

# LETTER HOME

## Add and Subtract to Solve Problems

Dear Family Member:

In this unit students will continue to develop mental math strategies for solving addition and subtraction problems. Students will explore a variety of strategies for solving addition facts with sums to ten. Students will also connect addition to subtraction while solving addition and subtraction problems.

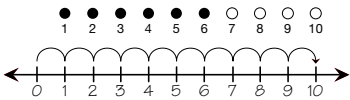
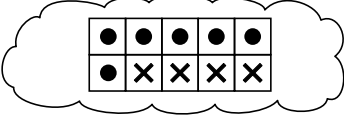
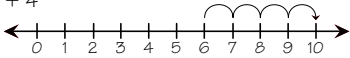
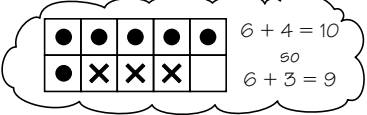
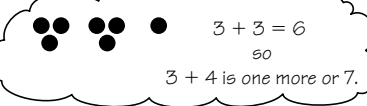
“Encouraging children to use efficient strategies to derive unknown facts before drill is better than ‘premature drill’ . . . and doing so increases both initial learning and retention.”  
(C.A. Thornton, “Strategies for the Basic Facts,” *Mathematics for the Young Child*, 1990.)

**Addition Strategies.** There is a body of research that supports students learning their addition facts in this manner. Generally, students move through three development stages when acquiring operational understanding and fluency with the math facts.

- Direct modeling in which students re-create the action;
- Counting strategies such as counting on and counting back; and
- Reasoning from known facts in which students work from facts they already know. For example, if a student knows  $5 + 5$ , then he or she has a quick way to access  $4 + 5$  (Carpenter, 1999; National Research Council, 2001).

Your child will be encouraged to invent his or her own strategies and to share his or her thinking with other students. Students will then summarize these strategies as they make a menu.

**Addition Strategies Menu for Small Numbers**

<p style="text-align: center;"><b>Counting All</b></p> <p><math>6 + 4</math></p> 	<p style="text-align: center;"><b>Making Ten</b></p> <p><math>6 + 4</math></p> 
<p style="text-align: center;"><b>Counting On</b></p> <p><math>6 + 4</math></p> 	<p style="text-align: center;"><b>Using Ten</b></p> <p><math>6 + 3</math></p> 
<p style="text-align: center;"><b>Another Strategy</b> _____</p>	<p style="text-align: center;"><b>Using Doubles</b></p> <p><math>3 + 4</math></p> 

**Figure 1:** Addition Strategies Menu for Small Numbers

Use the following activities to help your child at home:

- **Hi, Birdie and Bye-bye, Birdie.** Look for addition and subtraction stories in everyday situations. For example, you might see birds sitting on a telephone wire. Invite your child to count the birds with you. Make up a story like the following: “I see seven birds sitting on a wire. If three fly out of sight, how many will I see?” Take turns making up and solving the stories.
- **Change It.** After your child has solved a problem, take the same story and change it to an addition or subtraction problem. Using the above example: “Now I see 4 birds on the wire. What if 3 come back? How many will there be?”
- **Listen.** As you listen to your child’s explanations, be prepared to be surprised and often delighted by the creative approaches your child employs to solve problems.
- **Making Ten.** Ask your child to name the pairs of numbers that make a sum of ten, for example, 6 and 4 or 3 and 7.

## Math Facts and Mental Math

This unit begins the systematic review and assessment of the the addition facts in Groups A and B.

**Addition Facts.** Students review and practice the following addition facts to develop fluency:

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 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:  $25 + 1$ ,  $12 + 2$ .

## Grade 1 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 first 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 2.

Unit	Addition Facts	Focus
6	Groups A and B	Develop mental math strategies and number sense.
7	Group C sums to 10	
8	Group D sums to 10	
9	Groups A and B	Use strategies fluently and solve fact families.
10	Group C sums to 10	
11	Group D sums to 10	
12	Group A	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.
13	Group B	
14	Group C	
15	Group D	
16	Group E	
17	Group F	

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

**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. Starting in Unit 9, students will record their progress on *Addition 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 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.

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

Sincerely,