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 × 10 = 30.

Also, 4 × 10 = 40, 5 × 10 = 50, 6 × 10 = 60, 10 × 10 = 100.

Sonu : Then 13 × 10 will be 130, 24 × 10 = 240 and 40 × 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 × 6 = 2T × 6 = 12T = 120 50 × 7 = 35 T = 350

40 × 5 = 4T × 5 = 20T = 200 80 × 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 × 2T

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

Sonu : So 30 × 20 is 600, right ?

Tony : 3T × 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 × 20 = 800. 30 × 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.**

- 4 × 50 = ☐
- 3 T × 3 T = ☐
- 70 × 10 = ☐
- 6 × 20 = ☐
- 4 T × 2 T = ☐
- 20 × 20 = ☐

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 × 2 = 68.

✦ **Multiply.**

✤ **37 × 4**

×	30	7
4	120	28

120
+ 28
148

37 × 4 = 148

✤ **56 × 3**

×	50	6
3	150	18

150
+ 18
168

56 × 3 = 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.

×	20	5
10	200	50
2	40	10

200
+ 50
+ 40
+ 10
300

25 × 12 = 300 rupees will be collected.

✦ **Multiply.**

✤ **43 × 23**

×	40	3
20		
3		

43 × 23 = ☐

✤ **62 × 13**

×	60	2
10		
3		

62 × 13 = ☐

✤ **32 × 14**

×	30	2
10		
4		

32 × 14 = ☐

✤ **13 × 27**

×	10	3
20		
7		

13 × 27 = ☐

✦ **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	(1) 6	(2) 1

H	T	U
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 ?

85	Cost of 1 book
× 5	Number of books
	Rupees

Total cost ____ rupees

✤ 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 ?

45	books
× 8	cost of 1 book
360	rupees

Total cost of 45 books : 360 rupees.

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.