



Whole Number Addition & Subtraction in Grade 1



How Does Fluency Build from Conceptual Understanding in Grade 1?

Students flourish in mathematics when procedural fluency builds from a foundation of conceptual understanding, reasoning, and problem solving. When students make connections between concepts and procedures, they become confident mathematicians. This enables students to know which procedure is appropriate for a given situation and helps students anticipate their answers when using a selected procedure.

In Grade 1, students are expected to fluently add and subtract within 10. Their conceptual understanding for this goal begins in kindergarten as students learn the counting sequence, develop [cardinality](#), [subitize](#) (instantly recognize and combine sets), and recognize that numbers can be composed and decomposed in different ways. Grade 1 students apply these concepts to notice properties of operations and use counting strategies to add and subtract. Examples:

Problem:
Derrick has 6 red apples and 4 yellow apples. Emma has 4 red apples and 6 yellow apples.
Who has more apples?

I know 6 and 4 is the same amount as 4 and 6. They both have 10.

commutative property of addition

I put 6 in my head and counted on 4. That's 10.

counting on

What Role Does Problem Solving Play?

Problem solving is an opportunity for students to select, use, and adapt computation strategies. It promotes reasoning, sense making, formulating conjectures, and seeing connections. As students solve problems, they need time to discuss their ideas with classmates and the teacher in order to know why a specific computation is needed to solve a problem.

$3+2$ has the same value as $2+3$.

My conjecture is that whenever I flip two addends, the total will stay the same.



Conjecture: an opinion about what you believe is true based on some information

When students are given problems and allowed to select procedures meaningful to them, they naturally build upon their current understanding to construct their own strategies. Students adapt these strategies as they work together and share ideas. Initially, students use visual representations to model actions and relations in problems. Next, they begin to use more efficient counting strategies. Eventually, through varied problem solving experiences, students move toward use of number facts.

In Grade 1, students are expected to solve the following problem types:

- **Add to/Take From** - Result Unknown & Change Unknown
- **Put together/Take Apart** - Total Unknown, Both Addends Unknown, & Addend Unknown
- **Compare** - Difference Unknown

The problem type influences the strategies students use to solve it. To learn more about these problem types and problem solving strategies, visit [NCDPI's Grade 1 Unpacking Document](#).

What is Procedural Fluency?

Procedural fluency is being able to apply procedures efficiently, flexibly, and accurately.



- **Efficient:** Select a strategy within a reasonable amount of time.
- **Flexible:** Know multiple strategies; apply or adapt strategies when needed.
- **Accurate:** Solve Correctly.

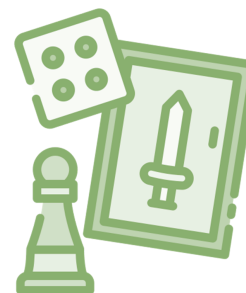
Procedural fluency is broader than basic fact fluency, which only involves single-digit numbers.

What are the Actions of a Fluent First Grader?

Component	Action
Efficient	Select an appropriate strategy. Easily use the strategy. Add and subtract within 10 in a reasonable amount of time. Produce facts within 10 from memory through reasoning or recall.
Flexible	Use strategies to add and subtract within 10 including <ul style="list-style-type: none">● Count on from one number.● Count back.● Decompose numbers (e.g., decompose a number leading to a ten).● Make a friendly number (e.g., make a ten).● Use the relationship between addition and subtraction. Adapt a strategy to fit the numbers or situation. Trade out strategies if the first one isn't helpful or becomes cumbersome.
Accurate	Complete steps accurately. Get the correct answer.

Grade 1 Resources to Build Conceptual Understanding and Develop Fluency

- [Strategies to Add & Subtract](#) (lesson), *Tools4NCTeachers*
- [Ten Frames](#) (lesson), *Tools4NCTeachers*
- [Math Flips](#) (activity), *Berkeley Everett*
- [Same But Different Images](#) (activity), *Sue Looney*
- [Splat!](#) (activity), *Steve Wyborney*
- [Around the House](#) (game), *Math Fact Fluency Companion Website*
- [Math Limbo](#) (game), *Tang Math*
- [Mouse Count](#) (task), *YouCubed*



Link to [Developing Proficiency with Whole Number Addition & Subtraction](#)