

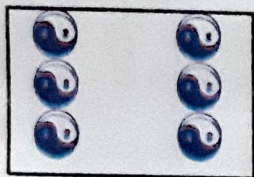


Multiples

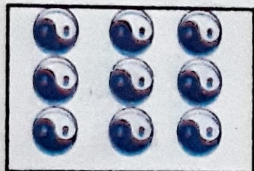
Look at the pictures -



$$\text{Three balls one time} = 1 \times 3 = 3$$



$$\text{Three balls two times} = 2 \times 3 = 6$$



$$\text{Three balls three times} = 3 \times 3 = 9$$



$$\text{Three balls four times} = 4 \times 3 = 12$$

Hey! This is the table of 3, 6, 9, 12,

We have seen -

Similarly, the numbers 3, 6, 9, 12 get divided by 3. These numbers are multiples of 3.

- The numbers 4, 8, 12, 16 are divisible by 4. These numbers are multiples of 4.
- The numbers 5, 10, 15, 20, 25, 30... are divisible by 5. These numbers are multiples of 5.

The multiples of any number is obtained when that number is multiplied by any number.



Let's See -

First three multiples of 6 are -

$$6 \times 1 = 6$$

$$6 \times 2 = 12$$

$$6 \times 3 = 18$$

Thus, first three multiples of 6 are – 6, 12, 18

We see that to get the first, second, third.... multiples of any number, the number is multiplied by 1, 2, 3.... respectively.



Do it yourself –

- Write the first 6 multiples of 5 and 7.
- Write the third multiple of 8.

Let's see these too –

- Is 12 a multiple of 3 ?
Yes, because $12 = 3 \times 4$
- Is, 16 a multiple of 4 ?
Yes, because $16 = 4 \times 4$
- Is 14 a multiple of 5 ?
No, because $14 = 1 \times 2 \times 7$, 5 is not there.

Let's know more –

- Write three multiples of 9 which are greater than 45 –
 $45 = 9 \times 5$ or 5 times 9

Thus, if we multiply 9 by the numbers greater than 5, we get the multiples greater than 45. For example -

$$9 \times 6 = 54,$$

$$9 \times 7 = 63,$$

$$9 \times 8 = 72$$





Do it yourself =

Shade the circle of the correct answer –

(a) Is 24 a multiple of 3 ? Yes ☐ No ☐

(b) Is 57 a multiple of 5 ? Yes ☐ No ☐

Find all the multiples of 5 less than 40.

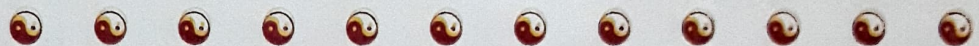
Factors



Activity –

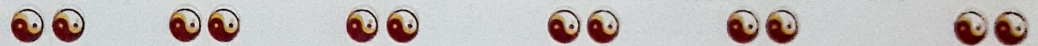
Let us divide 12 marbles in groups in such a way that each group gets the equal number of marbles –

First method



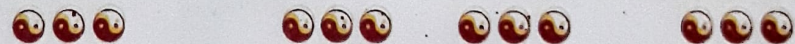
Each group has only 1 marble or $12 = 1 \times 12$.

Second method



Each group has only 2 marbles or $12 = 2 \times 6$.

Third method



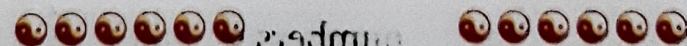
Each group has only 3 marbles or $12 = 3 \times 4$.

Fourth method



Each group has only 4 marbles or $12 = 4 \times 3$.

Fifth method



Here, only two groups will be formed or $12 = 6 \times 2$.

Sixth method



All the marbles will be included in this group or $12 = 12 \times 1$.



We see that 12 marbles have been divided by six methods, and each group is the factor of 12 as it divides 12 into equal parts.

