

# Grade 2

## Introduction:

In Grade 2, instructional time should focus on four critical areas: (1) extending understanding of base-ten notation; (2) building fluency with addition and subtraction; (3) using standard units of measure; and (4) describing and analyzing shapes.

1. Students extend their understanding of the base-ten system. This includes ideas of counting in fives, tens, and multiples of hundreds, tens, and ones, as well as number relationships involving these units, including comparing. Students understand multi-digit numbers (up to 1000) written in base-ten notation, recognizing that the digits in each place represent amounts of thousands, hundreds, tens, or ones (e.g., 853 is 8 hundreds + 5 tens + 3 ones).
2. Students use their understanding of addition to develop fluency with addition and subtraction within 100. They solve problems within 1000 by applying their understanding of models for addition and subtraction, and they develop, discuss, and use efficient, accurate, and generalizable methods to compute sums and differences of whole numbers in base-ten notation, using their understanding of place value and the properties of operations. They select and accurately apply methods that are appropriate for the context and the numbers involved to mentally calculate sums and differences for numbers with only tens or only hundreds.
3. Students recognize the need for standard units of measure (centimeter and inch) and they use rulers and other measurement tools with the understanding that linear measure involves an iteration of units. They recognize that the smaller the unit, the more iterations they need to cover a given length.
4. Students describe and analyze shapes by examining their sides and angles. Students investigate, describe, and reason about decomposing and combining shapes to make other shapes. Through building, drawing, and analyzing two- and three-dimensional shapes, students develop a foundation for understanding area, volume, congruence, similarity, and symmetry in later grades.

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## Grade 2 Overview

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### Operations and Algebraic Thinking

- Represent and solve problems involving addition and subtraction.
- Add and subtract within 20.
- Work with equal groups of objects to gain foundations for multiplication.

## **Number and Operations in Base Ten**

- Understand place value.
- Use place value understanding and properties of operations to add and subtract.

## **Measurement and Data**

- Measure and estimate lengths in standard units.
- Relate addition and subtraction to length.
- Work with time and money.
- Represent and interpret data.

## **Geometry**

- Reason with shapes and their attributes.

## **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.

## **Important Definitions:**

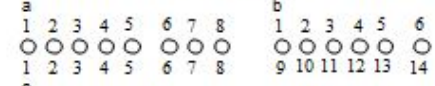
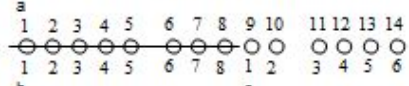

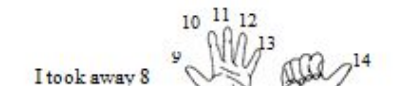
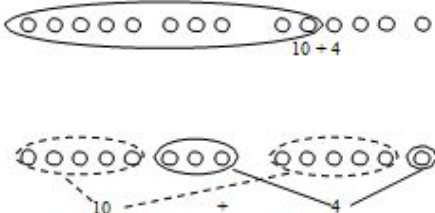
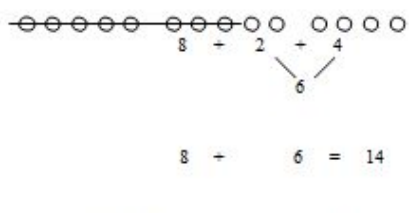
Fluency-skill in carrying out procedures flexibly, accurately, efficiently and appropriately.

Know from memory-quick, effortless, recall of facts. (\*\*Notice there are no Kindergarten standards that require students to “know from memory.”)

⊕ K-2 Common Addition and Subtraction situations ADDITION AND SUBTRACTION PROBLEM TYPES CHART

