

# 1<sup>st</sup> and 2<sup>nd</sup> Grade Math

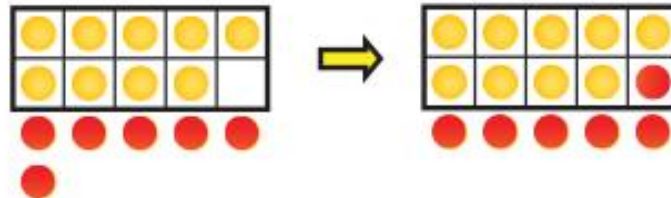
## PS166 Parent Workshop

October 16<sup>th</sup>, 2014

What is  $9 + 6$ ?

Start with the  
greater addend.

Make a ten.



## MATHEMATICS: EXPECTATIONS FOR STUDENTS & IDEAS FOR PARENTS

What's the shift?	What will students have to do?	What can parents do to help?
Build skills across grade levels	Keep building on learning year after year	Be aware of what your child struggled with last year and how that will effect ongoing learning
		Advocate for your child
		Ensure that support is given for "gap" skills, such as negative numbers, fractions, etc.
Learn more about less	Spend more time on fewer concepts	Know what the priority work is for your child at their grade level
Use math facts easily	Go more in-depth on each concept	Spend time with your child on priority work
		Ask your child's teacher for reports on your child's progress on priority work
Think fast AND solve problems	Spend time practicing by doing lots of problems on the same idea	Push children to know, understand and memorize basic math facts
		Know all of the fluencies your child should have
		Prioritize learning the fluencies your child finds most difficult
Really know it, really do it	Make the math work, and understand why it does	Ask questions and review homework to see whether your child understands <i>why</i> as well as <i>what</i> the answer is.
	Talk about why the math works	Advocate for the time your child needs to learn key math skills
	Prove that they know why and how the math works	Provide time for your child to work on math skills at home
Use math in the real world	Apply math in real world situations	Ask your child to do the math that comes up in daily life
	Know which math skills to use for which situation	

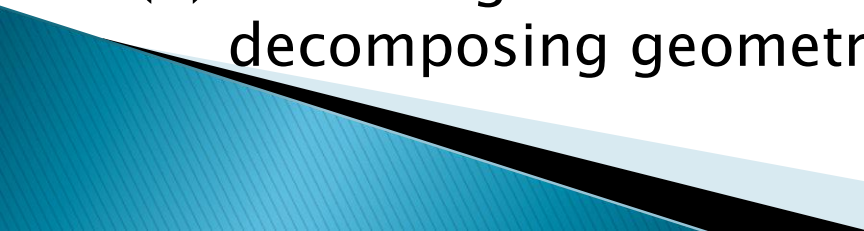
**Grade One:**

- Sums and Differences to 10 (45 days)
- Intro. to Place Value through Addition and Subtraction within 20 (35 days)
- Ordering and Comparing Length Measurements as Numbers (15 days)
- Place Value, Comparison, Addition and Subtraction to 40(35 days)
- Identifying, Composing and Partitioning Shapes (15 days)
- Place Value, Comparison, Addition and Subtraction to 100 (35 days)

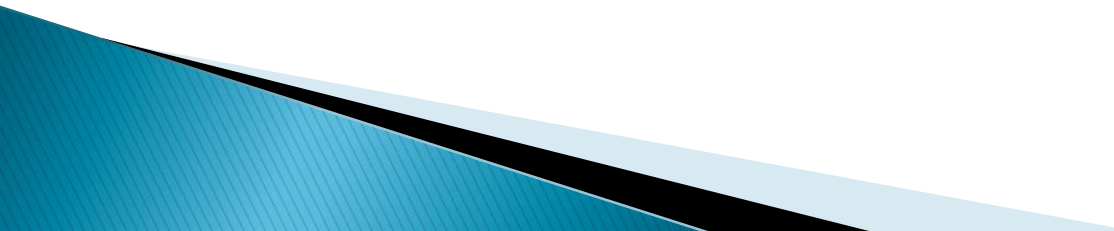
**Grade Two:**

- Sums and Differences to 20 (10 days)
- Addition and Subtraction of Length Units (12 days)
- Place Value, Counting, and Comparison of Nos. to 1000 (25 days)
- Addition and Subtraction within 200 with Word Problems to 100 (35 days)
- Addition and Subtraction within 1000 with Word Problems to 100 (24 days)
- Foundations of Multiplication and Division (24 days)
- Problem Solving with Length, Money and Data (30 days)
- Time, Shapes, and Fractions as Equal Parts of Shapes (20 days)