Thus, we can say that -

The factors of 12 are - 1, 2, 3, 4, 6 and 12

The smallest factor of 12 is 1 and the greatest factor of 12 is the number itself. Similarly, when two numbers are multiplied, the number obtained is called their product. For example $6 \times 3 = 18$

Here 18 is a product of 6 and 3. 6 and 3 are factors of 18.

Are there more factors of 18 ?

$$18 = 1 \times 18, 18 = 2 \times 9, 18 = 3 \times 6, 18 = 18 \times 1$$

Hence, 1, 2, 3, 6, 9, 18 are the factors of 18.

- The smallest factor of every number is 1 and the greatest factor is the number itself. The factor of any number cannot be greater than the number itself.
- A number is a factor of other number when the first number exactly divides the second number.



Do it yourself –

- All the factors of 10 are
- All the factors of 16 are
- All the factors of 21 are
- All the factors of 24 are



- Fill in the blanks –

(a) $4 \times 5 = 20$ implies that 4 and 5 are the of 20.

(b) $4 \times 7 = 28$ implies that and are the factors of 28 .

- Shade the circle of the correct answer –

(a) The factor of 71 is 8. Yes ☐ No ☐

(b) The factor of 81 is 9. Yes ☐ No ☐

(c) The factors of 12 are 1, 6, 12. Yes ☐ No ☐

Prime Numbers

Look : $2 = 1 \times 2$ implies that 1 and 2 are the factors of 2.

$3 = 1 \times 3$ implies that 1 and 3 are the factors of 3.

$5 = 1 \times 5$ implies that 1 and 5 are the factors of 5.

We have seen –

- 1 is the factor of every number.
- 2, 3, and 5 have only two factors namely 1 and the number itself.
- Prime numbers have two and only two factors.
- 2 is the only even prime number.

Those numbers which have only two factors (1 and the number itself) are called prime numbers or those numbers which are divisible only by 1 and the number itself are called prime numbers.



Composite Numbers

Look :

- $6 = 1 \times 6$
 $6 = 6 \times 1$
 $6 = 3 \times 2 \times 1$
 $6 = 1 \times 2 \times 3$

The factors of 6 are 1, 2, 3 and 6.

- $16 = 1 \times 16$ $16 = 8 \times 2$
 $16 = 16 \times 1$ $16 = 4 \times 4$
 $16 = 2 \times 8$ $16 = 2 \times 2 \times 2 \times 2$

The factors of 16 are 1, 2, 4, 8, 16.

We have seen : 6 and 16 have more than two factors.

Hence, the numbers having more than two factors are known as composite numbers.

- 1 has only one factor, therefore 1 is neither prime number nor composite number.

Look :

- Is 23 a prime number ?

Yes, because 23 has only two factors 1 and 23.

- Is 15 a prime number ?

No, because the factors of 15 are 1, 3, 5 and 15 which are more than two numbers. Hence, 15 is not a prime number, it is a composite number.



Do it yourself =

- Shade the circle of the correct answer —

☆ Is 19 a prime number ? Yes ☐ No ☐

☆ Is 24 a prime number ? Yes ☐ No ☐

- In the following numbers identify prime numbers and composite numbers —

3, 6, 7, 9, 11, 13, 15, 17, 23, 25, 31, 44



Even and Odd Numbers

We know that 2, 4, 6, 8, 10 are the multiples of 2. These numbers get divided by 2 exactly.

Those numbers which are exactly divisible by 2 are called even numbers or the numbers which are multiples of 2 are even numbers.

 **Think —** Are the numbers 20, 86, 110, 122 even numbers ?

What have you concluded

Look at the following numbers —

1, 3, 5, 7, 9, 11, 13, 15, 17, 19,

These numbers are not exactly divisible by 2 or these numbers are not the multiples of 2.

These numbers are called odd numbers.

Let's understand this too —

To find whether a given number is even or odd, we check the digit at ones place of the number. If the digit at ones place is 0, 2, 4, 6, 8, the number will be even otherwise it will be odd.

Let's See —

- Is 96 an even number ?

