## 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

$8+5=8+2+3=8+2+3=10+3=13$
Using "Make Ten" to solve a problem solve a problem such as $8+5$, a 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 $0+1,1+1,2+1,3+1,0+2,2+2,3+2,4+2$ <br> Group B $\begin{gathered} 3+0,4+0,4+1,5+1,6+1,5+2, \\ 6+2,5+3,7+1,1+8 \end{gathered}$ | $\begin{gathered} \text { Counting On, } \\ \text { Zero } \end{gathered}$ | Use strategies fluently for facts with sums to ten. <br> Develop mental math strategies and number sense and solve fact families for facts with sums more than ten. |
| 2 | $\begin{gathered} \text { Group C } \\ 1+9,2+7,2+8,2+9,3+6,3+7, \\ 3+8,4+6,4+7,5+5,5+6 \end{gathered}$ | Making Ten, Using Ten |  |
| 3 | $\begin{gathered} \text { Group D } \\ 3+3,3+4,4+4,4+5,6+6,6+7, \\ 7+7,7+8,8+8,10+9,10+10 \end{gathered}$ | Using Doubles |  |
| 4 | $\begin{gathered} \text { Group E } \\ 5+7,8+4,8+5,9+3,9+4, \\ 9+5,10+1,10+2,10+3 \end{gathered}$ | 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,

## Unit 1: Home Practice

## Part 1 Stories

Solve the problems.
A. $0+\square=2$
B. $7+1=\square$
C. $\square+4=6$
D. Draw a picture or write a story for Question $A$.

## Name

$\qquad$ Date

## Part 2 Petal Problems

Add the number in the middle to each of the numbers in the colored petals. Write your answers on the white petals. One is done for you.
1.

2.

$\qquad$

## Part 3 How Much Money

Write the total amount of money on the blank. Use coins to help you.
1.

2.

3.

4.

5.

6.


## Part 4 Word Problems

## Solve the problems.

1. Five kittens are playing with a ball of string. Three more kittens are eating. How many kittens are there in all?

Number sentence $\qquad$
2. Three whales are swimming close to shore. Nine more swim in from the deep water. How many whales are now in the group?

Number sentence $\qquad$
3. A pig has 9 piglets in her litter. She has already fed five of them. The rest are still hungry. How many piglets are hungry?

Number sentence $\qquad$
4. A pack of 13 wolves has 5 adults. The rest are pups. How many pups live in the pack?

Number sentence $\qquad$
5. Show or tell your strategy for solving Question 3.

## Part 5 More Word Problems

## Solve the problems.

1. There is a herd of elephants. Three baby elephants are born. Now there are seven elephants. How many elephants were in the herd to start?

Number sentence $\qquad$
2. There are 11 chattering monkeys. Four fall asleep. How many monkeys are still awake?

Number sentence $\qquad$
3. Twelve frogs are sitting near a pond. Some jump in. Four frogs are left sitting by the pond. How many frogs jumped in the pond?

Number sentence $\qquad$
4. Nine robins and 4 finches are at the bird feeder. How many more robins than finches are at the bird feeder?

Number sentence $\qquad$
5. Show or tell your strategy for solving Question 3.

## Triangle Flash Cards: Group A

- To practice an addition fact, cover the corner with the highest number. Add the two uncovered numbers.
- To practice a subtraction fact, cover one of the smaller numbers and subtract from the highest number.



## Triangle Flash Cards: Group B

- To practice an addition fact, cover the corner with the highest number. Add the two uncovered numbers.
- To practice a subtraction fact, cover one of the smaller numbers and subtract from the highest number.



## Two Ten Frames



Penny Chart


Nickel Chart

|  |  |  |  |  |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |



## Dime Chart



Quarter Chart

|  |  |  |  |  |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |



## Hundreds of Coins

## Day 8 Trade for Nickels

In how many more days will we make the next trade for a nickel? Why do you think that?

On Day 12 how many nickels will be in the Nickel jar? How do you know?

