GRADE: 8

UNIT (S): Number

TOPIC: Addition, Subtraction, and Word Problems up to Ten Thousands

DATE: October 6 -- October 10, 2025 (1 week)

STANDARDS:
(Number) Develop fluency with the standard algorithms for addition and subtraction. Build problem-solving skills to solve routine word problems involving sums and differences.

GENERAL OBJECTIVES:

- Reinforce understanding of place value as the foundation for all addition and subtraction operations.
- Develop fluency and confidence in adding and subtracting numbers up to ten thousands, including regrouping in any position.
- Apply addition and subtraction skills to solve routine word problems, writing and solving number sentences with unknowns.

SPECIFIC OBJECTIVES:
By the end of the week, students should be able to:

1. Accurately add numbers up to ten thousands, demonstrating regrouping in any place value position.
2. Write a number sentence with a variable (e.g., n + 15 = 42) to represent the situation in a word problem.
3. Solve for an unknown in an addition number sentence.
4. Accurately subtract numbers up to ten thousands, demonstrating regrouping in any place value position and using memorized subtraction facts for efficiency.
5. Solve for an unknown addend or difference in a subtraction number sentence within a word problem context.

KEY VOCABULARY

- Sum
- Difference
- Addend
- Place Value
- Regrouping (as a general term for carrying/borrowing)
- Standard Algorithm
- Number Sentence / Equation
- Unknown / Variable

KEY SKILLS

- Using place value charts and base-ten blocks to model addition and subtraction with regrouping.
- Executing the standard algorithms for addition and subtraction with accuracy.
- Translating word problems into solvable number sentences.

- Solving for an unknown quantity in an equation.

RESOURCES

- Whiteboards and markers (for all students)
- Place value charts (to ten thousands)
- Base-ten blocks (units, rods, flats, cubes)
- Number cards (0-9)
- Task cards with word problems
- Online math games for fact fluency (e.g., Blooket, Gimkit)
- "Problem of the Day" prompts

PRIOR KNOWLEDGE
Students will already be able to:

- Add and subtract two- and three-digit numbers with regrouping.
- Understand place value up to ten thousands.
- Recall basic addition and subtraction facts.

CONTENT

- **Addition with Regrouping:** The process of making a group of 10 in any place value column and carrying it to the next higher-value column.
- **Subtraction with Regrouping:** The process of breaking down a group from a higher place value column into 10 groups of the next lower value (e.g., 1 hundred = 10 tens).
- **Solving for Unknowns:** A variable (like a box __ or letter n) can stand for a missing number in an equation. To find it, we use the inverse operation (e.g., if n + 5 = 12, then n = 12 - 5).

TEACHING / LEARNING ACTIVITIES

ENGAGE

- Using number cards, the teacher displays a number like 34,567. In pairs, students use whiteboards to write the number in expanded form and state the value of each digit. This reactivates their place value understanding.
- Several students will hold large digit cards (e.g., 4, 8, 2, 1, 7) to form a number like 48,217. The teacher asks, "What number is 3,000 more?" or "What is 400 less?" Students physically rearrange the digits or discuss the change, introducing the week's concepts.

EXPLORE

- In small groups, students are given a problem like 4,758 + 3,696. They will use base-ten blocks and a place value mat to model the problem, physically regrouping blocks as needed. They record their process and final answer.
- Students work in pairs with task cards. Each card has a number sentence with a missing part (e.g., __ + 2,450 = 5,100 or 7,832 - __ = 4,917). They must use manipulatives or reasoning to find the unknown number.

EXPLAIN

- The teacher will lead a discussion on the Explore activities, asking groups to share their strategies for regrouping.
- **Formalizing the Algorithm:** The teacher will explicitly demonstrate the standard algorithm for addition and subtraction on the board, using a place value chart to show how regrouping connects to the written steps. Key language: "We can't have 15 ones, so we regroup 10 ones as 1 ten."
- **Introducing Variables:** The teacher will explain that a letter or symbol can represent the unknown. They model how to write a number sentence from a word problem and solve for the variable using inverse operations (e.g., "If the problem is 'find the missing addend,' we subtract.").

ELABORATE / EXTEND

- In teams, students will roll a dice to generate two numbers up to ten-thousands. They must:
    1. Add the numbers.
    2. Subtract the smaller from the larger.
    3. Write *one* word problem that uses either their sum or their difference as the answer.
- Teams then swap problems with another group and race to solve them, writing the correct number sentence with a variable.
- The teacher presents an equation with a missing number (e.g., n - 1,250 = 3,800). Teams "bid" on the correct value of n by holding it up on their notebooks. The team with the correct answer and the most confident bid wins a point.

EVALUATE

- Students will be presented with a two-part assessment:
    1. A traditional quiz with 5-8 computation problems (addition and subtraction with regrouping) and 2-3 word problems where students must write and solve a number sentence with a variable.
    2. Students choose one addition and one subtraction word problem they solved during the week. They create a journal entry that includes:
        - The original problem.
        - The number sentence they wrote (with the variable).

- A written explanation of the steps they took to solve it.
- A check of their answer using the inverse operation.

LINKS TO OTHER SUBJECTS

- **Science:** Connecting to data collection, e.g., "If a scientist tracked 12,450 migratory birds one year and 15,789 the next, what is the total number tracked over two years?"
- **Financial Literacy:** Creating simple budgets or calculating profit/loss. "If your startup costs were $8,500 and you made $12,200 in revenue, what was your profit?"
- **Geography:** Calculating distances between cities on a map or differences in population between two countries.

ASSESSMENT

- Observation and anecdotal notes during group challenges and games.
- Completed "Problem Solver's Journal" entries, assessed for accuracy, clarity, and reasoning.
- Results from the Skills Application Quiz.
- Peer evaluation during the "Build Your Own Problem" activity.