Factors and multiples

There are many hills around Ramapuram village. Seenu, Harika and Deepika wanted to go up to a hill on Sunday. One needed to climb 50 steps to reach the top. While climbing, Seenu stopped at every second step, Harika stopped at every third step and Deepika stopped at every fourth step.

(a)   So, Seenu stopped at steps 2, 4, __.

(b)   Harika stopped at steps 3, 6, __, __, __, __, __, __, __, __, __, __, __, __, __, __.

(c)   Deepika stopped at steps 4, 8, __, __, __, __, __, __, __, __, __.

(d)   At which steps did Seenu and Harika both stop 6, __, __, __, __, __, __, __.

(e)   At which steps did Seenu and Deepika both stop 4, __, __, __, __, __, __, __, __, __, __.

(f)   At which steps did all the three stop 12, __, __, __.

Multiples

Let us look for numbers divisible by 2, 5 and 10 in the table given below.

1	2 •	3	4	5 ✗	6	7	8	9	10 ✓
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

(a) (i) Put a '•' mark besides the numbers which when divided by 2 and leaves no remainder.

(ii) Now, write down all these numbers-

_____

_____

_____

_____

(iii) Which are the digits in the ones place in all these numbers?

So, all numbers that are divisible by 2 have __, __, __, __ and __ in the ones place.

> Numbers that are divisible by 2 are called even numbers. Numbers that are not divisible by 2 are called odd numbers. All numbers that are divisible by 2 are also called multiples of 2.

(b) (i) Put a **'x'** mark besides the numbers which when divided by 5 and leaves no remainder.

(ii) Now, write these numbers.

_____

_____

(iii) Which are the digits in the ones place in all these numbers?

So, all numbers that are divisible by 5 have __ or __ in their ones place.

> All numbers that are divisible by 5 are called multiples of 5.

(c) (i) Put a '✓' mark besides the numbers which when divided by 10 and leaves no remainder.

(ii) Now, write these numbers.

_____

_____

(iii) Which is the digit in the ones place in all these numbers?

So, all numbers that are divisible by 10 have 0 in their ones place.

> All numbers that are divisible by 10 are called multiples of 10.

Try This

All multiples of 10 will also be multiples of 2 and 5. Is this statement true or false? Why?

Activity

Skip the multiples of 3

Make children sit in a circle. Any child starts by saying 1, the child sitting next to her says 2 and the next says 'skip' instead of 3 as 3 is multiple of 3. The game continues like this and children have to say 'skip' instead of a multiple of 3.

