

# 4th Grade Math: Adding and Subtracting Multi-Digit Numbers

## Lesson Objective:

By the end of this lesson, students will be able to:

- Add and subtract multi-digit numbers with regrouping (carrying and borrowing).
  - Understand how to align numbers properly when performing addition and subtraction.
  - Solve word problems that involve adding and subtracting large numbers.
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## 1. Introduction to Adding and Subtracting Multi-Digit Numbers

**Explanation:** In 4th grade, we work with numbers that have many digits (up to the thousands or ten thousands place). When adding or subtracting multi-digit numbers, it's important to line up the numbers by their place values. We start from the right (ones place) and move to the left (tens, hundreds, etc.).

In addition, we may need to **regroup** (also called carrying or borrowing) to solve the problem correctly.

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## 2. Adding Multi-Digit Numbers

### Step-by-Step Guide to Addition with Regrouping:

**Example 1:** Add 5,734 and 2,869.

1. **Line up the numbers by place value:**

$$\begin{array}{r} 5,734 \\ + 2,869 \\ \hline \end{array}$$

2. **Add the digits starting from the right (ones place):**
  - $4 + 9 = 13$ . Write down the 3 in the ones place, carry over the 1 to the tens place.
  - $3 + 6 = 9$ . Add the carried-over 1:  $9 + 1 = 10$ . Write down the 0 in the tens place, carry over the 1 to the hundreds place.
  - $7 + 8 = 15$ . Add the carried-over 1:  $15 + 1 = 16$ . Write down the 6, carry over the 1 to the thousands place.
  - $5 + 2 = 7$ . Add the carried-over 1:  $7 + 1 = 8$ .

The result is **8,603**.

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### 3. Subtracting Multi-Digit Numbers

#### Step-by-Step Guide to Subtraction with Regrouping (Borrowing):

**Example 2:** Subtract **8,472** from **9,035**.

1. **Line up the numbers by place value:**

$$9,035 - 8,472 \begin{array}{r} 9,035 \\ - 8,472 \\ \hline \end{array}$$

2. **Subtract the digits starting from the right (ones place):**

- **5 - 2 = 3** (no borrowing needed).
- **3 - 7:** We can't subtract 7 from 3, so we borrow 1 from the hundreds place, making the 0 in the hundreds place a 9 and the 3 in the tens place a 13. Now, **13 - 7 = 6**.
- **9 - 4 = 5** (after borrowing).
- **9 - 8 = 1**.

The result is **563**.

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### 4. Practice Problems (Guided Practice)

#### Addition Practice:

1. Add:

$$12,345 + 7,654 \quad 12,345 + 7,654$$

2. Add:

$$23,987 + 45,123 \quad 23,987 + 45,123$$

#### Subtraction Practice:

1. Subtract:

$$65,432 - 32,987 \quad 65,432 - 32,987$$

2. Subtract:

$$50,000 - 23,456 \quad 50,000 - 23,456$$

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## 5. Solving Word Problems

**Example Word Problem:** Maria is saving money to buy a new bike. She already has **\$2,874**, and she earned another **\$1,653** from chores. How much money does Maria have in total now?

**Solution:** To find the total amount of money Maria has, we need to add:

$$2,874 + 1,653 = 4,527 \quad 2,874 + 1,653 = 4,527 \quad 2,874 + 1,653 = 4,527$$

So, Maria has **\$4,527**.

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## 6. Estimating Sums and Differences

### Why Estimating Helps:

Before solving a problem exactly, it's useful to estimate. This helps us know if our answer is reasonable.

**Example:** Estimate the sum of **8,629 + 4,315** by rounding each number to the nearest thousand:

- **8,629** rounds to **9,000**.
- **4,315** rounds to **4,000**.

Estimated sum: **9,000 + 4,000 = 13,000**.

The exact sum is **12,944**. The estimate shows that our answer is reasonable.

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## 7. Independent Practice

### Addition Practice:

1. Add:  $6,543 + 2,987$ ,  $6,543 + 2,987$ ,  $6,543 + 2,987$
2. Add:  $45,678 + 12,345$ ,  $45,678 + 12,345$ ,  $45,678 + 12,345$

### Subtraction Practice:

1. Subtract:  $34,567 - 12,123$ ,  $34,567 - 12,123$ ,  $34,567 - 12,123$
  2. Subtract:  $90,000 - 47,589$ ,  $90,000 - 47,589$ ,  $90,000 - 47,589$
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## 8. Challenge Problems

**Word Problem 1:**

Samantha collected **4,321** stickers. Her friend Sarah gave her **2,865** more. How many stickers does Samantha have in total?

**Word Problem 2:**

A store had **12,500** apples at the start of the week. They sold **8,249** apples. How many apples are left?

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**9. Review and Wrap-Up**

- **Key Concepts:** When adding or subtracting multi-digit numbers, always start from the rightmost digit and regroup (carry or borrow) when necessary.
- **Check Your Work:** Always double-check your answers by estimating sums and differences.