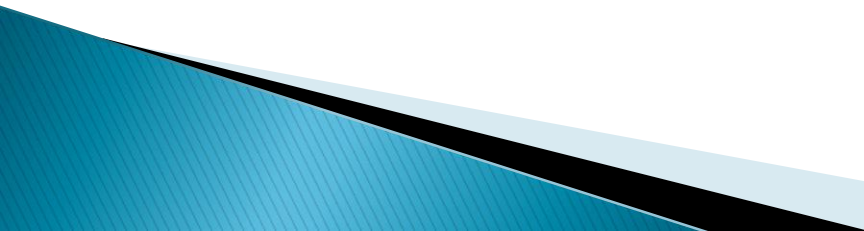
In **1<sup>st</sup> Grade**, instructional time focuses on four critical areas:

- (1) developing understanding of addition, subtraction, and strategies for addition and subtraction within 20;
  - (2) developing understanding of whole number relationships and place value, including grouping in tens and ones;
  - (3) developing understanding of linear measurement and measuring lengths as iterating length units; and
  - (4) reasoning about attributes of, and composing and decomposing geometric shapes.
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In **2nd Grade**, instructional time focuses on four critical areas:

- (1) extending understanding of the base-ten system
  - (2) building fluency with addition and subtraction
  - (3) using standard units of measure; and
  - (4) describing and analyzing shapes
- 

# Mathematical Practices

- ▶ Make sense of problems and persevere in solving them
  - ▶ Reason abstractly and quantitatively
  - ▶ Construct viable arguments and critique the reasoning of others
  - ▶ Model with mathematics
  - ▶ Use appropriate tools strategically
  - ▶ Attend to precision
  - ▶ Look for and make use of structure
  - ▶ Look for and express regularity in repeated reasoning
- 

## Required Fluencies

Kindergarten	1 <sup>st</sup> Grade	2 <sup>nd</sup> Grade
Add and subtract within five	<p>Add and subtract within 20, demonstrating fluency for addition and subtraction within 10.</p> <ul style="list-style-type: none"><li>• addition and subtraction facts within 10 (5 +3, 9-7)</li><li>• number pairs with a total of 10 ( e.g. 6+4, 8+2)</li><li>• what to add to a single-digit number to make 10 (e.g. <math>7+\square=10</math>)</li></ul>	<p>Add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.</p> <p>Add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.</p>

# 1<sup>st</sup> Grade critical area one: developing understanding of addition, subtraction, and strategies for addition and subtraction within 20

Count on 1, 2, or 3/Order Property:  $4+2$ ,  $2+4$ ,  $6+1$ ,  $1+6$

Zero in addition:  $5+0$ ,  $0+9$

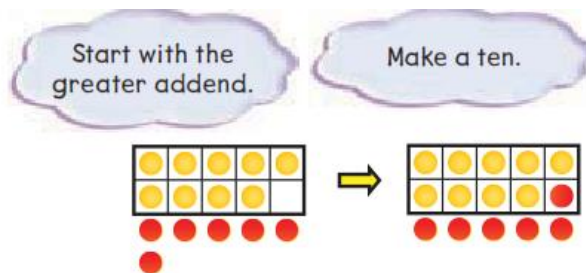
Addition doubles:  $1+1$ ,  $2+2$ ,  $3+3$ ,  $4+4$ ,  $5+5$ ,  $6+6$ ,  $7+7$ ,  $8+8$ ,  $9+9$

Subtraction doubles:  $2-1$ ,  $4-2$ ,  $6-3$ ,  $8-4$ ,  $10-5$ ,  $12-6$ ,  $14-7$ ,  $16-8$ ,  $18-9$

Near doubles:  $1+2$   $2+3$   $3+4$   $4+5$   $5+6$   $6+7$   $7+8$   $8+9$   
 $2+1$   $3+2$   $4+3$   $5+4$   $6+5$   $7+6$   $8+7$   $9+8$

## Make a Ten:

What is  $9 + 6$ ?



$$9 + 6 = 10 + 5 = 15$$

Add Ten:  $3+10 = 13$ ,  $10+7 = 17$

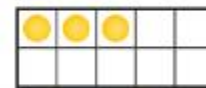
$$13 - 9 = \underline{\quad ? \quad}$$

Start at 9.