	Result Unknown	Change Unknown	Start Unknown
<b>Add to</b> (Join) (Combining)	Two bunnies sat on the grass. Three more bunnies hopped there. How many bunnies are on the grass now? $2 + 3 = ?$  (K)	Two bunnies were sitting on the grass. Some more bunnies hopped there. Then there were five bunnies. How many bunnies hopped over to the first two? $2 + ? = 5$  (1 <sup>st</sup> )	Some bunnies were sitting on the grass. Three more bunnies hopped there. Then there were five bunnies. How many bunnies were on the grass before? $? + 3 = 5$ <i>One-Step Problem</i>  (2 <sup>nd</sup> )
<b>Take from</b> (Separate) (Separating)	Five apples were on the table. I ate two apples. How many apples are on the table now? $5 - 2 = ?$  (K)	Five apples were on the table. I ate some apples. Then there were three apples. How many apples did I eat? $5 - ? = 3$  (1 <sup>st</sup> )	Some apples were on the table. I ate two apples. Then there were three apples. How many apples were on the table before? $? - 2 = 3$ <i>One-Step Problem</i>  (2 <sup>nd</sup> )
	Total Unknown	Addend Unknown	Both Addends Unknown <sup>2</sup>
<b>Put Together/ Take Apart<sup>3</sup></b> (Part-Part Whole)	Three red apples and two green apples are on the table. How many apples are on the table? $3 + 2 = ?$  (K)	Five apples are on the table. Three are red and the rest are green. How many apples are green? $3 + ? = 5, 5 - 3 = ?$  (K)	Grandma has five flowers. How many can she put in her red vase and how many in her blue vase? $5 = 0 + 5, 5 = 5 + 0$ $5 = 1 + 4, 5 = 4 + 1$ $5 = 2 + 3, 5 = 3 + 2$  (1 <sup>st</sup> )
	Difference Unknown	Bigger Unknown	Smaller Unknown
<b>Compare<sup>4</sup></b>	("How many more?" version): Lucy has two apples. Julie has five apples. How many more apples does Julie have than Lucy?  (1 <sup>st</sup> )	(Version with "more"): Julie has three more apples than Lucy. Lucy has two apples. How many apples does Julie have?  <i>One-Step Problem</i>  (1 <sup>st</sup> )	(Version with "more"): Julie has 3 more apples than Lucy. Julie has five apples. How many apples does Lucy have? $5 - 3 = ?$ $? + 3 = 5$ <i>One-Step Problem</i>  (2 <sup>nd</sup> )
	("How many fewer?" version): Lucy has two apples. Julie has five apples. How many fewer apples does Lucy have than Julie? $2 + ? = 5, 5 - 2 = ?$  (1 <sup>st</sup> )	(Version with "fewer"): Lucy has 3 fewer apples than Julie. Lucy has two apples. How many apples does Julie have? $2 + 3 = ?$ $3 + 2 = ?$  <i>One-Step Problem</i>  (2 <sup>nd</sup> )	(Version with "fewer"): Lucy has three fewer apples than Julie. Julie has five apples. How many apples does Lucy have?  <i>One-Step Problem</i>  (1 <sup>st</sup> )

K: Problem types to be mastered by the end of the Kindergarten year. 1<sup>st</sup>: Problem types to be mastered by the end of the First Grade year, including problem types from the previous year(s). However, First Grade students should have experiences with all 12 problem types. 2<sup>nd</sup>: Problem types to be mastered by the end of the Second Grade year, including problem types from the previous year(s).

Levels	$8 + 6 = 14$	$14 - 8 = 6$
<b>Level 1:</b> Count all (Direct Modeling)	Count All 	Take Away 
<b>Level 2:</b> Counting Strategies <ul style="list-style-type: none"> <li>Counting On</li> <li>Counting Up to</li> <li>Counting Back</li> <li>Counting Back to</li> </ul>	Count On 	To solve $14 - 8$ I count on $8 + ? = 14$ 
<b>Level 3:</b> Use Known Facts Use Derived Facts <b>ADDITION</b> <ul style="list-style-type: none"> <li>Make a Ten</li> <li>Doubles</li> <li>Commutative Property</li> </ul>	Make a Ten (Rcompose) 	$14 - 8$ : I make a ten for $8 + ? = 14$ 
Use Derived Facts <b>SUBTRACTION</b> <ul style="list-style-type: none"> <li>Think Addition</li> <li>Build up thru 10</li> <li>Build down thru 10</li> </ul>	Think Addition - I know that $8 + 6 = 14$ , so $14 - 8 = 6$	Build up thru 10 ( $14 - 6$ , I know that $8 + 2 = 10$ , $10 + 4 = 14$ , $2 + 4 = 6$ ) Build down thru 10 ( $14 - 6$ , I know that $14 - 4 = 10$ , $10 - 2 = 8$ , $4 + 2 = 6$ )

Note:

Many children attempt to count down for subtraction, but counting down is difficult and error-prone. Children are much more successful with counting on; it makes subtraction as easy as addition.