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**MATHEMATICS
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MATHEMATICS



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MATHEMATICS

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E-book



Assessment



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UNIT - 1



Multiplication



Multiplication is adding the same number to a specified number of times.

Example: $4 + 4 + 4 = 12$

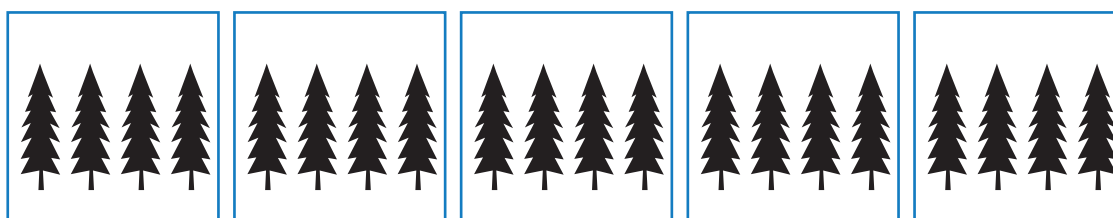
Here, we add 4 three times and the answer is 12.

This can be written as $4 \times 3 = 12$.

Multiplication is quicker way to add the number occurring repeatedly.

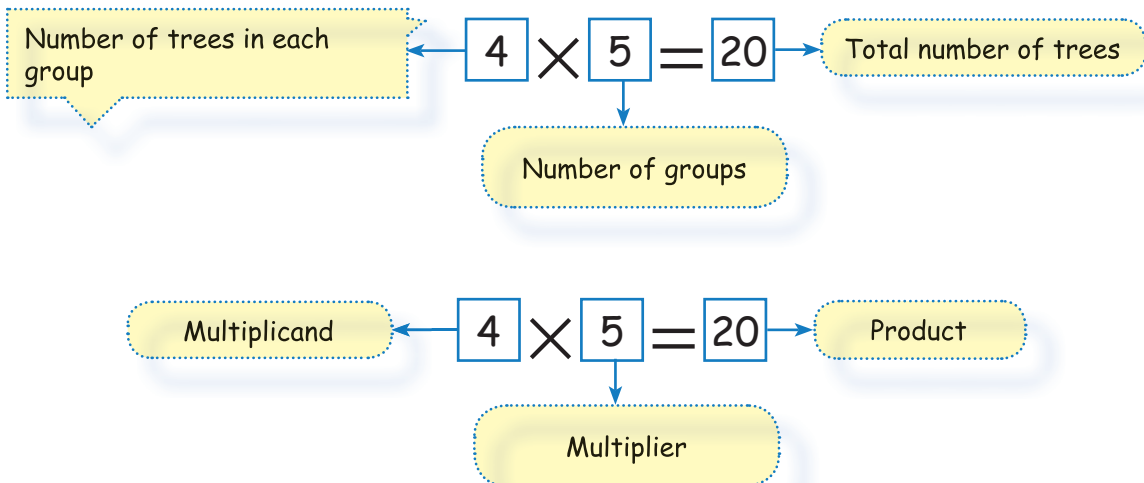
1.1 Symbol of multiplication

we use the symbol "x" to represent multiplication.



4 Trees in 5 groups is 20

This can be written as $4 \times 5 = 20$



Multiplication of a number with other number can be done in the following ways.

- (i) Dot multiplication (ii) Repeated addition (iii) Regrouping
 (iv) Standard multiplication algorithm (v) Lattice multiplication

1.2 Dot multiplication:



Complete the following table.

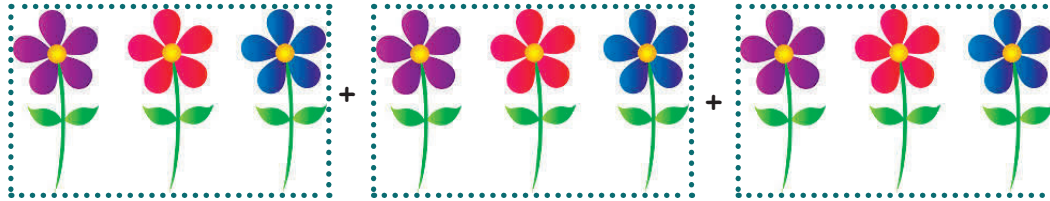
Stars	Number of horizontal rows	number of vertical columns	Total number of stars
	2	4	$2 \times 4 = 8$

1.3 Repeated addition:



Let us recall the repeated addition we have learnt in lower classes.

i) Find the total number of flowers.