A child who forgets to say 'skip' is out of the game. The two children who do not get out till the end are the winners of the game.
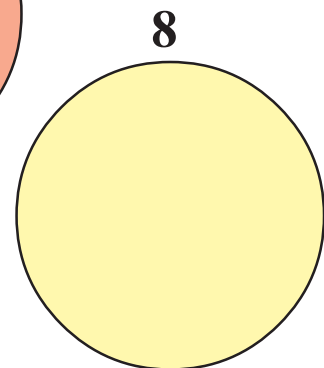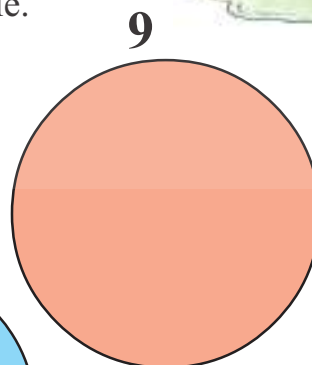
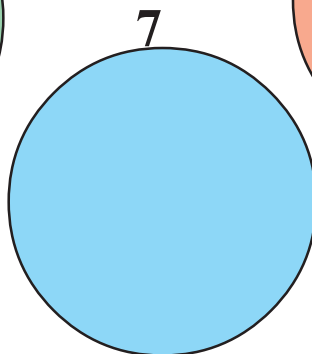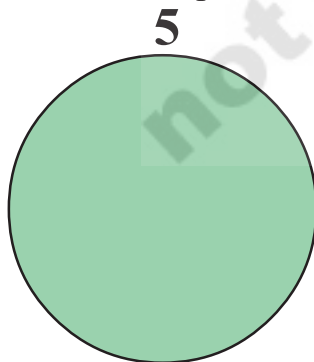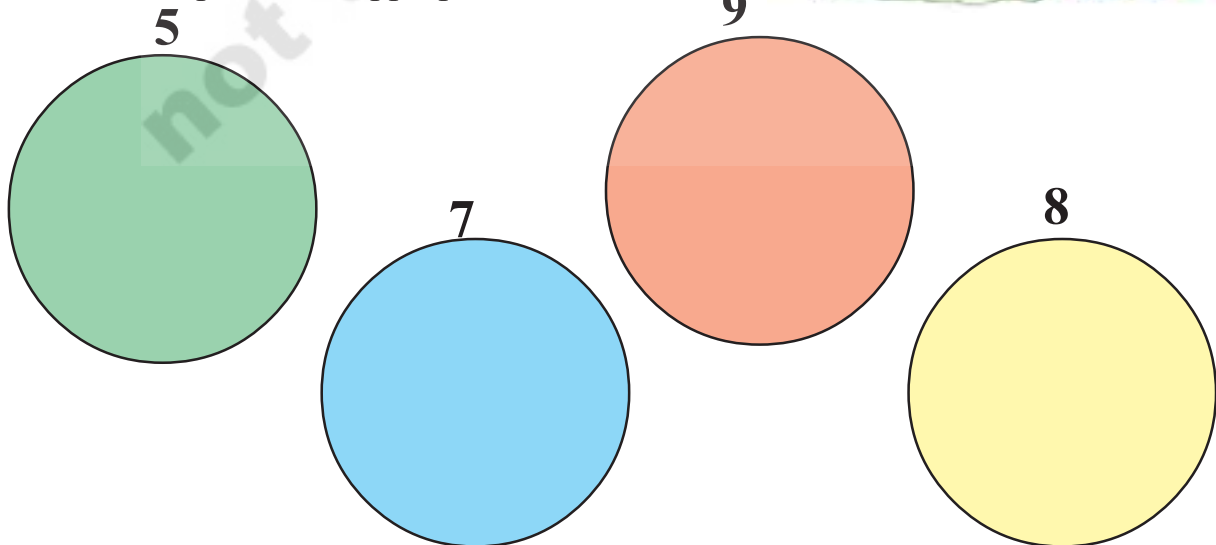Play this game with multiples of 4 and 5 also.

Play in pairs

Roll two dice together. Make a two digit number based on the dots showing on the dice.
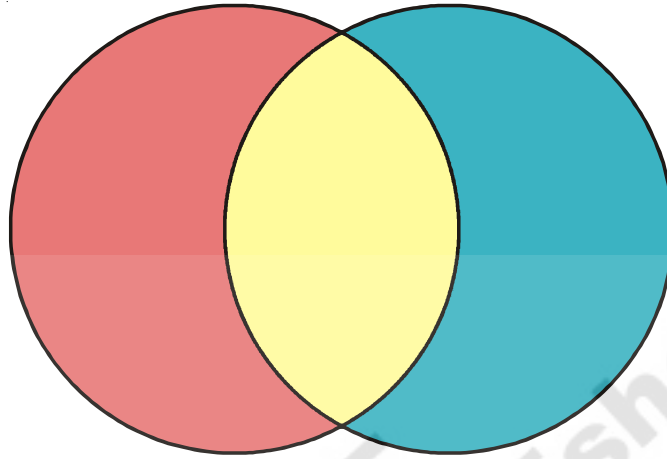
Akhila says 52 and Ganesh says 25.

Are these numbers multiples of any of the numbers written below?

Put the multiples in the appropriate circle.

5

9

7

8

Common multiples

Put multiples of 3 in the red circle and multiples of 5 in the blue circle. If the number is multiple of both 3 and 5 put it in the yellow area.

(a)   Write down the numbers which are multiples of both 3 and 5. _____

    _____

    These numbers are called common multiples of 3 and 5.

(b)   Which is the smallest common multiple of 3 and 5? _____

Now write the multiples of 2 in the green coloured circle and the multiples of 7 in the purple coloured circle. Write their common multiples in the yellow area.

(a)   Which is the smallest common multiple of 2 and 7? _____

Try This

1. Write the multiples of 2 in the blue coloured circle, the multiples of 3 in the green coloured circle and the multiples of 4 in the red coloured circle. Write the common multiples of 2 and 3 in the pink area, common multiples of 3 and 4 in the yellow area and common multiples of 2 and 4 in the orange area.

(a) Are there numbers which are common multiples of 2,3 and 4? Where will you write them?

(b) Which is the smallest common multiple of 2,3 and 4?

