

Logo Exchange

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Manuscripts should be sent by surface mail on a 3.5-inch disk (where possible). Preferred format is Microsoft Word for the Macintosh. ASCII files in either Macintosh or DOS format are also welcome. Submissions may also be made by electronic mail. Where possible, graphics should be submitted electronically. Please include electronic copy, either on disk (preferred) or by electronic mail, with paper submissions. Paper submissions may be submitted for review if electronic copies are supplied on acceptance.

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Logo Exchange solicits articles on all topics of interest to Logo-using educators. Submission guidelines can be obtained by contacting the editor. Opinions expressed in this publication are those of the authors and do not necessarily represent or reflect official ISTE policy.

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Sorry I'm Late

E editing *Logo Exchange* is a labor of love. Sometimes assembling an issue is like giving birth. This issue marks the end of *Logo Exchange's* 17th year of publication and my second as its steward. The past two years have seen *Logo Exchange* grow in size, breadth, and depth. I apologize for the tardiness of this issue and with the help of the wonderful Logo community, we will be back on track in no time.

The hardest part of assembling a journal like *Logo Exchange* is collecting content. Each issue requires that we beat the bushes to find Logo users willing to share their news, views, and ideas with others in the community. Our contributing editors have been sensational. Tom Lough, Carolyn Dowling, Alan Epstein, Doug Clements, Julie Sarama, and Jeff Richardson have been reliable sources of terrific articles issue after issue.

Unfortunately, Alan Epstein will no longer be able to write StarLogo Starters. I thank Alan for his excellent series of tutorials and am in the process of finding his successor. Please let me know if you find the StarLogo columns valuable.

My goal as Editor of *Logo Exchange* has been to create a print publication I would like to read. *Logo Exchange* is much more than a legitimate academic journal. I hope that you enjoy the reviews of books about Logo or books echoing the Logo philosophy; the teacher features; news; tutorials; and tales of great teaching. Each issue con-

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Logo Exchange needs your help. Won't you please consider making the following contributions to *Logo Exchange*?

- Suggest teachers to be profiled in Teacher Features. It would be fantastic if you could even write the profile or interview the great Logo teacher. We'll help in any way possible.
- Share ideas about ways in which you use Logo in your classroom.
- Write about great Logo projects created by kids.
- Send news of new Logo products, books and upcoming events.
- Write a how-to article about a specific Logo project or concept.
- Submit research papers related to Logo learning.
- Advocate a specific strategy for using Logo.
- Write a letter to the editor.
- Contribute a back page commentary about an issue burning in your heart/head.
- Send photos of classroom Logo activities and screenshots of kids' creativity.

We will assist you in getting your ideas on paper and into publication. Send your ideas, feedback and articles to logoexchange@stager.org. At a minimum, let me know what you would like to read in the pages of *Logo Exchange*.

See **SORRY I'M LATE** (Page 4)



Logo Y2K

With all the hoopla about Y2K problems, it concerns me that nothing has appeared in the press or on the news about the Y2K Logo problem. Has anyone given thought to how the year 2000 will affect our poor little turtle? Evidently not.

Well, I would like to take advantage of the *Logo Exchange's* international forum to spotlight this potentially troubling situation and to give it the attention it deserves!

For some of us, it is a study in naivete. For example, I have been exclaiming, "Forward 100!" with relatively wild abandon for more than 17 years. How silly of me! I never realized until recently that I should have been saying, "Forward 99!" instead. I suppose I was not aware of the two-digit limitation in DOS!

```
fd 97 rt 45
fd 98 rt 45
fd 99 rt 45
fd . . .
```

Hmm. What's next? Will there be a problem with the next step?

Or, maybe the following is more relevant.

```
fd 1998 rt 45
fd 1999 rt 45
fd . . .
```

Well, if no one sees the problem yet, maybe we should use the traditional *Logo Exchange* fallback: a challenge problem! How can we create a turtle with a Y2K problem?

Well, if no one sees the problem yet, maybe we should use the traditional *Logo Exchange* fallback: a challenge problem! How can we create a turtle with a Y2K problem?

I guess it depends on what you mean by a Y2K problem. If we're talking about the bottom-level, two-digit original DOS convention, that's onething. If we're talking about going from 1999 to 2000, that's anotherthing.

```
to onething :distance
if :distance > 99 [make
"distance 00]
fd :distance
end
```

```
to anotherthing :distance
if :distance > 1999 [make
"distance 0000]
fd :distance
end
```

Using these procedures instead of the usual `fd` in some of your Logo work might give some of you skeptics a quick idea of the scope of this looming problem!

[By the way, I honestly did encounter some interesting problems* with these procedures in various systems. Tell me about your experiences!]

"But, wait!" you say. "The Y2K problem is not about distance; it is about time!" While I will yield to your assertion, I will also mention in passing that Einstein suggested that time and space are quite closely related.

OK, so, let's focus on time.

Many Logo versions have one or more primitives that are related to time. For example, in some versions, the timer reporter gives the time in tenths of seconds since Logo was started up or since the most recent command to reset the timer.

Does the time reported by timer have a "rollover point" that might mimic the Y2K problem? Is there a maximum time beyond which the timer is automatically set back to zero?

After playing around a little bit, I wrote a `stepintime` procedure that made use of a line something like `fd (timer - :time)` in the hopes that I could see some errant behavior [such as the turtle moving backwards] if the timer rolled over to zero while the procedure was running.

I ran `stepintime` repeatedly as the timer approached several possible rollover points:

```
99
999
9999
99999
```

Nothing untoward (I almost said unforward!) happened. The value re-

See LOGO Y2K (Page 4)



Hope Chafian

by JEFF RICHARDSON

Hope Chafian is Computing teacher and Coordinating teacher and Coordinator of Learning Technologies across the Curriculum at The Spence School, an all-girls school in Manhattan.

Readers may be familiar with Hope's work through the Video Game Workshop project, which is a collaboration with Michael Tempel of the Logo Foundation. You can see the impressive projects created by their students at: <http://el.www.media.mit.edu/logo-foundation/VGW/>.

I caught up with Hope at this year's Logosium in Philadelphia.

Q: What did you do before teaching?

I was an economics and psychology major in college, so naturally I felt I had to go into the financial world. I worked for one year at a Japanese bank in New York. I couldn't wait to start making money so I took the first job offered to me where they didn't expect me to know how to type. I hated it from the first day I walked in the door.

Q: How did you get into teaching?

After my second day at the bank, I started thinking about doing something else—and thought about the kinds of things I liked to do.

At college, while I was taking a course on child development—I got a job in a school working with 3-, 4- and 5-year-olds—as a third hand in the classroom. I got to test out all the things I was learning in child development. I asked the kids all of Piaget's questions. It was fun, a lot of fun.



Hope Chafian (left) enjoying a cutthroat game of backgammon with her colleague, Sarah Lowe, at the Logosium '99 dinner.

I loved kids but wasn't sure about teaching. So I decided to get a Masters in Education thinking that if I didn't like to teach, there would be other things I could do with a Masters in Ed.

Q: How did you arrive at Spence?

I did my first semester of student teaching at Spence. I would share my work with my cooperating teacher, to have her look it over. She was quite impressed with the printout (I owned a Mac!). That teacher recommended me for the computer job at the school.

I knew nothing about teaching (with) computers, but I was willing to learn. (I secretly never envisioned myself as a homeroom teacher.)

Q: How and when did you find Logo?

When I came to Spence in September of 1988 Logo was already being taught at the school. The summer before I began teaching I took a course at Bank Street College with Michael Cook, and that fall I enrolled in Saturday workshops with Eadie Adamson.

I also hooked up with a New York City group of computer teachers, who

met monthly. Many of them taught Logo. And I was fortunate that the Logo Foundation was in New York City; I would call Michael Tempel all the time with questions.

Q: What was it that attracted you to Logo?

Turtle geometry hooked me. I always loved math as a kid and I immediately saw the power of the turtle.

Q: What drives your current work?

The kids drive my work. And that's really how I learned Logo well. When you have 15 students working on 15 different games, they all have different needs. I had to help them figure out how to accomplish their goals.

The children's goals, and the realizations of those goals, are there to see at the VGW site. Their work continues to grow, Michael Tempel and Hope presented some of their most recent projects at Logosium last June.

When school is out, Logo doesn't stop for Hope. The "Summer at Spence" Logo institutes, hosted by Hope Chafian, have been running for several years now, the most recent having just completed, with a group of teachers gathering from across the USA. **LX**

About the Author

Jeff Richardson is International Editor of *Logo Exchange* and President of SIGLogo. He has graduate students across Australia as a Senior Lecturer in Education at Monash University. Jeff may be reached at jeff@rmit.edu.au.



BOOK REVIEW

Points of Viewing Children's Thinking—a point of view!

by CAROLYN DOWLING

Points of Viewing Children's Thinking: A Digital Ethnographer's Journey by Ricki Goldman-Segall, 1998, Lawrence Erlbaum Associates, Mahwah, NJ. ISBN 0-8058-2432-4, www.pointsofviewing.com

This is a work of considerable subtlety and complexity. Through a combination of traditional text, video, and interactive Web pages, Dr. Goldman-Segall engages the reader in the type of multi-layered reflective process of perceiving and learning which is at the core of her subject matter.

For the reader/participant, the exercise is quite challenging at a number of levels. The written text follows a very traditional pattern of academic writing, densely referenced and extensively footnoted. On the one hand this mode of expression has some obvious links with hypertext in the choice which is presented between following the main highway of discussion and argument, or exploring the intricacies of the many byways on offer. On the other, however, it can be a "difficult" form of text for readers not accustomed to this convention, and not sufficiently confident to choose their own pathway. There is a clear disjunction between this style of discourse and the immediacy and informality of the Web-based interactions, including the viewing of the video segments. And while on the subject of the video, deficiencies in my hardware and software configurations certainly cannot be blamed on Dr.


Goldman-Segall. They are an unfortunate fact of life that can detract from an otherwise harmonious relationship with the subject matter, at worst denying access to the full richness of the experience.

These very different "points of viewing" through different media certainly provide the potential for a multiple layering of perspectives, though it is perhaps open to question whether they actually generate a readily integrated totality of experience or whether they function more as 'alternative' means of access.

So what is *Points of Viewing Children's Thinking* actually about? It is not just the modes of expression which involve multiple perspectives, but also the subject matter. The work integrates the varying theories and practices of ethnography, of media and of children's learning to create its own complex and unique "point of viewing" of data collected by the author/researcher in relation to two contrasting groups of students. In so doing it enriches our understanding of each of these areas, not to mention our broader notions concerning the nature of thinking, learning, research and knowledge.

