a nonprofit educational organization incorporated in New York State.

Logo *Update* is published three times yearly by the Logo Foundation. Subscription is free.

Logo Tool Box

Here are two Logo tools that may be used in many different projects.

The Pause That Refreshes

There are times when you want your Logo program to print some information, wait for the reader to read it, and then go on to the next part of your program. In many versions of Logo you can wait a specified amount of time, but this isn't really what you want, since some people read faster than others. Here's a pair of procedures that cause Logo to pause until a key is pressed, and then continue:

```
to pause
ignore readchar
end

to ignore :anything
end
```

You might use **pause** like this:

```
To show.off
print [Here's a square.]
repeat 4 [fd 60 rt 90]
print [Press any key.]
pause
print [Here's a star]
repeat 5 [fd 80 rt 144]
end
```

Readchar causes Logo to wait for a key to be pressed and then reports the character to **ignore**, which gobbles it up and then does nothing else with it. So why do we need **ignore**? Remove it

(cont. on pg 6)

Sound Mathetic Advice-"Look for Connections!"

by Carol Sperry

The next best thing to a leisurely chat with Seymour Papert is reading his new book, *The Children's Machine: Rethinking School in the Age of the Computer*. Papert, a longtime "yearner," as he describes those of us who long for diverse, exciting, and personal ways to learn, talks about the inevitable inviability of School, which he capitalizes to separate the institution from the more natural "school" of life. He criticizes School's adherence to a hierarchical structure and a reluctance to adapt to individual, organic styles of learning which value diverse interests, needs, and styles.

Papert continues the conversation started more than ten years ago in his classic *Mindstorms: Children, Computers, and Powerful Ideas*, which, more than any other book, influenced those of us teaching at the time to think deeply about computers in education. We were invited and encouraged to investigate how technology could profoundly change our ways of relating to learning and teaching. I read *Mindstorms* during an introductory course on computers taught by Papert and his colleagues at the New York Academy of Sciences in 1981. That course mirrored the philosophy underscored in the book — participants discussed powerful ideas, imaginations soared, and notions of constructionist learning took on palpable life through our work with Logo. *Mindstorms* continues to touch teachers and parents, from its beautifully wrought *Forward* — where we learn about the toddler Papert in love with gears — through the explorations of Logo thinking. Papert's genius lies in his ability to express complex, affective, and cognitive ideas in a manner that resonates with deep feelings held by many teachers. These feelings have, of course, to do with our abilities to learn and facilitate learning, but extend in a quite natural way to a sense of self-worth and confidence in our own instincts. For many of us, and probably for many of you reading this newsletter today, our lives as teachers, inseparable from who we are, were never quite the same after *Mindstorms*.

In *The Children's Machine*, Papert, the consummate bricoleur, builds on his previous work and pulls together many ongoing themes that permeate his thinking. He reminds us

(cont. on pg. 10)

(Welcome... cont. from pg. 1)

During July there will be a gathering in Australia, where there has long been an active Logo community.

The *VI International Logo Conference* will be held in Caracas, Venezuela in September. This conference is held once every two years in a different Latin- American country. This gives participants an opportunity to interact with educators involved in Logo projects in the host country. In Venezuela, a project which began in a few schools in 1989, has blossomed into a major nationwide effort.

The *V International Logo Conference* was held in San José, Costa Rica where the comprehensive, Logo-based Computers in Education Program has been underway since 1988. The Costa Rican experience is described by Clotilde Fonseca in her article beginning on page 3.

This article is part of what will be a regular feature of Logo *Update*: "Putting Ideas into Action." In each issue, one or two classroom, school, or district Logo projects will be highlighted. In this premier issue, we start at opposite extremes of the scale: The national project in Costa Rica is contrasted with Eadie Adamson's description of her work with one child in *The Best Learning* Is *Play*.

Other regular features of Logo *Update* will include news about Logo users groups, workshops, and courses, and the *Logo Tool Box*. Carol Sperry's book reviews will appear in each issue. Finally, Seymour Papert's article *Where's the Elephant?* is the first in an ongoing series of columns he will write for Logo *Update*, in which he will look at Logo from a historical perspective. As is so frequently the case, Papert does more than shed light on the issues at hand. He redefines the terms of the discussion.

Logo *Update* will also include a variety of items, such as Marian Rosen's *Butfirsties*, which defy categorization. We encourage readers to submit articles that would be of interest to Logo-using educators.

Logo *Update* will be a source of timely information and news; a collection of pointers to resources and other sources of support. One of these resources is the Logo Foundation itself.

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A National Transformation

by Clotilde Fonseca

Fabiana Alvarado is a 12 year old rural school girl who, like 115,000 other Costa Rican children in all areas of the country, participates in the Computers in Education Program.

Fabiana had never used computers prior to her joining the Program. Today she does not use computers only in school. What is more, as she herself puts it: "I asked Santa to bring me a computer for Christmas. My father said we had no use for it. I convinced him that if I got it, I would take charge of his business accounts."

Fabiana's father owns a small furniture store in rural San Isidro del General. Her family "saved and saved" so she could have the computer, and she is presently in charge of her father's accounting.

The use of computers in school changed Diego's personality. Timid and insecure, 12 year old Diego refused to appear in public or participate in school activities. Today, he says the computer has reassured him, made him more secure because he is appreciated for what he does. At his young age, he already shows a talent for architectural design.

Mario, 9, learned to program the computer on paper. His sister Tania, 11, taught him at home using her own notes after her computer lab sessions. When he joined the class, to everyone's amazement, Mario had exceptional command of the tool and was ready for quite complex projects.

The Computers in Education Program was created in 1988 by an initiative of President Oscar Arias Sánchez and his Minister of Education, Francisco Antonio Pacheco. It is a joint effort carried out by the Ministry of Public Education and the Omar Dengo Foundation, a private nonprofit organization created in 1987 to contribute to the improvement of education in Costa Rica.

The aim of the Program is to contribute to the improvement of the teaching and learning process and to modernize Costa Rican society. When it was initiated, some important educational policy determinations were made that defined the mode of implementation.

The decision was made to introduce computers first at the pre-school and elementary school levels. The transformation of the educational process was to begin with the young, who are generally more open and flexible. The objective behind this decision was to contribute to the creation of a generation of Costa Rican children who are better prepared to face the challenges of the future and who are naturally familiar with computer technology and its applications from an early age. This approach also implied a commitment to develop a similar program for the secondary level in the short term.

From the beginning, the Program was designed to bridge out from the schools' educational activities into the communities where the computer labs are located in

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The Best Learning *Is* Play

by Eadie Adamson

If it is true, as Sylvia Weir said, that learning disabled children show us "a magnified, slowed-down view" of learning (1), the experience of working with an exceptionally gifted child shows us learning that is decidedly in the "fast forward" mode. A mathematically gifted fourth grade student spent a year working with LogoWriter as a substitute for mathematics class. For the teacher this work was a challenging and exciting collaboration. For the student it was a year in which intellectual challenge, playfulness, and pursuit of knowledge turned in new directions. The activities pursued in this one-on-one year of study give us a glimpse into Logo-based learning distinguished by playful inquiry and rapid progress.

"Seb" had been accelerated and was a year younger than the rest of his fourth grade class. Seb is one of those children who is comfortable with his peers yet capable of conversing on an adult level. When I observed him playing in the classroom, the sophistication disappeared and he was a typical youngster, full of mischief, excitement, and delight in the world around him.