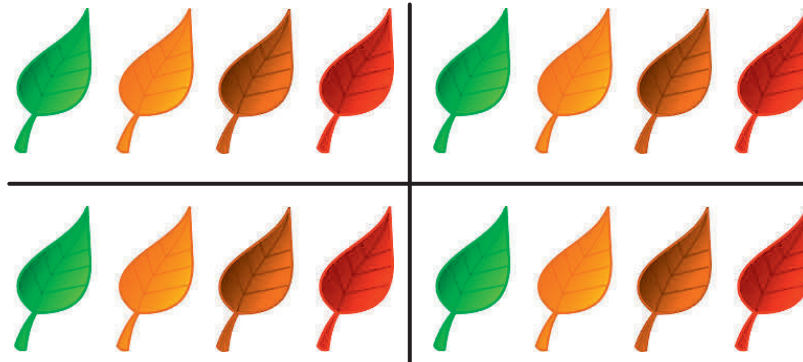
We can find the total number of flowers as follows.

$$3 + 3 + 3 = 9$$

3 groups of 3 flowers make 9

$$3 \times 3 = 9$$

ii) Find the total number of leaves.



$$4 + 4 + 4 + 4 =$$

$$4 \times 4 = 16$$

iii) How many apples are there in four plates



There are four plates. Each has five apples.

Total number of apples =

$$5 + 5 + 5 + 5 =$$



1.4 Construction of multiplication tables of 2, 3, 4, 5, & 10

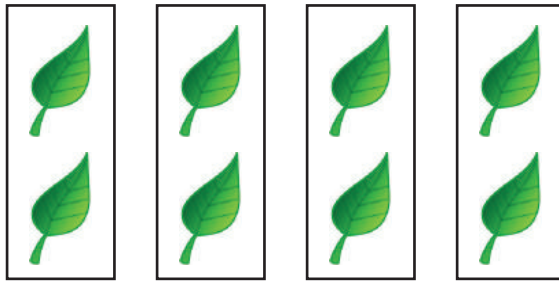
Multiplication table 2



Each box has 2 balls	Repeated addition facts	Multiplication facts
	2	$2 \times 1 = 2$
	$2 + 2$	$2 \times 2 = 4$
	$2 + 2 + 2$	$2 \times 3 = 6$
	$2 + 2 + 2 + 2$	$2 \times 4 = 8$
	$2 + 2 + 2 + 2 + 2$	$2 \times 5 = 10$
	$2 + 2 + 2 + 2 + 2 + 2$	$2 \times 6 = 12$
	$2 + 2 + 2 + 2 + 2 + 2 + 2$	$2 \times 7 = 14$
	$2 + 2 + 2 + 2 + 2 + 2 + 2 + 2$	$2 \times 8 = 16$
	$2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 + 2$	$2 \times 9 = 18$
	$2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 + 2$	$2 \times 10 = 20$



Multiplying by 2:

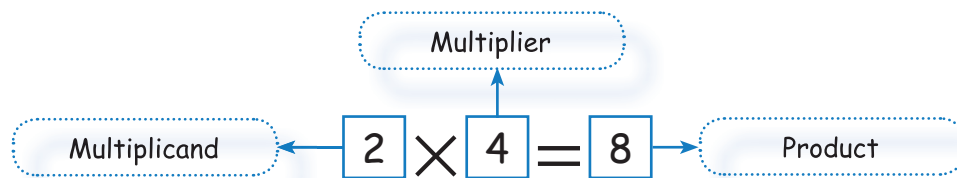


$$2 + 2 + 2 + 2 = 8$$

2 leaves in 4 groups is 8.