With some trepidation, being neurotically possessive of books I value, I lent this one out successively to two colleagues, an anthropologist and a lecturer in media studies. Perhaps not surprisingly, each "framed" the work according to his and her respective pre-occupations, but they were certainly

united in the enthusiasm of their responses. Having read the book and explored the different aspects of the web site, each was able to identify with acclamation many special points of interest and insight. In other words, the work displays an impressive soundness of scholarship in a number of different disciplines and intellectual directions.

There is a sense in which serious engagement with this material is, to use the now-familiar term, 'hard fun'. Is it worth it? Like most hard fun, I believe that it is, and I certainly found it to be a most thought-provoking and rewarding 'read'. For us, as for the author, *Points of Viewing Children's Thinking* can be the start of a new journey. It is more than a summation of experience with a neat conclusion. It opens new doors through which we can explore the world, learn for ourselves and encourage new ways in which young people can learn. 

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Logo News



October 23-24, 1999
Opening reception and setup
October 22, 4-6pm
MIT Media Laboratory
www.media.mit.edu/mindfest

Come join us for MindFest—a festival of designing, inventing, and learning.

A new generation of computerized construction kits, such as LEGO MINDSTORMS, is opening up new possibilities for playful learning. Kids (and adult hobbyists) can now build creatures, contraptions, and other creations that once required an advanced engineering background. MindFest is a celebration of the creativity unleashed by these new technologies.

Kids, educators, researchers, and hobbyists are all welcome. We encourage all of you to bring your own creations and inventions to show off in the MindFest exhibition space.

Panels will focus especially on the role of tinkering in learning and creativity—and, more generally, on the ways new technologies are transforming how we think and learn.

The festival will include:

- exhibitions of your creations
- panel discussions
- hands-on workshops
- show-and-tell sessions
- informal tutorials
- demonstrations of new technologies

We want all of you to help shape MindFest. If you would like to organize a session, please send your ideas to mindfest@media.mit.edu.

Advanced registration required. Attendance is limited. Please register early to guarantee a spot.

For more information, see www.media.mit.edu/mindfest.

MindFest is organized by the Epistemology and Learning Group and the Okawa Center at the MIT Media Laboratory. (LEGO MINDSTORMS is a trademark of The LEGO Group.)

First Impressions of MicroWorlds Pro **by Ray Catzel**

Editor's Note: A 45-day trial version of MicroWorlds Pro may be downloaded from www.microworlds.com.

MicroWorlds Pro is another evolutionary step in this product line. I think that it will especially appeal to teachers who want to produce lesson projects and younger students creating their own projects

Future issues of *Logo Exchange* will feature MicroWorlds Pro projects. Be sure to share your MicroWorlds Pro project ideas and programming experiences with *Logo Exchange*!

The students in the schools where I consult and teach are extremely enthusiastic about MicroWorlds. It certainly appeals to a greater variety of students than the “pre-MicroWorlds” Logo. All my students eventually get involved with logo coding because it helps them solve problems that they are absorbed in. The difference now is that I do not lose all those students who have little interest in spending most time fiddling with program syntax.

MicroWorlds Pro is another evolutionary step in this product line. I think that it will especially appeal to teachers who want to produce lesson projects and younger students creating their own projects. Both of these audiences want to see quick results, and the new features of MicroWorlds Pro will

help both users. Here are some of the new features that I think will be well received:

- Web authoring tools. You can very easily create a multimedia Web project without bothering with HTML, Java, or animated GIFs.
- Animation is quicker. Instead of having to produce the animations by coding it is now possible to point and click on the shapes that are required to create the animation. You can even change the direction of a moving object by simply holding the shift key and dragging the object in the desired direction. This is especially useful for very young students. Micro-Worlds does leave a `fd 5 wait 1` instruction for each turtle you animate with a mouse click.
- Spell checking is accomplished by linking (transparently) to the Microsoft Word spell checker.
- Charting features are enhanced by linking to Microsoft Excel. You can produce (and observe) dynamic graphics of real time simulations. MicroWorlds Pro can write to an Excel worksheet and read from one as well.
- Easy use of clip art. Instead of first changing the turtle's shape and then stamping it on the project page, the shapes can be simply selected and dropped via mouse-click. Clicking a shape on a turtle changes the turtle's costume. There are also twice as many shapes with each project and new shapes can be easily selected and imported using a viewer window. There are a number of thematic shapes files supplied with the CD. Copying and pasting from the Web and other Window applications is also easy.
- Compatibility with MicroWorlds 2.x. All those good projects that you have developed are usable as is.
- The Online help comes with in-

teractive samples. It is a great help to actually observe the effects of logo commands in procedures. The only negative is that invoking Help takes longer to load than the MicroWorlds2 help facility.

- The Graphical user interface is an improvement. The application is now contained in one window (instead of the three). You can access the Procedures page, graphics facilities, and other windows (dealt with below) by clicking on appropriate tabs.
- The Processes tab shows processes as they are running. You can even slow down the processes in order to follow the action.
- The Project Tab. This area provides an inventory of all the objects in your project, per page. This is a good debugging aid and will be appreciated by anyone who has tried to figure out the logic of someone else's MicroWorlds project.
- Coding in Logo. I cannot vouch for it but LCSi boasts that it is "the most powerful Logo ever developed!"
- Helpful booklets accompany the package: "MicroWorlds Pro Tips and Tricks" and "Learning MicroWorlds Pro"

To some Logo enthusiasts it is heresy to create facilities that blatantly allows the user to minimise coding; however, the facility is there to code all you want. To many of us who like to implement a project in the most efficient manner and prefer to focus on other problem solving issues such as the synchronisation of processes, as in multimedia animation and sound, etc., MicroWorlds Pro is excellent. It provides one of the richest and most exciting environments for exercising the higher-order thinking skills promoted by constructivist learning.

Ray Catzel
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Logo in Your Pocket!

TinyLogo is a programming language and program execution environment for the Palm handheld computer. It is especially friendly to beginning programmers or people who just want to get a simple idea of what programming is all about. It comes complete with Turtle Graphics. Once TinyLogo is installed, programs can be written and run entirely on the Palm computer. Also, since TinyLogo programs can be saved and loaded from memos, they can be exchanged with anyone else running TinyLogo. TinyLogo has over 75 built-in procedures and most importantly, allows you to extend the language by writing your own procedures. Within a very short time, new programmers can write their own procedures to create computer graphics, play music, manipulate words and sentences, and calculate numbers.

TinyLogo is offered as Freeware.

Hardware requirements: Any Palm handheld computer running Palm OS 2.0 or later.


TinyLogo can be downloaded from any of these sites:

- www.palmcentral.com—chosen as a "Hot Product" by Palm Central staff.
- www.orbworks.com
- www.pickled.com
- www.eurocool.com
- www.palmgear.com

Give it a try and let me know what you think. (Editor's Note: I look forward to Tiny Logo articles in future issues of *Logo Exchange*!)

Timothy Lipetz
lipetz@netset.com

Loads of StarLogo News!

Be sure to read this issue's StarLogo Starters column for information about exciting new versions of StarLogo! 



FEATURE ARTICLE

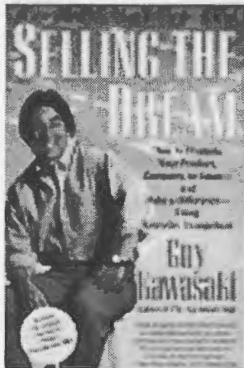
Books Loved by Logo Lovers

Logo Exchange has asked some of its recent contributors to recommend one of their favorite books. The eclectic collection is listed below.

Tom Lough

Founding Editor, Logo Exchange
The 7 Habits of Highly Effective People: Powerful Lessons in Personal Change by Stephen R. Covey
Selling the Dream: How to Promote Your Product, Company, or Ideas—And Make a Difference—Using Everyday Evangelism by Guy Kawasaki

The Covey book helped me learn more about myself and how to collect my thoughts and plan my actions to be more effective. He discusses a need for



a “par-adigm shift,” a change of perspective that many Logo teachers experienced when they first became aware of its potential. The seven habits can be applied directly to

instructional situations.

Although the title of the Kawasaki book might be off-putting to some, don't let it fool you! If you have been looking for a guide for channeling your passion about a cause, a concept, or an idea into effective action, then you've got to give this book a read.

Taken together, these two books have the potential to jumpstart any professional who is ready for the challenges of self-improvement and of self-initiated action. Wouldn't it be great if somehow we could arrange for every LX subscriber to get a copy of each! I'm sure there would be some exciting results. But the most exciting thing to think about is the effect this would have on our students!

Jeff Richardson

President, ISTE's SIGLogo
International Editor, Logo Exchange
Winnie the Pooh by A. A. Milne
The House at Pooh Corner by A. A. Milne

Winnie the Pooh and *The House at Pooh Corner*, both by A. A. Milne (and inseparably illustrated by E. H. Shepard) are a collection of stories that, like



so much of the best children's literature, began as a gift from a parent to a child. These stories time-

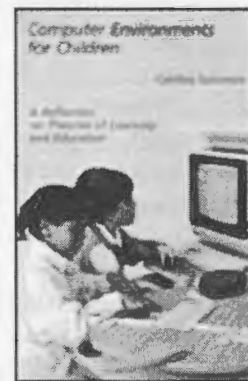
lessly amuse both children and adults, but at the same time transcend the form. Christopher Robin and his toys encompass the range of human aspiration and foibles, and the stories capture the ethereal magic of childhood

and the melancholy inexorability of its passing. These stories rank among the greatest of the century, if not all time, and will comfortably outlast Disney.

Michael Tempel

President of the Logo Foundation
Computer Environments for Children by Cynthia Solomon

Taking the work of four pioneers in educational computing—Seymour Papert, Robert Davis, Patrick Suppes, and Thomas Dwyer—Solomon shows how the design of each their computer



learning environments is intimately tied to an underlying philosophy of education. This is a valuable perspective to have when looking at any educational software.

This is an old book from the early 1980s. As it ages it takes on increased historical interest to add to its continuing relevance.

Mathematics, A Human Endeavor: A Book for Those Who Think They Don't Like the Subject by Harold R. Jacobs

Unlike most textbooks, which are written by committee and lack any personality, this one has a single author whose



approach to mathematics and passion for it come through strongly. Mathematical concepts are derived from real-world experiences that are used, not as occasional illustrative examples, but rather, as the basis of the book.