## Day 20 Coins in Pockets

1. A. Here are Jen's pockets. How much money does Jen have?

B. Jen trades some pennies for larger coins. Which coins does she have now?
2. Roberto has 3 coins in his pocket. They equal 204. What coins are in Roberto's pocket?
3. Look at the coins in Liz's pocket. Liz spends half of her money. How much money is left? Write a number sentence.


Number sentence

## Day 25 Sandy's Pennies

Sandy has 25 pennies in her piggy bank.

A. If she trades all the pennies for nickels, how many nickels will she have?
B. Fill in the blanks to show how she can skip count the nickels.
$\qquad$ , 10, $\qquad$ , 25
C. If she trades the pennies for nickels and dimes, how many of each will she have? Show or tell how you know.
D. She found $3 ¢$ more. Will she have enough for one more nickel? Show or tell how you know.
$\qquad$

## Day 36 Spilled Pennies

Show or tell how to solve each problem. Write a number sentence.

On day 36 some pennies spilled out of the Penny jar. 12 fell on the floor and 8 fell on the table.
A. How many pennies spilled out of the jar?

Number sentence $\qquad$
B. How many pennies are still in the jar?

Number sentence $\qquad$
C. Trade the 36 pennies in the Penny jar for nickels.

How many nickels are in the jar? $\qquad$
How many pennies are in the jar? $\qquad$

$\qquad$

## Day 50 Coin Purses

Find the value of the coins in each purse. Show how you group and skip count the coins. Write a number sentence to show how you grouped the coins.
A.


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$\qquad$

## Day 100 More Coins

1. A. Find the value of the coins. Write a number sentence to show how you grouped the coins.


Number sentence $\qquad$
B. If all 16 pennies are traded for nickels, how many nickels will there be?
C. If all the nickels and pennies are traded for dimes, how many dimes will there be?
$\qquad$
2. A. Find the value of the coins. Write a number sentence to show how you grouped the coins.


Number sentence $\qquad$
B. Show the same amount with fewer coins but more than 4 coins.

## Ten Frames and Number Line Display



## Number Line Display




of


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## TIMS Laboratory Method

## Draw

- Drawing the picture

- Collecting and organizing the data



## Graph

- Graphing the data

- Exploring the data

Sample Picture


Birth Months Data Table

| B <br> Birth Month | Number of Students |
| :---: | :---: |
| January |  |
| February |  |
| March |  |
| April |  |
| May |  |
| June |  |
| July |  |
| August |  |
| September |  |
| October |  |
| November |  |
| December |  |

## Birth Months Graph



## Show Your Strategy Cards



## Show Your Strategy Card Display



$\qquad$

## Here's What I Thought



Record the Problem:
$\square$

$\qquad$

## Use Addition Strategies



Dear Family Member:
In school, we are learning to use different strategies and tools to solve addition problems. These problems build on work your child did in school today. Your child may use counters, ten frames, the number line, or different strategies to solve the se problems.

Thank you.

## Solve the problems. Show or tell how you solved each and write a number sentence.

1. Mark and his friend Roberto collect baseball cards. Mark has 9 and Roberto has 8 . How many baseball cards do they have altogether?

Number sentence $\qquad$

$\qquad$
2. Emily and Levi collect football cards. Emily has 7 cards and Levi has 3 cards. How many do they have altogether?

Number sentence $\qquad$

3. Rosa collects coins from different countries. She has 5 from Mexico and 4 from Canada. How many coins does she have?

Number sentence $\qquad$

$\qquad$
4. Darius collects cars. He has 8 blue cars and 8 red cars. How many cars does he have?

