# Algebra through Applications

## with Probability and Statistics

Developed by Zalman Usiskin

*A viable alternative to the traditional first-year algebra course*

Unique — Algebra through applications, not just with applications.

Varied — 4600 questions, problems, and exercises, 1500 dealing with applications of all kinds involving student and school situations, consumer affairs, sports, geography, and more.

Readable — Appropriate for whole-class use or as a self-help text for individual students.

Calculators — Optional; problems for calculators are designated with a "C."

Audience — First-year high school algebra students of average ability, two-year college students who are beginning algebra; bright sixth-, seventh-, and eighth-grade students; and as supplementary material in accelerated classes.

The two paperback volumes are organized around the following topics:

- Some Uses of Numbers
- Patterns and Variables
- Addition and Subtraction
- Multiplication
- Models for Division
- Sentence-Solving
- Linear Expressions and Distributivity
- Slopes and Lines
- Powering
- Operations with Powers
- Squares and Square Roots
- Sets and Events
- Linear Systems
- Quadratic Equations
- Functions

THESE unique first-year algebra materials were developed by Zalman Usiskin of the University of Chicago under a grant from the National Science Foundation. They develop the usual skills and concepts of traditional first-year algebra (except that factoring polynomials and complicated fractional expressions are de-emphasized), but the skills are developed through applications and models rather than from the field properties. Artificial word problems are not used. Greater attention is given to operations, linear expressions, sentence solving, and problems arising from real situations.

In all, 2455 students participated. Overall, the experimental group enjoyed the word problems and their textbook more than the control group, and the study indicated that they found these materials more interesting than most. Data indicate that the experimental materials can be used successfully in a variety of school situations, comparing favorably with traditional first-year algebra materials.

Here is a first-year algebra course that—

- offers a picture of the wide range of applications of mathematics from which algebraic symbolism develops naturally;
- covers the standard skills associated with first-year algebra using practical and interesting instead of contrived word problems;
- presents only limited work with factoring and complicated fractional expressions;
- devotes time to fundamental ideas from statistics and probability;
- is no more difficult than standard courses;
- can be implemented with no special teacher training or changes in the school curriculum.