This can be written as $2 \times 4 = 8$

4 times 2 is 8



Activity:



x	1	2	3	4	5	6	7	8	9	10
2	2	4			10				18	

Exercise



Fill in the boxes:



$2 \times 6 =$	
$9 \times 2 =$	
$3 \times 2 =$	

$7 \times 2 =$	
$2 \times 5 =$	
$2 \times 2 =$	

$8 \times 2 =$	
$4 \times 2 =$	
$2 \times 3 =$	



Multiplication table 3



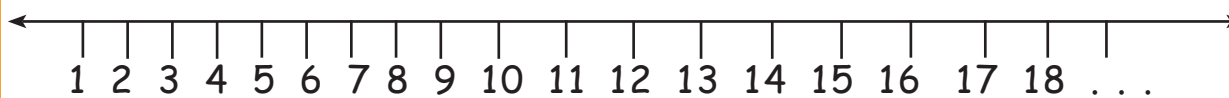
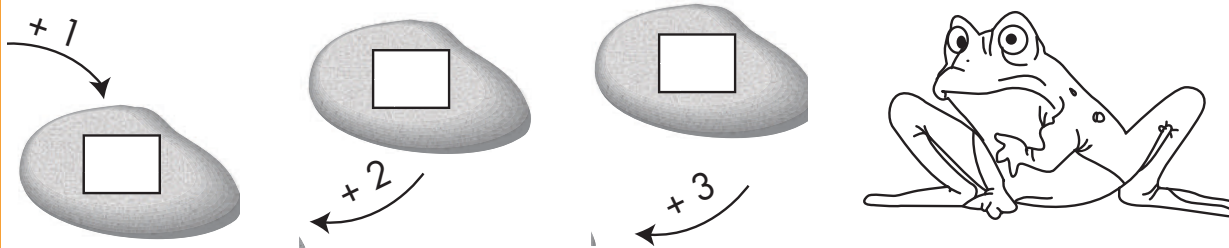
Boxes of 3 stars	Repeated addition facts	Multiplication facts
***	3	$3 \times 1 = 3$
*** ***	$3 + 3$	$3 \times 2 = 6$
*** *** ***	$3 + 3 + 3$	$3 \times 3 = 9$
*** *** *** ***	$3 + 3 + 3 + 3$	$3 \times 4 = 12$
*** *** *** *** ***	$3 + 3 + 3 + 3 + 3$	$3 \times 5 = 15$
*** *** *** *** *** ***	$3 + 3 + 3 + 3 + 3 + 3$	$3 \times 6 = 18$
*** *** *** *** *** *** ***	$3 + 3 + 3 + 3 + 3 + 3 + 3$	$3 \times 7 = 21$
*** *** *** *** *** *** *** ***	$3 + 3 + 3 + 3 + 3 + 3 + 3 + 3$	$3 \times 8 = 24$
*** *** *** *** *** *** *** *** ***	$3 + 3 + 3 + 3 + 3 + 3 + 3 + 3 + 3$	$3 \times 9 = 27$
*** *** *** *** *** *** *** *** *** ***	$3 + 3 + 3 + 3 + 3 + 3 + 3 + 3 + 3 + 3$	$3 \times 10 = 30$



Activity:



Shall we say the multiples of 3.



Multiples of 3 = 3, 6, 9, 12, 15, 18

Exercise



1. Fill in the following tables:



x	1	2	3	4	5	6	7	8	9	10
2	2		6				14			
3	3				15					30



2. Fill in the boxes:

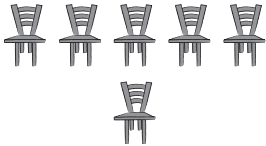
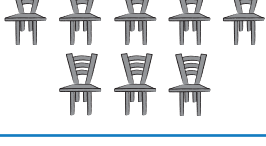
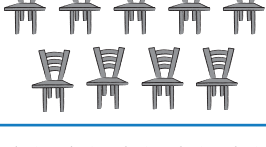
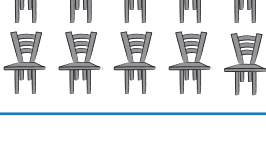
$$6 \times 3 = \square \quad 5 \times 3 = \square \quad 3 \times 3 = \square \quad \square \times 3 = 9$$

$$10 \times 3 = \square \quad 3 \times 6 = \square \quad 8 \times 3 = \square \quad 2 \times \square = 6$$

$$4 \times 3 = \square \quad 3 \times 10 = \square \quad 3 \times 4 = \square \quad 9 \times \square = 27$$