Seb had already been identified as an extraordinarily gifted child. Possessing strong talents in every academic area, the strength which set him apart from his classmates was mathematics. His parents, aware of his gifts and cognizant of the fact that the home atmosphere can influence a child's intellectual development, provided a great deal of intellectual stimulus at home and maintained a keen interest in Seb's progress. The challenge for me was to provide a substitute for math class: an intellectually stimulating year of work with Logo. We met for about an hour every morning during his class's math time. In addition Seb had a Logo class that met weekly, with a second class period on alternate weeks. As Seb began working on projects with me, he often used the class time to pursue his ideas, generously sharing what he learned with interested classmates.

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We began with Logo geometry. To my astonishment, during that first session Seb progressed from deriving the angles for polygons and writing procedures with variables to writing a generalized polygon procedure. Seb's progress was like that of a mathematically adept adult learner, filled with lively curiosity about how things work. It was clear this was going to be an exciting experience for us both!

While working with the polygons, Seb rather playfully repeated a septagon multiple times. To our surprise, the figure began to change ever so slightly. One of the lines began to thicken, indicating that the calculation of the angle for the turn had to be off by a very small number. As the process continued to run, the distortion of the form increased gradually. This led to a discussion of the importance of accuracy and situations in which such a small difference could be significant. Seb wanted to see what would happen if the septagon continued. How much off course would it go? What would it look like? Would it ever come back to where it started? We set up an experiment on the computer and let it run

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Logo Software Sources

Six companies that distribute software in the United States and Canada have provided Logo *Update* with these descriptions of their products.

Harvard Associates
10 Holworthy Street
Cambridge, MA 02138
800 776-4610

Harvard Associates has developed *PC Logo*™ for MSDOS computers. The recently released version 4.0 includes a number of enhancements:

- EGA and VGA graphics are supported.
- There is an on-line help system.
- *PC Logo* now uses the standard PCX graphics format so that graphics can be transferred between Logo and other programs.
- A mouse is not required, but can be used.
- You can create as many turtles as you want and change their shapes, colors, and the speeds at which they draw.

There is also a version of *PC Logo* for use with the Microsoft Windows operating system. In addition to the features described above, *PC Logo for Windows*™ has separate windows for commands, graphics, editing, and debugging. You can position them anywhere you like.

Data and graphics can be exchanged with other Windows programs and you can integrate Windows API functions and multimedia into your Logo programs.

A user guide which includes both a reference and a tutorial accompanies *PC Logo*. Harvard Associates also distributes a library of additional Logo books and materials. *PC Logo* is also available in French and Spanish.

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LEGO Dacta
555 Taylor Road
Enfield, CT 06082
800 527-8339

LEGO Dacta, the educational division of LEGO Systems, Inc., has developed products that combine LEGO® elements with versions of the Logo programming language. Students build working models using LEGO bricks, gears, motors, and sensors and connect their models to a computer via an interface box.

LEGO Dacta's original computer-controlled product is LEGO TC Logo for Apple II and MSDOS computers. The more recently released *LogoWriter Robotics*™ uses the same LEGO elements and computer interface, but the software combines all of LCSI's *LogoWriter* with the original LEGO TC Logo software.

The new *Control Lab*™ for Macintosh and MSDOS computers uses 9-volt motors, lamps, and sound elements, along with angle, temperature, light, and touch sensors. The software features a Setup page for testing motor, lamp, sound, and sensor connections; project pages with tools for creating interactive buttons and sliders to control the model, and for integrating graphs, text, pictures, and sensor monitors into documentation. There is a Procedure page for writing and editing procedures, and a Command Center for carrying out commands and running procedures.

Control Lab is suited for secondary technology education students. Activities include a lift bridge, a robot arm, a greenhouse, and a color bar code reader.

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Logo Computer Systems Inc.
PO Box 162
Highgate Springs, VT 05460
800 321-5646

Logo Computer Systems Inc. (LCSI) develops and markets a line of educational products based on the Logo philosophy. It has been a leading producer of Logo language products worldwide beginning with *Apple Logo*™ in 1981. Since then the company has developed over twenty-five versions of Logo, including *LogoWriter*®, which is available in eleven languages and is used around the world.

During the last three years, LCSI has been working with a team of educators led by Dr. Seymour Papert, to design and develop a completely new Logo-based learning environment that will let students control the computer even more easily than before. This collaboration has led to the development of the MicroWorlds family of products, which includes *MicroWorlds Language Art*™, *MicroWorlds Project Builder*™, and *MicroWorlds Math Links*™. The design of these products reflects the underlying Logo philosophy that learners are builders of their own knowledge as they interact with the world around them.

- *MicroWorlds Project Builder* includes student and teacher materials that highlight all the new features of the MicroWorlds software and present project ideas that were technologically difficult to execute with previous software packages--both Logo and non-Logo products. *MicroWorlds Project Builder* gives students the opportunity to create projects that include the types of features to which they've become accustomed through video games and other media.
- *MicroWorlds Language Art*, built on the same core software, is for teachers who wish to use technology to enhance their language arts curriculum. The on-disk materials and documentation focus on encouraging students to explore words, text, form and the images these words and text evoke.
- *MicroWorlds Math Links* is for teachers who support the NCTM Standards for Teaching Mathematics. The on-disk materials and documentation focus on linking math to different curriculum areas and suggest projects that students may not perceive as mathematical but that encourage mathematical thinking.

The MicroWorlds family of products are available for color Macintosh computers.

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Paradigm Software, Inc.
PO Box 2995
Cambridge, MA 02238
617 576-7675

Paradigm Software's *Object Logo*™ is a very powerful and sophisticated version of Logo with appeal to both beginning and advanced users, with extensive math, graphics, robotics, and development capabilities.

Object Logo takes full advantage of the Macintosh user interface, including pull-down menus, multiple windows and the availability of more than 16 million colors.

Its math package features true fractional arithmetic, complex numbers, and a full complement of trigonometric and logarithmic functions.

The turtle graphics include an infinite number of turtles, each capable of having its own characteristics and responding to its own collections of Logo procedures.

Object Logo's unique object-oriented environment reduces programming time and enhances the understanding of creating modular programs. Some of its built-in objects include turtles, windows, menus, and timers, all of which can be created and controlled with Logo programs. You can also create your own objects with the characteristics you choose.

Object Logo includes a compiler, which allows Logo programs to run faster. Compiled programs may also become stand-alone applications that can be run independent of Logo.

In addition to a 480-page reference manual, *Object Logo* comes with a comprehensive 200-page tutorial called *Logo for the Macintosh*, written by Hal and Amanda Abelson. Based on Hal Abelson's 1982 book *Logo for the Apple II*, it makes *Object Logo* accessible to learners with little or no prior Logo experience.

Paradigm has also developed the *Pearl Controller*™ , an interface that allows you to use the Apple II or MSDOS LEGO TC Logo systems with your Macintosh and *Object Logo*. The *Pearl Controller* ships with a LEGO TC Logo emulator, a HyperCard stack, and a development environment giving you the same commands as in the original LEGO TC Logo software. You can also access sensors from the menubar, and it is possible to connect as many as 16 LEGO interface boxes to a single computer.

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Softeast Corporation
Knox Trail Office Building
2352 Main Street
Concord, MA 01742
508 897-3172

Softeast Corporation distributes *WIN-LOGO*™, a version of Logo for MSDOS computers that uses a windows-like graphical interface and pull-down menus.

WIN-LOGO has windows, or "areas" for graphics, text, commands, debugging, and help. These windows can be resized and repositioned using a mouse or the keyboard. This is accomplished without the need for the Microsoft Windows operating system. *WIN-LOGO* requires MSDOS.

WIN-LOGO also has these features:

- There are 12 turtles, which can change shape and color, and draw in different pen widths.
- Graphics created using other programs can be imported into Logo.
- A wide variety of graphics cards and printers are supported.
- Users can define their own Logo primitives in C or assembly language and incorporate them into *WIN-LOGO*.