Alan Epstein

StarLogo Starters Contributing Editor
Turtles, Termites, and Traffic Jams
by Mitchel Resnick

This book is the seminal text on StarLogo and describes the underpinnings and applications for this massively parallel version of Logo. Resnick's descriptions are accessible and provide ample examples of how a Logo environment with multiple turtles, controlled independently by common procedures and variables, can be used to study environments of interacting agents. Applications include system dynamics, mathematics, science, social systems, and biology. Highly recommended.

Susan Ohanian

Educator and author of numerous books about education

The Way We Were? The Myths and Realities of America's Student Achievement by Richard Rothstein

Short, readable, timely, and on target, this volume provides teachers with the answers to people who insist that our schools are doing a lousy job. Richard Rothstein is a research associate of the Economic Policy In-



stitute and in this volume he presents convincing and important evidence that the nation's public schools are performing as well as or better than ever (and that most parents are happy with their children's schools). One can only hope that our congressmen and newspaper pundits might read this book. Failing that, every teacher should.

Brian Harvey

How to Survive in Your Native Land
by James Herndon

I'd suggest different books for different people, so I had to make some assumptions about the audience for this article.

I'm imagining an experienced teacher who hasn't read much philosophy of education (since otherwise s/he already knows what to read). Herndon was a teacher, not a philosopher, and he worked in public schools for his entire career, unlike many other reformers who finally couldn't stand it and started private alternative schools instead. So he's hardheaded and practical, and he speaks the language of real teachers. At the same time, he sees through all the rituals that schools take for granted. This book is deceptively easy to read; the language is down-to-earth and the anecdotes are funny and well told. But it's crammed full of wisdom and mind stretching questioning; I've read it dozens of times, and I learn something new every time.

For the teacher who's already read Herndon, John Holt, Paul Goodman, and so on, and is looking for a less well-known recommendation that may be harder to read because of its academic writing style, there are two chapters about education in *Between Man and Man* by Martin Buber that I find very inspiring.

Gary S. Stager

Editor-In-Chief, Logo Exchange
One Size Fits Few, The Folly of Educational Standards by Susan Ohanian
The Schools Our Children Deserve: Moving Beyond Traditional Classrooms and "Tougher Standards" by Alfie Kohn



My two current favorites address the hysterical trend towards tougher meaner higher educational standards. Logo-using educators will find much to worry and inspire them in both of these

fine books. Both Kohn and Ohanian use humor and common sense to chal-



ALFIE KOHN
author of *The Schools Our Children Deserve*

lenge the conventional wisdom regarding school improvement. Ohanian "names names" and Kohn supports their arguments with meticulously documented research. I'm going to go broke buying copies of these

books to give as gifts. **LX**



My Favorite Things: A Web-based Logo Project

by STEPHEN COSTA

In 1997 I was working with two Year 4 teachers and their two classes in a three-way rotational activity program. I took one-third of the students at a time for Social Studies. During my 80-minute lessons I introduced MicroWorlds to each group of Year 4 students. I saw each group once a week. Our MicroWorlds lessons focused on using the drawing tools, use of text boxes, fonts and text colors, importing music and sounds, and the creation of navigation buttons. The above list sounds pretty daunting and it would be if you couldn't find a "hook" to grab the students imagination and interest. The "hook" I used was to encourage the kids to focus on what they are most interested in themselves and answer the following questions:

Whatever *their* special interests are—and . . .

What are the most important things in *their* own world!

Their brief was to create a multime-

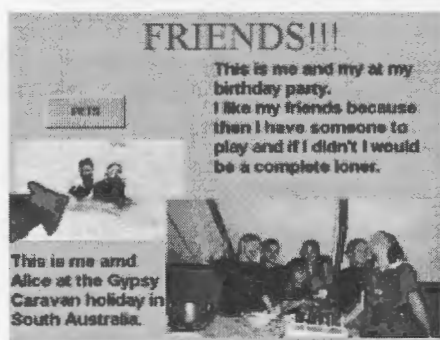
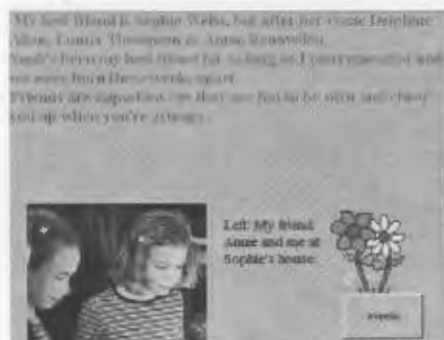
dia project that presented five of their favorite things. The *hook* also extended to allowing the students to bring their favorite things to be scanned and included in the project. I promised to allow anything that could fit on the scanner to be brought. We had cuddly soft toys and teddy bears, all types of medallions and medals, Barbie dolls, pictures of all sorts of places, people and creatures, (no live creatures allowed) favorite book covers, certificates, etc., etc., etc. . . .

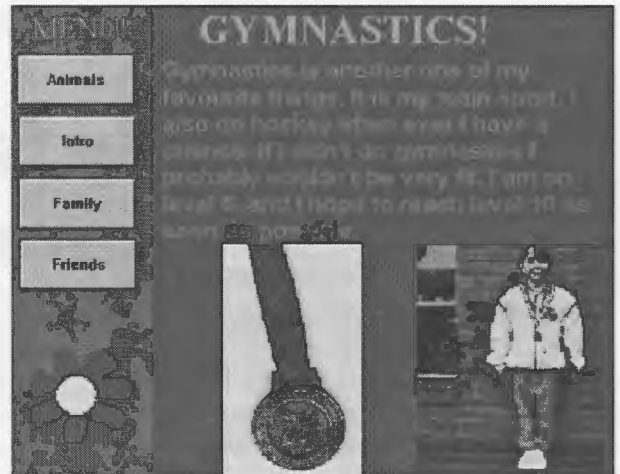
The animated discussions of what was a "favorite thing" helped to make the most reluctant of students show glimmers of real interest. They started by naming a page for each of their favorite things. They then made textboxes and wrote about the favorite thing. They chose the Font, Text color, and Size. They also chose to paint the background in whatever color they felt was most attractive. (Purple always seems to be a winner!)

Lesson 2 centered on demonstrat-

ing how to scan and save a scanned image, with a handful of students. The remainder of the group continued to write about their favorite things, add drawings and paint backgrounds while waiting their turn to scan their precious possessions. The first "scanning" group was asked to help/teach two other students how to scan and save their items. My next step was to help two or three students import their scanned pictures and place them on the correct pages of their MicroWorlds project. Once again it was then their job to help/teach one or two others to do the same!

Lesson 3 was devoted to more scanning, which encouraged more writing! The number of "favorite things" started to multiply and I was also persuaded to help supervise lunchtime "scanning" sessions. The more advanced students continued to push the envelope. It was a very small step from Importing Pictures to importing other things on the menu list, like Sounds





and Music. The recording of their voices using the Recording icon, was also a popular addition. We were shortly surrounded by a cacophony of noise, masquerading as songs or other sounds. Our projects were truly beginning to become multimedia projects.

Lesson 4 saw the inclusion of buttons to navigate through the projects, some fine tuning and sharing. There was a positive atmosphere during each lesson as they continually shared their ideas, skills and efforts. The students helped, encouraged and praised one another continually. There was a genuine interest in “listening, watching and reading” one another’s projects. As the students saw what was “special” to someone else helped them to appreciate what makes things important in people’s lives and hopefully also their own!

Using a medium that allows each student to be creative and successful is the key. It has been accepted that people learn in a variety of ways. A number of people learn best by seeing, or by hearing, or by drawing, speaking etc. It is therefore very beneficial to the learning process when we can include writing, drawing, music, graphics, sounds, and the power of a computer with a powerfully rich medium like MicroWorlds. A computer allows the user to be creative in a number of ways, especially when accompanied with the multimedia aspects available in the Micro-Worlds program. Schools in gen-

eral need to develop, and encourage programs in which basic skills and new technical/digital skills can work hand in hand. This will help to equip our students for a world in which both skills will be of equal importance.

This project then grew to the point that the students wanted everyone to see their work, even if they didn’t have the MicroWorlds software on their machines. So I decided to save all the pages as HTML files so we could show it on the Internet! This is possible using MicroWorlds and the MicroWorlds Web Player software downloaded from the LCSi Web site.

To make a MicroWorlds project run through a browser like Netscape or Explorer is fairly straightforward. To view your project on the Web as it is (with all its dynamic content), you can download MicroWorlds Web Player available at the LCSi Web site at www.microworlds.com. The MicroWorlds Web Player only works with Internet Explorer 3.0 or Netscape 3.0 (or better!) There is a new plug-in available from the MicroWorlds Web site.

All students had to do was save their project using the *savehtml* command in their own individual folders. By using folders, all the saved images would be available to each individual project. Another way to reduce the concern of having the projects “crash” because picture files were not saved in the appropriate folders, is to have the stu-

dents use the “Paint Brush” editing tool and cut the pictures and paste them into a *shapes box*!

By doing this the picture files are just Shapes and the projects will not have any problems with missing picture files!

This Project ended up including one more evolutionary step. I saved all the students’ folders with their HTML MicroWorlds files in one main folder and created a CONTENTS page with links to each student’s project. This large file which included a copy of a Netscape Browser, was then pressed into a master CD-ROM. The master CD was sent off for duplication so each student could receive a CD containing all of the MicroWorlds projects! The CD-ROM was a wonderful way to demonstrate each student’s work, skills, and favorite things with the entire school community. LX

About the author

Steve Costa is the Deputy Head of the Junior School at Methodist Ladies’ College in Melbourne, Australia. In addition to being the current Vice President of SIGLogo, Steve has inspired thousands of Australian educators for his 10 years of teaching with laptops and Logo.



Advances in StarLogo

by **URI WILENSKY & MITCHEL RESNICK**

This issue's column shares exciting news about three new versions of StarLogo. Please share your StarLogo projects with your fellow Logo Exchange readers!

StarLogoT for Java and StarLogo T2.0 for the Macintosh Available

The Center for Connected Learning is pleased to announce a new release of StarLogoT, StarLogoT2.0.

Like our previous releases, this version of StarLogoT is currently available only for the Macintosh. Stay tuned for another version of StarLogoT, called N-Logo, which is a superset of StarLogoT written in Java and available for multiple platforms (including, of course, PC). N-Logo is expected to be released late this summer.

Due to the extensive feedback we got from the StarLogoT1.6 beta release, StarLogoT1.6b, we have done a complete overhaul of the documentation and tutorials. Hence the "jump" from T1.6 to T2.0.

In StarLogoT2.0, we have created new Web-based documentation and menu help that is fully interlinked. We have also added significant new content. This documentation is designed to get new users started much more rapidly and to give a fuller description of the StarLogoT language for our more experienced users. StarLogoT2.0 also

introduces new features and sample models. We expect that these changes will make StarLogoT2.0 the most powerful and easy to use version of StarLogoT yet.



