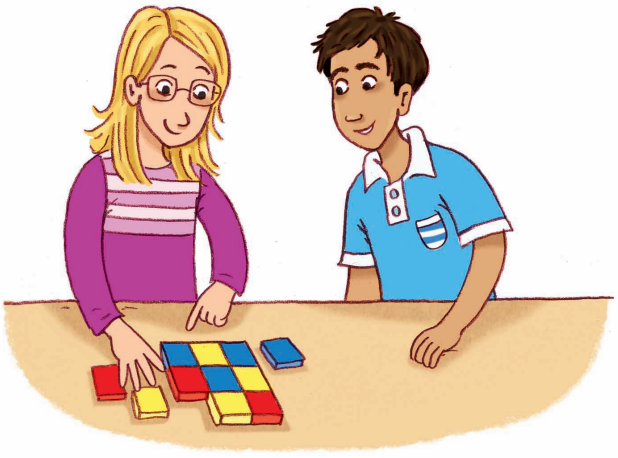
LETTER HOME

Products and Factors

Dear Family Member:

We are beginning a new unit in math called *Products and Factors.* We will explore multiplication and division by looking at ways objects can be put into arrays. An array is a collection of objects arranged in equal rows. Things that come in arrays can be counted by multiplication. For example, an auditorium that has 20 rows with 10 seats in each row has 20 × 10 seats.

We will investigate the different sizes of arrays that are possible with certain numbers of objects. For example, we can arrange 20 objects into four equal rows, but not into three equal rows. This will naturally lead us to explore the relationship between multiplication and division, as well as to practice the multiplication facts.



Students arrange tiles in rows as they learn about multiplication and division.

You can help your child with multiplication using the following ideas:

Play Floor Tiler. This game will help your child learn the multiplication facts and learn the relationships between factors and multiples. Directions are in the *Student Guide.*

Play Product Bingo. This is another game that will help your child learn the multiplication facts and learn the relationships between factors and multiples. Directions are in the *Student Guide*.

Words. In this unit, your child will learn words such as factor and multiple. Ask your child what these words mean. He or she will also learn about some special numbers such as prime numbers and square numbers. Ask about these. You might also ask your child to explain why the square numbers (4, 9, 16, etc.) are called "square."

Math Facts and Mental Math

This unit begins the systematic review and assessment of the multiplication facts.

Multiplication Facts. Students review the 5s, 10s, and square numbers to maintain and increase fluency and to learn to apply multiplication strategies to larger numbers.

You can help your child review these facts using the flash cards that are sent home or by making a set of flash cards from index cards or scrap paper. Study facts in small groups each night. As your child goes through the flash cards, put the cards in three stacks: Facts I Know Quickly, Facts I Can Figure Out, and Facts I Need to Learn.

For Facts I Need to Learn, work on strategies for figuring them out. Good strategies include:

Skip counting. To solve 5 × 6, skip count: 5, 10, 15, 20, 25, 30

Reasoning from known facts. To solve 5 × 6, I know 5 × 3 = 15 and 15 + 15 = 30

Turn-around facts or fact families. 20 ÷ 4 = 5 because I know 4 × 5 = 20.

For Facts I Can Figure Out, use the flash cards to practice the facts for fluency.

For Facts I Know Quickly, help your child use mental math strategies to multiply 10s and 100s:

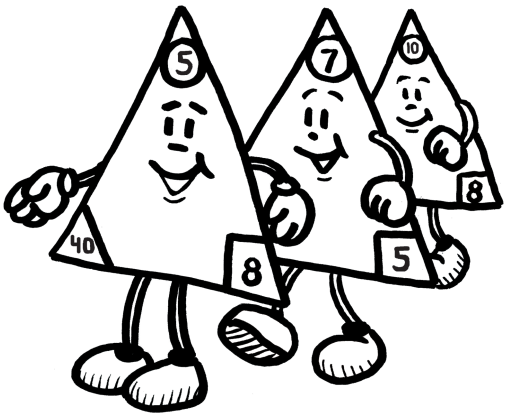
50 × 30 = 150, 100 × 60 = 6000, 40 × 40 = 1600

Grade 4 Math Facts Overview

The goal of the math facts development in *Math Trailblazers* is for students to learn the basic facts efficiently, gain fluency with their use, and retain that fluency over time. A large body of research supports an approach in which students develop strategies for figuring out the facts rather than relying on rote memorization. This not only leads to more effective learning and better retention, but also to the development of mental math skills. In fact, too much drill before conceptual understanding may interfere with a child's ability to understand concepts at a later date. Therefore, the teaching of the basic facts in *Math Trailblazers* is characterized by the following elements:

Use of Strategies. Students first approach the basic facts as problems to be solved rather than as facts to be memorized. In all grades, students are encouraged to use strategies to find facts, so they become confident that they can find answers to facts problems that they do not immediately recall. In this way, students learn that math is more than memorizing facts and rules which "you either get or you don't."

Distributed Facts Practice. Students study small groups of facts that can be found using similar strategies. In fourth grade, they review multiplication facts to maintain or gain fluency. See Figure 1. Students also work on division facts (fact families) starting in Unit 6.



Unit	Multiplication Facts Group
3	5s, 10s, and Square Numbers
4	2s, 3s, and 9s
5	Last Six Facts (4×6, 4×7, 4×8, 6×7, 6×8, 7×8)

Figure 1: *Development of Multiplication Facts in Grade 4*

Practice in Context. Students continue to practice the facts as they use them to solve problems, investigate math concepts, and play math games.

Appropriate Assessment. Students are regularly assessed to see if they can find answers to facts problems quickly and accurately and retain this skill over time. They take a short quiz on each group of facts. Students record their progress on *Facts I Know* charts and determine which facts they need to study.

A Multiyear Approach. In Grades 1 and 2, the curriculum emphasizes the use of strategies that enable students to develop proficient strategies for the addition and subtraction facts by the end of second grade. In Grade 3, students review the subtraction facts and develop proficiency with the multiplication facts. In Grade 4, the addition and subtraction facts are checked, the multiplication facts are reviewed, and students develop fluency with the division facts. In Grade 5, students review the multiplication and division facts.

Facts Will Not Act as Gatekeepers. Use of strategies and calculators allows students to continue to work on interesting problems and experiments while learning the facts. They are not prevented from learning more complex mathematics because they do not have quick recall of the facts.

Thank you for taking time to talk with your child about what he or she is doing in math.

Sincerely,