WIN-LOGO comes with both a full reference guide and a user manual.

Softeast Corporation will soon be releasing a version of *WIN-LOGO* for the Microsoft Windows operating system.

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Terrapin Software, Inc.
400 Riverside Street
Portland, ME 04103
800 972-8200

Terrapin Software, Inc. provides Logo languages and Logo-based curriculum materials for all popular computers.

Terrapin focuses on the use of Logo in learning mathematics and programming by continuously updating our software with carefully selected additions to the classic Logo language, and by offering an array of curriculum materials for a wide range of ages and subject areas.

Terrapin publishes *Terrapin Logo*™ for Macintosh, Apple II, and Commodore 64 computers, and *Logo PLUS*™ for the Apple II. We also offer *PC Logo* for MSDOS computers.

Terrapin's comprehensive and growing collection of materials helps teachers integrate Logo into their existing curricula. These books and disk-based materials include

- *Kinderlogo*™ for grades PreK-3, a set of single-keystroke programs for young and special learners.
- *Logo Works*™ for grades 4-8, a first course in Logo that focuses on fundamental geometry concepts.
- *Logo Project Book*™ for fifth graders to adult learners, with lessons and projects for learning about words and lists.
- *Logo Probability*™ for grades 5-10, a Logo-based lab for exploring topics in probability and statistics.
- *Logo Math*™ for grades 6-12, a comprehensive set of tools and games for secondary mathematics learning.
- *A First Course in Programming*™ for grades 9-12, a complete one-semester course in structured programming using Logo.
- *101 Ideas for Logo*™ for grades 3-adult, for use with any version of Logo.

Terrapin also offers *Terrapin Robotics*™, a robotics interface and kit for Macintosh, Apple II, and MSDOS computers. It works with a variety of popular construction kits, including LEGO and Fischer Technics, and is appropriate for explorations in robotics for learners of any age. ▲

Two Other Resources:

ISTE
1787 Agate Street
Eugene, OR 97403-1923
503 346-4414

The International Society for Technology in Education publishes many books and periodicals on the uses of technology in education. These include the *Logo Exchange*, a quarterly journal, and a dozen Logo books. ISTE also supports SIGLogo, a special interest group for Logo-using educators.

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CLIME
10 Bogert Avenue
White Plains, NY 10606
914 946-5143

The Council for Logo in Mathematics Education is an affiliate of the National Council of Teachers of Mathematics. CLIME's mission is to support and encourage the use of Logo in mathematics education. The organization publishes a newsletter and the *CLIME Microworlds* --collections of Logo programs and tools. (The *CLIME Microworlds* are distributed by the Logo Foundation as well as by CLIME.)

Workshop

LCSI invites you to learn more about its newest product

MircoWorlds Project Builder™

by attending one of the free hands-on workshops being held June 10 and June 15 in Edison, New Jersey.

For more information 800 321-5646

Logo Users Groups

by Michael Tempel, Carolina Goodman, & Jane Hirsch

New York--The New York Logo Users Group was started in 1989 by Michael Tempel and Eadie Adamson. In the beginning there was no elaborate plan for the group, just a shared feeling among Logo-using teachers that they wanted to get together regularly to exchange ideas and concerns.

The first meeting was held at the Allen Stevenson School in New York City, where Eadie was teaching at the time. We decided to meet on the second Tuesday of every other month. The Computer School in New York City School District 3 agreed to host the meetings.

We had a regular time and place, but not much structure or content. The first few meetings tended to be rather loose combinations of exchanges of technical information, announcements of conferences, workshops, and new product releases, sharing of ideas, and open discussions.

We have tried different meeting formats. One month we had a hands-on workshop using Logo to explore circles. It was valuable, but uncomfortably rushed in the short two-hour time frame of our meetings. Another meeting was devoted entirely to an informal conversation with Seymour Papert.

Over time, a more orderly format emerged. The focal point for the meetings has become presentations by one or two teachers of their classroom Logo projects. Each presenter usually provides a written hand-out and often a disk of Logo programs for members to take away.

Some of the presented projects have been published.* Laura Allen's *Cityscapes*, Tom Trocco's *Egyptian Hieroglyphics*, and Orlando Mihich's *African Textiles* are Logo Foundation Publications. Orlando's work has also been described in articles in *Logo Exchange* and *Logo Link*.

During the current school year we decided to hold the meetings at different schools, often with the hosting teachers, and sometimes students, making presentations. The change of location allows members to see different computer labs and school environments.

There have been several spin-offs from the New York Logo Users Group. During the spring 1992 semester and again this spring, some Users Group members have participated in an on-going Logo Seminar with Michael Tempel acting as facilitator. The seminars are devoted to developing Logo skills in the context of individual projects. The focus is more

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* See page 14 for more information about these projects.

Starting a Logo Users Group

by Carolina Goodman

What a delight it is to share experiences, projects, techniques, theories, and philosophies with other Logo teachers.

We decided to meet every other month. The same day and time (e.g. third Wednesday of the month 4:00pm-6:00pm) made it easy to remember. We took turns hosting the meeting. Here are some ideas for starting your own interest group.

How to Organize that First Meeting

Be sure to have good snacks and drinks. A computer lab with an LCD monitor is a good place. Have a sign up sheet and name tags available. Designate someone to keep notes. A roster and minutes are helpful.

Begin by sitting in a circle and have people introduce themselves--where and what they teach, and what they hope to accomplish in the Users Group. It would be great to have one person ready to share a project or some information in a formal way. Our first meeting focused on looking at LogoWriter on the Mac LC, presented by a math teacher. The last part of the meeting is a great time to do informal problem solving with specific questions from individuals — or to break up into grade level groups to create a project to take back to class.

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(**Tool Box** continued from page 2)

from the **pause** procedure and you'll see.

Pick of the Letter

Here's a procedure that's so useful, it ought to be a primitive. (Maybe it is a primitive in your version of Logo.) **Pick** randomly picks an item from a list.

```
To pick :lst
output item 1 + random count :lst :lst
end
```

You can flip a coin	`print pick [H T]`
or roll a pair of dice	`print (pick [1 2 3 4 5 6]) + (pick [1 2 3 4 5 6])`
or roll a pair of loaded dice	`print (pick [1 2 3 3 3 4 5 6]) + (pick [1 2 3 4 4 4 5 6])`
or **pick** a random letter from the alphabet	`print pick "abcdefghijklmnopqrstuvwxyz`

(**Pick** works on words as well as lists)

If you **pick** three letters and make a word out of them, how likely is it that you'll come up with a specific word, say "cat." Read Mitchel Resnick's *Logo Overnight** to learn more about this and other random fun. ▲

*Resnick, Mitchel *Logo Overnight* Logo Foundation, NY 1993

VI International Logo Congress

September 20-23, 1993--Caracas, Venezuela

Call for Participation

Since 1989, a computers in education project based on a constructionist methodology has been developing in Venezuela, using Logo as one of its main tools.

The choice of Caracas as the site for the VI International Logo Congress provides participants with a unique opportunity to share experiences with teachers and children who have worked in this project in Venezuelan schools.

Objectives of the Congress

- To exchange experiences, research results, and proposals on the introduction of computers into the educational system.
- To analyze the achievements, advancements and difficulties of nation-wide, regional or individual school projects using Logo as the main platform.

Central Themes

- Development of nation-wide, regional, or individual school projects.
- Strategies and alternatives in teacher education.
- Use of Logo in the development of language skills, mathematical reasoning, and a scientific attitude.
- Perspectives on the use of computers with pre-school children.
- Technology in education from a constructionist perspective: a new alternative for special education?
- Alternative methods of project evaluation.
- Telecommunications in education, a tool to develop projects in constructionist environments.
- Technological and pedagogical advancements with Logo.

