PREFACE

The active learning unit on real numbers detailed on the following pages was developed to cover all of the mathematical concepts listed in the unit entitled "Introduction to Real Numbers" in the Program of Studies for Junior High Schools of Alberta.* The topics listed for the unit in the Program of Studies are:

1. Extension of the number system to include irrational numbers.
2. Properties of the operations on the real numbers: closure, commutative, etc.
3. Additional properties of the number system: order, completeness, density.
4. An introduction to graphing on the real plane.
5. Solution of problems involving conditions or equations with real numbers.**

Activities that would foster an understanding of the concepts identified above and that would promote active learning on the part of students were collected from a wide variety of sources and modified to suit the needs of the unit or, where necessary, the author created original activities to fill a particular requirement. Many more activities were collected (forty-six in all) than would be needed by any particular student. The idea was to provide the student and teacher with a choice of activities based on individual interests and needs.

While the author attempted to provide students with many types of materials to provide a variety of experiences, the mathematical goals of the unit were kept in mind. It was easy to find new materials that were interesting, stimulating, and easily learned, but unless they served purposes other than just motivation and pleasure, they were not included.

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*Alberta Department of Education, Program of Studies for Junior High Schools of Alberta (Edmonton: Queen's Printer, 1969).

**Ibid., p. 47.

Every effort was made to make the activities "ready-to-use" for both student and teacher, subject to the teacher's judgment as to whether or in what way any particular activity would be used.

The activity unit was tried out with eight classes of grade eight students from three Calgary Junior High Schools during April, May, and June, 1970. Evaluation of the feasibility of the unit was based on interviews with each of the four participating teachers as well from a checklist evaluation of specific activities and from student comment sheets. Using criteria that included differences in content, instructional demands, instructional effectiveness, and student attitudes, the real numbers active learning unit was judged by the teachers as preferable to the conventional textbook oriented approach. The four teachers indicated that they would use a majority of the activities in the real numbers unit in following years.* Data collected on student achievement and attitudes indicated achievement not significantly different from that of control classes following the conventional approach, and significantly more positive attitudes towards mathematics in the active learning classes as compared with the control classes.

Hopefully, the activities collected and described in detail on the following pages will be found useful by any junior high school teacher planning to pursue an active learning approach to mathematics with his students.

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*For more information on the evaluation of the feasibility of the activity unit, see: Dale Fisher, "A Feasibility Study on Active Learning With Real Numbers" (Unpublished M. Ed. Thesis, Department of Curriculum and Instruction, The University of Calgary, Calgary, 1970).