Count up 1  
to make 10.



Count up 3  
more to 13.



You counted up 4.

$$13 - 9 = \underline{4}$$



By using these strategies we have covered all 121 addition basic facts!

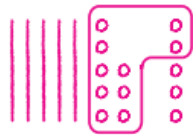
	Zero in Addition		Doubles, Doubles Plus One		Add With Ten (10 as an Addend)
	Counting On 1, 2, 3; Order Property		Make a Ten (adding 7, 8, 9)		

+	0	1	2	3	4	5	6	7	8	9	10
0	$0+0$	$0+1$	$0+2$	$0+3$	$0+4$	$0+5$	$0+6$	$0+7$	$0+8$	$0+9$	$0+10$
1	$1+0$	$1+1$	$1+2$	$1+3$	$1+4$	$1+5$	$1+6$	$1+7$	$1+8$	$1+9$	$1+10$
2	$2+0$	$2+1$	$2+2$	$2+3$	$2+4$	$2+5$	$2+6$	$2+7$	$2+8$	$2+9$	$2+10$
3	$3+0$	$3+1$	$3+2$	$3+3$	$3+4$	$3+5$	$3+6$	$3+7$	$3+8$	$3+9$	$3+10$
4	$4+0$	$4+1$	$4+2$	$4+3$	$4+4$	$4+5$	$4+6$	$4+7$	$4+8$	$4+9$	$4+10$
5	$5+0$	$5+1$	$5+2$	$5+3$	$5+4$	$5+5$	$5+6$	$5+7$	$5+8$	$5+9$	$5+10$
6	$6+0$	$6+1$	$6+2$	$6+3$	$6+4$	$6+5$	$6+6$	$6+7$	$6+8$	$6+9$	$6+10$
7	$7+0$	$7+1$	$7+2$	$7+3$	$7+4$	$7+5$	$7+6$	$7+7$	$7+8$	$7+9$	$7+10$
8	$8+0$	$8+1$	$8+2$	$8+3$	$8+4$	$8+5$	$8+6$	$8+7$	$8+8$	$8+9$	$8+10$
9	$9+0$	$9+1$	$9+2$	$9+3$	$9+4$	$9+5$	$9+6$	$9+7$	$9+8$	$9+9$	$9+10$
10	$10+0$	$10+1$	$10+2$	$10+3$	$10+4$	$10+5$	$10+6$	$10+7$	$10+8$	$10+9$	$10+10$

**1<sup>st</sup> Grade** critical area two: developing understanding of whole number relationships and place value, including grouping in tens and ones.

- ❖ Think of whole numbers between 10 and 100 in terms of tens and ones. **75 = 7 tens and 5 ones**
- ❖ Compare numbers to 100 using the symbols  $>$  (more than),  $=$  (equal to), and  $<$  (less than). **64 > 49   34 < 51   25 = 23 + 2**
- ❖ Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10.

$$58 + 5 = \underline{63}$$



$$29 + 7 = ?$$

$$\begin{array}{r} 29 \\ + 7 \\ \hline \end{array} = 29 + 1 + 6 = 36$$

1     6

$$38 + 20 = ?$$

$$58 + 40 = ?$$

## 2nd Grade critical area one: extending understanding of the base ten system

- ❖ Count in fives, tens, and multiples of hundreds, tens, and ones

Count by ones from any number

747, 748, 749, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Count by fives

50, 55, 60, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Count by tens

114, 214, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Count by 100

470, 480, 490, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

- ❖ Compare numbers using place value

> is greater than  
< is less than  
= is equal to

Hundreds	Tens	Ones
3	5	2
3	4	6

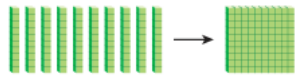
The hundreds are equal.

5 tens > 4 tens

352 > 346

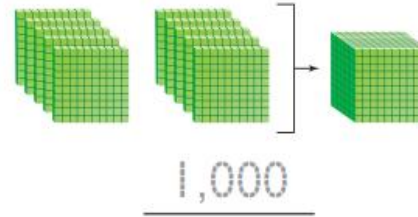
# ❖ Understand Multi-Digit Numbers to 1,000

10 tens is the same as 1 **hundred**.



$$\begin{array}{r} \underline{10} \text{ tens} \\ \underline{1} \text{ hundred} \\ 100 \end{array}$$

There are 10 hundreds in 1 **thousand**.



$$\begin{array}{r} \underline{10} \text{ hundreds} \\ \underline{1} \text{ thousand} \\ 1000 \end{array}$$

These are some different ways to show 32.

