## 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


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.

## 2 TG•Grade 1•Unit 6•Letter Home

| 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. |
| 13 | Group B |  |
| 14 | Group C |  |
| 15 | Group D | Develop mental math strategies and number sense and solve fact families for facts with sums more than ten. |
| 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,
$\qquad$

## Unit 6: Home Practice

Part 1 Three Parts Together
Use counters, ten frames, or the number line.
A. $2+8+5=$ $\qquad$
B. $0+10+3=$ $\qquad$
C. $9+1+2=$ $\qquad$
D. $7+3+6=$ $\qquad$

E. $4+6+3=$ $\qquad$ F. $6+4+6=$ $\qquad$
G. $5+5+5=$ $\qquad$ H. $3+7+4=$ $\qquad$
I. $8+2+7=$ $\qquad$
J. $1+9+8=$ $\qquad$

$\qquad$

## Part 2 Word Problems

Solve each problem and write a number sentence. You may use the number line, ten frame, or counters such as pennies. You may also draw a picture or diagram.


1. Ming had ten cookies in his lunch. He gave 3 to Jackie. How many cookies did he have left?
2. Maya has 9 stickers. Jacob has 6 . How many more stickers does Maya have than Jacob?
3. Shannon and John combined their rock collections. Together they have 8 rocks. If Shannon had 5 rocks, how many rocks did John have?
$\qquad$
4. Jerome picked 5 flowers for his teacher. He bought 4 more. How many did he give to her in all?
$\qquad$

## Part 3 Combining and Partitioning

Fill in the empty boxes and write number sentences to match.

Dear Family Member:
Your child has been learning to represent addition and subtraction using part-whole diagrams like the ones on this page. Help your child fill in the empty boxes and write a number sentence to match. Some problem situations can be solved with addition and others can be solved with addition or subtraction. Your child may use counters such as pennies or beans to help solve the problems.

Thank you.
1.

addition number sentence
2.


| addition number sentence |
| :--- |
| subtraction number sentence |

3. 


addition number sentence
subtraction number sentence
$\qquad$

## Part 4 Number Story

## Fill in the empty boxes and write number sentences to match.

1. 


addition number sentence
2.


| addition number sentence |
| :--- |
| subtraction number sentence |

3. 


$\qquad$
4.

5. Write a story that matches the number sentence in Question 2.
$\qquad$
$\qquad$
$\qquad$

## Addition Flash Cards: Groups A and B





## Addition Cards for Small Sums 1



## Addition Cards for Small Sums 2



## Addition Cards for Small Sums 3



## Sorting Mat



## Box Diagram



## Partitions of Five


$\underline{5+0=5} \quad \underline{4+1=5} \quad \underline{3+2=5}$

## Partitioning Eight Into Parts (CHomowork)

Separate 8 into two parts. The first one is done for you. Write a number sentence for each one.
1.

2.

3.

$\qquad$
4.

$\qquad$

## Using Sums

(EMomowork)
Fill in the outer ring to find the parts for the sum in the middle.



## Practicing Addition Facts

## ( AMomowork)

Dear Family Member:
Please help your child develop strategies for solving the addition facts in Groups A and B. There are three activities listed here. Help your child choose a different activity every day.

Thank you.

## Addition Flash Card Sort

Take home your Addition Flash Cards: Groups A and B. Ask a family member to choose one flash card at a time for you to solve. Sort the flash cards into three piles: Facts I Know Quickly, Facts I Can Figure Out, and Facts I Need to Learn. Clip the cards in the Facts I Know Quickly pile together and place them back into the envelope. Practice the facts in the last two piles again.

## Addition Flash Card War

Play Addition Flash Card War with a partner. Divide the Addition Flash Cards for the facts in Groups A and B between two players. For each round the players will turn over one card to show the addition fact. The player with the greatest sum wins the round and collects both cards. If the two cards have equal sums, the players will each turn over another card to see who wins the round. The player with the most cards at the end of the game wins.


Player 1

Player 2

Player 2 wins this round

## More or No More Game

Play a few rounds of this game with your child. Directions and game boards are attached.

## More or No More Game

The object of the game is to earn the most points by getting the highest sums. This game is for two players.

