Lesson - 3, 4 and 8 times tables

Year: Year 3

Hello, I am Otto! Multiplication tables are a superpower. When you know them, shopping, baking, sport and games are all quicker to work out. In this chapter you learn the 3, 4 and 8 times tables, how they link to each other, how to divide using them and how to solve problems with them.

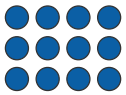
Starter activity

A pack of cookies has 4 cookies. You need cookies for 6 friends, one pack each. How many cookies is that? Count in 4s on your fingers: 4, 8, 12, 16, 20, 24. Six packs make 24 cookies. Now share 24 cookies between 3 friends. How many does each friend get? $24 \div 3 = 8$. You have just used three different tables in one story.

What is multiplication?

Definition: multiplication

Multiplication is repeated addition. 4×3 means 4 groups of 3, which is $3 + 3 + 3 + 3 = 12$. We can show it as groups or as an **array**, which is an arrangement of objects in rows and columns.



The array has 3 rows of 4 dots. $3 \times 4 = 12$. The array also shows 4 columns of 3, so $4 \times 3 = 12$.

Rule: multiplication in any order

You can multiply in any order: $3 \times 4 = 4 \times 3$. This is called the **commutative** property. It halves the number of facts you have to learn.

Example 1

Write a multiplication for 5 bags with 8 sweets in each bag.

5 groups of 8: $5 \times 8 = 8 + 8 + 8 + 8 + 8 =$ **40**. You can also write $8 \times 5 = 40$.

The 3 times table

Sum	Answer
1×3	3
2×3	6

Sum	Answer
3 × 3	9
4 × 3	12
5 × 3	15
6 × 3	18
7 × 3	21
8 × 3	24
9 × 3	27
10 × 3	30
11 × 3	33
12 × 3	36

Key fact: patterns in the 3 times table

- The answers go up in 3s: 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36.
- The answers alternate odd and even: 3 odd, 6 even, 9 odd, 12 even.
- The digits of every answer in the table up to 30 add up to a multiple of 3 (1 + 2 = 3, 1 + 5 = 6, 2 + 1 = 3).

Method: using 3 × n = 2 × n + n

1. Split the table into two easy ones: 3 × 7 = 2 × 7 + 7.
2. Work out the double: 2 × 7 = 14.
3. Add the extra group: 14 + 7 = 21.

Example 2

Work out 3 × 8.

Double 8 is 16 (2 × 8). One more group of 8 gives 16 + 8 = **24**.

The 4 times table

Sum	Answer
1 × 4	4
2 × 4	8
3 × 4	12
4 × 4	16
5 × 4	20

Sum	Answer
6 × 4	24
7 × 4	28
8 × 4	32
9 × 4	36
10 × 4	40
11 × 4	44
12 × 4	48

Rule: 4 times is double double

To multiply by 4, **double and double again**. 4 × 6: double 6 is 12, double 12 is 24. So 4 × 6 = 24. This works because 4 = 2 × 2.

Key fact: patterns in the 4 times table

- The answers go up in 4s: 4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, 48.
- Every answer is even.
- The ones digits repeat: 4, 8, 2, 6, 0, 4, 8, 2, 6, 0.

Example 3

Work out 4 × 7.

Double 7 is 14. Double 14 is 28. So 4 × 7 = **28**.

The 8 times table

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

Sum	Answer
11 × 8	88
12 × 8	96

Rule: 8 times is double the 4 times table

To multiply by 8, **double the 4 times table answer**. 8 × 6: 4 × 6 = 24, and double 24 is 48. So 8 × 6 = 48. Or double three times: 6 → 12 → 24 → 48.

Key fact: patterns in the 8 times table

- The answers go up in 8s: 8, 16, 24, 32, 40, 48, 56, 64, 72, 80, 88, 96.
- The ones digits count down in evens: 8, 6, 4, 2, 0, 8, 6, 4, 2, 0.
- Every answer is even, and every answer is in the 4 times table.

Example 4

Work out 8 × 7.

4 × 7 = 28. Double 28 is 56. So 8 × 7 = **56**.

Watch out

Be careful not to mix up the tables, for example 8 × 7 = 56 (not 54), and 4 × 8 = 32 (not 36). If you are not sure, use the doubling rule to check. Also remember that 3 × 4 and 4 × 3 are the same: you do not need to learn them twice.

Division as the inverse of multiplication

Definition: division

Division means sharing equally or finding how many groups. It is the **inverse** of multiplication, which means it undoes it. Every multiplication fact gives two division facts. For example 4 × 6 = 24, so 24 ÷ 4 = 6 and 24 ÷ 6 = 4.

Method: dividing using a times table

1. Look at the number you are dividing by, for example 24 ÷ 8.
2. Ask: what times 8 makes 24? Count in 8s: 8, 16, 24.
3. It took 3 jumps, so 24 ÷ 8 = 3.
4. Check: 3 × 8 = 24.

Example 5

Work out 36 ÷ 4 and 27 ÷ 3.

36 ÷ 4: 4 × 9 = 36, so the answer is **9**. 27 ÷ 3: 3 × 9 = 27, so the answer is **9**.

Multiplying a 2-digit number

Method: partitioning

1. Split the 2-digit number into tens and ones, for example 23 = 20 + 3.
2. Multiply each part: 4 × 20 = 80 and 4 × 3 = 12.
3. Add the parts: 80 + 12 = 92.

Example 6

Work out 3 × 24.

24 = 20 + 4. 3 × 20 = 60 and 3 × 4 = 12. 60 + 12 = **72**.

Problem solving

Example 7

Four friends each buy a ticket for the cinema that costs £8. How much do they pay altogether?

4 tickets at £8 each: 4 × 8 = 32. They pay **£32**.

Example 8

There are 3 pizzas, each cut into 8 slices. Sam, Ali and 4 friends share all the slices equally. How many slices does each person get?

Slices in all: 3 × 8 = 24. People: Sam, Ali and 4 friends make 6 people. 24 ÷ 6 = **4 slices** each.

Did you know?

The multiplication table we use was written down by people in ancient Babylon on clay tablets about 4000 years ago. They counted in sixties, not tens, and that is why we still have 60 minutes in an hour and 360 degrees in a circle. Your 3, 4 and 8 times tables are part of a very old story.

Otto's tip

Learn a table by saying it aloud, in order and out of order. Use the doubling links: 4s are double the 2s, and 8s are double the 4s. Practise a few minutes every day instead of a long time once a week.