

Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from

Standard K.OA.5 Fluently add and subtract using numbers within 5.

Key Elements:

• Before children can conceptually understand addition and subtraction facts they must first have **one-to-one correspondence**, **conservation of number**, and they must know the **count sequence**. Knowing the count sequence is as simple as knowing what number comes next. Just because a child knows the count sequence does not mean that they understand numbers, but it is an important step in the development of numbers. One-to-one correspondence is understanding that one item is represented by a unique count. Conservation of number is understanding that the final item counted tells the number in the group. For example, seven items are counted so there are seven items in the group.

Once students have had several concrete experiences with take from and add to situations they can begin to work on their computation and procedural fluency. It is important to note that fluency is much more than flashcards and memorized facts. Timed fact fluency often does more harm than good. There are typically 3 elements that define fluency: accuracy (correctness), efficiency (quick retrieval of facts both written and oral), and flexibility (use of strategies to help with recall). Fluency will develop largely on its own over time as students apply strategies that they understand.

Jo Boaler states, "There are many good teaching strategies for encouraging fluency in math, but the ones that are effective are those that simultaneously develop number sense – the flexible use and understanding of number and quantities – without instilling fear and anxiety. Strategies that involve reasoning about numbers and operations, such as the pedagogical approach called "number talks," are ideal for developing fluency with understanding."

The National Council of Teachers of Mathematics published the following position on Procedural Fluency in July 2014.

"Procedural fluency builds from an initial exploration and discussion of number concepts to using informal reasoning strategies and the properties of operations to develop general methods for solving problems (NCTM, 2014). *Effective teaching practices provide experiences that help students to connect procedures with the underlying concepts and provide students with opportunities to rehearse or practice strategies and to justify their procedures. Practice should be brief, engaging, purposeful, and distributed* (Rohrer, 2009). Too much practice too soon can be ineffective or lead to math anxiety (Isaacs & Carroll, 1999)."

+	0	1	2	3	4	5
0	0	1	2	3	4	5
1	1	2	3	4	5	
2	2	3	4	5		
3	3	4	5			
4	4	5				
5	5					

In order to fluently add and subtract within 5, students need to be confident in the "add zero", "count on one/count back one", and "count on two/count back two" strategies. Students should have extensive practice using these strategies and talking about why these strategies work. Eventually, these facts will become automatic for students which is an indicator of mastery.

*Please note that the fluency standard for students in kindergarten is facts within 5, but students work to develop conceptual and representational understanding with facts within 10.

