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# Introduction

*Problemoids* is a problem-solving program designed to meet the needs of intellectually gifted students and other students who might benefit from an enriched mathematics program more advanced than that provided in the standard curriculum. *Problemoids* engages students in high-level thinking about challenging problems and provides a stimulating opportunity for students to develop and increase their repertoires of problem-solving strategies.

*Problemoids* Level 4 contains 36 problem sets with five problems in each set. Altogether, there are 180 problems with solutions. The problems differ from those in the typical curriculum in that solving them requires one or more mental abstractions. A separate book is available for students.

The problems in *Problemoids* require students to use the full spectrum of thinking skills in Bloom's Taxonomy with special emphasis on high-level skills such as analysis, synthesis, and evaluation. The mathematical skills required of students are appropriate for grade four. Topics covered in the program extend, enrich, and reinforce topics typically covered in the mathematics curriculum: sets, number and numeration, operations, geometry and measurement, algebra, and probability and statistics.

Strategy-directed hints accompany the main problem in each set to assist students in solving the problem and in learning problem-solving strategies. Solutions to main problems emphasize problem-solving strategies suggested in the hints by showing how to solve the problems using those strategies.

Students obtain maximum benefit by participating at all available levels of the *Problemoids* program; yet, students can participate at any level without prior exposure to the program.

## Goals

The main goals of the program include:

- (1) Improving students' problem-solving performance.
- (2) Enriching students' mathematics program by teaching problem-solving strategies.
- (3) Assisting students in creating a "memory bank" of problems, solutions, and methods of solutions.

Other objectives include:

- a. Exercising students' high-level thinking skills by challenging them with problems which require use of analysis, synthesis, and evaluation on a regular basis.
- b. Fostering a sense of self-confidence in solving problems.
- c. Extending students' perseverance in attempting solutions to challenging problems.
- d. Providing experiences which may serve to increase students' interest in mathematics.

## Program Content

The program is organized into 36 sets of problems. Altogether there are 180 individual problems. Less difficult problems appear earlier in the book; more difficult problems appear later. Each problem set includes a main problem and four related problems called "looking back questions." The solutions to looking back questions are related to the solution methods of the main problem in the set.

Problems are designed to provide experience in choosing and using problem-solving strategies. The