Chapter
4

Multiplication

Curricular Goals

- CG-1: Understands numbers (counting numbers and fractions), represents whole numbers using the Indian place value system, understands and carries out the four basic operations with whole numbers, and discovers and recognizes patterns in number sequences
- CG-4: Develops problem-solving skills with procedural fluency to solve mathematical puzzles as well as daily-life problems, and as a step towards developing computational thinking

Competencies

- C-1.3: Understands and visualises arithmetic operations and the relationships among them, knows addition and multiplication tables at least up to 10x10 (pahade) and applies the four basic operations on whole numbers to solve daily life problems
- C-4.1: Solves puzzles and daily-life problems involving one or more operations on whole numbers (including word puzzles and puzzles from 'recreational' areas, such as the construction of magic squares)
- C-4.3: Selects appropriate methods and tools for computing with whole numbers, such as mental computation, estimation, or paper pencil calculation, in accordance with the context

Learning Outcomes

At the end of the lesson, learners will be able to:
compute the product using number line. **apply** multiplication tables of 7, 8 and 9 to find products. **find** the product of 3-digit numbers with 1- and 2-digit numbers. **apply** multiplication to solve real-world problems.

21st CENTURY SKILLS

- Critical Thinking
- CALCULATING

Get Ready!

Multiplication indicates how many times a number is added to itself.

It is actually repeated addition.

In multiplication, the number to be multiplied is known as the **multiplicand**.

The number by which the multiplicand is multiplied is called the **multiplier**.

The answer is called the **product**.

	T	O	
		5	← Multiplicand
×		2	← Multiplier
	1	0	← Product

Fill in the blanks with the correct number.

a. 42 × 2 = ...

b. 54 × 0 = ...

c. 27 × 1 = ...

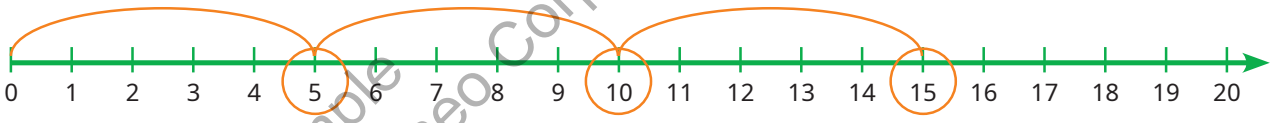
d. 11 × 7 = ...

Think of a real-life situation where you use multiplication.

Let's Learn

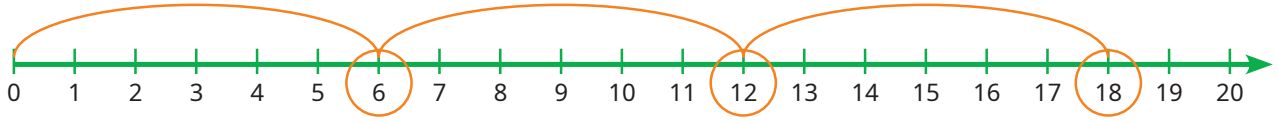
Multiplication Using Number Line

Vinnie's jump is 5 steps long. She wants to know how far she will go in 3 jumps.



1 × 5 = 5; 2 × 5 = 10; 3 × 5 = ☐

Kazo's jump is 6 steps long. He wants to know how far he will go in 3 jumps.



1 × 6 = 6; 2 × 6 = 12; 3 × 6 = ☐

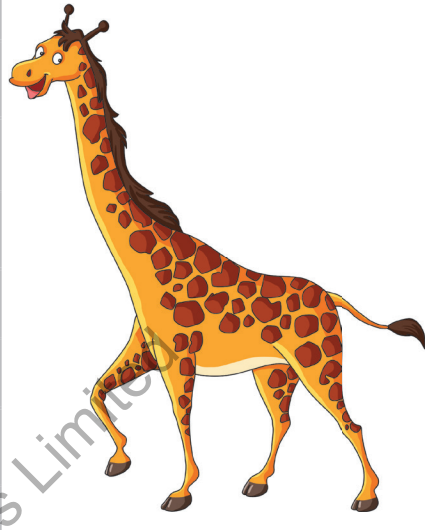
Multiply the following:

