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change shape as the size of the cutout squares changes. I have asked many different groups of students to explore this problem using a variety of tools: paper, scissors, tape, rulers, Rice Krispies (what better volume measure!), and Logo.

After building and measuring a number of boxes, the students are given a set of pre-defined Logo procedures designed to provide both visual and numerical information on this problem. The commands BOX 1, BOX 2.5, and BOX 4 return both pictures of boxes with 1-, 2.5-, and 4-inch squares removed, and the resulting volumes.

The students, working two to a computer, devise search strategies for finding the maximum volume. I enjoy standing at a spot where I can see the computer screens, and watching the images converge.

Readers who wish to obtain a listing of these procedures, or listings of TI graphing calculator programs that work similarly, should write to me at Metropolitan State College of Denver, Campus Box 38, P.O. Box 173362, Denver, CO 80217-3362. (E-mail: romagnal@mscd.edu.) For a more details about doing these activities with general math students, see my book *Wrestling with Change: The Dilemmas of Teaching Real Mathematics* (Heinemann, 1994). □

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sides of the triangle are in the ratio 2:1, so the opposite angles must also be in the ratio 2:1. So this one must be 30 degrees." The others liked this; they figured out how much to turn the turtle so that the interior angle would be 30 degrees, and walked the turtle forward by an amount they had already determined using the Pythagorean Theorem. Unfortunately, this did not close the triangle. Hmph. One of the two expert Logo users turned to me and said, "I see that this doesn't work, but why?" I thought to myself, "What an interesting question!" She thought for a moment, and then with her voice laden with trepidation, said "Well, we could use trig." None knew how.

The second thing that I am struck by as I reflect on this workshop is an ironic twist, indeed. The hierarchical, Byzantine bureaucracy that is often blamed for impeding change has — at least in this case — slowed the move away from Logo I have noted in many other schools. Logo is still mentioned explicitly in this large urban district's curriculum guide. Because of this, teachers are still being pushed to consider Logo. Some have become Logo programming experts, while others learn the language as they gain experience in the district.

These teachers have asked the fundamental question: How can Logo help to develop in their students the mathematical knowledge that is also specified in the district's curriculum guide (you know, basic arithmetic skills of the kind measured by tests like CTBS)? With the experts in this group as resources, these Chapter One middle school teachers are ready to research answers to this key question.

Unfortunately, two of the three experts are retiring in June. □

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