## Materials

- Number Cards 0-8
- More or No More Spinner
- Clear plastic spinner or a paper clip and pencil
- More or No More Recording Sheet


## Directions

1. Player 1 draws a number card and places it face up.
2. Both Player 1 and Player 2 record the
 number on the ten frame on their recording sheet.

3. Player 1 spins the spinner and follows the directions, completes his or her ten frame, and writes a number sentence to represent the addition problem.


Player 1

4. Player 2 then takes a turn spinning the spinner, completing his or her ten frame and number sentence.


Player 1

5. The player with the greatest sum earns 1 point. Both players keep track of the points earned on their recording sheet. After five rounds, the player with the

Score

| Player 1 | Player 2 |
| :---: | :---: |
| 1 | 0 | highest score wins the game.

Player 2 starts the next round.

## More or No More Spinner



More or No More Recording Sheet: Game One
Score

Round 1


Round 2


Round 3


Round 4


Round 5


Total

| Player 1 | Player 2 |
| :--- | :--- |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

Name Date
More or No More Recording Sheet: Game Two


## Round 2



## Round 3



## Round 4



## Round 5



Total

| Player 1 | Player 2 |
| :--- | :--- |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

## Number Cards 0-8




## Ten Frames



## How Many More

## ( SHomowork)

Dear Family Member:
In our study of addition and subtraction, your child has been learning to use addition strategies to solve comparison subtraction situations. For example, "There are 7 girls and 3 boys in line. How many more girls than boys?" They can use counters such as pennies or beans to help them.

Thank you.

## 1. How many more circles

 than triangles $\square$ ?


$$
7+\square=10
$$




$$
3+\square=7
$$

## 3. How many more bananas <br>  than apples ?



$$
\square+5=5
$$

$\qquad$
4. How many more
 than



$$
\square+4=9
$$

5. How many more balls ?


$$
6=4+\square
$$

6. How many more $X_{s}$ than $\bigcirc_{s}$ ?

XXXX


$$
1+\square=4
$$

7. How many more birds than cats


## Large Ten Frame and Box Diagram



## 0-10 Small Ten Frame Cards




## Make Ten

This game is played by two players. The object of the game is to be the player that finds the most combinations that make the sum of 10.

## Materials

4 sets of Number Cards 0-10

## Directions

1. Each player draws five cards from the deck.

2. The remaining cards are stacked in the center.
3. Player 1 lays down cards to form as many combinations equaling 10 as possible. He or she says the number sentence aloud for each
 combination.
4. Player 1 may now ask Player 2 for a specific card needed to make another sum of 10 .
5. If Player 2 has that card, he or she must give it to Player 1, who can then lay down that combination.

6. If Player 2 does not have the card, Player 1's turn is over. Player 1 then draws from the center deck until he or she has five cards again.
7. Player 2 takes a turn and follows the same steps.
8. The game is over when all the cards in the center are gone. The player with the most combinations of ten wins the game.

$\qquad$

## How Many More to Ten

## (SHomowerk)

Dear Family Member:
This activity focuses on addition to 10 . Since these are important facts to learn, we are using several different ways to show the parts of ten. Help your child read the word problems below. Then help him or her solve the problems and show the answer in three different ways: using ten frames, in number sentences, and in diagrams. The first one is an example. Your child may use counters like small beans or popcorn to help complete the ten frame.

Thank you.

Solve each problem and show your answer in 3 ways.
Ex. Linda has 6 books at school. How many more books does she need to make ten?

$6+4=10$
number sentence


1. Nila needs to cut up 10 apples. She already cut 3 apples. How many more apples does she need to cut?

number sentence

2. Ming's house is 10 miles from school. He walked 2 miles. How far does he still need to walk?

number sentence

3. Levi chews 5 sticks of gum of his 10 pack. How many more sticks of gum does he have?

number sentence

4. Write an addition number sentence to match the ten frame below. Fill in the boxes to match.

number sentence

5. Write an addition story to match the number sentence in Question 4.
$\qquad$
$\qquad$

## Make Ten at Home


#### Abstract

Dear Family Member: Your child played the game Make Ten in school and is ready to teach it to someone at home. You may use the number cards your child brought home or use a deck of playing cards by removing the kings, queens, and jacks. The ace can represent the number 1. Have beans, toothpicks, or other small objects handy for your child to use in solving problems during the game. Also, please help your child keep a record of the number of people he or she teaches to play the game.