Special Guest Speakers

Boris Berenfeld, TERC, USA
Lea Fagundes, Univ. Federal Do Rio Grande Do Sul, Brazil
Clotilde Fonseca, Fundacion Omar Dengo, Costa Rica
Seymour Papert, Massachusetts Institute of Technology, USA

Participation

VI Congreso Logo is for educators, education students and specialists in technology in education. Participation may be as part of the audience or through a presentation of a paper about:

Research: Work in which the scientific method has been used to determine the direct or indirect effects of factors associated with experiences in the use of technology in educational contexts.

Experiences: Presentations of accomplishments, difficulties, and issues in developing projects that use Logo as their main platform.

Proposals: Presentation of ideas, or potential projects that constitute creative and innovative contributions to the use of technology in education.

Spanish to English translation will be available during the main presentations.

Submission of Papers

Authors are encouraged to submit a one-page summary presenting the basic contents of their work. Include you name, title, institution, and the theme or themes covered by the paper. Presentations may be made in Spanish or English. Papers should be sent to the address listed below.

Deadline

Papers must be submitted by June 30, 1993. Authors will be notified of acceptance by July 30, 1993.

Site

The Congress will take place at Universidad Metropolitana, in Caracas, Venezuela.

Costs

Registration: US$100 (US$70 for students)

Accommodations: Rates are US$29 to US$184 per night for a single room, depending upon the hotel. Doubles and suites are available at a lower cost per person. Additional information will be sent upon request.

Use this address to submit papers, to request a registration form, and for further information about accommodations:

VI International Logo Congress c/o Logo Foundation
250 West 57th Street, Suite 2603
New York City, NY 10107
Tel: 212 765-4918 Fax 212-765-4789 Email: michaelt@media.mit.edu

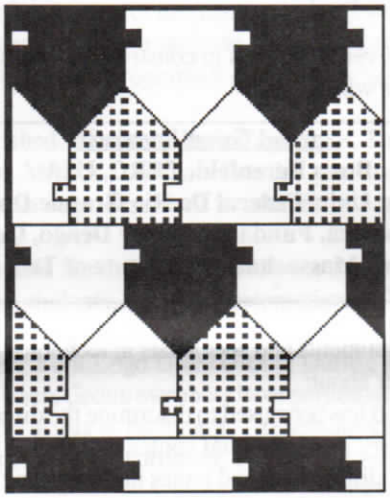
(Best Learning. . . cont. from pg. 3)

all day. Seb took on the task of determining how many times it would be necessary to repeat the procedure so that the experiment could run over an entire weekend.

I asked Seb to devise a way to build a triangular stack of regular triangles. Seb was clearly a strong visual thinker and his analysis of the form was different from what I had intended. Rather than looking at the shape as a series of small triangles building up, he worked from the outside in, seeing a large outer triangle first, then another smaller one upside down, and so on. The end result, of course, is the same as if he had begun with a single small triangle. In the procedure he also used multiplication and division of the variable for size, keeping the number constant. The project presented a meaningful context for looking at a recursive process. Seb wrote another version of a triangular stack that took an input for the base number of triangles and another for the size of each triangle. Again his playfulness with numbers was demonstrated as he experimented with large base numbers and very small sizes, working until he could find a set of numbers that made a stack reaching from the bottom to the top of the screen without wrapping.

When we worked on tessellations, Seb first drew a figure which he planned to use to fill the plane. Then, using a single variable, he proceeded to develop a procedure to draw the shape. I watched astonished as he programmed the procedure itself without the usual moves back and forth from the editor to the screen. He was moving and turning the turtle in his head, amazingly managing to keep track of its position through many twists and turns, using division and multiplication of the variable, and having no need to try it out with the turtle first! His visual sense was clearly very highly developed. Perhaps this is why working with the Logo turtle was particularly compelling for him.

Here is a fragment of the completed design, which is created from a single variable for size:

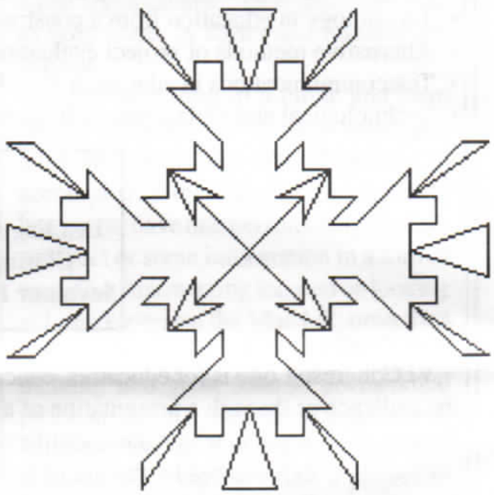


* * *

At times I supplied Seb with problems to solve on his own. Working from the Appendix of Phil Lewis's book (2) Seb explored writing mathematical functions in Logo, solving problems such as conversions to and from the metric system. After working on procedures for transformation of Fahrenheit to Celsius and its reverse, I challenged Seb to make a graphic illustration of temperatures. Seb created a project with two thermometers. His project used the functions he had written. The program would take a Fahrenheit temperature as input, draw and label the two thermometers, and color in the correct temperature level. His playful spirit showed again as Seb became much amused by using numbers that sent the "mercury" bursting through the tops of the thermometers.

* * *

I found work with Seb continually surprising. Problems that might take an average student a long time to complete were explored and solved with dispatch. This affected how I could plan what we would do. I needed always to be prepared to see quick solutions and to be ready to discuss new ideas. Sometimes, however, Seb's intellectual curiosity led him to pursue a project in greater depth, with more persistence over a longer time than expected. This happened first when we worked with Cartesian coordinates. He created a beautiful symmetrical design and then was challenged to plot the points. I gave him a tool procedure to help him with this, expecting he would tire of the process before the plotting of this long series of points was completed. To my surprise, he worked steadily on it for two sessions, and spent several more embellishing the design.



```
to plot :list
if empty? :list [STOP]
setpos first :list
plot butfirst :list
end

to design
plot [[-20 20][-10 20]
[-30 30][-20 30][-20 40]
[-10 30][-10 40][-30 60]
[-20 60][-40 80][-40 90]
[-20 60][-20 70][-10 70]
[-10 60][0 60][-10 90]
[10 90][0 60][10 60]
[10 70][20 70] [20 60]
[40 90][40 80][20 60]
....and on and on....
```

Seb was like a sponge, eager to soak up every new idea. Toward the end of the year, for a report on the solar system, Seb decided to create an animation of a meteor orbiting a satellite, a tough problem. Seb worked on perfecting this elliptical orbit for well over a week. The project led us to discuss kinds

(Cont. on pg. 10)

(**Logo Users Groups** cont. from pg 6)

on teachers' own knowledge of Logo than on classroom implementation. University graduate credit is available for those who want to pursue it.

Two additional users groups have been formed from NYLUG. The Long Island Logo Users Group was initiated by one of our members, Marylin Tahl, to accommodate teachers in the eastern suburbs of New York City who find it difficult to manage the commute into town. In addition to its regular meetings, LILUG also sponsored a Logo seminar for interested members.

Another NYLUG member, Mark Steinberger, felt that we should also be looking at software that is in the Logo spirit, even if it isn't Logo. No one could think of a name for the group, so the flyers went out announcing the formation of :New Users Group. One meeting was devoted to sharing Hyper Studio projects. Simulation software was the topic at another session. There was plenty of discussion about just what "Logo-like" software is, and when and why software other than Logo should be used.

