LONG MULTIPLICATION

Long multiplication is a method used for multiplying larger numbers. It requires knowledge of the multiplication table for single digits.

A MULTIPLICATION TABLES FOR MULTIPLES OF 10

Discover: Imagine starting with a simple one-digit number, such as 3. What happens when we multiply by multiples of 10? Let's explore step by step:



- $3 \times 80 = 240$
- $3 \times 90 = 270$

Notice that the multiplication table for multiples of 10 looks similar to the regular table, but you just add a zero at the end.

$3 \times 1 = 3$	$3 \times 10 = 30$
$3 \times 2 = 6$	$3 \times 20 = 60$
$3 \times 3 = 9$	$3 \times 30 = 90$
$3 \times 4 = 12$	$3 \times 40 = 120$
$3 \times 5 = 15$	$3 \times 50 = 150$
$3 \times 6 = 18$	$3 \times 60 = 180$
$3 \times 7 = 21$	$3 \times 70 = 210$
$3 \times 8 = 24$	$3 \times 80 = 240$
$3 \times 9 = 27$	$3 \times 90 = 270$

B LONG MULTIPLICATION BY ONE-DIGIT NUMBERS

Discover: How do we multiply a two-digit number by a one-digit number? For example, to calculate 2×34 , we can break the problem into simpler parts:



This example demonstrates how to use column multiplication to multiply a multi-digit number by a single digit.

Method Long Multiplication by One-Digit Numbers

• Set up column multiplication: Align the digits by their place value (ones, tens, etc.):

$$\times \frac{34}{2}$$

• Multiply the ones place: Multiply the ones digit of the top number by the one-digit multiplier:

$$\times \frac{34}{8} \times \frac{2}{4 \times 2} = 8$$

- Multiply the tens place: Multiply the tens digit of the top number by the one-digit multiplier:
 - $\begin{array}{c} 3 \\ \times \\ \underline{2} \\ 8 \\ 60 \\ 30 \\ \times 2 \\ = 60 \end{array}$
- Add the results: Sum the partial results to find the final product:

$$34 \\ \times \frac{2}{8} \\ + \frac{60}{68} \\ 30 \times 2 = 60 \\ \hline 68 \\ 8 + 60 = 68$$