New Features:

- New Apple Guide command reference accessible from the StarLogoT help menu.
- Greatly expanded HTML documentation (and Tutorial) also available from the StarLogoT help menu.
- Revised set of sample models.
- New introductory "Code Example" models.
- Histogramming commands (histogram-turtles-with, histogram-turtles, sethist-num-bars., sethist-color, sethist-xrange, sethist-range).

- Reporter nsum, nmax, and nmin commands (nsum-report, nsum4-report, nmax-report, nmax4-report, nmin-report, and nmin4-report).
- Hill-climbing primitives (uphill, uphill4, downhill, and downhill4).
- Statistics primitives (mean, variance, standard-deviation, list-max, pp-plotlist, pp-plotpointlist, and list-min).
- Legend window for plot pens (setpen-name).
- Interactive dialog primitives (message and yes-or-no).
- Function pop-up menu in the procedures window.

New Bug Fixes:

- Fixed a bug that caused StarLogoT1.6b1 to crash under MacOS System 7 at startup.
- Graphs no longer generate discontinuities when resized.
- Improved support for French keyboards. Projects with 1 x 1-sized patches will now save their patch state.
- The = 's operator works correctly with output from alive?-of and other similar (e.g., *?-of) observer commands.
- Observer procedures, which set patch or turtles variables no longer crash StarLogoT when using the output command.



Included Models:

StarLogoT2.0 is distributed with two folders of models.

The Sample Models folder contains a set of models that are exemplary models and demonstrate good coding practice. This package is a subset of the entire Connected Models package. The entire set of Connected Models isn't distributed with this release but is available at www.ccl.tufts.edu/cm/models/.

The Code Examples folder contains a set of models that are intended to demonstrate common StarLogoT idioms. These are very simple models that can serve as an introduction to StarLogoT and as building blocks for your models.

The Connected Models package has many new models including new versions of slime, speakers, wolf-sheep predation, rumor mill, planar transformations, ants, sphere, follower, firefly, traffic-basic, traffic-2lane, nuclear reaction, scattering, geometron and many others. To download the entire Connected Models package or to download individual models, visit the StarLogoT models page at www.ccl.tufts.edu/cm/models/.

The project Web page (www.ccl.tufts.edu/cm) as well as the models page (www.ccl.tufts.edu/cm/models) will be getting many updates over the next few weeks, so keep those bookmarks.

As always, if you want to be kept up-to-date on future releases of

StarLogoT, send a message to:

listproc@listproc.tufts.edu

the body of the message should say:

subscribe complex-users *your-first-name your-last-name*

To be removed from the announcement list, send a message to:

listproc@listproc.tufts.edu

the body of the message should say:

unsubscribe complex-users

To download StarLogoT2.0, visit our Web page (www.ccl.tufts.edu/cm) and click on the StarLogoT button.

To provide feedback to the development, documentation, and model building team, please send a message to:

complex-feedback@listproc.tufts.edu

To report bugs please send a message to:

bug-StarLogoT@listproc.tufts.edu

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Java StarLogo from the MIT Media Lab



At first, StarLogo ran only on a supercomputer (the Connection Machine). Then, five years ago, the MIT Media Lab released a Macintosh version of StarLogo. Now, finally, there is a version of StarLogo for PCs.

This new version, tentatively named Java StarLogo, is still in beta (prototype) form, but it is now being distributed (for free) from the main StarLogo Web site (www.media.mit.edu/starlogo).

As the name suggests, Java StarLogo is implemented in Java, the "write-once-run-everywhere" programming language. As a result, Java StarLogo can (in theory) run on all different types of computers. But Java StarLogo is designed especially for use on PCs.

As with previous versions of StarLogo, Java StarLogo is designed to help you model and explore the workings of decentralized systems, such as bird flocks, traffic jams, and market economies. But you will notice that Java StarLogo has some significant differences from earlier versions.

There are some new features. You can add sound effects to your programs, and you can use the new "grab" primitive to facilitate turtle-turtle interactions. The interface has also changed. There are now separate command centers and procedure windows for the turtles and the "observer". The goal is to simplify and clarify who you are "talking to" when you write StarLogo commands and procedures.

The current version of Java StarLogo reduces some of the capabilities of the StarLogo patches (the pieces of the world in which the turtles live). The patches can still hold information, and the turtles and observer can still act on the patches. But the patches themselves can not execute instructions. This restriction improves the speed of StarLogo; it is also intended to simplify the language, making it easier for people to build their own models.

Java StarLogo is still a work in progress. The MIT team plans to add more features in the coming months (see the StarLogo Web site for updated versions)—and also plans to rethink the name of the software.

The MIT team is very interested in your comments and suggestions.

Send reports to: bug-starlogo@media.mit.edu.



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Geometric Skills: From Hands-On Manipulatives to the (LOGO) Turtle's Path

by ESTELLA P. DE LOS SANTOS AND BARBA PATTON

An old Chinese proverb is appropriate even today when using technology for teaching problem-solving and geometry (Huetinck, 1992):

Tell me, I'll forget
Show me, I may remember
Involve me, I'll understand.

Introduction

The NCTM Evaluation Standards (1989) call for increased attention to be devoted to the use of calculators, computers, and manipulatives in assessment. Early in the 20th century, Bruekner (1930) and Brownell documented the advantages that children exhibit when introduced to manipulatives as an early method of teaching. Both Bruckner and Brownell are fore-runners in the research of diagnostic and remedial mathematics. Later researchers such as Dienes (1973), Ross and Kurtz (1993), Canny (1984), Walsh (1994), and Ashlock (1990) have found definite advantages when manipulatives are included in lessons.

According to the Third International Mathematics and Science Study, fourth-grade students in the United States are above the international average in the area of geometry, yet they are well below the international average by the eighth grade. In a comparison with 41 countries, the United States did not score well in geometry. The national average in geometry for eighth graders in the United States was 48% correct. Japanese students led all nations with 80% correct in geometry, fol-

lowed by the students from Singapore with 76% correct. The international average was 56% correct. The United States ranked 35th in geometry out of the 41 participating countries (U.S. Department of Education, 1996).

Research on Manipulatives

Research has shown children must have hands-on experiences in order to learn mathematics concepts. According to Moser (1986, 9), "experiences with materials help provide a strong basis for conceptual understanding, whether it be of later procedural skills or an appreciation of properties and relationships." Moser states, "the proper use of manipulatives at the early stages of development may remove the need for later remediation." He further discusses that materials should be part of geometry, measurement, statistics, and problem solving as well as for arithmetic lessons.

Parham (1983) found students who used manipulative materials scored at approximately the 85th percentile. Students who did not use manipulative materials scored at the 50th percentile. This finding is in agreement with an earlier study by Suydam and Higgins (1977). They found lessons using manipulative materials have a higher probability of producing greater mathematics achievement than do lessons in which manipulatives are not used. The use of manipulative materials appears to be of definite importance in how well children understand and achieve in mathematics (Suydam, 1986). Canny (1984) found significantly higher differences in problem-solving scores of fourth-grade students

when manipulatives were used to introduce content.

Ross and Kurtz (1993, 255) have outlined some suggestions for using manipulatives. When planning a lesson, the teacher should be certain that:

1. manipulatives have been chosen to support the lesson's objectives;
2. significant plans have been made to orient students to the manipulatives and corresponding classroom procedures;
3. the lesson involves the active participation of each student; and
4. the lesson plan includes procedures for evaluation that reflect an emphasis on the development of reasoning skills.

Children are helped in the building of firm understanding of mathematical concepts by the use of manipulative materials (Kennedy, 1986). "The meaning theory" espoused by William Brownell early in the 20th century, "is based on the belief that children must understand the basic concepts that underlie what they are learning if learning is to be permanent" (Kennedy, 1986, 6). According to Dienes (1966, 11),

...it should be remembered that we cannot teach concepts—we can only present situations and experiences which will help the children to learn them. Far more of our teaching, especially in these early grades, should be aimed at concept development, and far less should be used for the learning of facts.

The most primitive notions in geometry are not to do with measurement. A child is not particularly concerned as to the exact distance to certain objects, or just exactly how far he has moved, or at what angles certain objects are situated. He takes notice of these in an implicit sort of way. What is interesting to him is getting things for himself—moving about in space, in order to do what he wants.

Piaget and Richard Skemp studied cognitive development. Both concluded that individuals pass through four stages as they mature and that manipulative materials are learning aids that are significant in all four stages (Kennedy, 1986). Fennema and Dienes also advocated the use of manipulative materials for children in early learning. As children mature and are able to handle concepts symbolically, these researchers supported the gradual decrease of the manipulative materials (Kennedy, 1986). Geometry and other topics in mathematics that middle graders deal with are better understood when children use manipulative materials in appropriate ways (Suydam in Kennedy, 1986). Ignoring and abandoning manipulatives too quickly can put children at risk when developing new mathematical concepts, according to Driscoll (1981).

Many LOGO studies involving children at Piaget's pre-operational stage may have had invalid results as young children were instructed in manners that may not have been developmentally appropriate. Dienes (1975) states that young children may not have developed concepts of distance and measurement; therefore, these children may not be successful in angle measurement and length, which are basic concepts associated with LOGO. Angle measure and length concepts are abstract concepts that may not be developmentally appropriate activities for young children.

Research on LOGO

LOGO, which means "word" in Greek, was developed in the late 1960's by Seymour Papert and his colleagues at Massachusetts Institute of Technology's (MIT) Artificial Intelligence Laboratory. LOGO was designed to provide an environment in which students learn in a natural setting (Papert, 1980). "LOGO was developed to serve as a conceptual framework for the learning of mathematics. Therefore, one rationale for

LOGO programming is that students will learn geometry by using concepts that aid them in understanding and directing the LOGO turtle's movement" (Clements & Serima, 1995, 381). Papert believed that LOGO would enable students to learn mathematics as naturally as they learn to speak.

Computer environments are designed to allow students to build on their visual strengths rather than tactile skills. The connection needs to be made between LOGO code (program) and the resultant figure (output). The computer environment provides the student with the ease of editing, repeating constructions, and operations; thus, promoting the construction of geometric notions and increasing analytical thinking. The students' ability to create procedures, alter them, and reflect on them, is powerful because it allows the students to treat sequences of actions as cognitive objects that can be altered and reflected upon. The computer environment should create a problem-solving atmosphere conducive for exploration and conjecture (Clements & Battista, 1994).