Number sentence $\qquad$

5. Complete each number sentence.
A. $8+\square=10$
B. $\square+6=10$
C. $10=\square+9$
D. $7+\square=10$
E. $5+\square=10$
F. $\square+4=10$
G. $\square+3=10$
H. $10=\square+2$

## Large Triangle Flash Card



## Triangle Flash Cards: Note Home

## (Allomowork)

Dear Family Member:
Your child is beginning a systematic study of the addition and subtraction facts. In each unit, your child will study a small group of facts using Triangle Flash Cards. In this unit, your child will study the addition facts in Group A $(0+1,1+1,2+1,3+1,0+2,2+2,3+2,4+2)$ and those in Group $B(3+0,4+0,4+1,5+1,6+1,5+2,6+2,5+3,7+1$, $1+8)$. To help with the study of the facts, follow these directions.

- Choose a card and cover the corner with the largest number. It is shaded. Ask your child to add the two uncovered numbers.

$$
\begin{aligned}
& 3+1=? \\
& 1+3=?
\end{aligned}
$$



- 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.
- Circle the facts in the Facts I Know Quickly pile on the Addition Facts I Know chart. Clip the cards from this pile together and place them into an envelope.
- Practice the facts in the last two piles again. Discuss strategies that are useful for learning these facts.
- Keep these tools at home to help your child study these facts for a few minutes each day.

Thank you.

$\qquad$

## Addition Facts I Know

Circle the facts you know quickly.

| $1+1$ | $1+2$ | $1+3$ | $1+4$ | $1+5$ | $1+6$ | $1+7$ | $1+8$ | $1+9$ | $1+10$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $2+2$ | $2+3$ | $2+4$ | $2+5$ | $2+6$ | $2+7$ | $2+8$ | $2+9$ | $2+10$ |  |
| $3+3$ | $3+4$ | $3+5$ | $3+6$ | $3+7$ | $3+8$ | $3+9$ | $3+10$ |  |  |
| $4+4$ | $4+5$ | $4+6$ | $4+7$ | $4+8$ | $4+9$ | $4+10$ |  |  |  |
| $5+5$ | $5+6$ | $5+7$ | $5+8$ | $5+9$ | $5+10$ |  |  |  |  |
| $6+6$ | $6+7$ | $6+8$ | $6+9$ | $6+10$ |  |  |  |  |  |
| $7+7$ | $7+8$ | $7+9$ | $7+10$ |  |  |  |  |  |  |
| $8+8$ | $8+9$ | $8+10$ |  |  |  |  |  |  |  |
| $9+9$ | $9+10$ |  |  |  |  |  |  |  |  |
| $10+10$ |  |  |  |  |  |  |  |  |  |

## 0-10 Small Ten Frame Cards




## Jordan's Work

Jordan showed his work like this:


$$
6+4+1=11
$$

What did he do to solve the problem?

$\qquad$

## 8 Ten Frames



## 0-20 Number Lines




## Make Ten

This game is played by two players. The object of the game is to be the player who 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' 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.

$\qquad$

## See Ten and Add

Dear Family Member:
Students are continuing to practice the make-ten strategy to solve addition
problems. Help your child find the numbers that make ten as they solve each
problem.
Thank you.

Draw a circle around the numbers that make ten in the first problem in each pair. Then complete both problems in each pair. Show what you did on the ten frames.
Ex.
$7+3+2=12$
$10+2=12$

A. $3+4+6=\square$

B. $5+1+9=$ $\square$

$10+5=\square$

$\qquad$
C. $8+2+6=\square$
$10+6=\square$

D. $2+5+5=\square$
$10+\square=12$

E. $4+0+10=\square$
$10+4=\square$


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F. $8+2+3=\square$
$10+3=\square$

$\qquad$

## Make Ten with Irma

## (SMomowork)

## Dear Family Member:

Students are practicing the make-ten strategy to solve addition problems. Help your child name the tens partners as they use this strategy.
For example, $8+2=10$ and $6+4=10$.
Thank you.

1. Help Irma solve $9+6$.
So $9+6=$ $\square$
$\qquad$
$\qquad$
2. Show how to solve $7+5$ using Irma's strategy. Write a number sentence.


Number sentence $\qquad$
3. Show how to solve $4+8$ using Irma's strategy. Write a number sentence.


Number sentence $\qquad$
4. Show how to solve $6+7$ using Irma's strategy. Write a number sentence.


