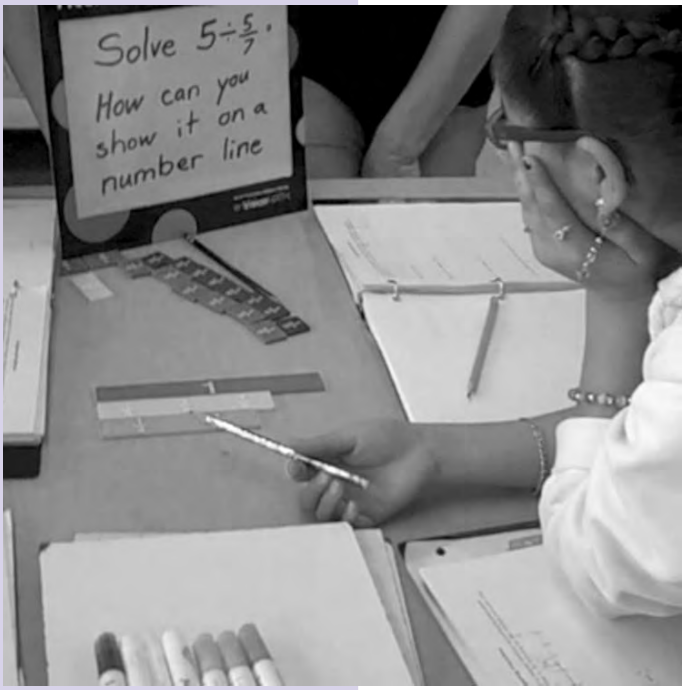
MATH *at* HOME

HELPING YOUR CHILDREN LEARN AND ENJOY MATHEMATICS

MEETING THE ALGEBRA CHALLENGE

Algebra is important! Right now, this course represents the greatest challenge in mathematics education for students, teachers, schools, and districts. That's because the goal for California is for *all students* to learn algebra and master the new way of thinking about mathematics that it requires.

Reaching the goal of "algebra for all" means that students and teachers will have to work hard, but that's not all. Parents and guardians must provide active support for algebra learning, beginning in kindergarten and continuing through high school.



Because of increased international competition and a growing body of research about college readiness, our state's mathematics standards specifically require that all students be taught algebra. This instruction starts in kindergarten, when "pre-algebra" ideas are first introduced. Students continue to develop pre-algebra skills through seventh grade, then take the rigorous and comprehensive algebra I course in grade 7, 8, or 9. All students must pass this course before advancing to most other high school math classes—and before they can graduate. Completion of algebra I is a high school graduation requirement.

Algebra is only one aspect of mathematics that students are required to study, but it presents a unique challenge for many learners. Although it can be a struggle, succeeding in algebra I is crucial. Students who master algebra are more likely to go to college, so it is well worth the extra study time it may require.

Algebra is used in almost all other areas of mathematics, including measurement, statistics, probability, problem solving, and geometry. Just as important, you'll find it plays a part in most careers, from engineering,

research, and architecture to business, computer technology, and all of the sciences—even plumbing and auto repair. This is why high schools and colleges view algebra as essential for every student.

While teaching algebra is the primary responsibility of mathematics teachers, parents also play a significant role. You aren't expected to teach algebra yourself, but you can help by understanding its importance, supporting your children as they learn pre-algebra skills in elementary and middle school, and giving them encouragement and moral support when they advance to algebra I.

Building a strong foundation for algebra

What do your children need to learn in elementary and middle school to ensure later success in algebra? Mathematics educators have identified three areas of study that provide a critical foundation.

- **Fluency with whole numbers:** This means that your children should develop a strong "number sense" and be able to add, subtract, multiply, and divide whole numbers with ease. They should also be able to quickly recall math facts, estimate calculations, and solve whole-number problems.

- **Proficiency with fractions:** Your children should learn to work with and compare fractions, decimals, and percentages. This includes being able to add, subtract, multiply, and divide fractions and use them in problems involving rates, proportions, and probability.

- **Understanding of geometry and measurement:** Preparation for algebra should also include the ability to analyze two- and three-dimensional shapes, understand proportional relationships, and find unknown lengths, angles, and areas.

These three broad topics don't represent the complete mathematics curriculum leading up to algebra, but they are essential components. As your children are introduced to these concepts and study them in greater depth throughout the grade levels, you can assist by making sure they grasp key ideas and learn to solve related problems. If they struggle, seek assistance as soon as possible as each step of math instruction builds on previous knowledge and skills.

WHAT IS ALGEBRA?

Algebra generalizes mathematical ideas by using letters or symbols for numbers in equations. It is a language of variables, operations, and formulas.

3 x 4 = 12 is not algebra.
This is not an algebraic equation because 3 and 4 are specific numbers that give one and only one correct answer when multiplied.

X + Y = 100 is algebra.
This is an algebraic equation where X and Y can represent many different numbers that, when added together, total 100.

Algebra is often used to state mathematical generalizations, such as the laws of physics that determine whether bridges and buildings stand or fall. Algebra allows us to discover important patterns in nature and express those patterns in equations that are universal and can be used in problem-solving situations.