Not all research on the use of LOGO has been positive; in fact, some has shown only small effects. Some of the studies found students did not use higher-order thinking skills as they focused only on visual and nonanalytical approaches. Many of these studies were conducted with students in Piaget's concrete development stage. The LOGO environment must support students' mathematical development. Research suggests that a LOGO environment contain the following attributes (Clements & Serima, 1995, 383):

1. Encourage construction of the abstract from the visual.
2. Maintain close ties between representations—LOGO code, the action of the turtle, and the resultant figure.
3. Facilitate examination and modification of code—ease of editing and repeating constructions and operations, along with "undoing," "stepping," and similar functions.
4. Encourage procedural thinking.
5. Provide freedom within constraints.

Constructive computer environments appear to facilitate the students' progression to higher levels of geometric thinking. In the LOGO environment, students are able to make connections between specific examples of geometric shapes and abstract

characteristics of shapes. The LOGO environment facilitates and illustrates precision and exactness in geometric thinking. LOGO's turtle graphics environment encourages students to build upon their geometric knowledge. Clements and Battista (1994) firmly believe this provides a reason to begin geometric explorations using LOGO and that the LOGO environment mirrors students' geometric thinking.

Evaluation of learning environments must be reconsidered. Traditional approaches do not assess students' conceptual or higher order thinking. Pre- and in-service teachers need their skills upgraded periodically in order to provide their students with constructive pedagogical environments that incorporate geometric computer technology. Researchers must discover how computer environments can be utilized to build on the geometric knowledge students acquire each year (Clements & Battista, 1994).

Clements, Battista, Serima, Swaminathan, and McMillen (1997) investigated the development of linear-measure concepts within an instructional unit on geometric paths, including the role of noncomputer and computer interactions. The conjecture was that combined noncomputer and LOGO experiences positively affect length measurement skills. They observed three levels of strategies for solving length problems:

1. apply general strategies such as visual guessing of measures and naive guessing of numbers or arithmetic operations;
2. draw hatch marks, dots, or line segments to partition lengths to serve as perceptible units to quantify the length;
3. no physical partitioning—use an abstract unit of length to project onto unsegmented objects. (320)

Battista, Serima, Swaminathan, and McMillen (1997) hypothesized that at the first level of acquiring strategies for solving length problems, students have sufficient physical measurement experience iterating and partitioning into units. This experience allows the students to construct schemes that allow them to partition unsegmented lengths. Second-level schemes are figurative in that the students need to use physical action to create perceptual partitions. As these partitioning schemes develop, they include the constraint that equal intervals must be main-

tained in the solving of problems. The equal-interval constraint can be realized most efficiently when it is done in imagery, in anticipation, without forcing perceptual markings. This equal interval constraint leads to the construction of an anticipatory scheme as the third-level strategies begin to emerge. Students who do not connect spatial and numerical schemes will benefit from activities that guide them to synthesize the two schemes. LOGO may help students progress along these three levels of measurement skills.

Yusuf (1991) studied the effects of LOGO Based Instruction (LBI) on students' understanding of the concepts of point, ray, line, and line segment; and their attitudes toward learning geometry and learning LOGO. Sixty-seven students in the seventh and eighth grade participated in this study. The experimental group received LBI and the control group received traditional lecture, and paper and pencil instruction developed by Yusuf. Students taught by the LBI method scored significantly higher on a researcher-made test that tested conceptual knowledge of point, ray, line, and line segment. Students in the experimental group also had better attitudes toward geometry and LOGO than the control group.

One feature of LOGO is repeated use of estimation of angle measure. Several studies have shown that LOGO does improve angle estimation, while others are not as conclusive. Children who have worked with LOGO are better able to compare angles (Noss, 1987); however, Simmons and Cope (1990) found that LOGO appeared to have a negative effect on angle comparison.

Van Hiele's (1986) research revealed LOGO experiences can help students learn geometry; however, it also revealed students often continue to use visually based, nonanalytical approaches. LOGO activities can encourage students to progress on the van Hiele hierarchy:

- Level 1: Visualization, recognition or appearance;
- Level 2: Analysis, description or properties of patterns;
- Level 3: Informal deduction, theoretical, abstraction, order or interrelation of patterns;
- Level 4: Deduction or logical reasoning; and
- Level 5: Rigor or formal logic (van Hiele, 1986; Yusuf, 1991).

The research of Clements & Battista (1994) and Yusuf (1991) has shown that

LOGO can be used to develop students' geometrical concepts and aid them in progressing to higher levels of geometric thinking.

One reason frequently cited by researchers (Burns and Hageman, 1989; Swan and Black, 1988) and decision-makers in education for placing such a heavy emphasis on computer programming is its presumed impact on problem solving beyond programming activities. Masterson (1985) found LOGO is one of the few programming languages designed to meet the requirements of being simple yet powerful and cognitively efficient. LOGO programming activities are believed to contribute to problem solving.

Burns and Hagerman (1989) investigated the significance of LOGO instruction among third grade children. They found significant increases in internal locus-of-control for students who had LOGO instruction over students who used another type of computer programming software. The children who received LOGO instruction also emphasized decomposition of complex problems in problem-solving. They concluded that certain qualities of LOGO can increase mastery-oriented thinking in young children.

Swan and Black (1988) tested 133 students in grades 4-8. The students had a minimum of 30 hours of LOGO instruction. They found that five of the six problem-solving strategies that were investigated, transferred from a LOGO environment to a general problem-solving environment. The five strategies which were found to transfer were: strategies formation, forward chaining, systematic trial and error, alternative problem representation, and analogical reasoning. Backward chaining was not found to transfer from a LOGO to a general problem-solving environment. In a later study, Swan (1989) found transfer of subgoal formation, forward chaining, systematic trial-and-error, and analogy but did not find alternative representation to transfer from a LOGO environment to a general problem-solving environment among students in grades 4-6. Swan and Black (1988) also found highly significant differences between grade levels on measures of subgoals formation, systematic trial-and-error, and analogy. They concluded that developmental differences in students affect a student's ability to transfer certain problem-solving strategies. These findings support Piaget's conclusions that systematic trial-and-error strategies are an important determinant of formal operational ability.

Clements (1986) studied the effects of LOGO and CAI environments on cognition and creativity on students in first and third grade. The third-grade students scored significantly higher regardless of treatment. These results may be due to the cognitive differences between the two age groups. Both treatment groups had significant increases on classification skills. The LOGO treatment was most effective on classification, seriation, and creativity. There were no significant differences among the treatments on reflectivity and impulsivity or reading and mathematics achievement.

Pea and Kurland (1984) tested 32 children aged 8-9 and 11-12 and found no transfer of planning skills from a LOGO environment to a nonprogramming environment. The older students had better planning skills than the younger students. Thinking time for programming and nonprogramming students did not differ. There was no evidence that the programmers were more likely to follow a model of planned debugging than nonprogrammers. Once again cognitive development may be a significant underlying factor.

Lehrer, Guckenberger, and Lee (1988) evaluated the influences of LOGO on children's thinking. The 45 subjects in their study were in the third grade. One group was taught how to apply general programming strategies to solve problems presented in LOGO, a second group was taught to use LOGO to solve geometry problems, and the third group was a nonprogramming group. The two LOGO groups were better able to plan a solution and had significantly better understanding of informal geometry concepts than the nonprogramming group.

Misconceptions About LOGO

Geva and Cohen (1987) outline four prerequisite skills for learning LOGO: distinction between right and left, use of the turtle as a frame of reference, assignment of appropriate axis, and application of units of measurement for determining distance and angles. Some first- and second-grade children do not know left from right. Most primary children have difficulty determining the turtle's left or right when the turtle is facing down, to the side or at a diagonal. Students with egocentric conceptions of space have trouble differentiating between their right and the turtle's right. Mayer and Fay (1987) noted that students, who did not have egocentric misconceptions, showed significant gains on spatial cognition while the egocentric children did not.

Some children have difficulty in realizing that "Right" and "Left" commands only turn the turtle and do not move the turtle as the "Forward" and "Back" commands do (Geva and Cohen, 1987; Fay and Mayer, 1987). Some students have misconceptions about the numeral entered with the "Left" and "Right" commands. They may believe the numeral represents the length of a side rather than an angle measure. Students, who have no concept of what length or angle measure are, have difficulty understanding the concepts underlying programming in LOGO. This implies that it is difficult for most young children to master LOGO without extensive instruction.

Simmons and Cope (1990) tested 59 children between the ages of 9 and 12 after three months of LOGO instruction. While 92% of the children were able to write the code to draw a square, only 24% wrote the correct code for a triangle. None of the children were able to mark the rotation angle or exterior angle. Most children marked the interior angle formed by the turtle's rotation. The results also showed that 97% of the children were able to estimate the size of a 90-degree angle, while 36% of the children confused the exterior and interior angle estimates. The results indicate confusion about constructing internal and external angles with LOGO commands.

Cope, Smith, and Simmons (1992) found that elementary students as well as secondary students had misconceptions about turtle rotation and the resulting angle. Students were confused about interior and exterior angles when constructing regular polygons. They were not aware that the turtle rotates according to the exterior angle when constructing a regular polygon. For example, the turn command "Right 120" constructs the exterior angle of a triangle rather than the interior angle of 60 degrees. There were 12 students aged 10 to 11 who participated in a 12-hour course in LOGO over a 10-week period. During all interactions with children, the concept of exterior angles was emphasized. The results showed that these students could estimate an average of 7.25 angles out of 8 given angles within 10 degrees. All 12 students could write the LOGO code to draw a square, but only five could write the code to draw a triangle. When children were asked to mark the angle referred to in a set of LOGO instructions, 8 of 11 students marked the internal angle rather than the external angle. When interviewed, 9 out of 11 students could estimate a 120-degree angle within 10 degrees. The results

indicate that the students could estimate angles out of the context of the LOGO environment but did not make the connection between turtle rotation in LOGO and exterior angles. These results seem to indicate that knowledge of complimentary and supplementary angles may need to be taught before children learn to program using LOGO.

Kieran (1986) also found that fourth- and sixth-grade students were not able to understand the relationship between the angle of rotation (exterior angle) and the constructed angle (interior angle). Fourth-grade students were confused by the fact that "Right 45" created a larger interior angle than "Right 90" in the following sequence of commands: "Forward 100, Right 45, Forward 100" and "Forward 100, Right 90, Forward 100". The first set of commands creates a 135-degree angle, and the second set of commands create a 90-degree angle. Kieran used a Laser Turtle that illuminated the screen with a laser every 5 degrees as the turtle rotated. Kieran found that many of the children were still confused about the relationship between the constructed angle and angle of rotation. The students were also confused about the relationship between the measure of the angle and the lengths of the "arms". The students could better draw a figure that corresponded to given commands (show the output) than provide the commands that were needed to draw a figure (write a program).