Do This

1. Which of these numbers are divisible by 2?

    49   64   96   112   153   190   272

    297   308   529   666   780   981   995

2. Which of these numbers are divisible by 5? By 10? By both?

Number	Divisible by 5	Divisible by 10	Divisible by both
5			
65			
120			
175			
335			
400			
585			

3. Which of the following are multiples of 4?

   2   8   14   26   36   44

   Are all multiples of 4 also multiples of 2?

4. Write down any 5 multiples of 9.

5. Write down any 5 multiples of 6.

6. Complete the following table below. Whether all multiples of 6 are also multiples of 2 and 3?

Number	Divisible by 2	Divisible by 3	Divisible by 6
9			
14			
18			
24			
22			
36			
44			
27			
33			

Factors

Teacher: Write 12 as the product of 2 numbers.

1×12

2×6

3×4

All of you are correct.

$1 \times 12 = 12$

$2 \times 6 = 12$

$3 \times 4 = 12$

Teacher : We get 12 when we multiply 3 and 4. So 12 is a multiple of 3 and 4. Similarly 12 is a multiple of 2 and 6 and 12 is also a multiple of 1 and 12. 1, 2, 3, 4, 6 and 12 are called the factors of 12.

(a)   Now, find the factors of 18. Hint : There are 6 factors.

You will find all but are the factors of 12 and 18 in the given table. Now fill this incomplete multiplication table and find out

(a)   What are the factors of 20?

(b)   What are the factors of 36?

(c)   What are the factors of 15?

(d)   What are the factors of 7?

(e)   Which number has only one factor?

(f)   Which numbers have only 2 factors?

(g)   Which number is a factor of all numbers?

×	1	2	3	4	5	6	7	8	9	10
1										
2						12			18	
3				12		18				
4			12							
5										
6		12	18							
7										
8										
9		18								
10										

Exercise

1. Which of these numbers are odd and which of these numbers are even?

   23, 18, 65, 70, 47, 325, 610, 354, 289,

   842, 169, 431, 400, 553, 724, 807, 999

2. Encircle the numbers which are divisible by 5.

   10, 25, 70, 52, 45, 68, 94, 85, 100, 71, 20, 58,

   43, 235, 400, 353, 255, 91, 78, 420, 32, 99

   Which of these numbers are also divisible by 10?

3. Write the first 10 multiples of 5 and 4.

   (a) Multiples of 5 = _____, _____, _____, _____, _____, _____, _____, _____, _____, _____, _____, _____, _____, _____, _____

   (b) Multiples of 4 = _____, _____, _____, _____, _____, _____, _____, _____, _____, _____, _____, _____, _____, _____

   (c) Common multiples of 4 and 5 = _____, _____

4. Write the factors of the following numbers.

   (a) 14   (b) 24   (c) 16   (d) 42

5. (a) Write the first 6 multiples of 3.

   (b) Write the first 6 multiples of 9.

   (c) Are all the multiples of 3 also multiples of 9?

   (d) Are all the multiples of 9 also multiples of 3?

6. (a) Write the first 6 multiples of 12.

   (b) Write the first 3 multiples of 4.

   (c) Are all the multiples of 4 also multiples of 12?

   (d) Are all the multiples of 12 also multiples of 4?

7.   Are all numbers which are divisible by 10 also divisible by 2 and 5?

Number	Divisible by 2	Divisible by 5
10	✓	✓
20		
30		
40		
50		
150		
210		

Extend this list with numbers of your choice and check.

8.   The teacher gave julie and jaasmine ribbon of equal length. Jasmine cut pieces of 5 inches each from her ribbon and Julie cut pieces of 7 inches each. Both girls had no ribbon left after they had cut thir ribbons. What is the minimum length of ribbon that the teacher could have given to the girls?

9.   There are 10 boys and 15 girls in a class. The teacher wants to divide the children into groups such that each group contains an equal number of boys and girls. What is the greatest number of groups that she can make like this?

10.   A truck can carry 12 sacks weighing 100 kg each at one time. Another truck can carry 15 sacks weighing 100 kg each at one time. If both trucks carry an equal number of bags in the day, then what is the minimum number of sacks they could have carried?

11.   There a 3 clocks in a shop. One climes after every 5 minutes, the second after every 15 minites and third after every 30 minutes. If all of them have climed at 10 o'clock for how many hours they all again clim (at what time)?