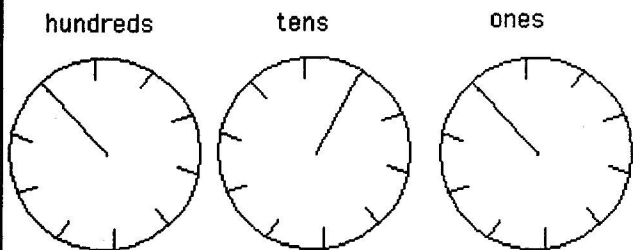# Counter Tool

by Mary Schofield
Procedures originally developed by Media Microworlds, Inc. as part of a package called "Seymour Papert: On Logo"

The purpose of this microworld is to have children explore counting with circular gauges. It can help students develop their place value skills.

hundreds   tens   ones

Useful procedures:

GAUGE *turtles divisions* will draw circular gauge(s) with a given number of divisions.
Example: GAUGE [0 1] 10 will tell turtles 0 and 1 to draw a circular gauge divided into 10 parts.

MOVE.HAND 1 will tell current turtle to advance the hand one division.
MOVE.HAND -1 will tell current turtle to move the hand back one division.
ADD *number*   advances the gauge's hand *number* positions.
SUBTRACT *number*   sets the gauges back *number* positions
RESET   sets current gauge to zero
Example:
TELL [0 1 2] RESET   resets gauges drawn by turtles 0, 1, and 2.

Challenge: Remove the ADD and SUBTRACT procedures and have your students invent them.

Quarts

by Ihor Charischak

This microworld was described in the Problem of the Month column in the CLIME News (V. 2 N. 1). Also see the letters to the editor in this issue.

In his famous book, *How to Solve It*, George Polya poses the following problem: How can you bring up from the river exactly six quarts of water when you have only two containers, a four quart pail and a nine quart pail, to measure with? In order to help me solve the problem, I created a computer simulation of the experiment.

Here's a solution to a similar, but simpler problem.

Problem: Make 4 quarts if you have a 6 quart container (A) and a 2 quart container (B).

Solution: It takes two steps after the containers are drawn (CON A 6 CON B 2). FILLUP A puts 6 quarts in container A. POUR A B puts two quarts in container B and leaves 4 quarts in A which solves the problem. Polya's problem is more challenging. Try solving it. Can you find a general rule? (For more on this microworld read the letters to the editor (page 2) in this issue. Δ

CON position height	draws a container in position A or B with the given height. For example, CON A 4 CON B 9 will draw figure 1.
FILLUP container	fills container A or B
EMPTY container	empties container A or B
POUR container1 container2	pours liquid from one container into the other.

Size ⟶ 4   9
Amount⟶ 0   0

Container⟶ A   B