Children develop more mathematically correct, coherent, and abstract ideas about angle and turn concepts after working with LOGO (Clements, Battista, Seriem, & Swaminathan, 1996). However, Kynigos (1993) believes that further investigation needs to take place on the design of geometrical computer programs and their use in learning situations. Research will possibly provide opportunity for more focus on the instruction of geometric ideas using developmentally appropriate practices.

Activities with Manipulatives

De Los Santos and Patton have designed the following activities to help students understand geometric concepts which may be essential before programming using LOGO. Each of the hands-on activities involve the use of manipulatives.

1. Introduce concept of angle.
2. Introduce 90°, 180°, and angles of other degrees.
3. Measure complementary angles.
4. Measure supplementary angles.

5. Introduce interior angles.
6. Introduce polygons.
7. Measure interior angles of polygons.
8. Introduce exterior angles.
9. Measure degrees in a circle.

After the students have been introduced to these concepts using manipulatives, then LOGO activities may be presented. De Los Santos and Patton have incorporated the following LOGO activities to help students understand concepts that are essential to the understanding of geometry. These activities will be used immediately after the hands-on activities with manipulatives. The shareware "Micro-soft Windows LOGO" will be used. The activities are:

1. Introduce the LOGO software.
2. Introduce the turtle.
3. Move the turtle (Relationship to length of line segment).
4. Turn the turtle (Relationship to angle measure).
5. Create figures.
6. Define procedures.
7. Write procedures with variables.
8. Develop polygon procedures.
9. Create own designs.

Activities with LOGO

The following activities with LOGO have been designed to correlate with the activities with manipulatives discussed above.

1. Introduce angle.
2. Introduce 90, 180 and angles of other degrees.
3. Sum of supplementary angles is 180 degrees.
4. Sum of the interior angles of any triangle equal 180 degrees.
5. Sum of the interior angle of any quadrilateral equal 360 degrees.
6. Every circle has 360 degrees.

Clements & Battista (1994) outline the following benefits of constructive computer programs: elaboration, objects as representations of a class, viability, precision, explication, personal and intuitive, mirroring thinking, ways of thinking, and autonomy.

Clements & Battista (1994) discuss eight educational implications of computer environments: tasks and teacher mediation, hands-on experience, adequate time, rethinking assessment, grouping students, whole-class discussions, teacher education, and preparatory work.

LOGO is a valuable educational tool that can be used at all levels of the mathematics curriculum. Hyde (1992) describes several examples that can be used to teach students LOGO before they are expected to develop their own procedures. Hyde believes that there is great value in spending sufficient time teaching LOGO especially at higher levels of sophistication.

Conclusions

According to Brownell, instruction must be meaningful and must be organized around mathematical ideas and relations. Students "must also have experiences in using the arithmetic they learn in ways that are significant to them at the time of learning, and this requirement makes it necessary to build arithmetic into the structure of living itself" (1986, 38). Brownell believed that computational skills among schoolchildren would be greater if the children were taught with an emphasis on concepts rather than memorization of facts and algorithms. Brownell (1987, 39) believed that the most common error in teaching mathematics was "the acceptance of memorized responses in place of insistence on understanding."

Battista and Clements investigated the use of LOGO by elementary students. They found that students use visual imagery to reason. They suggest that teachers allow students to use this mode of reasoning to learn geometric ideas. Teachers need to ask questions that help students incorporate conceptual knowledge into their visual-reasoning processes. Visual imagery can make a substantial contribution at all levels of geometric thinking. In teaching geometry, teachers should not only focus on the properties of figures and relationships among them, teachers should "help students develop vivid images and coordinate these images with their conceptual knowledge" (Battista & Clements, 1991, 20).

Edwards concluded that the LOGO environment is an example of a computer software package that supports mathematics learning. This type of mathematics "learning is constructivist since the learner must build upon his or her existing knowledge." The LOGO environment has the "potential to allow students more independent and self-directed exploration of mathematical patterns." Edward believes the learner is able to go beyond the goals of the software and "continue to satisfy their own desire to find meaning and order in their educational experiences" (1992, 79-81).

Difficulties and misconceptions in geometry can be easily masked by traditional approaches but must be dealt with in a LOGO environment. This may lead to some frustration for both the teacher and the students but also to greater development of mathematics abilities. The meaningfulness of the visual representations provides an opportunity to enhance students' intuitions. Students can analyze geometric situations, discover concepts, and construct sophisticated ideas when they are given the proper tools, time, and teaching (Clements & Battista, 1994).

Geva and Cohen (1987), Fay and Mayer (1987), Mayer and Fay (1987), Simmons and Cope (1990), Cope, Smith and Simmons (1992), and Kieran (1986) addressed the difficulties and misconceptions about LOGO that plagued students in their respective studies. The students were confused and made errors in the following areas: length, angle measure, and interior and exterior angles. The relationship between concepts proved to be very difficult for the students. These researchers concluded that when the students were presented the concepts only in a LOGO environment that misconceptions occurred and the students did not have transfer of learning to other environments.

Simmons and Cope (1990) concluded that teachers should not assume that unstructured use of LOGO with minimal teacher intervention will benefit children's concept of angle and angle measure. According to Piaget and Inhelder (1967), children's representations of space are based on action, rather than on passive copying of sensory data. "Children's actions in certain LOGO environments are both perceptual—watching the turtle's movements, and physical—interpreting the turtle's movement as physical motions like one's own" (Clements & Seriem, 1995, 382).

De Los Santos and Patton believe that a LOGO environment creates a visual representation; however, the tactile (hands-on) approach is missing. They conjecture that in order for children to learn concepts of angle and angle measure a combination of LOGO activities and tactile (hands-on) activities with manipulatives must be included in the lessons.

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- describe, model, draw, and classify shapes;
 - investigate and predict the results of combining, subdividing, and changing shapes;
 - develop spatial sense;
 - relate geometric ideas to number and measurement ideas;
 - recognize and appreciate geometry in their world.
- 5-8 Standard 12**
- In grades 5-8, the mathematics curriculum should include the study of the geometry of one, two, and three dimensions in a variety of situations so that students can—
- identify, describe, compare and classify geometric figures;
 - visualize and represent geometric figures with special attention to developing spatial sense;
 - explore transformations of geometric figures;
 - represent and solve problems using geometric models;
 - understand and apply geometric properties and relationships; and
 - develop an appreciation of geometry as a means of describing the physical world.
- From Curriculum and Evaluation Standards for School Mathematics (NCTM, 1989), "Geometry has substantial potential as a field within which children can primarily practice inductive inferences from personal experience, while simultaneously being a field inviting engagement in deductive thinking" (Freudenthal, 1973). Kieran (1986) validated that LOGO is a computer programming environment that is ideal for experiencing concepts of angle and measurement.
- According to Clements and Battista (1994), the following are implications for the design of computer environments: building on visual strengths to more powerful geometric thinking, connected representations, expanded primitives, facilitation of change and exploration, procedures, freedom within constraints, plumb the depths of simple task, and theory.



Logo and the Mathematics Education Standards

by DOUGLAS H. CLEMENTS AND JULIE SARAMA

Last time we discussed what role research should play in determining standards that guide our teaching. In this column, we discuss NCTM's new standards and the role of Logo in these standards.

The New Standards

For more than 10 years, Standards have been a primary focus on the Council's efforts to improve mathematics education. One of us (Doug) is on the writing team to produce the new version, called the *Principles and Standards for School Mathematics*, or *PSSM*. The official release will be at the NCTM meeting in Spring 2000. A draft is now available at www.nctm.org.

The old *Standards* were designed to serve three purposes: to ensure quality, to indicate goals and to promote continuing improvement. The new *PSSM* have the same goals for students.

1. Learning to value mathematics
2. Becoming confident in their ability
3. Becoming mathematical problem solvers
4. Learning to communicate mathematically
5. Learning to reason mathematically

From the beginning, NCTM designed their standards to be an ongoing process. Since the standards in the '80s, we have learned a great deal. Many people have been working on implementing the Standards at differ-

ent levels. We discussed some of this research in the previous column. In addition, there have been tremendous increases in technology. For example, the Internet was a curiosity in 1989, but is quickly becoming a part of the fabric of our society. All these suggest that the standards need to remain current to reflect the changing needs of students and the changing experiences of teachers. The question, then, is: What should stay the same and what should change?

Most important, the main message of the original *Standards* document remains unchanged. We continue to be pursuing the same goals for *all* students. We have the same four process standards . . . plus one . . . a new standard on representation. We have similar content standards.

There are substantial changes. First, as the title implies, there are principles as well as standards. Second, four grade bands are included rather than three to allow more detailed discussions

within each grade. Also, the document includes for the first time a focus on pre-school mathematics. The grade bands are PreK-2, 3-5, 6-8, and 9-12+. Third, a set of common standards spans the grade bands—this shows how mathematics develops across the grades. Fourth, for the first time NCTM will be presenting standards electronically. Let's take a closer look at some of these new features.

Principles

Principles in the *PSSM* are core beliefs that guide educational decisions (Fig. 1). The principles describe basic tenets about high quality mathematics instruction programs. Read them on the Web; we'll discuss the technology principle later.

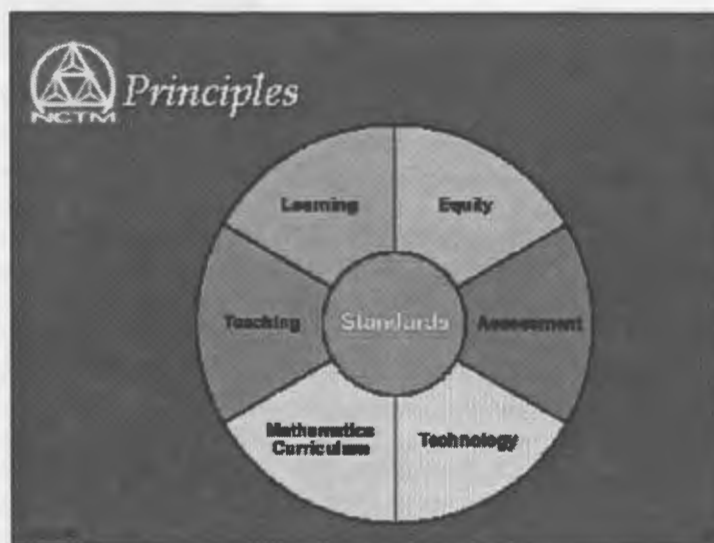


Figure 1. The principles of the *PSSM* surround and guide creation and implementation of the standards.

