

Multiplication



Multiplication of tens

Tony : Multiplying a number by ten means taking ten times that number.

Thus, 3×10 is ten times 3 or three tens, or $3 \times 10 = 30$.

Also, $4 \times 10 = 40$, $5 \times 10 = 50$, $6 \times 10 = 60$, $10 \times 10 = 100$.

Sonu : Then 13×10 will be 130, $24 \times 10 = 240$ and $40 \times 10 = 400$.

Tai : Yes. **To multiply a number by ten, we just need to put a zero after it.**

Salma : 20×3 means $20 + 20 + 20$. And that is 60.

Tony : 20×3 means three times 2 tens = 6 tens = 60.

Tai : To find 20×3 , we can multiply 2 and 3 and place a zero after it. So the product is 60. In this way,

$$20 \times 6 = 2T \times 6 = 12T = 120 \quad 50 \times 7 = 35 T = 350$$

$$40 \times 5 = 4T \times 5 = 20T = 200 \quad 80 \times 3 = 24 T = 240$$

Sonu : If there's a zero in the units place of both numbers, what do we do ?

Tai : When multiplying 30×20 , write one of the numbers in the tens form.

30×20 means $30 \times 2T$

Salma : But this gives us 60T. That means 600.

Sonu : So 30×20 is 600, right ?

Tony : $3T \times 2T$ is 6H !

Tai : Right ! It means that in 30×20 , first carry out 3×2 and then write two zeros after their product.

Try it. $40 \times 20 = 800$. $30 \times 30 = 900$.

**If there is a zero in the units place of both numbers, then,
multiply the digits in their tens places and
write two zeros after the product.**

◆ **Multiply.**

$$\clubsuit 4 \times 50 = \boxed{}$$

$$\clubsuit 3 T \times 3 T = \boxed{}$$

$$\clubsuit 70 \times 10 = \boxed{}$$

$$\clubsuit 6 \times 20 = \boxed{}$$

$$\clubsuit 4 T \times 2 T = \boxed{}$$

$$\clubsuit 20 \times 20 = \boxed{}$$

Multiplication of a two-digit number by a one-digit number : the lattice method

Sonu : Yesterday I bought two books for 34 rupees each.
Guess how much I must have paid for them.

Salma : To find it out, we must multiply 34 by 2.

Tai : I will tell you a trick for doing this multiplication. For making the 6 times table, we had divided 6 into two convenient parts, 4 and 2. Let's do the same here. We shall split 34 into two convenient parts, 30 and 4. As 30 is a tens number, it is easy to multiply.

×	30 (3 T)	4 (4 U)
2	(30 × 2) 60	(4 × 2) 8

Sonu : First, we multiply 30, that is 3 tens by 2. We get 6 tens, which is 60.
Then, 4 units × 2 = 8
Lastly, we add 60 and 8.
 $60 + 8 = 68$. So, $34 \times 2 = 68$.

◆ **Multiply.**

❖ 37×4

×	30	7
4	120	28

$37 \times 4 = 148$

120
+ 28
148

❖ 56×3

×	50	6
3	150	18

$56 \times 3 = 168$

150
+ 18
168

◆ Use the above method to carry out the following multiplications.

❖ 42×3

×	40	2
3		

❖ 51×6

×	50	1
6		

❖ 73×5

×	70	3
5		

❖ 39×8

×	30	9
8		

Multiplying two two-digit numbers : the lattice method

- ❖ Twelve rupees are to be collected from each child for a visit to the zoo. If 25 children are going, how much money will be collected ?

Nandu : To find it out, we have to multiply 25 by 12.

Tai : We shall again split the numbers into convenient parts and multiply using the lattice method.

Let's split the numbers like this : $25 = 20 + 5$ and $12 = 10 + 2$.

x	20	5
10	200	50
2	40	10

200
+ 50
+ 40
+ 10
300

$25 \times 12 = 300$ rupees will be collected.

✦ **Multiply.**

✿ 43×23

$\times$	40	3
20		
3		

$43 \times 23 = \boxed{}$

✿ **62 × 13**

$\times$	60	2
10		
3		

$62 \times 13 = \boxed{}$

✿ **32 × 14**

$\times$	30	2
10		
4		

$32 \times 14 = \boxed{}$

✿ 13×27

$\times$	10	3
20		
7		

$13 \times 27 = \boxed{}$

✦ **Multiply.**

✿ **56 × 16**

✿ **71 × 12**

✿ 29 × 29

Multiplication : Vertical Arrangement

Tai : We have learnt to multiply using the lattice method. Let us learn another way to do the same. We have understood the operation. We shall only write it in a different way.