a. 5 × 5 = ☐ b. 4 × 2 = ☐ c. 5 × 3 = ☐ d. 0 × 6 = ☐

e. 5 × 2 = ☐ f. 4 × 3 = ☐ g. 3 × 2 = ☐ h. 5 × 4 = ☐

Multiplication Table of 7

7	1 × 7 = 7
7 + 7	2 × 7 = 14
7 + 7 + 7	3 × 7 = 21
7 + 7 + 7 + 7	4 × 7 = 28
7 + 7 + 7 + 7 + 7	5 × 7 = 35
7 + 7 + 7 + 7 + 7 + 7	6 × 7 = 42
7 + 7 + 7 + 7 + 7 + 7 + 7	7 × 7 = 49
7 + 7 + 7 + 7 + 7 + 7 + 7 + 7	8 × 7 = 56
7 + 7 + 7 + 7 + 7 + 7 + 7 + 7 + 7	9 × 7 = 63
7 + 7 + 7 + 7 + 7 + 7 + 7 + 7 + 7 + 7	10 × 7 = 70



Multiplication Table of 8

8	1 × 8 = 8
8 + 8	2 × 8 = 16
8 + 8 + 8	3 × 8 = 24
8 + 8 + 8 + 8	4 × 8 = 32
8 + 8 + 8 + 8 + 8	5 × 8 = 40
8 + 8 + 8 + 8 + 8 + 8	6 × 8 = 48
8 + 8 + 8 + 8 + 8 + 8 + 8	7 × 8 = 56
8 + 8 + 8 + 8 + 8 + 8 + 8 + 8	8 × 8 = 64
8 + 8 + 8 + 8 + 8 + 8 + 8 + 8 + 8	9 × 8 = 72
8 + 8 + 8 + 8 + 8 + 8 + 8 + 8 + 8 + 8	10 × 8 = 80

Multiplication Table of 9

9	1 × 9 = 9
9 + 9	2 × 9 = 18
9 + 9 + 9	3 × 9 = 27
9 + 9 + 9 + 9	4 × 9 = 36
9 + 9 + 9 + 9 + 9	5 × 9 = 45
9 + 9 + 9 + 9 + 9 + 9	6 × 9 = 54
9 + 9 + 9 + 9 + 9 + 9 + 9	7 × 9 = 63
9 + 9 + 9 + 9 + 9 + 9 + 9 + 9	8 × 9 = 72
9 + 9 + 9 + 9 + 9 + 9 + 9 + 9 + 9	9 × 9 = 81
9 + 9 + 9 + 9 + 9 + 9 + 9 + 9 + 9 + 9	10 × 9 = 90

Know More

Have you noticed that in the multiplication table of 9, the digits of each product add up to 9?

0 + 9 = 9,

1 + 8 = 9,

2 + 7 = 9...

Multiply the following:

a. 6 × 7 = ☐ b. 3 × 7 = ☐ c. 9 × 7 = ☐

d. 5 × 8 = ☐ e. 2 × 8 = ☐ f. 4 × 8 = ☐

g. 8 × 9 = ☐ h. 7 × 7 = ☐ i. 1 × 9 = ☐

Exercise 4.1

Write the product using multiplication tables.

a. 8 × 9 = ☐ b. 7 × 8 = ☐ c. 2 × 3 = ☐

d. 7 × 2 = ☐ e. 8 × 5 = ☐ f. 4 × 5 = ☐

g. 3 × 4 = ☐ h. 9 × 2 = ☐ i. 7 × 7 = ☐

j. 5 × 3 = ☐ k. 10 × 2 = ☐ l. 8 × 4 = ☐

Multiplication

Multiplying 3-digit Number by a 1-digit Number

Without Regrouping

Example: Multiply 123 by 3.

Step 1: Multiply the ones digit by 3.

3 × 3 = 9 ones

	H	T	O
	1	2	3
×			3
			9

Step 2: Multiply the tens digit by 3.

