



transition to algebra

make algebra make sense

Fostering Algebraic Habits of Mind

Transition to Algebra is designed to build students' algebraic habits of mind, key mathematical ways of thinking that bring focus and coherence to students' work with mathematics. *The algebraic habits of mind central to TTA reflect the Standards for Mathematical Practice (SMP) outlined in the Common Core State Standards (CCSS).*

1 Puzzling and Persevering

Students often see mathematics as a collection of rules to know and follow. Genuine problems—in school and out—are not so cut-and-dried. Standardized tests also give problems that require students to think beyond the rules. Even ordinary word problems require students to figure out where to start and what to do next. There is no “formula” for how to do that, which is one reason students find word problems difficult. Puzzles place that particular skill—figuring out where to start—front and center. The puzzles in *Transition to Algebra* have been chosen strategically to support mathematical ways of thinking essential in algebra. (ALIGNED WITH CCSS, SMP#1: MAKE SENSE OF PROBLEMS AND PERSEVERE IN SOLVING THEM)

“Puzzling is a critical part of the curriculum. The Transition to Algebra program has supported my 6th graders in becoming thoughtful, creative, 'out-of-the-box' thinkers.”

—Cindy Carter, math teacher, grades 6–7, Dedham, MA

2 Seeking and Using Structure

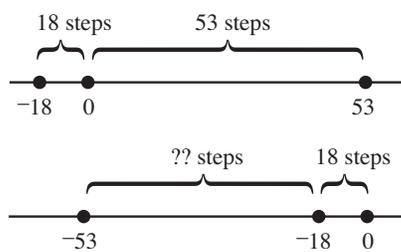
Students in beginning algebra are often taught to solve equations like $2(x + 3) + 4 = 24$ by going through a particular set of steps written in a particular way. On successive lines, they write the original equation, -4 below each side, a new equation, $+2$ below each side, a new equation, and so on. That method works for all first-year algebra cases and helps students “see the steps.” But it doesn't encourage students to see the overall structure. Both are necessary. *Transition to Algebra* helps students see the structure and the logic of algebra; it often also makes calculation much easier. (ALIGNED WITH CCSS, SMP#7: LOOK FOR AND MAKE USE OF STRUCTURE)

“Transition to Algebra's ease of use flows from its makes-sense approach. It is very well developed, coherent, and clearly presented so that teachers and students alike can see the logical progression of content.”

—Linda Ferreira, Math Coordinator, Attleboro, MA

3 Using Tools Strategically

Appropriate use of tools requires some reasoning about and picturing results before they are fully derived. In arithmetic and algebra, that means reasoning about calculations and operations and predicting how part or all of a calculation would go without carrying it out fully. For example, if students understand $-18 - 53$ as asking about the distance between -18 and 53 , and picture



the two numbers on the number line, they can “set up” that calculation mentally without needing special rules. The number line image,

mentally or on paper, shows that two distances (to zero) are being added. And the sign of the result is negative, as students would expect when subtracting a larger number (53) from a smaller one (-18). The calculation $-18 - -53$ shows a different picture. (ALIGNED WITH CCSS, SMP#5: USE APPROPRIATE TOOLS STRATEGICALLY)

“Transition to Algebra supported the learning of complex skills through the organizing tools and stepped students up to higher-level processes.”

—Kate Clapp, High School Math Educator,
Ben Bronz Academy, West Hartford, CT

