

Mastering Multi-Digit Multiplication

What is Multi-Digit Multiplication?

Multi-digit multiplication helps calculate the total when there are many groups with large numbers. For example, if you have 34 groups with 12 items each, you multiply 34×12 to find the total.

Key Terms to Know

1. **Multiplication:** A quick way of adding the same number multiple times.

Example:

$$3 \times 4 = 12$$

This means you add 3 four times:

$$3 + 3 + 3 + 3 = 12$$

2. **Multiplier and Multiplicand:**

- o The **multiplicand** is the number being multiplied (the "input" being scaled).
- o The **multiplier** is the number by which the multiplicand is multiplied (the "repeated count").

Example:

In 3×4 , 3 is the **multiplicand** (what you're scaling), and 4 is the **multiplier** (how many times you scale it).

3. **Factors:** The numbers involved in multiplication (both the multiplicand and the multiplier are factors).

Example:

In 34×12 , 34 and 12 are the factors.

4. **Product:** The result of multiplying two numbers.

Example:

How to Multiply Multi-Digit Numbers

1. Write the numbers vertically:

$$\begin{array}{r} 34 \\ \times 12 \\ \hline \end{array}$$

2. Multiply the ones place. Multiply 2 by 34:

$$\begin{array}{r} 34 \\ \times 2 \\ \hline 68 \end{array}$$

3. Multiply the tens place. Multiply 1 (representing 10) by 34. Write the result one place to the left:

$$\begin{array}{r} 34 \\ \times 10 \\ \hline 340 \end{array}$$

4. Add the results together:

$$\begin{array}{r} 68 \\ + 340 \\ \hline 408 \end{array}$$

Key Takeaways

- **Partial products** are the results from multiplying each digit separately.
- Always align numbers properly by place value.
- Add the partial products to get the **final product**.

References

- National Council of Teachers of Mathematics. (n.d.). *Principles and Standards for School Mathematics*. Retrieved from www.nctm.org
- U.S. Department of Education. (n.d.). *Helping Your Child Learn Mathematics*. Retrieved from www.ed.gov