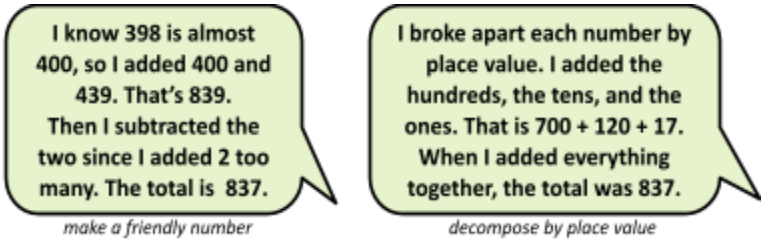
Whole Number Addition & Subtraction in Grade 3

How Does Fluency Build from Conceptual Understanding in Grade 3?

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 3, students are expected to fluently add and subtract whole numbers up to 1,000. The ability to add and subtract large numbers depends on a deep, conceptual understanding of place value, which begins to develop in kindergarten when students compose and decompose teen numbers 11 to 19. In Grade 1, students develop understanding of two-digit place value and extend this understanding to three-digit numbers in second grade. Understanding of the base ten number system is the foundation for many addition and subtraction strategies. Examples:

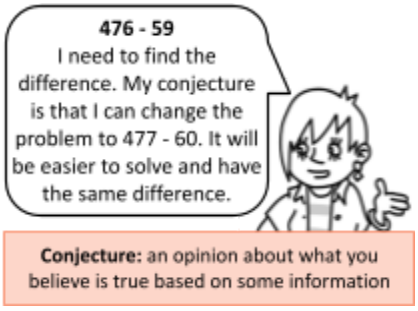
Problem:
Saul earns $398 mowing lawns and $439 raking leaves. How much money does Saul earn?



make a friendly number *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.



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.

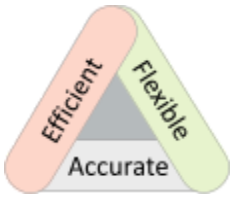
Students in grade 3 are expected to solve the following addition and subtraction problem types:

- **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 Number Unknown & Smaller Number 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 3 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 Third Grader?

Component	Action
Efficient	Select an appropriate strategy. Easily use the strategy. Add and subtract within 1,000 in a reasonable amount of time.
Flexible	Use strategies to add and subtract within 1,000 including • Count on from one number or add up in chunks. • Count back. • Decompose numbers (e.g., decompose a number leading to a ten). • Use friendly numbers (e.g., make a ten, doubles and near doubles, compensation, adjust one number before subtracting). • Use the relationship between addition and subtraction. • Keep a constant difference. 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 3 Resources to Build Conceptual Understanding and Develop Fluency

- Summer Vacation (lesson) *Tools4NCTeachers*
- Addition Number Talk (lesson), *Tools4NCTeachers*
- Subtraction Number Talk (lesson), *Tools4NCTeachers*
- Close Enough, pp. 40-41 (game), *NCDPI Games*
- Math Limbo (game), *Tang Math*
- Classroom Supplies (task), Illustrative Mathematics
- Adding 3-Digit Numbers (task), *Open Middle*

Link to Developing Proficiency with Whole Number Addition & Subtraction