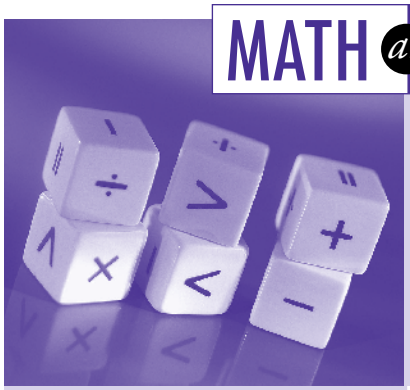


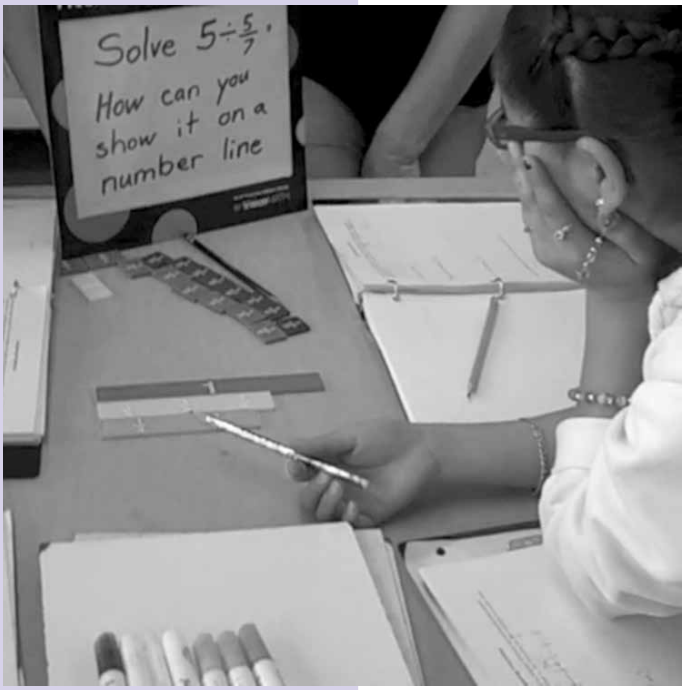
MATH *at* HOME

HELPING YOUR CHILDREN LEARN AND ENJOY MATHEMATICS

MEETING THE ALGEBRA CHALLENGE

Algebra is important! It helps us investigate, describe, and understand our world. Algebra is mathematics that allows us to use letters and symbols to generalize relationships and analyze mathematical situations via formulas and equations. For students, algebra is also the gateway to success in college and careers!

Algebra represents a different way of thinking about and using math. Everyone needs algebra. It is useful in all areas of mathematics—measurement, statistics, probability, problem solving, and geometry—and it is now required in most professions, including those that depend on science, technology, engineering, and mathematics (STEM). To learn higher mathematics, all students need to master this abstract way of thinking as part of a solid mathematics foundation.



Because of increased international competition and a growing body of research about college and career readiness, our state's Common Core Mathematics Standards introduce "pre-algebra" ideas in the elementary grades, then add more sophisticated algebra concepts through middle school. Although algebra is only one of the mathematics subjects that students are required to study, it presents a unique challenge for many learners because it is a transition from concrete arithmetic and computation to the symbolic language and abstract thinking of advanced mathematics.

Parents and guardians can actively support their children as they learn algebra throughout the grades and smooth their transition to higher math. As a parent, you aren't expected to teach your children algebra yourself, but you can help by understanding algebra's importance, supporting your children as they learn pre-algebra skills in elementary and middle school, and giving encouragement and moral

support when they advance to higher mathematics in the traditional or integrated high school course sequences of the Common Core mathematics curriculum.

What do your children need to study in elementary and middle school to ensure later success in algebra? They will need to:

- **Build fluency with numbers:** A strong "number sense" allows students to understand the uses of mathematics beyond simple computation. An understanding of how numbers fit together in our number system is needed in order to make generalizations in algebra.
- **Develop proficiency with fractions:** The same concepts and skills that allow us to add, subtract, multiply, divide, convert, and compare equivelent and unlike fractions are also used in solving algebraic equations.
- **Discover and investigate patterns:** Patterns are everywhere in our world. Once students discover patterns, they also need to find the rules underlying those patterns. Algegra can be used to describe the "rules" of patterns mathematically.
- **Generalize relationships:** A function is a relationship between two characteristics that vary, but are affected by each other. Algebra can be used to make mathematical generalizations about such relationships that are true for all cases.
- **Integrate ideas of geometry and equations:** The ability to analyze two- and three-dimensional geometric shapes, understand proportional relationships, and find unknown lengths, angles, and areas can all be described using algebraic equations, formulas, and graphs.

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.

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.

These broad topics alone do not lead to proficiency in algebra, but they are essential components. As your children are introduced to these concepts and study them in greater depth throughout the grade levels, seek assistance as soon possible if they struggle. Algebra builds on previous mathematical knowledge, so it is essential that students don't fall behind.