$\begin{array}{r} \underline{3} \text{ tens} \ \underline{2} \text{ ones} \\ 30 + 2 \end{array}$	$\begin{array}{r} \underline{2} \text{ tens} \ \underline{12} \text{ ones} \\ 20 + 12 \end{array}$	$\begin{array}{r} \underline{1} \text{ ten} \ \underline{22} \text{ ones} \\ 10 + 22 \end{array}$

You can use a quick picture to show a number.  
You can write a number in different ways.

five hundred thirty-six



$$\begin{array}{r} \underline{5} \text{ hundreds} \ \underline{3} \text{ tens} \ \underline{6} \text{ ones} \\ 500 + 30 + 6 \\ \hline 536 \end{array}$$

## Number Bonds

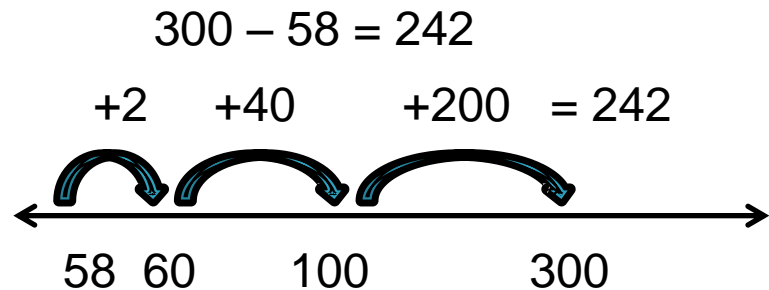
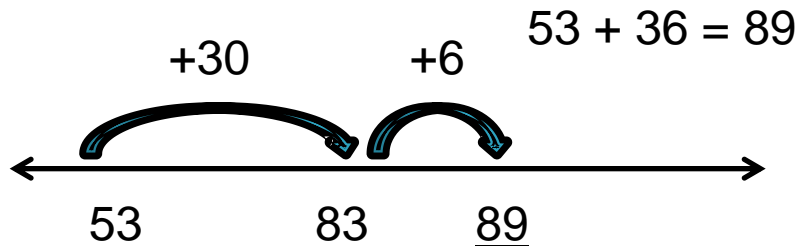
Sample

2 hundreds 6 tens 3 ones

## 2nd Grade critical area two: building fluency with addition and subtraction

- ❖ Solve problems within 1000 by applying understanding of place value: decompose numbers into hundreds, tens, and ones

### Empty Number Line



### Expanded Form

$$53 + 38$$

$$\begin{array}{r} 50 + 3 \\ + 30 + 8 \\ \hline 80 + 11 = 91 \end{array}$$

$$146 + 235$$

$$\begin{array}{r} 100 + 40 + 6 \\ + 200 + 30 + 5 \\ \hline 300 + 70 + 11 = 381 \end{array}$$

$$259 - 125$$

$$\begin{array}{r} 200 + 50 + 9 \\ - 100 + 20 + 5 \\ \hline 100 + 30 + 4 = 134 \end{array}$$

$$744 - 536 \quad \begin{array}{r} 30 \\ 700 + 40 + 14 \end{array}$$

$$\begin{array}{r} - 500 + 30 + 6 \\ \hline 200 + 0 + 8 = 208 \end{array}$$

# Addition and Subtraction Word Problem Types

Darker shading indicates the four Kindergarten problem subtypes.

1<sup>st</sup> and 2<sup>nd</sup> grade students work with all problem types. Unshaded problems are the more difficult problem types. Students work with these in Grade 1 but are not expected to show mastery until Grade 2.

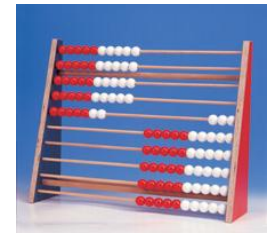
Table 2: Addition and subtraction situations by grade level.