2 × 3 = 6 tens

	H	T	O
	1	2	3
×			3
		6	9

Step 3: Multiply the hundreds digit by 3.

1 × 3 = 3 hundreds

	H	T	O
	1	2	3
×			3
	3	6	9

Thus, 123 × 3 = 369

With Regrouping

Example: Multiply 225 by 9.

	H	T	O
	2	④ 2	5
×			9
			5

Step 1: Multiply the ones digit by 9.

5 × 9 = 45 ones = 4 tens + 5 ones

Write 5 in the ones column.

Carry over 4 tens to the tens column.

	H	T	O
	② 2	④ 2	5
×			9
		2	5

Step 2: Multiply the tens digit by 9.

2 × 9 = 18 tens + 4 tens (carry over)

= 22 tens = 2 hundreds + 2 tens

Write 2 in the tens column.

Carry over 2 hundreds to the hundreds column.

	Th	H	T	O
	②	② 2	④ 2	5
×				9
	2	0	2	5

Thus, 225 × 9 = 2025

Step 3: Multiply the hundreds digit by 9.

2 × 9 = 18 hundreds + 2 hundreds (carry over)

= 20 hundreds

= 2 thousands + 0 hundreds

Write 0 in the hundreds column.

Carry over 2 thousands to the thousands column.

Exercise 4.2

1. Find the product.

a.

	H	T	O
	3	1	4
×			2

b.

	H	T	O
	1	1	2
×			2

c.

	H	T	O
	2	2	3
×			3

d.

	H	T	O
	1	2	4
×			2

e.

	H	T	O
	2	1	1
×			4

f.

	H	T	O
	1	2	1
×			3

2. Find the product.

a.

	Th	H	T	O
		1	4	8
×				4

b.

	Th	H	T	O
		1	9	8
×				7

c.

	Th	H	T	O
		2	3	4
×				8

d.

	Th	H	T	O
		2	8	4
×				3

e.

	Th	H	T	O
		3	1	2
×				5

f.

	Th	H	T	O
		3	3	5
×				9

Multiplying 3-digit Number by a 2-digit Number

Example 1: Multiply 221 by 12.

	Th	H	T	O
		2	2	1
×			1	2
		4	4	2
+	2	2	1	0
	2	6	5	2

Step 1: Multiply 221 by 2.
221 × 2 = 442

Step 2: Multiply 221 by 10.
221 × 10 = 2210

Step 3: Add 442 and 2210.
442 + 2210 = 2652

Thus, 221 × 12 = 2652

Example 2: Multiply 233 by 14.

	Th	H	T	O
		(1) 2	(1) 3	3
×			1	4
		9	3	2
+	2	3	3	0
	3	2	6	2

Step 1: Multiply 233 by 4.
233 × 4 = 932

Step 2: Multiply 233 by 10.
233 × 10 = 2330

Step 3: Add 932 and 2330.
932 + 2330 = 3262

Thus, 233 × 14 = 3262

Exercise 4.3

1. Find the product.

a.

	Th	H	T	O
		1	1	0
×			1	2
+				

b.

	Th	H	T	O
		2	3	4
×			1	1
+				

c.

	Th	H	T	O
		1	4	3
×			1	2
+				

d.

	Th	H	T	O
		4	4	3
×			1	8
+				

e.

	Th	H	T	O
		5	4	8
×			1	3
+				

f.

	Th	H	T	O
		3	6	4
×			1	4
+				

Word Problem

Example: Mitali travels 125 km in one day. How many kilometres will she travel in 5 days?

Number of kilometres travelled in a day

Number of days ×

	H	T	O
	①1	②2	5
×			5
	6	2	5

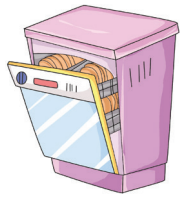
Thus, she will travel 625 km in 5 days.

Cross-curricular focus: English

• Life Skills
• BEING RESPONSIBLE

Exercise 4.4

1. A stationer has pencils in 5 colours. If there are 226 pencils of each colour, how many pencils are there in all?
2. There are 273 balloons in a packet. How many balloons will be there in 8 such packets?
3. A lorry can carry 326 bicycles in a trip. How many bicycles can the lorry carry in 8 trips? At what age did you learn to ride a bicycle? Write a paragraph about your experience.



