

Grade K • Module 4

Number Pairs, Addition and Subtraction to 10

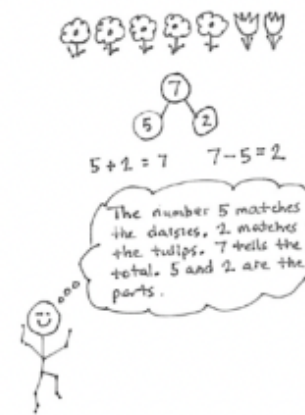
OVERVIEW

Module 4 marks the next exciting step in math for kindergartners—addition and subtraction! Students begin to harness their practiced counting abilities, knowledge of the value of numbers, and work with embedded numbers to reason about and solve addition and subtraction expressions and equations (**K.OA.1**, **K.OA.2**).

In Topic A, decompositions and compositions of numbers to 5 are revisited to reinforce how a whole can be broken into two parts and how two parts can be joined to make a whole. Decomposition and composition are taught simultaneously using the number bond model so students begin to understand the relationship between parts and wholes before adding and subtracting, formally addressed in Topics C and D.

Topic B continues with decomposing and composing 6, 7, and 8 using the number bond model. Students systematically work with each quantity, finding all possible number pairs using story situations, objects, sets, arrays, $5 + n$ patterns,¹ and numerals (**K.OA.3**).

Topic C introduces addition to totals of 6, 7, and 8 within concrete and pictorial settings, first generating number sentences without unknowns (e.g., $5 + 2 = 7$) to develop an understanding of the addition symbol and the referent of each number within the equation. Next, students graduate to working within the addition word problem types taught in kindergarten: *add to with result unknown* ($A + B = \underline{\quad}$), *put together with total unknown* ($A + B = \underline{\quad}$), and *both addends unknown* ($C = \underline{\quad} + \underline{\quad}$) (**K.OA.2**). Students draw a box around the total to track the unknown.



Topic D introduces subtraction with 6, 7, and 8 with no unknown. The lessons in Topic D build from the concrete level of students acting out, crossing out objects in a set, and breaking and hiding parts, to more formal representations of decomposition recorded as or matched to equations ($C - B = \underline{\quad}$).

Topics E, F, and G parallel the first half of the module with the numbers 9 and 10. Topic E explores composition, decomposition, and number pairs using the number bond model (**K.OA.3**). It is essential that students build deep understanding and skill with identifying the number pairs of 6 through 10 because this is foundational to Grade 1's fluency with sums and differences within 10, as well as Grade 2's fluency with sums and differences to 20. Topics F and G deal with addition and subtraction, respectively. Students are refocused on representing larger numbers by drawing the $5 + n$ pattern to bridge efficiently from seeing the embedded five to representing that as addition.

5 + n pattern				
6 = 5 + 1	7 = 5 + 2	8 = 5 + 3	9 = 5 + 4	10 = 5 + 5
.....
.....
.....

¹Operations and Algebraic Thinking progressions document, p. 10.

After addition and subtraction have been introduced, Topic H explores the behavior of zero: the additive identity. Students learn that adding or subtracting zero does not change the original quantity. Students also begin to see patterns when adding 1 more and the inverse relationship between addition and subtraction ($8 + 2 = 10$ and $10 - 2 = 8$). Finally, students begin to formally study and explore partners to 10 (**K.OA.4**), though this essential work has been supported throughout Module 4 during Fluency Practice.

The culminating task of this module asks students to demonstrate their understanding of addition as *putting together*, or *adding to*, and subtraction as *taking apart*, or *taking from*. Students use mathematical models and equations to teach a small group of students, administrators, family members, or community partners about a decomposition of 10.