Multiplication table 4

A chair has 4 legs	Repeated addition facts	Multiplication facts
	4	$4 \times 1 = 4$
	$4 + 4$	$4 \times 2 = 8$
	$4 + 4 + 4$	$4 \times 3 = 12$
	$4 + 4 + 4 + 4$	$4 \times 4 = 16$
	$4 + 4 + 4 + 4 + 4$	$4 \times 5 = 20$
	$4 + 4 + 4 + 4 + 4 + 4$	$4 \times 6 = 24$
	$4 + 4 + 4 + 4 + 4 + 4 + 4$	$4 \times 7 = 28$
	$4 + 4 + 4 + 4 + 4 + 4 + 4 + 4$	$4 \times 8 = 32$
	$4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4$	$4 \times 9 = 36$
	$4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4$	$4 \times 10 = 40$



Exercise



1.

Complete the table.



×	1	2	3	4	5	6	7	8	9	10
4				16			28		36	

2.



If there are 4 toys in a box, how many toys will be there in 5 boxes?

$$\square \times \square = \square$$

3.

Fill in the boxes.

$$3 \times \square = 12$$

$$5 \times 4 = \square$$

$$\square \times 4 = 28$$

$$9 \times 4 = \square$$

$$6 \times \square = 24$$

$$\square \times 3 = 12$$

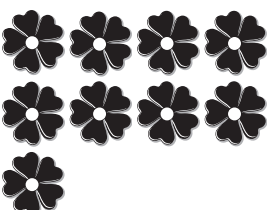
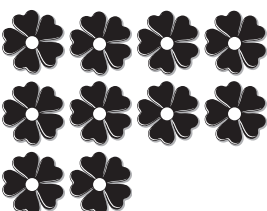
$$4 \times \square = 16$$

$$\square \times 4 = 40$$



Multiplication table 5



A flower has 5 petals	Repeated addition facts	Multiplication facts
	5	$5 \times 1 = 5$
	$5 + 5$	$5 \times 2 = 10$
	$5 + 5 + 5$	$5 \times 3 = 15$
	$5 + 5 + 5 + 5$	$5 \times 4 = 20$
	$5 + 5 + 5 + 5 + 5$	$5 \times 5 = 25$
	$5 + 5 + 5 + 5 + 5 + 5$	$5 \times 6 = 30$
	$5 + 5 + 5 + 5 + 5 + 5 + 5$	$5 \times 7 = 35$
	$5 + 5 + 5 + 5 + 5 + 5 + 5 + 5$	$5 \times 8 = 40$
	$5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5$	$5 \times 9 = 45$
	$5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5$	$5 \times 10 = 50$



Exercise



1.

Fill in the blanks:



$$\text{-----} \times 5 = 10$$

$$4 \times \text{-----} = 20$$

$$6 \times 5 = \text{-----}$$

$$9 \times \text{-----} = 45$$

$$\text{-----} \times 5 = 50$$

2.