Thank you.


## Make a tally mark for each person you teach to play the game.

Tallies $\qquad$

## Make a tally mark for every five minutes you play the game.

Tallies $\qquad$ Total minutes $\qquad$

## Parent's signature

$\qquad$
Child's signature $\qquad$
Return this sheet to school by $\qquad$ .

$\qquad$

## Part-Whole Diagram and Number Sentences

## Whole


number sentence
number sentence

## Subtraction Story

## (EMomowork)

Dear Family Member:
In our study of subtraction, your child has been writing simple number stories to match a picture. For example, "There were 5 donuts, 2 were eaten, there were 3 left" is a number story. The corresponding number sentence is $5-2=3$. Have your child tell you a subtraction number story about the picture below. Then help your child write the story and the number sentence on the back.

Thank you.


Name

## Look at the picture. <br> Draw a picture for a subtraction story.

Write your story. Fill in the part-whole diagram and write a number sentence.


## Comparing How Many More



Solve each problem. Write an addition and subtraction number sentence for each problem. For each number sentence, draw a box around the number that tells how many more.

1. There are 7 birds and 4 cats. How many more birds than cats?

addition number sentence
subtraction number sentence
2. There are 5 boys and 4 girls at a party. How many more boys than girls?


3. There are 2 bats and 8 balls. How many more balls than bats?

## 


4. There are 3 circles and 6 triangles. How many more triangles than circles?

5. There are 7 girls and 2 boys. How many more girls than boys?

addition number sentence
subtraction number sentence
6. There are 4 bunches of bananas and 8 apples. How many more apples than bunches of bananas?
 addition number sentence
7. Look around your home. Write a story that compares two groups of objects. Write number sentences.

There are $\qquad$ and $\qquad$ How many more $\qquad$ than ?

Subtraction Cards for Small Numbers 1


Subtraction Cards for Small Numbers 2


Subtraction Cards for Small Numbers 3


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Subtraction Cards for Small Numbers 4


Subtraction Cards for Small Numbers 5


Subtraction Cards for Small Numbers 6


## Zoo Store

## EMomowork)

Dear Family Member:
Help your child read each problem below. He or she may use the number line, ten frame, or counters such as pennies to solve the problems. Your child may also choose to draw a picture or diagram. Help your child draw or write a subtraction story for Question 5.
Thank you.

## Solve each problem. Write a number sentence to match.



1. There are 10 customers in the store. Six are boys. How many are girls?
2. The zoo store had 9 toy tigers. They sold 7 . How many are left?
3. The store had 5 toy zoo trains. They sold some to a man. Then the store had 2 zoo trains. How many did the man buy?
$\qquad$
4. In the morning, the owner put some animal books in the window. He sold three that day. Then he had 7 left. How many were in the window that morning?
5. Complete the number sentence $10-8=\square$. Then draw a picture and write a subtraction story about a zoo store to match the sentence.

Fact Families 1


Fact Families 2


Fact Families 3


Fact Families 4


Fact Families 5


Fact Families 6


## Fact Families at Home



Dear Family Member:
The set of math facts you can make from the same numbers is called a fact family. Here is the fact family for the numbers 2,7 , and 9 :

$$
\begin{array}{ll}
2+7=9 & 7+2=9 \\
9-7=2 & 9-2=7
\end{array}
$$

Thinking of related facts together helps students remember them. Thank you.

Complete the number sentences in each fact family.
A. $3+1=\square$
B. $2+0=\square$
$1+\square=4$
$0+\square=2$
C. $\square+2=7$
$2+5=\square$
$\square-1=3$
$\square-0=2$
$4-3=\square$
$\square-2=0$
$7-2=\square$
$\square-5=2$

List the number sentences in the fact family for each set of numbers.
D. $7,1,8$ $\square$
E. 2, 3, 5 $\qquad$

