Microworld Collection - Volume III *by the Council for Logo and Technology in Mathematics Education (CLIME), May, 1993.*

One of the reasons that CLIME was originally formed was to create a forum for sharing ideas about learning and teaching with Logo. As a result CLIME began to develop Logo programs or microworlds as they are called, that can be used as resources for classroom activities. This past spring we completed our 3rd volume of CLIME Microworlds. Unfortunately, we have not been able to keep up with the rapidly changing and additional versions of Logo. It was easier when most people used Apple IIs and Terrapin 3.0 and LogoWriter were the main programs. Now the Macintosh is making its presence felt in the educational arena. Terrapin now has Logo for the Macintosh in addition to Logo Plus and Terrapin 3.0. On the LCSI side we saw not only a version of LogoWriter for the Mac but also the advent of a whole new environment called Microworlds that will be growing in popularity as educators get Macintoshes with enough fire power to run the program. And there are several other versions (like WIN Logo, Object Logo, and Harvard Associates Logo 4.0). It has gotten to the point where we can no longer keep up the ability to provide microworlds for all the different versions. So, unfortunately, our volume 3 is written only in LogoWriter (for the Mac, Apple II, and IBM & compatible machines). We still have a glimmering hope that these pages will eventually be translated into Terrapin format, **but we need your help**! We need people who are able to translate LogoWriter pages to Terrapin Logo for the Mac to help in creating the Terrapin version of Micorworlds V. III. Even if it's only one program that you can do - your contribution will be most appreciated!

This collection of microworlds has been used by teachers in a variety of places and contexts. Since the effectiveness of a microworld depends on the context in which it is used, you may want to find out more about how the application was used than is shared in these notes. Feel free to call or write me at the CLIME office or the individual authors for more information.

We hope you find these programs useful. As you may notice, some microworlds continue to evolve. (For example, see Knights Revisited.) Also included in this issue are articles, lesson plans and ideas for use with the microworlds. We hope that you find these programs useful. Please let us know how you used them. Also, if you find any bugs in the programs please let us know, so we can fix them.

Ihor Charischak, CLIME, 10 Bogert Avenue, White Plains, NY 10606 (914) 946-5143.

And now presenting a summary of the third volume of the CLIME Microworlds Collection. A drum roll please.

d'Alembert's Challenge

This page contains a simulation of an old coin deception game that apparently was first tried by an 18th century mathematician, d'Alembert. Very useful as a part of a unit on probability and an introduction to coin tossing.

Coins Game

Three students are tossing coins. One is tossing 4 coins, another 6, and the third student tosses 8. Each student will count the number of times the coin toss results in an equal number of heads and tails. Each student tosses 10 times. Who do think will win? Is this a fair game? Who has an advantage? Why?

Balance Pictures *by Robert Berkman, Bank Street School, New York, NY & Ihor Charischak*

This is a simulation of a balance beam equation solver. Some useful commands:

ADDL 5 B	adds 5 boxes to the left side
ADDR -2 M	subtracts 2 "marbles" from the right side
SUBR 2 M	subtracts 2 "marbles" from right side
DIVL 2	divides left side by 2
DIVR 3	divides right side by 3
SOLUTION	outputs the solution to the equation
SOLVE	asks you for the solution

Candy Bar *by John Olive, Univ. of Georgia, Athens, GA 30602*

This application is used by young students to help them better understand fractions. John describes how this microworld can help students in his article "The Problem of Fractions in the Elementary School". (Arithmetic Teacher, May, 1991, P. 22).

The Chaos Game *by Michael Tempel, Logo Foundation, New York, NY*

Some years ago Chaos become popular. James Gleick's book was a best seller. There was a PBS program about chaos. In one segment of the show Michael Barnsley's Chaos Game was described:

Put three dots on a piece of paper. Put your pencil at

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