Cooperative Means to Interdisciplinary Ends

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If the Logo version you are using has a different command than TONE for music, just make the appropriate substitutions in the procedures above. Or, you could write a utility procedures, such as the one below for use with Apple Logo II.

```
TO TONE :FREQ :DUR
TOOT :FREQ :DUR
END
```

The children make a design appropriate for the musical selection. LogoWriter provides two ways to build a word design, using either the LABEL or word processing functions. It is easier to use word processing for longer selections.

```
STAG
DECOJATON*
RINGING BELLS**
GLOWING CANDLES***
CAROLS FILL THE AIR*
FRIENDS AND FAMILIES**
NOEL

Happy Holidays!
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Elaine Blitman and Barbara Jamile are the K-2 and 3-4 supervisors at the Punahou School in Honolulu, HI. They have been using Logo with young children since 1982. Their CompuServe number is 76067,211.

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**Logo LinX**

_by Judi Harris_

**Cooperative Means to Interdisciplinary Ends**

Many educators find Logo to be a natural facilitator of group cooperative problem solving activities. I have also found it to be a natural facilitator of team teaching efforts. In this month's column, I plan to vary the focus of the article just a bit, from a Logo project idea to the cooperative development process that was its genesis.

"Genesis" is certainly an appropriate term here. At one of the two Solomon Schechter Day Schools (private religious schools) in Philadelphia, I had the good fortune to work with Sara Lynn Newberger, a knowledgeable and energetic fourth-grade Jewish studies teacher, and Nancy Lee Rodenberg Bergey, a most talented science coordinator.

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**Interdisciplinary Roots**

Schechter was in the midst of a six-week interdisciplinary science exploration of "Shapes, Patterns, and Structures." The teachers of all subjects: general studies, Jewish studies, and specialties, were interweaving SSPS (Schechter Shapes, Patterns, and Structures) projects and activities into their curricula, facilitated and cheered on by NancyLee. The time was ripe for cooperative teaching, when NancyLee "just happened" to mention what the fourth grade was studying.

The joint project began almost accidentally. Sara Lynn was in the faculty room, describing the method that she was using to help her students understand the chanting melody notation system (trope signs) included in the Hebrew version of the book of Genesis. She was helping the children to focus on the patterns of the trope signs, so that they eventually would understand how the notations emphasized the meanings of the phrases to which they were attached.

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**Logo Structures from Long Ago**

Sara Lynn had drawn the symbols on flash cards, overhead transparencies, and worksheets, attached to rectangular boxes, that looked something like this:

```
[Box 1] [Box 2] [Box 3] [Box 4]
```

The boxes represented whatever Hebrew words the trope signs were punctuating.

When I happened upon this faculty room conversation, Sara Lynn was describing how she would help the fourth-graders to "diagram" selected Hebrew verses from Genesis, then deduce their common trope sign patterns. Several of the teachers listening were interested in the organization of these patterns, and how they reflected the meaning of the Bible verses. As Sara Lynn described their hierarchical procedural structure, my "Logo light bulb" lit up.

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**Logo ma non "trope"-po**

What followed was one of the most rewarding experiences of my work with children and teachers. Sara Lynn had learned to use the Bank Street Writer for composing class progress reports and report card comments, and was happily planning to use the Hebrew version of the program ("Kosher Writer") but had not, as of yet, been bitten by the "Logo bug." Her students had been using Logo since second grade.

When I think back on it, Sara Lynn showed an immense amount of trust (an essential component in successful team teaching) by committing a good portion of her free time to discussions with this seemingly "possessed" computer specialist. I insisted that a Logo microworld could significantly help her students to accomplish the process and content goals that she had described in the faculty room. We were equally ignorant of each other's specialties, but equally interested in child-centered, holistic learning.

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**Happy Holidays!**
Our project planning discussions were as interesting as the children's interactions with the resultant microworld. We began by examining the structure of the trope notation system, drawing similarities to programming structures in Logo. This necessitated "reciprocal tutoring;" trope patterns for me, and Logo procedure patterns for Sara Lynn. Once content goals were established in both realms (I thought this the perfect way to encourage the students' writing of single-function procedures, then cooperatively arranging them in a hierarchical super-procedure structure), we began to discuss process goals in terms of what the students should be able to do with the microworld.

The Microworld

Herein lies the full power of cooperative planning for teaching. By focussing upon the actions that the students would be able to select in the microworld (the "new primitives"), we two teachers were able to integrate the content's own structure (Torah trope patterns) into the organization of the microworld itself. The discourse was delightful. Each suggestion that either of us posed could be fleshed out in terms of how a specific student action would reflect powerful ideas in the study of trope patterns and/or Logo. Our respective ignorance of each other's specialties forced us both to be specific and lucid about our ideas. This probably helped to increase the quality of the microworld. Before we began this joint venture, we had predicted just the opposite.

A cooperative project is a cooperative project. The students worked with the cantor (among whose synagogue responsibilities is that of chanting weekly Bible portions) to write Logo music procedures for each of the trope melodies. Sara Lynn and I constructed the microworld so that as student users type trope name abbreviations, they hear the melody and see the verse diagrammed on the screen. The microworld "remembers" the order of signs for each verse. When the diagram is finished, the computer prompts a chapter and verse number, then stores the diagram in procedure form on the disk. In this way, a database of verse diagrams is compiled by the students, which the user can then print out and reproduce in any combination as paper handouts and/or overhead transparencies. Sara Lynn's relative lack of computer experience helped me to make the program quite user friendly.

Eight Steps to Success

I realize that few, if any, of you will have need for a Torah trope microworld in your classroom. The point here is not the product, but the process, and the possibilities of its generic application. (Sound familiar?) You may very well be the only staff member at your school that has any knowledge of Logo; yet, that certainly doesn't mean that you can't help other teachers to integrate Logo into their traditional (and nontraditional) content curricula. Similar microworlds can be cooperatively developed and shared in practically any subject area.

These guidelines may be helpful:

1. Decide upon the content goals of the microworld.
2. Decide upon the process goals of the microworld.
3. Determine how the content and processes selected are naturally organized.
4. Divide the organization into the smallest single-function user actions; these will be the microworld primitives.
5. Code the subprocedures so that they are as flexible, easy to understand, and easy to change as possible.
6. Encourage the potential users to help to program the microworld subprocedures.
7. Decide that the microworld will never be "finished;" revise it continuously according to user feedback.
8. Encourage other teacher and student users to change the microworld to suit their purposes and preferences.

Michael Friendly, the Logo Exchange North American Field Editor, is currently compiling a database of Logo microworlds. If you have developed any microworlds for use in teaching, or have ideas for some, consider sharing what you have on a wider scale. Please send microworld information to:

Michael Friendly
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Psychology Department
Toronto, Ontario M3J 1P3
Canada

Timeless Wisdom

The theme of the national Conference on Alternatives in Jewish Education (CAJE) gathering at which I presented this project was, appropriately,

I have learned much from my teachers, more from my friends, and from my students most of all.

Originally written in Hebrew, this quote is probably more than one thousand years old. Its lesson still rings true.

May this holiday season inspire peaceful cooperative ventures for all peoples, and may we all share in the joy and respect that are implicit in such worthy endeavors.

Judi Harris was an elementary school computer use facilitator, graduate education instructor, and computer consultant for a number of public and private schools in Pennsylvania. She is now a doctoral student in education at the University of Virginia. Her CompuServe electronic mail address is 75116,1207.