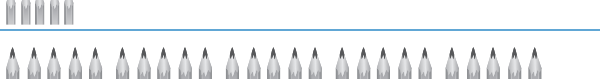
If there are 6 roses in a vase, how many roses will be there in 6 vases?

$$\square \times \square = \square$$



Multiplication table 10



10 pencils in one box	Repeated addition facts	Multiplication facts
	10	$10 \times 1 = 10$
	$10 + 10$	$10 \times 2 = 20$
	$10 + 10 + 10$	$10 \times 3 = 30$
	$10 + 10 + 10 + 10$	$10 \times 4 = 40$
	$10 + 10 + 10 + 10 + 10$	$10 \times 5 = 50$
	$10 + 10 + 10 + 10 + 10 + 10$	$10 \times 6 = 60$
	$10 + 10 + 10 + 10 + 10 + 10 + 10$	$10 \times 7 = 70$
	$10 + 10 + 10 + 10 + 10 + 10 + 10 + 10$	$10 \times 8 = 80$
	$10 + 10 + 10 + 10 + 10 + 10 + 10 + 10 + 10$	$10 \times 9 = 90$
	$10 + 10 + 10 + 10 + 10 + 10 + 10 + 10 + 10 + 10$	$10 \times 10 = 100$



Exercise



Complete the following table:



x	1	2	3	4	5	6	7	8	9	10
5										
10										

1.5 Multiplication by regrouping:



This method can be used by multiplying a two digit number.

Consider the following multiplication

$$53 \times 7$$

53 can be regroup into 5 tens and 3 ones.

Hence, 53×7 can be written as $(50 + 3) \times 7$

$$= (50 \times 7) + (3 \times 7)$$

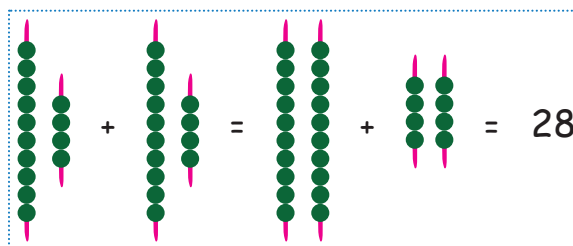
$$= 350 + 21$$

$$= 371.$$

Example

$$14 \times 2 = ?$$

That is 2 Times 14



$$14 \times 2 = 2 \times 1 \text{ Ten} + 2 \times 4 \text{ Ones}$$

$$= 2 \times 10 + 2 \times 4 = 20 + 8$$

$$14 \times 2 = 28$$

Exercise



1. Multiply the following numbers by regrouping



(i) 75×8

(ii) 26×5

(iii) 372×6

(iv) 402×7

(v) 752×3



1.6 Multiplication using standard algorithm:



Multiply using multiplication table

Step 1: Multiply Ones

T	O
1	4
×	2
	8

$$4 \times 2 = 8$$

Step 2: Multiply Tens

T	O
1	4
×	2
2	8

$$1 \times 2 = 2$$

$$\text{Product} = 14 \times 2 = 28$$



Example

1. Multiply. 23×4

Step 1:

H	T	O
	1	
	2	3
	×	4
		2

$$3 \times 4 = 12$$

Step 2

H	T	O
	1	
	2	3
	×	4
	9	2

$$2 \times 4 = 8$$

$$\text{Product} = 23 \times 4 = 92$$

2. Multiply. 32×5

Step 1:

H	T	O
	1	
	3	2
	×	5
		0

$$2 \times 5 = 10$$

Step 2:

H	T	O
	1	
	3	2
	×	5
1	6	0

$$3 \times 5 = 15$$

$$\text{Product} = 32 \times 5 = 160$$





1.7 Lattice multiplication:

Lattice multiplication is helpful while dealing with numbers with more than two digits.

We follow the following steps in Lattice multiplication.



Step 1: Write the numbers to be multiplied as follows.

(i) 52×36

5	2	
		3
		6

(ii) 893×25

8	9	3	
			2
			5

Step 2: Draw diagonals of the square.

5	2	
		3
		6

8	9	3	
			2
			5

Step 3: Multiply the numbers and write them in the cells as shown below

5	2	
1	0	
5	6	3
3	1	
0	2	6

8	9	3	
1	1	0	
6	8	6	2
4	4	1	
0	5	5	5

Step 4: Find the sum of each diagonal and write as follows.

	5	2	
1	1	0	
	5	6	3
8	3	1	
	0	2	6
	7	2	

	8	9	3	
1	1	1	0	
	6	8	6	2
11	4	4	1	
	0	5	5	5
	12	12	5	