The New York Logo Users Group seems to be solidly established, though it has no formal structure, just a mailing list. A "member" is anyone who has shown up for at least one meeting and left a name and address for future notices--about 120 people so far. There have been between 10 and 50 people at each meeting. The Logo Foundation sends out the meeting announcements for the group. If you want to "join" call or write with your name and address, or better yet, just show up at the next meeting:

Logo Users Group Meeting
Tuesday, June 8, 1993
Spence School
22 East 91st St. (btwn 5th & Madison)
New York City
Call 212 765-4918 for more information

* * *

Los Angeles--A Logo Users Group was started in Los Angeles in November 1991. It is currently a small but dedicated group of public and private school Logo teachers who meet every other month. The formation of the group was motivated by a feeling that Logo teachers need to carve out time to share ideas with each other and to learn from and support each other.

The idea for organizing our group came partly from a similar group on the opposite coast, ASTROLUG (Albany Schenectady Troy Logo Users Group) whose members assisted Molly and Dan Watt in offering The Logo Institute in 1988. (Hello, ASTROLUG, are you still there?) Jane Hirsch, one of the attendees from the West Coast, took home the idea of a Logo Users Group, gestated it for five years, and has at last seen it come into existence in Los Angeles.

Initial discussions centered around what our expectations were and how we could telecommunicate. Logo Express seemed the most natural vehicle, but not all of us had it. We can also use CORE, the free network open to all teachers in California.

At our first meeting, Mike Sewell of Mirman School highlighted the features of Macintosh LogoWriter and shared some of the projects he and his students have developed in math, including one they developed for graphing.

At the second meeting Allan Hancock of Berkeley Hall School presented many wonderful lesson ideas for elementary school students. One of the student projects was using a PICK procedure to explore forming 3-letter combinations. Allan's students enjoyed another use of random in a racing game.

Jane Hirsch gave a demonstration of *Object Logo* which makes it possible to control Macintosh objects, such as windows and buttons, through Logo, and also to write a Logo program and then turn it into a "stand alone" application that does not require Logo to run. There is also a robotics interface for *Object Logo* and a lower-cost student version which includes a highly readable student manual written by Harold and Amanda Abelson.

After these presentations, there was informal teaching and sharing of ideas, and spirited discussions of the relative virtues of a planned computer curriculum versus letting children's skills evolve on a more individualized basis.

Two members of our group have written Logo books (not yet published). Linda Jones of California State University, Northridge, wrote one for a Logo course she teaches to preservice teachers. Look for Linda's 1993 science text *Engaging Students In Science* published by Merrill-MacMillan, which includes Logo activities. Dave Kressen presented his rough draft on advanced Logo for middle school at the March 1993 International Conference for Technology in Education at MIT. (You can contact him through Pacific Oaks College in Pasadena.)

Carolina Goodman and Gwen Roberts used part of a Logo Users Group meeting to practice their presentation "Transformational Geometry: From Manipulatives to Logo," which they gave at ICTE. We also had an opportunity to look at a new version of Logo for MS-DOS computers called WIN-LOGO by Softeast Corporation.

On the "off" months, we have met with a local section of the California Mod Tech Consortium. Mod Tech is the support group for CORE, the state-wide network set up through the State University system. While these meetings are devoted to telecommunications, their discussions and workshops cover the full range of topics from the latest hardware and software to computer coordinator issues. CORE has a gateway to Internet, and we were delighted to find a useful Logo newsgroup—COMP.LANG.LOGO. Brian Harvey's UCBLogo is available on line!

The LA Logo Users Group is eager to expand its membership. All are welcome!

Contact: Carolina Goodman
Campbell Hall
4533 Laurel Canyon Blvd.
North Hollywood, CA 91607
818 505-9892 ▲

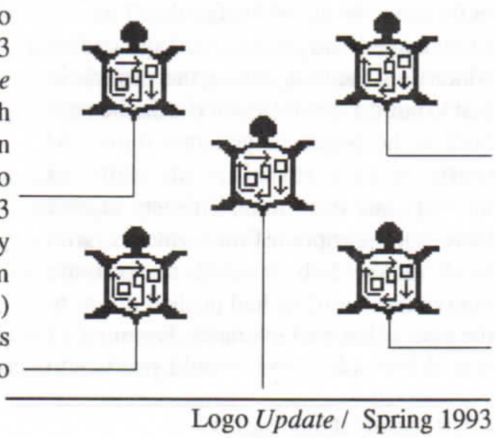
1993 International Logo Conference

Melbourne Australia

July 4 - 7, 1993

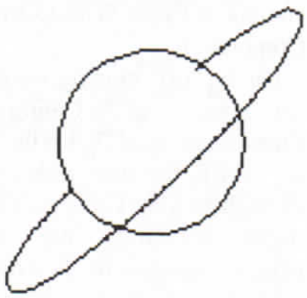
Keynote Speakers:
Idit Harel & Barry Newell

For more information contact:
Methodist Ladies' College
207 Barkers Road
Kew, Victoria 3101 Australia
Telephone: 03 274 6412
FAX: 03 819 2345
Email: K0331@applelink.apple.com



(**Best Learning** . . . cont. from pg. 8)

of curvatures, headings, positions, and methods to test that the meteor was following the same track with each "rotation."



```
to orbit
pu
setpos [178 68]
pd
seth 50
st
repeat 15 [fd 1 rt .125]
fd 2
repeat 10 [fd 2 rt 1.5]
fd 4 rt 28.25
repeat 3 [fd 2 rt 27]
fd 4 rt 28.25
repeat 10 [fd 2 rt 1.5]
repeat 35 [fd 1 rt .125]
repeat 65 [fd 1 rt .125]
fd 2
repeat 10 [fd 2 rt 1.5]
fd 4 rt 28.25]
repeat 3 [fd 2 rt 27]
fd 4 rt 28.25
repeat 10 [fd 2 rt 1.5}
repeat 20 [fd 1 rt .125]
pu
ht
repeat 65 [fd 1 rt .125]
st pd
orbit
end
```

* * *

When we turned to fractals, I began by drawing a single example of a "square" fractal, in which the center third of a line is replaced by a square "bump." Seb quickly wrote a procedure with a variable to draw the form. I drew for him a half-size version of the next "level" of the fractal. "I get it," he exclaimed, and programmed a procedure which used the first, cutting the variable in half to build a second level. His excitement built as he began to generate more and more levels, refusing attempts at interruptions from me. With any learner there is an appropriate time to interject with next ideas. Seb wanted no outside intervention until he had pushed things to the limit of his own tolerance. Eventually I was able to ask, "Now would you like to see another way to do this?" and show him a recursive procedure to generate a fractal. Seb went on from this to alter the procedure so that it drew fractal "bumps" for triangles, pentagons and hexagons.

The progress of a very bright young student working with Logo resembles an adept adult in the speed of learning. What distinguishes the child learner is the playful inquiry into ideas. Adults have learned, sadly, to leave this spirit of play behind. Teachers need to allow the student time to be playful as they explore new ideas. The playful aspects of Logo are doorways opening into new knowledge. Seb's journey during the year would not have been so astonishing or so interesting without this aspect of play which often led our investigations in new directions. It also required tolerance from the teacher and a willingness to see this play as a necessary part of the learning process. Do any of us play enough any more?