Standards

The principles form a foundation for the standards. The standards have been reorganized into five common standards that the grade bands, with grade-band specific elaborations. This should focus attention on how mathematical learning develops from PreK to grade 12. So, a teacher at a particular grade band can see what students should know coming into that grade band, and what they will be doing in coming years.

The content standards describe the mathematics students should know and be able to do. The process standards describe processes through which students should acquire and use their knowledge. Again, note the addition of a Representation Standard.

They standards include the following:

Content Standards

- Number and Operation
- Patterns, Functions, and Algebra
- Geometry and Spatial Sense
- Measurement
- Data Analysis, Statistics, and Probability

Process Standards

- Problem Solving
- Reasoning and Proof
- Communication
- Connections
- Representation

Having the same Standards for each grade band does not mean that the same content is learned each year. Topics are not repeated forever. Nor are the Content Standards given equal instructional focus at each grade.

Take, for instance, the learning of number across grades Pre-K–12. In the early years, much attention is given to developing understanding and facility with number and operation. Although this knowledge continues to develop in later grades (for example, real and complex numbers in 9–12), there is less time devoted to the teaching and learning of number and operation in high

school. The expectation is that students will be using knowledge from previous grades, not relearn it year after year.

Algebra, on the other hand, has a different timetable. In the early grades, students are introduced to algebraic concepts and instruction, and attention to this topic is increased as students proceed through the years. The most focused teaching and learning of algebra takes place at the 6–8 and 9–12 grade bands.

To understand how this works, let's take a closer look at sample problems across the grade bands for the first "ex-

"Start with any two congruent triangles. Join them along sides of equal length. What kind of figure results?" A progression of thinking is evident. The task assumes greater student facility working with shapes and builds on instructional experiences from previous grades.

At grades 6–8, students would be asked to "Investigate the properties of the diagonals of different types of quadrilaterals." Here, they are expected to describe and analyze properties across a range of geometric objects.

At grades 9–12, they might be given the following task:

Analyze characteristics and properties of 2- and 3-dimensional geometric objects: Grades 9–12 example

A line segment, 18 inches long is randomly divided into three lengths. What is the probability that the three lengths could be used as the sides of a triangle?

pectation" of the Geometry and Spatial Sense Standard, "Analyze characteristics and properties of two- and three-dimensional geometric objects."

At the PreK–2 level, children might be given a paper rectangle and asked, "Cut this rectangle apart and use the pieces to make a different shape." This simple task develops students' understanding of basic geometric shapes. It provides students with a mathematical experience of solving a problem while analyzing the characteristics of a rectangle.

At grades 3–5, a more advanced task that addresses the same expectation is:

High school students are expected to be able to use properties of figures to solve complex problems and to prove the validity of those solutions. So, even though the same standards and expectations are used across the grades, they grow and develop.

Electronic Format

The final innovation of the updated Standards we will address in this presentation is the Electronic Format. This version will make the Principles and Standards even more useful. The electronic format will resemble what you experience when you visit a web

site on the Internet (and will be on the Web as well as on CD-ROM). It will include links to help you more easily navigate the document. It will also include additional examples and information that cannot fit within the size constraints of the print document, as well as elements (such as video) that are not possible in print format.

The hope is that this will create a lively document that will help teachers better understand the Standards, and that will promote interesting discussions about the Standards and how they might be implemented. Electronics leads us to our final, and most relevant, topic.

Technology, Logo, and the Standards

The technology principle states that well-integrated uses of technology facilitate students' learning of mathematics and can extend the mathematics that students learn. The new *Standards* takes a much stronger stance regarding the necessity of using technology than did the old document. It maintains and extends the vision and insists that all children have access to computers and calculators in learning mathematics.

The technology principle as written in the present draft discusses Logo explicitly.

"In the elementary grades LOGO and other computer environments provide concrete ways of introducing students to the ostensibly abstract ideas of algorithms, routines and subroutines, and variables, as well as more subtle metacognitive issues such as the need for planning. The fact that children have to tell the computer what to do, and that it does exactly what they tell it to do, makes the specification of algorithms concrete in a way that might otherwise be inaccessible to young children. Creating a square 10 units on a side by typing a command such as:

```
repeat 4: forward 10, turn  
right 90
```

rather than

```
forward 10; turn right 90;  
forward 10; turn right 90;  
forward 10; turn right 90;  
forward 10
```

introduces the concept of iteration and the idea of routines. That the square can be called "Box10" and used as part of another figure simply by typing "Box10" introduces students to the idea of subroutines. Moreover, replacing "10" by "n" in the definition creates a mathematical function, in which a different picture is produced for each value of n. Given these visual outputs, these ideas are meaningful to the children who create them."

The principles are being rewritten and the final draft will differ. However, Logo should have an even greater presence in the final *PSSM*, as this version will contain many more electronic examples. For example, the PreK-grade 2 electronic examples will include a simple Logo environment for younger children and regular Logo for elementary students.

The final *PSSM* will also include environments that are in the spirit of Logo: Computer environments in which children explore and construct deep ideas about mathematics. All these will be available to you soon. We hope that you'll like what you'll see. **LX**

About the Authors

Douglas H. Clements, Professor at the State University of New York at Buffalo, has studied the use of Logo environments in developing children's creative, mathematics, metacognitive, problem-solving, and social abilities. Through a National Science Foundation (NSF) grant, he developed a K-6 elementary geometry curriculum, *Logo Geometry* (published by Silver Burdett, & Ginn, 1991). With colleagues, he is working on the previously mentioned NSF research grant and is finishing a second NSF-funded project, *Investigations in Number, Data, and Space*, to

develop a full K-5 mathematics curriculum featuring Logo. With Sarama, he is co-authoring new versions Logo for learning elementary mathematics. One, *Turtle Math*, is currently available from LCSi. Sarama and Clements are co-PI's on the aforementioned *Building Blocks* project, which is developing mathematics software for preschool to grade 2 children.

Julie Sarama, Ph.D., is an assistant professor at Wayne State University, where she teaches mathematics content courses for pre-service teachers and research courses for graduate mathematics education students. She has studied teachers' use of computer innovations and students development of mathematical constructs while working in computer microworlds. She is co-author of several *Investigations* units and of *Turtle Math* and has designed and programming new versions of Logo and other computer microworlds. She is co-principal investigator on the new *Building Blocks* project.

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Turtles of Differential Equations

by OMAR M. S. HAMED

Exploring a mathematical concept within a Logo environment adds a dimension of joy and fun to the exploration process. Here, Logo is used to explore some basic differential equations (DEs) concepts within MicroWorlds and a new Logo style version of the Euler method for solving initial value problems is presented.

Agriculture and architecture students here at King Saud University study as part of their second calculus course a section that serves as introductory material for the basic concepts of differential equations. We cover concepts related to first order differential equations of the form $y' = f(t,y)$. The section is normally taught with an analytical approach; that is the basic definitions are given followed by description of the basic analytical methods, separation of variables and the integrating factor method for the linear differential equation case.

A different approach has been to teach the course with the Logo philosophy. That is utilizing the turtle as an object to think with. See references below for details on the logo philosophy development and on the calculus reform movement.

Slope Fields: Seeing DEs

A geometrical viewpoint is vital for the understanding of DEs and their solutions. Traditionally, the mathematical term "point" is used when viewing mathematical objects graphically. We use Logo to replace the point by the

more powerful, more realistic and more enjoyable object, the turtle.

First-order DEs are statements about the slopes of solution curves. These slope fields can be generated almost naturally within a logo environment. First the given function $f(t,y)$ is defined as follows:

```
To f :t :y
op ...as given by the DE.
end
```

Then, a few turtles are hatched and placed randomly on the screen—simulating the Cartesian plane. Each may be assigned a color. The set of turtles are then instructed to get on with their work as follows:

```
Clean
everyone
[ repeat 40
[seth 90 - arctan f xcor ycor
stamp
fd 50 ]]
```

That is each turtle is set to head in the direction of the slope of the solution curve, stamp herself and then move to a new point. Running these instructions for the DE $y' = 0.02t$ produced the following slope field.

Initial Value Problems (IVPs)

IVPs are a combination of a DE and an initial condition. Geometrically, an initial condition amounts to choosing the one solution curve that passes

through a particular point. Thus placing a set of turtles randomly on the screen and forcing them to set their heads in the direction of the slope curve amounts to specifying a corresponding set of initial conditions, i.e., at turtle i , $y(xcor) = ycor$. Approximate solution curves for the set of IVPs defined by the starting positions of the set of turtles, may thus be obtained by the following set of instructions

```
Clean
Everyone [ pd forever [seth
90 - arctan f xcor ycor fd
1]]
```

Applying this procedure to the set of IVPs specified by the DE $y' = 0.02t$ and by the set of initial conditions defined by positioning five turtles randomly on the screen, produced the following set of approximate solution curves.

This procedure may be considered as a version of the well known Euler method for solving IVPs. The difference being that here our fixed step length, h in numerical methods terminology, is in the direction of the tangent line and not the difference between the x -coordinates of two successive approximating points.

This leads to a variable step length in the sense of Euler's method. The steeper the solution curve the smaller the value of h . This should be consid-

See EQUATIONS (Page 27)



IN THEIR OWN WORDS

The Last Tragic Hours of the Titanic Animated

by **JASON FARR & DAMIEN BAUM**, Year 9 students at Paralowie R12 School, Adelaide, South Australia

Ideas and feelings

We enjoyed doing animations and making projects with MicroWorlds. It allowed our imaginations to run wild. We liked how you could change the pictures during the animation, how the turtle changed into random colors during the rocket display, putting in pop-up text boxes, and finally making things change size.

What we learned about the Titanic

We learned what speed the Titanic was doing (41 km/hr) and the speed it should have been doing (21 km/hr). We learned about the compartments, that if four were punctured, it would still float, but if five or six were punctured, it would sink. We also learned that when the Titanic sank, the women and children were let off first, but the rest of the passengers were left in the freezing waters.

The Slideshow

To make it easier to find Titanic pictures, the teacher made a slideshow full of pictures on the subject for us to use. When we wanted a picture, we went to the slideshow and flicked through it until we found the picture we wanted. We then stopped the slideshow, went down to the

MicroWorlds tools, selected the dotted square, made a border around the picture and then copied it and pasted it into our project.

Problems we had

Problem 1: When we were doing the sinking pictures, we found that the water level was never the same in the original slideshow pictures. To fix it we had to double click the picture and then erased or filled the water to match the level on the page.

Problem 2: When we were doing our animations introduction, we initially wanted it to scroll but to do that meant making the textbox visible and we didn't like that. We eventually decided to use a series of pop-up text boxes so as to keep the textboxes transparent.