◆ **Multiply :** 34×2

T	H
3	4
×	2
6	8

First multiply the 4 in the units place by 2. 2 fours are 8. Hence, write 8 under the line in the units place. Now, multiply the 3 in the tens place by 2. 2 threes are 6. Write this 6 under the line in the tens place. The product is 68.

Tony : Good ! This is a quick method.

◆ **Multiply.**

T	U
4	2
×	2
8	4

T	U
2	4
×	2

T	U
2	2
×	4

T	U
3	1
×	3

Multiplication by carrying over

Tony : How to multiply 26 by 3 ?

Salma : Let's arrange the multiplication vertically.

First multiply the 6 in the units place by 3.

3 sixes are 18.

T	U
2	6
×	3

Tai : From these eighteen units, we take 10 units to make 1 ten or 1T. We write this ten at the top in the tens place. We write the remaining 8 in the units place under the line. Multiply the 2 in the tens place by 3. Three twos are 6, and with the new 1 ten, we get 7 tens. This, we write in the tens place in the answer.

The product is 78.

T	U
1	
2	6
×	3
7	18

carrying over

◆ Multiply : 18×4

T	U
3	
1	8
×	4
7	2

First multiply 8 units by 4. Four eights are 32. 30 of these 32 units make 3 tens. Write these 3 tens in the tens place at the top and the 2 units under the line in the units place. Now multiply the 1 in the tens place by 4. 4 ones are 4, and, alongwith the 3 written at the top, we have 7 tens. Write these in the tens place under the line. The product is 72.

◆ Multiply.

T	U
1	5
×	5

T	U
2	4
×	3

T	U
2	7
×	3

T	U
1	5
×	6

	T	U
	2	
	2	3
×		7
1	6	1

Tai : Now, look at this carefully. We have to multiply 23 by 7. First we multiply 3 units by 7. Seven threes are 21. Of these 21 units, we make 2 tens and write them at the top in the tens place. 1 is left in the units place. Now, 7 twos are 14, and together with the carried over 2, we get 16 tens.

Salma : 16 tens means 1 hundred, 6 tens. So the product is 161.

H	T	U
	3	6
×		4

H	T	U
	4	0
×		8

H	T	U
	5	4
×		7

H	T	U
	9	2
×		8

Word Problems

- ❖ How many chocolates in 9 jars if there are 34 chocolates in 1 jar ?

	3		
	3	4	Chocolates in 1 jar
	×	9	Number of jars
3	0	6	Number of chocolates

Total number of chocolates 306

- ❖ If one book costs 85 rupees, what is the total cost of 5 such books ?

$$\begin{array}{r}
 85 \quad \text{Cost of 1 book} \\
 \times 5 \quad \text{Number of books} \\
 \hline
 \text{Rupees} \\
 \text{Total cost } \boxed{} \text{ rupees}
 \end{array}$$

- ❖ One metre of cloth costs ₹ 95. How much will 6 metres of cloth cost ?

Cost of cloth rupees

- ❖ One litre of milk costs 40 rupees. How much will 3 litres of milk cost ?

Cost of milk rupees

◆ Solve the following problems.

- ❖ 25 children in a row. How many in 7 rows ?
- ❖ How much will 6 towels cost at 53 rupees a towel ?
- ❖ 72 apples in 1 box. How many in 5 boxes ?
- ❖ One box holds 40 laddoos. How many laddoos do 9 boxes hold ?

◆ Make your own problems of multiplication and solve them.

Information : 8 rupees for 1 book,
45 books

Problem : If one book costs 8 rupees, how much do 45 books cost in all ?

$$\begin{array}{r}
 45 \quad \text{books} \\
 \times 8 \quad \text{cost of 1 book} \\
 \hline
 360 \quad \text{rupees} \\
 \text{Total cost of 45 books : 360 rupees.}
 \end{array}$$

Information : 48 pomegranates in 1 box
7 boxes

Problem : If there are 48 pomegranates in 1 box, how many are there in 7 boxes?

Total number of pomegranates in the 7 boxes is

- ❖ 15 trees in one row, 9 rows
- ❖ 16 toys, cost of each toy ₹ 10.
- ❖ 20 laddoos in one box, 8 boxes
- ❖ Cost of one book ₹ 36, 7 books.