References

(1) Weir, Sylvia. *Cultivating Minds: A Logo Casebook.* (Harper & Row, NY, 1987) pg. 5

(2) Lewis, Philip G. *Approaching Precalculus Mathematics Discretely.* (MIT Press, Cambridge, 1990)

This article is an excerpt from *From Polygons to Functions to Orbits to Fractals,* which is available from the Logo Foundation. ▲

(**Starting a Logo** . . . cont. from pg. 6)

Where to Advertise

Prepare an article, an ad, or a flyer with a contact name and phone number. We advertised through several channels:

- Our county superintendent of schools has an office of technology that sends mailings to all county schools.
- The largest school district in the area, Los Angeles Unified, included an ad in their technology newsletter.
- The state computer teachers' organization would be a great place for an article or ad. They also have affiliate groups in the area that have their own newsletters.
- *Logo Link* , Logo *Update*, *Terrapin Times*
- Check with LCSI for LogoExpress hosts in the area.
- California has a free electronic network through the State University system.
- California also has a free electronic network through Fred-Mail.
- Several commercial electronic networks, including CompuServe, have Logo forums.
- Contact the local colleges and university Educational Technology professors to pass the information along in pre-service or in-service classes.

Make an assignment at the first meeting that each person bring someone new to the next meeting!

If you would like more information or assistance in beginning your own Logo Users Group, or if you have started one which you would like to tell us about, contact:

Logo Foundation
250 West 57th Street
New York, NY 10107-2603
Phone: 212 765-4918
Fax: 212 765-4789▲

(**Sound Mathetic** . . . cont. from pg. 2)

that, in spite of the power of the new technologies to create "personal media capable of supporting a wide range of intellectual styles," School has remained static, rarely utilizing the ways we most naturally learn and insisting on a curriculum-bound base with its calculated number of fixed items to be transmitted to the student. Avoiding the simplistic and flawed notion of computer as technological fix, Papert wonders at the expectations of those who place computers in otherwise unchanged classrooms. He warns that "dissatisfaction within society at large is rapidly making it impossible to save education as we know it by continuing to tinker around its edges." He asks us to rethink our assumptions, to value multiple ways of knowing, and to attend to the importance of bodies of knowledge that draw on this country's diversity.

The publication of *Mindstorms* brought Papert an avalanche of letters from teachers, and invitations to many schools put him more solidly into their world. In *The Children's Machine*, he inveighs against School's attempts to make teachers into technicians and honors teachers' efforts to battle the system's hierarchical ways of thinking about learning. The book is peppered with tales of formal and informal learning experiences, such as forays into "kitchen math" and the pedagogical lessons of the general culture: Remember how "Baby" learned to dance in the movie, *Dirty Dancing*. We hear stories of teachers,

(Cont. on next pg.)

(Sound Mathetic . . . cont.)

school cultures, and even the saga of an entire country's cooperative effort to help teachers and community appropriate technology and the shift in educational philosophy that such a move warrants.

As in any conversation, Papert shares many of his own learning experiences with us and seems, in that action, to ask us to revisit our own most potent learning experiences and find those moments that excited and moved us the most to learn. He might easily call this practice a mathetic concept, as he explains in an intriguing chapter called "A Word for Learning." We need a name for the art of learning, he says, for our various collections of methods of learning. Papert resurrects the very good word he proposed in *Mindstorms*: mathetics. At the heart of this chapter is Papert's own story of how he learned to overcome his inability to remember names of even the most common flowers. This is a lovely and informative account of an individual journey of learning, of finding ways to learn. He discovers a mathetic principle that works powerfully for him — that of connecting what he calls a "hot" area — his love of etymology, with a "cold" area — this strange business of flower names.

Papert's flower story illustrates what is possible when we look at "learning as a dimension of life," and not as a School-bound activity. Our efforts to construct mathetically rich environments replete with the exciting tools technology has to offer could catapult our expressions of learning into a humane, inclusive, joyous activity that would satisfy even the most dissatisfied Yearners among us. ▲

HyperStudio To Include Logo

HyperStudio, a multimedia program originally designed for the Apple IIgs, is being released in a Macintosh version. This new version will include a programming language, and that language is Logo! For more information contact:

Roger Wagner Publishing
1050 Pioneer Way, Suite P
El Cajon, CA 92020
619 442-0522
FAX: 619 442-0525

(National . . . cont. from pg. 3)

order to contribute to the socio-economic development of different areas of the country and to reduce the generation gap which might result from intensive computer use exclusively by the young. In the evenings, the school computer labs are used by adults who are learning to use word processing, spread sheets, data base, and other software.

The Program has a broad geographical basis. In order to provide equal opportunities to children in all area of the country, priority has been given to rural and inner city schools.

In most schools, there is a laboratory containing 20 computers with color monitors, a printer, and a local network. Beginning in 1991 telephone lines and modems were installed in order to connect the schools into a national telecommunications network. This allows better technical and pedagogical support and provides the children with the benefits derived from national and international communications.

Students generally attend the lab for two 40-minute periods per week, working in pairs at the computers. Teamwork and cooperation are fostered and interdisciplinary projects are encouraged.

Normally, all the students in the school attend the sessions. They go to the lab in the company of their classroom teacher. There they work with the support of a lab teacher, who is actually a classroom teacher herself working overtime in the lab. The laboratory provides a time and place for exploration.

Students are introduced to the computer through the use of Logo. This powerful educational tool was carefully selected to meet the Program's pedagogical objectives. One of the central elements leading to the selection of Logo was the fact that it requires the teacher's active involvement, not only in the command of the technology, but more important, in using his or her own potential to generate learning contexts — microworlds — for and with the students.

Within the Program most lab activities are centered around educational projects defined jointly by the classroom teacher and the lab teacher. These projects are almost always related to the children's curricular activity and are realized on the computer through the use of Logo.

Around these projects, children do research, plan, discuss ideas, and decide on the characteristics of the specific concept they want to develop. They look to the teacher for support and guidance as to the computational or education tools needed to put it into being.

An example of an interdisciplinary project is the study of the rain forest carried out by students in San Isidro de Perez Zeledon. Their studies took them to the forest and the library. They interviewed scientists, government officials, and their neighbors. The results of their investigations included models of volcanos, and collections of soil and leaf samples as well as Logo projects that included charts and maps, and animations and drawings of flora and fauna along with descriptions and poems.

In 1991, students from several schools contributed colorful designs and drawings to a collection of Christmas cards that were distributed by the Omar Dengo Foundation.

Students in Limon share experiences and Logo projects with friends in New Brunswick, Canada via telecommunication.

* * *

From the beginning, teacher education has been the cornerstone of the Computers in Education Program. A group of twelve Ministry of Education teachers and professors from the University of Costa Rica were selected to start the training program. These first "tutors" attended a three-week workshop in the winter of 1988 which was personally led by Seymour Papert. These tutors became the leaders in the training program and the core element in the follow-up and support activities which constitute one of the central building blocks of the project.

Over the years, new tutors have joined. Some of them have their base in the different regions they have been appointed to and are responsible for day-to-day support.

In each school, the principal and two to four teachers are formally trained as lab teachers. Participation of the school administrator has been a crucial element in the Program's success.

Teacher education is an ongoing process. Every year all lab teachers in the Program attend a two-week workshop. Special sessions are also offered to inform and involve

(Cont. on pg. 12)

(**National** . . . cont. from pg. 11)

classroom teachers.

The focus of the Program is on education more than on technology. As a matter of fact, in the selection of lab teachers there is no requirement as to previous computer experience. What is essential is the teachers' interest in renewing methodology and their openness to change. The teacher should have a certain mental framework to be able to see him or herself as a facilitator and to be able to break away from the traditional "teacher as authority" concept.

In-service training and constant support constitute the fundamental pillars of the Costa Rican Computers in Education Program, and are carried out at a national level and in the various regions of the country.

An annual meeting of the Teachers of Educational Informatics is held yearly for the purpose of expanding teachers' knowledge of the field and allowing them to exchange ideas and concerns. In 1991, this annual meeting became an international conference which was planned to coincide with the 5th International Logo Conference held in Costa Rica in November 1991.

