

The following is taken directly from the publication Algebra Thinking: First Experiences.

Notes to the Teacher

What is Algebra Thinking: First Experiences?

Algebra Thinking is a 128-page binder of activity pages for grades 5-8. The binder includes eight sections of activities designed to help middle school students think logically and algebraically. All of the activities have been designed to work with Rainbow Cubes, 1-cm cubes in six colors. Many of the activities can be used with any small counters.

What is the philosophy of Algebra Thinking?

The Curriculum and Evaluation Standards for School Mathematics published by the National Council of Teachers of Mathematics states that it is “essential in grades 5-8 that students explore algebraic concepts in an informal way to build a foundation for the subsequent formal study of algebra.” The goal of *Algebra Thinking: First Experiences* is to provide nontraditional settings that involve students in hands-on logic activities that promote the kind of thinking that will lead to success in algebra.

What exactly is Algebra Thinking?

The activities in this binder do not correspond directly to topics in a traditional algebra text. They are puzzle-like and therefore inviting, but they encourage higher-level thinking, such as organized listing, working backwards, holding some problem elements constant while allowing others to vary, using organized guessing, finding all the ways, using variables, making tables, and looking for patterns. Some of the activities can use algebraic notation for recording; this is discussed in the notes section for each activity.

The most important aspect of these activities is that they are all manipulative. This provides students with something important: a way to start. So often when approaching a challenging problem, students read the directions and give up saying, “I don’t know what to do.” When objects are involved it is easy to start by moving them around a little, then rereading the problem, and before they know it, the students are solving the problem!

How should I use Algebra Thinking in my classroom?

You will find many ways to use these activities. The eight sections are loosely organized in order of difficulty, but you may choose to present them in a different order. Within each section, however, the activities are definitely sequenced from easy to hard.

There is only one important thing *not* to do. Don’t lead the whole class through the pages together. This usually means that almost no one has exactly the right amount of time for the problems (some have too much, some have too little), and most students will end up watching you solve the problems for them.

Instead, be sure they understand the directions, then encourage students to work together, in pairs or small groups, to talk and write about their findings, then report and discuss their thinking with the larger group.