



# Whole Number Addition & Subtraction in Grade 2



## How Does Fluency Build from Conceptual Understanding in Grade 2?

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. Grade 2 has two fluency goals:

### GOAL 1: Develop Fluency from Conceptual Understanding within 20

Grade 2 students are expected to fluently add and subtract within 20. This fluency builds upon the conceptual understanding of addition and subtraction strategies explored in grade 1. Strategies include counting on, making 10, decomposing a number leading to a 10, using the relationship between addition and subtraction, and creating a simpler problem. Grade 2 students develop fluency within 20 as they **efficiently** select appropriate strategies for given situations, **flexibly** apply or adapt strategies, and **accurately** add and subtract.

### GOAL 2: Develop Fluency from Conceptual Understanding within 100

Grade 2 students extend their knowledge of place value, properties of operations and the relationship between addition and subtraction to fluently add and subtract numbers within 100. They explain why strategies work and decide which strategies are most appropriate in a given situation. Students use drawings or objects to support their explanations. Students are fluent when they display **efficiency**, **flexibility**, and **accuracy**. The standard algorithm for addition and subtraction is neither an expectation or focus in grade 2. Examples of grade 2 addition and subtraction strategies:

**27+38**

I made 27 and 38 with place value blocks. I had 5 tens and 15 ones. 15 ones is 1 ten and 5 ones so I made another ten. That's 6 tens and 5 ones, or 65.

*directly model using place value*

I decomposed 27 into 20 and 7 and 38 into 30 and 8. Then I added the tens and the ones.

$20+30=50$	$7+8=15$
$50+15=65$	

*decompose by place value*

I started with 27. I needed 3 more to make 30, so I broke off 3 from 38 and added it to 27. I still needed to add 35. I added 3 tens and 5 ones to get 65.

*make a friendly number*

**31-13**

I made 31 with place value blocks. I didn't have enough ones to subtract 3, so I decomposed a ten into 10 ones. This gave me 11 ones. I took away 3 ones to get 8 ones. Then, I subtracted 1 ten from my 2 tens. I have 18 left.

*directly model using place value*

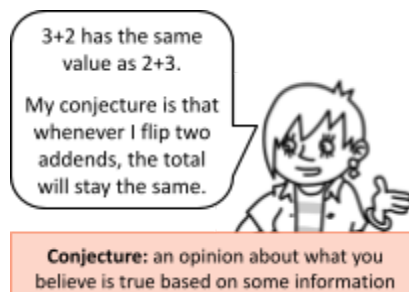
I broke each number into tens and ones. I couldn't take 3 ones from 1 one so I broke 31 into 2 tens and 11 ones.

Then I subtracted 1 ten from 2 tens and 3 ones from 11 ones. This left me with 10 and 8 which is 18.

*decompose by place value*

## 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.



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 2, students are expected to solve the following problem types:

- **Add to/Take From** - Result Unknown, Change Unknown, Start Unknown
- **Put together/Take Apart** - Total Unknown, Both Addends Unknown, & Addend Unknown
- **Compare** - Difference Unknown, Bigger Unknown, & Smaller Unknown
- **2-Step Problems involving single digits:** Add to/Take From Change and Result 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 2 Unpacking Document](#).

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## What Does it Mean to Be Fluent?

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.

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## Grade 2 Resources to Build Conceptual Understanding and Develop Fluency

- [Maze Hundreds Chart](#) (activity), *Steve Wyborney*
- [Break Apart](#) (game), *Greg Tang*
- [Easy as Pie](#) - pp. 8-10, *NCDPI Games*
- [Shut the Box](#) (game), *YouCubed*
- [How Far to 100](#) (lesson) *Tools4NCTeachers*
- [Arrow Cards](#) (lesson), *Tools4NCTeachers*
- [Whopper Jar](#) (task), *Graham Fletcher*
- [Subtracting Two-Digit Numbers](#) (task), *Open Middle*

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