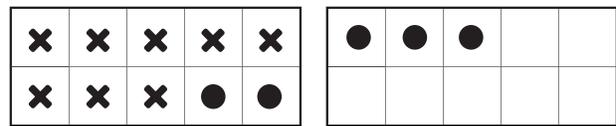# LETTER HOME

Welcome to Second Grade

Dear Family Member:

The *Math Trailblazers* curriculum was developed to meet national recommendations for improving mathematics education. In this first unit of second grade, the main focus is on solving addition and subtraction problems—some in word problems, some in the context of interpreting a table or graph. Your child's class will explore different tools and strategies to solve these problems. They will use connecting cubes, ten frames, and the number line. Students will examine strategies such as counting on, using doubles, making ten, and reasoning from facts already known. Research shows that using strategies to learn math facts results in a better understanding of the mathematics involved and more reliable recall later on.

Doubling is a natural strategy that many children easily develop. Students remember the doubles easily and use them to solve other problems such as adding near doubles, for example, 7 + 8. "Make ten" builds on your child's experience with partitioning numbers and with using ten. To solve a problem such as 8 + 5, a

$$8 + 5 = 8 + 2 + 3 = \boxed{8 + 2} + 3 = 10 + 3 = 13$$

Using "Make Ten" to solve a problem

student learns to recognize that 8 plus 2 more will make ten. Then the problem changes as follows:

$8 + 5 = 8 + 2 + 3 = 10 + 3 = 13$.

You can provide additional practice at home by creating word problems and asking your child to solve them and explain his or her reasoning. As your child describes strategies, you will learn a great deal about his or her math reasoning.

The TIMS Laboratory Method, an adaptation of the scientific method, is also reviewed in this unit. Students will collect, organize, graph, and analyze data about the birthdays of students in the class.

The unit begins with a long-term project that involves coins and exchanging pennies for nickels, nickels for dimes, etc.

Math Facts and Mental Math

Students' fluency with addition facts in Groups A and B and the related subtraction facts will be assessed in this unit.

Group A: 0 + 1, 1 + 1, 2 + 1, 3 + 1, 0 + 2, 2 + 2, 3 + 2, 4 + 2

Group B: 3 + 0, 4 + 0, 4 + 1, 5 + 1, 6 + 1, 5 + 2, 6 + 2, 5 + 3, 7 + 1, 1 + 8

You can help your child review these facts using the flash cards the teacher sent home or by making a set of flash cards from index cards or scrap paper. Study the 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.

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 strategies to solve problems like these using mental math: $23 + 2, 12 + 3, 24 - 2$

Grade 2 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 Second Grade, they practice the addition facts with sums to ten, then the related subtraction facts to those facts, then all the addition facts. See Figure 1.

Unit	Addition Facts	Strategies Used	Focus
1	Group A 0 + 1, 1 + 1, 2 + 1, 3 + 1, 0 + 2, 2 + 2, 3 + 2, 4 + 2 Group B 3 + 0, 4 + 0, 4 + 1, 5 + 1, 6 + 1, 5 + 2, 6 + 2, 5 + 3, 7 + 1, 1 + 8	Counting On, Zero	Use strategies fluently for facts with sums to ten. Develop mental math strategies and number sense and solve fact families for facts with sums more than ten.
2	Group C 1 + 9, 2 + 7, 2 + 8, 2 + 9, 3 + 6, 3 + 7, 3 + 8, 4 + 6, 4 + 7, 5 + 5, 5 + 6	Making Ten, Using Ten	
3	Group D 3 + 3, 3 + 4, 4 + 4, 4 + 5, 6 + 6, 6 + 7, 7 + 7, 7 + 8, 8 + 8, 10 + 9, 10 + 10	Using Doubles	
4	Group E 5 + 7, 8 + 4, 8 + 5, 9 + 3, 9 + 4, 9 + 5, 10 + 1, 10 + 2, 10 + 3	Making Ten, Using Ten	
5	Group F 8 + 6, 9 + 6, 9 + 7, 10 + 4, 10 + 5, 10 + 6, 10 + 7, 10 + 8, 9 + 8, 9 + 9	Making Ten, Using Ten	
6	Group C and D	Making Ten, Using Ten	Use strategies fluently and solve fact families.
7	Group E	Using Doubles	
8	Group F	Making Ten, Using Ten	

Figure 1: *Development of addition facts and the related subtraction facts in Grade 2*

Practice in Context. Students continue to practice all 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 will record their progress on *Addition Facts I Know* charts to 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 proficiency with addition and subtraction facts by the end of second grade. Students focus on gaining proficiency with the facts with sums to ten in Grade 1 and on facts with sums more than 10 in Grade 2. 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 allow students to continue to work on interesting problems and experiments while learning the facts. Lacking quick recall of the facts does not prevent students from learning more complex mathematics.

Sincerely,