# 4 Steps to Problem Solving

Adapted from "Science World," November 5, 1993.

Billstein, Libeskind and Lott have adopted these problem solving steps in their book "A Problem Solving Approach to Mathematics for Elementary School Teachers (The Benjamin/Cummings Publishing Co.). They are based on the problem-solving steps first outlined by George Polya in 1945 (in “How to Solve It”).

1. UNDERSTANDING THE PROBLEM

* Can you state the problem in your own words?

* What are you trying to find or do?

* What are the unknowns?

* What information do you obtain from the problem?

* What information, if any, is missing or not needed?

2. DEVISING A PLAN

The following list of strategies, although not exhaustive, is very useful.

* Look for a pattern.
* Examine related problems, and determine if the same technique can be applied.
* Examine a simpler or special case of the problem to gain insight into the solution of the original problem.
* Make a table.
* Make a diagram.
* Write an equation.
* Use guess and check.
* Work backward.
* Identify a subgoal.

3. CARRYING OUT THE PLAN

* Implement the strategy or strategies in step 2, and perform any necessary actions or computations.

* Check each step of the plan as you proceed. This may be intuitive checking or a formal proof of each step.

* Keep an accurate record of your work.

4. LOOKING BACK

* Check the results in the original problem. (In some cases this will require a proof.)

* Interpret the solution in terms of the original problem. Does your answer make sense? Is it reasonable?

* Determine whether there is another method of finding the solution.

* If possible, determine other related or more general problems for which the techniques will work.