	Result Unknown	Change Unknown	Start Unknown
<b>Add To</b>	<i>A</i> bunnies sat on the grass. <i>B</i> more bunnies hopped there. How many bunnies are on the grass now? $A + B = \square$	<i>A</i> bunnies were sitting on the grass. Some more bunnies hopped there. Then there were <i>C</i> bunnies. How many bunnies hopped over to the first <i>A</i> bunnies? $A + \square = C$	Some bunnies were sitting on the grass. <i>B</i> more bunnies hopped there. Then there were <i>C</i> bunnies. How many bunnies were on the grass before? $\square + B = C$
<b>Take From</b>	<i>C</i> apples were on the table. I ate <i>B</i> apples. How many apples are on the table now? $C - B = \square$	<i>C</i> apples were on the table. I ate some apples. Then there were <i>A</i> apples. How many apples did I eat? $C - \square = A$	Some apples were on the table. I ate <i>B</i> apples. Then there were <i>A</i> apples. How many apples were on the table before? $\square - B = A$
	Total Unknown	Both Addends Unknown <sup>1</sup>	Addend Unknown <sup>2</sup>
<b>Put Together / Take Apart</b>	<i>A</i> red apples and <i>B</i> green apples are on the table. How many apples are on the table? $A + B = \square$	Grandma has <i>C</i> flowers. How many can she put in her red vase and how many in her blue vase? $C = \square + \square$	<i>C</i> apples are on the table. <i>A</i> are red and the rest are green. How many apples are green? $A + \square = C$ $C - A = \square$
	Difference Unknown	Bigger Unknown	Smaller Unknown
<b>Compare</b>	"How many more?" version. Lucy has <i>A</i> apples. Julie has <i>C</i> apples. How many more apples does Julie have than Lucy?  "How many fewer?" version. Lucy has <i>A</i> apples. Julie has <i>C</i> apples. How many fewer apples does Lucy have than Julie? $A + \square = C$ $C - A = \square$	"More" version suggests operation. Julie has <i>B</i> more apples than Lucy. Lucy has <i>A</i> apples. How many apples does Julie have?  "Fewer" version suggests wrong operation. Lucy has <i>B</i> fewer apples than Julie. Lucy has <i>A</i> apples. How many apples does Julie have? $A + B = \square$	"Fewer" version suggests operation. Lucy has <i>B</i> fewer apples than Julie. Julie has <i>C</i> apples. How many apples does Lucy have?  "More" version suggests wrong operation. Julie has <i>B</i> more apples than Lucy. Julie has <i>C</i> apples. How many apples does Lucy have? $C - B = \square$ $\square + B = C$





# 1<sup>st</sup> Grade: Rekenrek



- ❖ supports the natural development of number sense
- ❖ uses 5 and 10 as anchors for counting, adding and subtracting
- ❖ provides learners with the visual models they need to discover number relationships and develop a variety of addition and subtraction strategies

## Possible Activities:

- ❖ Quick Images
- ❖ Strategy Building (e.g. doubles, near doubles, build to ten)
- ❖ Finding Different Ways to Make a Given Number
- ❖ How Many More?

# 2<sup>nd</sup> Grade: Number Talks

❖ Short, ongoing routine that provides students with meaningful ongoing practice with mental computation to develop computational fluency.

1. Teacher presents problem written in horizontal format.
2. Students figure out the answer mentally.
3. Students share their answers.
4. Students share their thinking.
5. The class agrees on the correct answer.
6. Steps 1–5 are repeated for additional problems.

## Today's strategy: Doubles/Near Doubles

Category 1 – doubles using basic facts to 10 (e.g.  $6+7$  or  $9+8$ )

Category 2 – doubles using basic facts between 10 and 20 (e.g.  $15+14$  or  $19+20$ )

Category 3 – doubles using basic facts between 20 and 50 and with 100 (e.g.  $44+46$  or  $99+98$ )



# Resources

- ▶ For more information on the Common Core State Standards go to:

[www.corestandards.org/what-parents-should-know/](http://www.corestandards.org/what-parents-should-know/)

- ▶ For free games and activities aligned with each Common Core State Math Standard to download and print for use at home:

[www.k-5mathteachingresources.com/1st-grade-number-activities.html](http://www.k-5mathteachingresources.com/1st-grade-number-activities.html)

[www.k-5mathteachingresources.com/2nd-grade-number-activities.html](http://www.k-5mathteachingresources.com/2nd-grade-number-activities.html)