In addition, since 1989, the program hosts an annual Children's Computers in Education Conference. In this activity school children from all over the country meet to present the premier projects developed in their schools during the school term. The projects prepared for each conference are guided by an overall theme such as Science and Technology, Human Rights, and Sustainable Development.

The Costa Rican Computers in Elementary Education Program is the result of much planning and effort on the part of Costa Rican intellectuals, politicians, and educators. The Program selected a model of introducing computers that is "teacher-centered" in the sense that it relies on the talents and enthusiasm of teachers for its success. The positive response of the Costa Rican educators has been the cornerstone of the Program's success. Those teachers have accepted the challenge of opening up to information technology and attempting to change and enrich an otherwise obsolete educational system.

The Costa Rican Computers in Education Program is characterized by "a sense of mission," as Dr. Seymour Papert has stated. The Program's focus is beyond the scope of technology; it aims at the gradual transformation of Costa Rican education and society.

Dr. Claudio Gutierrez, a researcher in the area of artificial intelligence and former President of the University of Costa Rica, has said about the Program and its teachers: "I rejoice with you in the existence in Costa Rica of a non-directive educational program based on computer science . . . Logo children are discoverers . . . The teachers accompanying them are not kings: the highest title to which they can aspire is the honor of being called "baquianos" (which means "pathfinders") . . . What a beautiful definition of the present day teacher!"

Many Costa Rican teachers are slowly starting to become facilitators and travel companions — "baquianos" — in this exciting and demanding era of knowledge exploration and technological change.

To them, the computer may very well become a springboard for professional development and personal change. For the children, as Fabiana, Diego, Mario, and Tania very well show, this process has already begun. ▲

(**Welcome** . . . cont. from pg. 2)

The Foundation was created in 1991 when two companies, Logo Japan and Logo Computer Systems, provided start-up funding and asked Seymour Papert to create a nonprofit organization devoted to supporting Logo.

As we worked to define the collection of activities that would carry out that mandate, two broad categories emerged.

First, the Foundation is a source of publications about Logo, including this newsletter. We distribute books from selected publishers; research reports; descriptions of classroom, school, and district projects; and collections of Logo tools. Often, articles in Logo *Update* will be pointers to larger documents. For example, the Logo Foundation distributes *Computadoras en la Escuela Pública Costarricense*, Clotilde Fonseca's book about the Computers in Education Program of Costa Rica, as well as a brief video tape about the project. Eadie Adamson's article is an excerpt from her paper *From Polygons to Functions to Orbits to Fractals*, a Logo Foundation publication. If you wish to receive the complete list of Logo Foundation publications, check the appropriate box on the Response Form at the end of this newsletter.

Second, the Logo Foundation provides direct support services for educators including workshops, courses, and seminars; Logo users groups; and conferences. Our emphasis is on projects with a long-term commitment to working with Logo. Professional development is an ongoing process. Check the appropriate box on the Response Form if you wish to receive more information about these services.

You should also use the Response Form to request a subscription to Logo *Update*. This first issue is being sent to over 50,000 people. The Logo software companies whose product descriptions appear inside have generously provided their mailing lists for this purpose. We cannot afford such a large mailing again. To continue to receive Logo *Update* you must request an ongoing subscription. This subscription is free of charge.

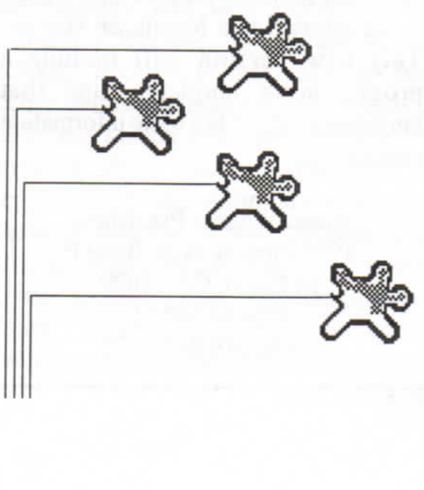
Finally, please consider making a donation to the Logo Foundation. The Foundation is a publicly supported, nonprofit organization. Individual contributions are an important part of our funding and enable us to continue our service to Logo-using educators. All contributions are tax deductible.

Thank you for your support. We look forward to serving you in the future. ▲

Valiant Turtles Can Come Out of Storage

For many years, Valiant Technology, Ltd., of London, England, produced a robot turtle for use with various versions of Logo. Until recently, service for these creatures was hard to come by in North America. Now Valiant has a distributor in the United States. So, if you have an injured Valiant Turtle that's been sitting in storage, you may be able to revive it.

Contact:
Valiant Technology
188 Industrial Drive
Elmhurst, IL 60126
800 552-9869



(. . . **Elephant?** cont. from pg. 1)

obviously relevant: books about computers, about education, and about putting the two together.

The critical logician in me felt a little silly when the associationist bricoleur in me reached for Robert Dehort's *The Life and Lore of the Elephant* and *Why Animals Have Tails*. "It's just a metaphor, stupid!" said the logical me. "Real elephants have nothing to do with this!" But the bricoleur won, for the trail led me to see the connection between ears, legs, and tails in a deeper light than I had before. And it turned the story into a much better metaphor for parts and wholes of understanding.

Why *does* the elephant have such big floppy ears? Last month I would have said, "Must have to do with how and what the elephant hears." No doubt, but I learned something else from Robert Dehort's lovely book. Because an elephant has so much more volume than surface area it has a hard time dissipating heat and the big floppy ears contribute by serving as radiators. I suddenly imagined the blind man exclaiming as he touched the leg: "Gee, there's not enough skin here to blow off the heat from all the muscles in this leg. . . . I bet this thing has big floppy ears."

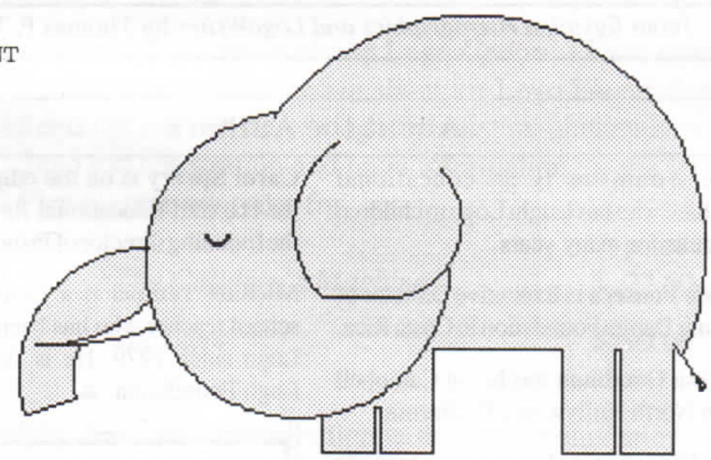
The smallness of the tail can also be connected with the bigness of the legs. If you look at a dinosaur or a cat you will see how in both cases the tail helps to balance the animal. But an animal with a squat body like an elephant firmly planted on its four big columns of legs doesn't need a counter-weight in a tail.*

By this time the meaning of the word "blind" in the original story had changed for me. In its complacent reading the story allows those of us who are blessed with sight to congratulate ourselves on seeing the connections between the ears, legs, and tails of the elephant. But to "see" real connections we also need a spirit of playful, exploratory inquiry and skill in the unnamed art of making connections. And most of all, we need to have a taste for making connections, to retain the joy in connecting that is innate in all of us — though so often attenuated in school by habits of dissociated learning.