Number sentence $\qquad$

## Doubles and Near Doubles Ten Frames Cards




$\qquad$

## Use Doubles to Add

## (Sllomowork) <br> Dear Family Member: <br> In school we have been developing strategies for solving the doubles $(5+5)$ and near doubles $(5+6)$ addition facts. Ten frames can help your child see the numbers in the addition fact and develop strategies for solving them. Help your child use these cards.

Thank you.

1. Choose a card from the Doubles and Near Doubles Ten Frames Cards. Answer these questions as you look at each card.

- What addition fact is shown?
- What is the sum?
- What strategy did I use?

2. Show or tell how to use $6+6$ to solve $6+7$.
3. Show or tell how to use $9+9$ to solve $9+8$.
4. Complete each Rule Machine using the rule. Write your own in the last row.
A.

Rule: Doubles +1

| Input | Output |
| :---: | :---: |
| $\bigcirc \bigcirc \bigcirc \bigcirc \bigcirc \bigcirc$ |  |
| 3 |  |
| 5 |  |
| 7 |  |
| 9 |  |
|  |  |

B.

Rule: Doubles -1

| Input | Output |
| :---: | :---: |
| $\bigcirc \bigcirc$ |  |
| 2 |  |
| 7 |  |
| 9 |  |
| 10 |  |
|  |  |

$\qquad$

## Solve Subtraction Problems

## (SMomowork)

Dear Family Member:
Students have been working on using strategies to solve subtraction problems. Your child may use counters, ten frames, number lines, or pictures to solve these problems. For each problem, your child should write a number sentence and show or tell how he or she solved the problem.
Thank you.


1. You have $13 ¢$. You buy a set of paddles and balls. How much money do you have left?

Number sentence $\qquad$


2. Natasha has 15 c. She buys something to play with and now she has $6 ¢$ left.

What did she buy? $\qquad$
Number sentence $\qquad$

3. How much more do the stickers cost than the ball?

Number sentence $\qquad$

$\qquad$

## Show a Word Problem

Show the problem in a diagram:

| Whole |  |  |
| :--- | :--- | :---: |
| Part | Part |  |
|  |  |  |

Use ten frames:


Use a number line:


Number sentence

## Animal Trading Cards



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$\qquad$

## Practice with Trading Cards

## (Alomowork)

Dear Family Member:
Your child has been solving addition and subtraction problems in class. Encourage him or her to share some of the strategies and tools used in class. Help your child read and solve the problems below. Ten frames, part-whole diagrams, or number lines are good tools for solving these problems.
Thank you.

## Show or tell how to solve each problem. Write a number sen-

 tence.

1. Carla had 18 c. She bought a puppy card. How much money did she have left?


Number sentence
2. Luis has the sheep card, monkey card, and whale card in his collection. What did his collection cost?


Number sentence $\qquad$
3. Mark spent 9\$ on two different cards. Circle the cards he bought.


Number sentence $\qquad$
4. Josh has 15¢. He bought two different cards. Circle the cards he bought.


Number sentence $\qquad$

## Tens Game

The object of this game is to make ten by adding or subtracting the numbers on the cards. The winner collects the most cards. This game is for $\mathbf{2}$ to $\mathbf{4}$ players.

## Materials

- 1 set of Number Cards 0-19 per player shuffled into a deck Directions

1. Choose a player to be the dealer. The dealer places 12 cards on the desk face up.
2. Players take turns. On your turn, look for ways to make 10 by adding or subtracting the numbers on the cards. You can use more than 2 cards. Remove the cards and tell the other players how the numbers make ten. Place the cards in a pile face down. Your turn continues as you keep choosing cards until you think you found all the cards that can make ten.
3. The dealer then replaces the cards removed so the next player has 12 cards.
4. Players continue to take turns until there are no more cards and there are no more ways to make ten.
5. Each player then counts his or her cards. The player with the most cards wins the game.

Name $\qquad$

## Number Cards 0-19