In 96 the digit at ones place is 6 which is even. Hence, 96 is an even number

- Is 113 an even number ?

In 113, the digit at ones place is 3 which is not an even number. Hence, 113 is an odd number.

For example— Find all the even and odd numbers between 15 and 30.

Look : The numbers between 15 and 20 are -

16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29

Even Numbers — 16, 18, 20, 22, 24, 26, 28

Odd Numbers — 17, 19, 21, 23, 25, 27, 29



Do it yourself –

Circle the even numbers – 220, 333, 4186, 5361

Prime Factorization

Expressing a number as a product of prime numbers, is called Prime Factorization.

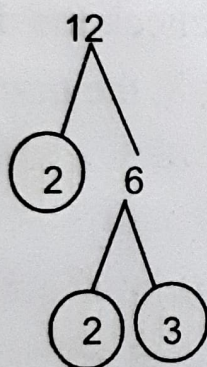
For example $6 = 2 \times 3$ Here, 2 and 3 are the prime numbers.

$30 = 2 \times 3 \times 5$ Here, 2, 3 and 5 are the prime numbers.

Factor Tree

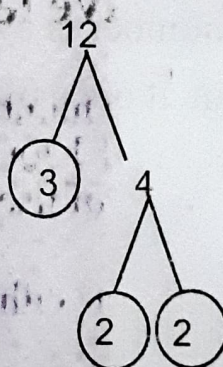
We build a factor tree in which we write the factors of the number at the end of the branches going downwards. The branch comes to an end when it gets a prime number as a factor.

For Example - **Factor tree to show the prime factorization of 12**



$$12 = 2 \times 2 \times 3$$

or



$$12 = 3 \times 2 \times 2$$

Here, 2, 2 and 3, 12 are prime factors of 12.

Co-Prime Numbers

Look- Factors of 9 are – 1, 3, 9

Factors of 16 are – 1, 2, 4, 8, 16

The common factor of both the numbers is only 1. Hence, when the common factor of two numbers is '1' only, these numbers are called co-prime numbers. Hence, 9 and 16 are co-prime numbers.

When both the numbers do not divide each other, they are called co-prime numbers.





Think -

Are 9 and 14 co-prime numbers ?

Look at these too -

Are 6 and 7 co-prime numbers ?

$$6 = 1 \times 2 \times 3$$

$$7 = 1 \times 7$$

6 and 7 are co-prime numbers.



Do it yourself -

Put the sign of tick (✓) against the co-prime numbers -

• 8, 9 ☐

• 12, 15 ☐

Two consecutive numbers are always co-prime numbers.

For example -

(a) 11, 12

(b) 24, 25

We have learnt

- The product of two or more numbers is called their multiple.
- Every number is multiple of 1 for example - $7 \equiv 1 \times 7$, $4 \equiv 1 \times 4$
- Every number is a multiple of itself. For Example $7 \equiv 7 \times 1$, $5 \equiv 5 \times 1$
- Every multiple of a number is either greater than or equal to the number.
- 1 is a factor of every number.
- The smallest factor of any number is 1 and the greatest factor is the number itself.
- The factor of every number is either smaller or equal to the number itself.
- Writing the prime factorization of the given numbers.



Exercise

1. Write the 5 multiples of each of the following numbers -
(a) 4 (b) 6 (c) 9
2. If one factor of 35 is 5, what will be its another factor?
3. What will be the smallest and the greatest factor of the following numbers?
(a) 15 (b) 36 (c) 40 (d) 45
4. Write down all the prime numbers between 10 and 20.
5. Write all the prime factors of 30.
6. In the given numbers 2, 3, 4, 5, 6, 7, 8, 9, 10 find the sum of all the odd numbers and the sum of all the even numbers and find the difference of their sums.
7. Draw a factor tree to get the prime factorization of 60.
8. Find the smallest number which forms an odd number when we add it to any even number.
9. Find the smallest number which forms an even number when we add it to any odd number.
10. Write all the even numbers between 51 and 71.