Problem 3: When we wanted our ship to sink, we could still see the ship under water, which was unrealistic. To fix this problem, we made turtle screens the same color as the water.

What we learned about MicroWorlds

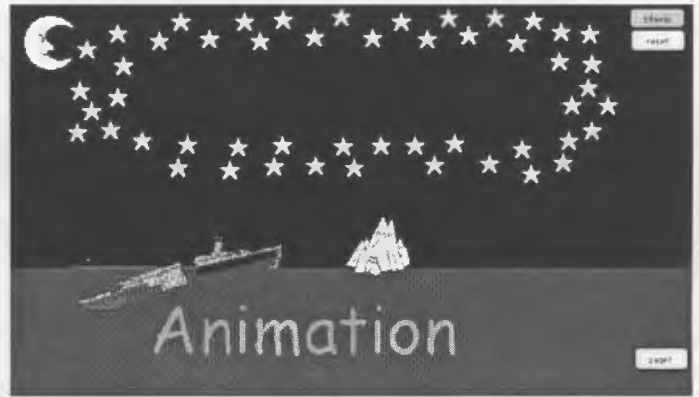
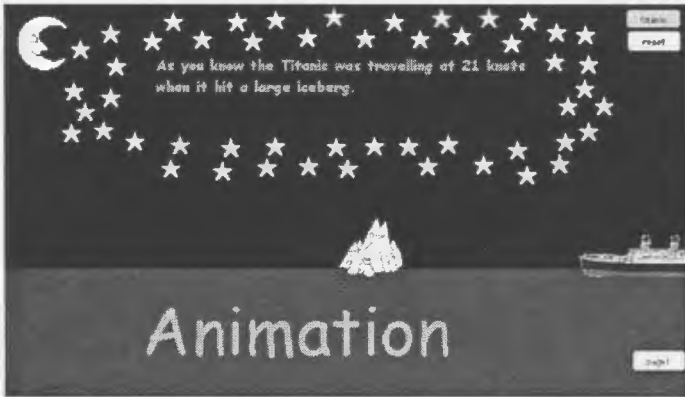
Animation—We learned how to make things move in all types of directions, how to change the speed, and how to change the size and color.

Changing Speed—To change the speed, there are two options you can use. They are glide and repeat 70 [fd



1 wait 2]. We found that glide was inflexible because it doesn't take decimals for the howfast input and so we couldn't use it to make the ship go slow enough.

Special Effects—We learned that if you use your imagination you can create your own special effects. We created our own special effect by changing a turtle into a big blue block the same color as the water, which acted as a screen for the Titanic to sink behind.



Here is our code from the Procedure page for our Titanic animation:

```

to titanic
t2,
seth 270
setsh 6
text7, showtext
wait 50
hidetext
text8, showtext
wait 50
hidetext
text9, showtext
wait 50
hidetext
text10, showtext
wait 50
hidetext
text11, showtext
wait 50
hidetext
text12, showtext
wait 50
hidetext
text13, showtext
wait 40
hidetext
launch[text2, showtext wait 20 hidetext]
repeat 70 [fd 3 wait .5]
text3, showtext
launch[text3, showtext wait 20 hidetext]
repeat 145 [fd 2 wait 1]
launch[text4, showtext wait 20 hidetext]
repeat 50 [fd 1 wait 2]
launch[text5, showtext wait 40 hidetext]
repeat 10 [rockets]
t2,
setsh 11
setsize 45
wait 30
setsh 12
setsize 45
wait 30

```

```

setsh 13
setpos [-179 -60]
setsize 45
wait 30
setsh 14
setpos [-179 -67]
setsize 45
wait 30
seth 180
repeat 85 [fd 1 wait 1]
end

```

```

to reset
t2,
setsize 20
setsh 3
setpos [371 -51]
t29, ht
ask [text7 text8 text9 text10 text11 text12
text13][hidetext]
ask [text2 text3 text4 text5][hidetext]
end

```

```

to rockets
t29, ht pu
setpos [-97 -57]
snapshot
pu
seth -45 + random 90
pd
make "temp pick rocketlist
setc last :temp glide 200 5
st setsh first :temp
wait 2
restore
dotimes[i 80][setsize 20 + :i] ht setsize 20
wait 20
end

```

```

to rocketlist
op[[48 red] [46 orange] [45 cyan] [44 green]
[43 yellow]]
end

```

LX

The Teacher's Comments


by **BILL KERR**

I teach in the Middle School Unit at Paralowie R12 School. Fortunately, we have some flexibility in Curriculum Design. I saw the Titanic theme as an opportunity to integrate a Society and Environment motif with the Maths/Science concept of floating, sinking and density. Student interest in the Titanic was still high towards the end of 1998 when we did this work so that was an added bonus.

The students had only been learning MicroWorlds for two and a bit terms (10-week terms) at the commencement of the Titanic Project. I put together a slideshow from Internet sites to speed up the process of integration

of real life graphics into their MicroWorlds projects. This greatly enhanced the interest level of the students and the final quality of the project.

Most of the code was written by the students involved but I did have to help them out especially with the colour synchronisation (using a paired list) and expansion of the rockets, using dotimes.

It is a tribute to the design of MicroWorlds that an impressive project like this can be put together by a couple of dedicated students in a few weeks. They are excited at the prospect that their work might be published in an American educational computing magazine. 

EQUATIONS / Continued from Page 24

ered as an advantage in this new version of Euler method.

Implementing such an approach is worthwhile even in a traditional lecturing style environment. Just simply adding the turtle as an object to think with seems to immediately change the status of the learners to an active one. They start posing many questions of the type "what if."

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CIRCUS COMES TO TOWN / Continued from Page 28

community lost many teachers to Hyperstudio. I assured Roger that the Logo community did not conspire against Hyperstudio/Hyperlogo. We just weren't involved in its development or approached as a potential partner. Hyperlogo also failed to reflect 20 years of Logo development and is not as well integrated into Hyperstudio as it could be. *Logo Exchange* will happily publish articles about Hyperlogo.


Roger Wagner's personal class and commitment to educational dialogue was exhibited when he invited me to lead a session, "What is Logo?" at his annual Hyperfest Conference this past June in San Diego. Roger, his Marketing Director Maureen Gross (a former LEGO Logo teacher), and Hyperstudio creator Mike Westerfield all attended my presentation and spent considerable time discussing the differences between Logo and Hyperstudio afterwards. The Seventh Annual Hyperfest was an impressive celebration of Hyperstudio and its thriving community during three days of education and hard fun. Hundreds of die-hard Hyperstudio users attended.

Two days after this impressive demonstration of commercial and educational success, armed guards led by the Vice President of Knowledge Adventure stormed into the Roger Wagner Publishing offices and ordered everyone out of

the building. Roger and his entire management team were fired on the spot. Apparently the enormous goodwill, product upgrades, and community building Roger was known for and made Hyperstudio so successful was now viewed as annoying or unnecessary by the parent company. A fine man and his loyal customer base deserved better.

Apparently, the circus is not dependent on one performer. Knowledge Adventure issued a disingenuous press release announcing how exciting it was that Hyperstudio would now be part of a line including a program that prints banners and greeting cards. Hyperstudio is no longer a message-driven community of creative computer-using educators, it is a box of software like any other.

Logo Exchange welcomes articles about Hyperlogo and hopes that abandoned Hyperstudio users will be welcome in Logo's big tent. I wish Roger Wagner the very best and hope he will contribute to the Logo learning movement in the future. I still think that Logo is the best thing kids and teachers can do with a computer.

Keep the faith and keep up the good work. Publicize your Logo triumphs as an inoculation against the market forces questioning your judgment and classroom practice. 



When the Circus Comes to Town

by **GARY STAGER**

I recently led a Logo-based workshop at a large educational computing conference. This was unusual since most American conferences keep any mention of Logo at a safe distance from their conference program. In the workshop was at least one gentleman who was quite skilled at using MicroWorlds. The chaos of the workshop and size of the audience kept me from speaking with him until afterwards. I soon learned that he was a teacher from Chile where he used MicroWorlds in his school. Travel to the United States for this conference must have cost a considerable amount of money.

This very good conference, run by a large commercial enterprise, was like most conferences—an excuse to have a large commercial exhibition peddling wares to potential customers. As the educational software industry consolidates (Mattel and Havas now own the vast majority of educational computing brands and distribution), the conference exhibit halls increasingly resemble circuses. Under these big tops are free, give-away “souvenirs,” popcorn, ice cream jugglers, acrobats, magicians, loud music, and amazing feats of drill and practice. You’ve seen all of the acts before. There is very little new or creative to excite you.

The closing session of this conference asked participants and presenters to sit in a circle and share what they

learned at the event. The usual comments about new products, ideas for Web pages and a repudiation of programming as being “old fashioned” were all expressed. Our Logo-using colleague from Chile said the following when it was his turn to speak: “I am from a poor country where it is very difficult to get hardware and software. What I learned from this conference is that we are doing a very very good job.”

One could sense the disbelief and bemusement of other circle members. It was as if they were thinking, “How could this person from a developing country be doing a very very good job? He doesn’t even have the latest version of Reader Rabbit.”

That’s when I had an epiphany.

I am often asked why Logo is more popular outside of North America. While America’s reliance on instructionism is certainly one factor, the commercial forces brought to bear by the educational computing industry has a suffocating effect on open-ended applications like Logo. This is especially true since successful Logo use does not require the latest hardware or software purchases.

Perhaps developing countries will find it equally difficult to sustain Logo use after the circus comes to town. The educational computing circus, like most commercial forces, is designed to make potential customers question their choices and covet new products.

In the case of educational computing, choosing a new product undermines the use of Logo. I hope our friends around the world will be able to resist the temptations when the circus comes to their town.

Mugged by Clowns

Hyperstudio creator Roger Wagner is one of the software industry’s genuine good guys. Through vision, evangelism, outstanding customer service, and hard work, Roger created an entire market category. Hyperstudio remains one of the most successful software products ever developed for schools. While I have some issues with the design and the “it’s so easy to use” philosophy of Hyperstudio, I applaud Roger’s tireless efforts on behalf of classroom creativity. He did good while doing well. Hyperstudio is a good product (not as good as some Logo versions of course) and it made lots of money. A year or two ago Roger sold his company to Knowledge Adventure, now a division of Havas (a French water utility), and was told that he could continue heading his research, development, and marketing division.

Roger often expressed his disappointment that the Logo community didn’t embrace Hyperstudio after Hyperlogo was added to the multimedia-authoring tool. In fact, the Logo

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