4. 128 utensils can be washed in a dishwasher at a time. How many utensils can be washed by running the washer 13 times? We should help our parents with daily domestic chores. What help do you offer at home?

5. There are 14 tomatoes in a box. How many tomatoes will be there in 243 such boxes?

Smart Multiplication

Method 1: $18 \times 25 = 18 \times (5 \times 5)$
$= (18 \times 5) \times 5$
$= 90 \times 5$
$= 450$

Method 2: $18 \times 25 = 18 \times (20 + 5)$
$= (18 \times 20) + (18 \times 5)$
$= 360 + 90$
$= 450$

Exercise 4.5

1. Use smart multiplication (method 1) to find the product.

a. 28×35 b. 16×25 c. 12×45 d. 25×32
e. 22×55 f. 75×42 g. 34×15 h. 35×26

2. Use smart multiplication (method 2) to find the product.

a. 34×25 b. 14×35 c. 18×45 d. 14×25
e. 18×15 f. 25×65 g. 35×82 h. 45×44

Multiplication by 10, 100 and 1000

By 10

To multiply a number by 10, write a zero at the end of the number.

3 × 10 = 30; 12 × 10 = 120; 25 × 10 = 250

45 × 10 = ...	30 × 2 = (3 × 2) × 10 = 6 × 10 = 60
36 × 10 = ...	60 × 2 = (6 × 2) × 10 = 12 × 10 = ☐
48 × 10 = ...	70 × 4 = (7 × 4) × 10 = ☐ × 10 = ☐

By 100

To multiply a number by 100, write two zeros at the end of the number.

4 × 100 = 400; 5 × 100 = 500; 23 × 100 = 2300

45 × 100 = ...	300 × 2 = (3 × 2) × 100 = 6 × 100 = 600
36 × 100 = ...	400 × 2 = (4 × 2) × 100 = ☐ × 100 = ☐
48 × 100 = ...	600 × 3 = (6 × 3) × 100 = ☐ × 100 = ☐

By 1000

To multiply a number by 1000, write three zeros at the end of the number.

4 × 1000 = 4000; 5 × 1000 = 5000; 2 × 1000 = 2000

3 × 1000 = ...	4000 × 2 = (4 × 2) × 1000 = 8 × 1000 = 8000
6 × 1000 = ...	5000 × 3 = (5 × 3) × 1000 = ☐ × 1000 = ☐
8 × 1000 = ...	6000 × 7 = (6 × 7) × 1000 = ☐ × 1000 = ☐

Word Problem

Example: A school bus can seat 25 children. How many children can be seated in 20 such buses?

Number of children in one bus

= 25

Number of buses

= 20

Total number of children

= 25 × 20 = 25 × 2 × 10 = 50 × 10 = 500

Hence, 500 children can be seated in 20 buses.

- Life Skills
- Helping

Exercise 4.6

1. Find the product.

a. 4 × 10 = ☐

b. 5 × 30 = ☐

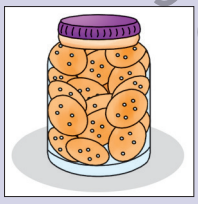
c. 2 × 100 = ☐

d. 9 × 200 = ☐

e. 3 × 2000 = ☐

f. 7 × 1000 = ☐

2. Use the picture and the multiplication fact to form word problems. One has been done for you.

Picture clue	Multiplication fact	Word Problem
	2 × 20 = 40	There are 20 cookies in a jar. How many cookies are there in 2 such jars?
	5 × 100 = 500	

	10 × 10 = 100	
	8 × 12 = 96	

3. **A bar of chocolate can be divided into 8 pieces. How many pieces will be there in 10 such bars?**

4. **Aditya's best friend needed money since his cousin was admitted in the hospital. Aditya together with other children of his class contributed ₹ 100 each. If there were 25 students in his class, how much money did they contribute altogether?**

5. **1000 people can sit in a stadium. How many people can sit in 9 such stadiums?**