Grade 1

Introduction:

In Grade 1, instructional time should focus 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.

1. Students develop strategies for adding and subtracting whole numbers based on their prior work with small numbers. They use a variety of models, including discrete objects and length-based models (e.g., cubes connected to form lengths), to model add-to, take-from, put-together, take-apart, and compare situations to develop meaning for the operations of addition and subtraction, and to develop strategies to solve arithmetic problems with these operations. Students understand connections between counting and addition and subtraction (e.g., adding two is the same as counting on two). They use properties of addition to add whole numbers and to create and use increasingly sophisticated strategies based on these properties (e.g., "making tens") to solve addition and subtraction problems within 20. By comparing a variety of solution strategies, children build their understanding of the relationship between addition and subtraction. Fluency is defined as the skill of carrying out procedures flexibly, accurately, efficiently, and appropriately. There is no time element associated with fluency.
2. Students develop, discuss, and use efficient, accurate, and generalizable methods to add within 100 and subtract multiples of 10. They compare whole numbers (at least to 100) to develop understanding of and solve problems involving their relative sizes. They think of whole numbers between 10 and 100 in terms of tens and ones (especially recognizing the numbers 11 to 19 as composed of a ten and some ones). Through activities that build number sense, they understand the order of the counting numbers and their relative magnitudes.
3. Students develop an understanding of the meaning and processes of measurement, including underlying concepts such as iterating (the mental activity of building up the length of an object with equal-sized units) and the transitivity principle for indirect measurement. Students should apply the principle of transitivity of measurement to make indirect comparisons, but they need not use this technical term.
4. Students compose and decompose plane or solid figures (e.g., put two triangles together to make a quadrilateral) and build understanding of part-whole relationships as well as the properties of the original and composite shapes. As they combine shapes, they recognize them from different

perspectives and orientations, describe their geometric attributes, and determine how they are alike and different, to develop the background for measurement and for initial understanding of properties such as congruence and symmetry.

Grade 1 Overview

Operations and Algebraic Thinking

- Represent and solve problems involving addition and subtraction.
- Understand and apply properties of operations and the relationship between addition and subtraction.
- Add and subtract within 20.
- Work with addition and subtraction equations.

Number and Operations in Base Ten

- Extend the counting sequence.
- Understand place value.
- Use place value understanding and properties of operations to add and subtract.

Measurement and Data

- Measure lengths indirectly and by iterating length units.
- Tell and write time.
- Represent and interpret data.
- Identify and count pennies and dimes.

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:

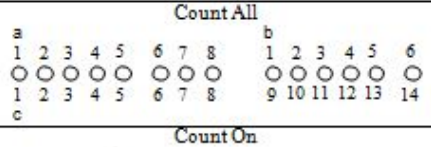
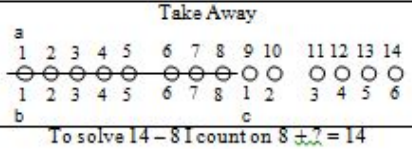
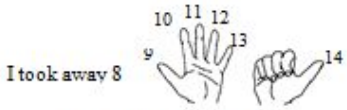
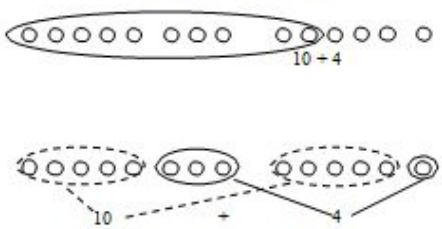
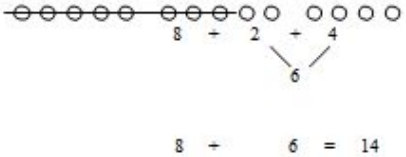
Fluency-skill in carrying out procedures flexibly, accurately, efficiently and appropriately.

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
Add to (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?** $2 + ? = 5$ ***(1st)***	**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?** $? + 3 = 5$ ***One-Step Problem*** ***(2nd)***
Take from (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?** $5 - ? = 3$ ***(1st)***	**Some apples were on the table. I ate two apples. Then there were three apples. How many apples were on the table before?** $? - 2 = 3$ ***One-Step Problem*** ***(2nd)***
	Total Unknown	**Addend Unknown**	**Both Addends Unknown[2]**
Put Together/ Take Apart[3] (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?** $5 = 0 + 5, 5 = 5 + 0$ $5 = 1 + 4, 5 = 4 + 1$ $5 = 2 + 3, 5 = 3 + 2$ ***(1st)***
	Difference Unknown	**Bigger Unknown**	**Smaller Unknown**
Compare[4]	**("How many more?" version): Lucy has two apples. Julie has five apples. How many more apples does Julie have than Lucy?** ***(1st)***	**(Version with "more"): Julie has three more apples than Lucy. Lucy has two apples. How many apples does Julie have?** ***One-Step Problem*** ***(1st)***	**(Version with "more"): Julie has 3 more apples than Lucy. Julie has five apples. How many apples does Lucy have?** $5 - 3 = ?$ $? + 3 = 5$ **One-Step Problem** ***(2nd)***
	("How many fewer?" version): Lucy has two apples. Julie has five apples. How many fewer apples does Lucy have than Julie? $2 + ? = 5, 5 - 2 = ?$ ***(1st)***	**(Version with "fewer"): Lucy has 3 fewer apples than Julie. Lucy has two apples. How many apples does Julie have?** $2 + 3 = ?, 3 + 2 = ?$ ***One-Step Problem*** ***(2nd)***	**(Version with "fewer"): Lucy has three fewer apples than Julie. Julie has five apples. How many apples does Lucy have?** ***One-Step Problem*** ***(1st)***

K: Problem types to be mastered by the end of the Kindergarten year.1st: 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.2nd: 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
Level 1: Count all (Direct Modeling)	Count All 	Take Away 
Level 2: Counting Strategies • **Counting On** • **Counting Up to** • Counting Back • Counting Back to	Count On 	To solve 14 – 8 I count on $8 + ? = 14$  8 to 14 is 6 so 14 – 8 = 6
Level 3: Use Known Facts Use Derived Facts **ADDITION** • Make a Ten • Doubles • Commutative Property Use Derived Facts **SUBTRACTION** • Think Addition • Build up thru 10 • Build down thru 10	Make a Ten (Recompose)  Think Addition – I know that 8 + 6 = 14, so 14 – 8 = 6	14 – 8: I make a ten for $8 + ? = 14$  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.