The relationship between parts and wholes has been an important theme of Logo from the beginning. But the difference between the two views of the parts of the elephant brings out one respect in which Logo has made progress in this domain. A traditional Logo approach to "making an elephant" might begin with an analysis into parts in order to set up subprocedures to draw each of them. The elephant is the superprocedure that combines the parts:

```
TO ELEPHANT
HEAD
BODY
LEGS
TAIL
END

TO HEAD
SKULL
TRUNK
TUSKS
EARS
END
```



...and so on.

But while it is a strength of Logo that the parts can be dealt with independently, the second version of the elephant story highlights a weakness that was the mirror image of this positive quality: Logo was better at separating parts than at dealing with *systems* made of elements that interact dynamically with one another. A spreadsheet comes closer to being a "system": When you change one number in a spreadsheet many others change as well. An animal is a system: When a part evolves, other parts may have to evolve as well. Even a videogame is a system when characters and objects respond to what the others do.

(Cont. on pg. 14)

* The word "squat" was added to fix a bug in my original argument pointed out by Michael Tempel. Think of a brontosaurus.

Butfirsties

by Marian Rosen

I was sitting in a workshop at a national convention and I was angry. The topic was the teaching of Logo and we hadn't had one good laugh all day. I began playing a game I used to play when I was bored in school. I start with a combination of letters such as 'unk and prefix it with consonants or blends. . . bunk, funk, gunk, junk, clunk, stunk, etc. Propers names are allowed. I've never been able to find a letter clump that makes more words than "ail," but I keep trying.

And then it hit me. . . . Butfirsties. Logo has a reporter **butfirst** that reports all but the first letter of a word or all but the first word of a list. e.g.,

```
Print butfirst "logo
```

gives `ogo`

```
Print butfirst [I am
teaching logo]
```

gives `am teaching logo`

A new word game was born.

A serious bird is a STERN TERN.
A mother kangaroo with octuplets has a POUCH OUCH.

The program might look like this:

```
to butfirstie :wrd
op se :wrd butfirst
:wrd
end
```

Try your brain on these (answers are on page 14):

1. The remains from a bank fire.
2. A cafeteria object found in a teachers' lounge.
3. Midwest farmer discussing the crop.
4. An unusual stove.
5. A new mine.
6. A thin missile.

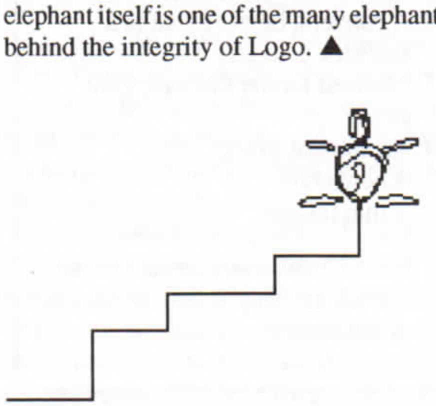
Got it? Send in any good ones you can think up. Maybe we can have a Butfirstie corner.

(... Elephant? cont. from pg. 13)

But anyone who has tried to program a videogame in Logo (or most any other language!) will know how hard is to make this happen.

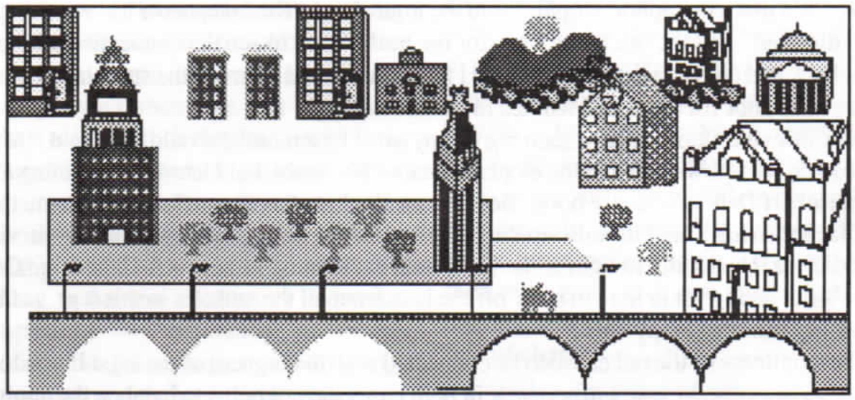
Recent developments in Logo take advantage of greater computer power to remedy this deficiency. For example, my colleague at MIT, Mitch Resnick, has made a Logo called *Logo which allows many thousands of turtles to interact in "soft simulations" of such phenomena as traffic jams and the social behavior of ants. The key feature of *Logo (which runs on a supercomputer called the Connection Machine) is that the procedures for the various creatures can run at the same time. It is an example of "parallel" computing or "multiprocessing."

On a more accessible plane, the latest version of Logo from LCSI (soon to be released in a Macintosh version under the name "MicroWorlds") allows smaller numbers (tens rather than thousands) of turtles each to run its own independent program at the same time. Thus the operation of an entire "project" is more like the image of a population of people interacting with one another than like a series of procedures coming out one at a time to do their thing. Where then is the elephant? In subsequent columns I shall develop the analogy between the biological and the Logo elephants along the lines of comparing the ideas that most powerfully allow us to see connections in the two cases. At least one of these powerful ideas is shared: the idea of system as a unifying concept. But each kind of system has its own specific intellectual connectors: The relation of form to strength and to energy plays a major role in determining how the parts of an animal interact. In the case of Logo (and computation) the connecting ideas are the ideas related to parts, wholes, and connections themselves. Thus the elephant itself is one of the many elephants behind the integrity of Logo. ▲

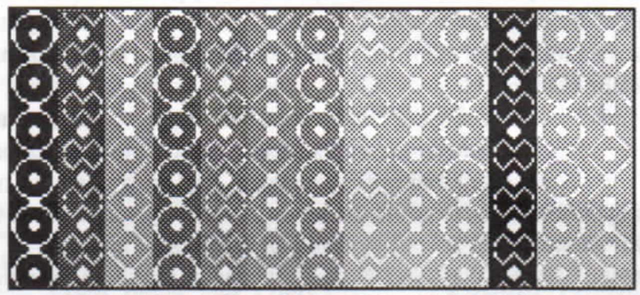


Classroom Logo Projects

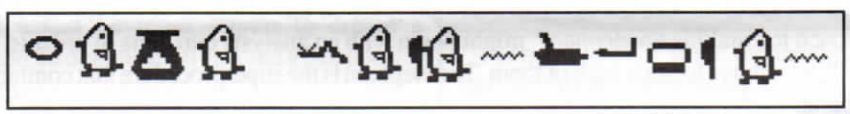
These images are from project reports written by teachers and published by the Logo Foundation. You may use the Response Form on the next page to request the list of publications.



From *Cityscapes* by Laura Allen



From *African Textiles* by Orlando Mihich



From *Egyptian Hieroglyphics and LogoWriter* by Thomas F. Trocco

About the Authors

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Butfirstie Answers:

1. Cash ash.
2. Stray tray.
3. Stalk talk.
4. Strange range.
5. More ore.
6. Narrow arrow.

Something to think about: rewrite **butfirstie** so that **boat** gives **oat boat**, which is a grain ship. ▲

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If you are offering a Logo course or workshop, please let us know so we may include the information in Logo *Update*. The next issue will be published in September 1993.

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Fresno Pacific College
1717 S. Chestnut Avenue
Fresno, CA 93702
209 453-2000

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Johns Hopkins University Homewood Campus
• Logo I --June 12- Aug. 4, '93
Contact: Diane Tobin
Technology Dept.
Johns Hopkins University
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Long Island University
• Programming for the Educator: Logo--July 5-9, '93
• LEGO Logo--July 12-16, '93
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516 299-2147
Contact: Mrs. Rayzel Sachs for information on registration and fees.
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SCOPE: Suffolk County Organization for the Promotion of Education
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