

# Playing with Numbers

# FACTORS

- ▶ Exact divisors of the numbers are called the factors of that number.
- ▶ Example: 1,2,3,6,9 and 18 are the factors of 18.

# MULTIPLES

- ▶ Number 10 can be represented as  $10 = 2 \times 5$ . So we can say that 10 is a multiple of 2 and 5.

# FACTS ABOUT FACTORS AND MULTIPLES

- ▶ 1 is a factor of every number.
- ▶ Every number is a factor of itself.
- ▶ Every factor of a number is an exact divisor of that number.
- ▶ Every factor is less than or equal to the given number.
- ▶ Numbers of factors of a given number are finite.
- ▶ Every multiple of a number is greater than or equal to that number.
- ▶ Every number is a multiple of itself.

# PERFECT NUMBER

- ▶ Perfect number is a number for which sum of all its factor is equal to twice the number.

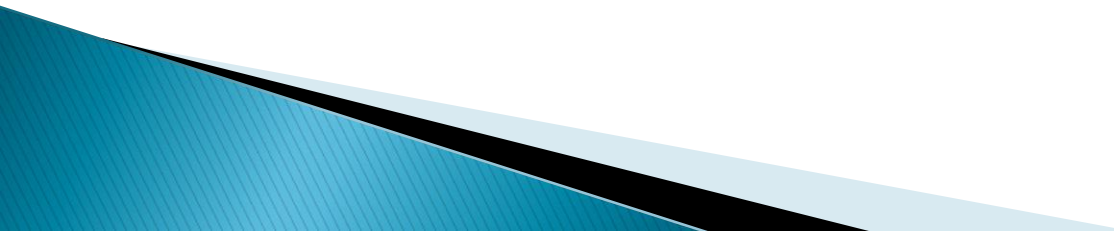
Example: Number = 6

Factors of 6 = 1,2,3 and 6

Sum of all factors =  $1+2+3+6 = 12$

Twice of the number =  $2 \times 6 = 12$

So, 6 is the perfect number.



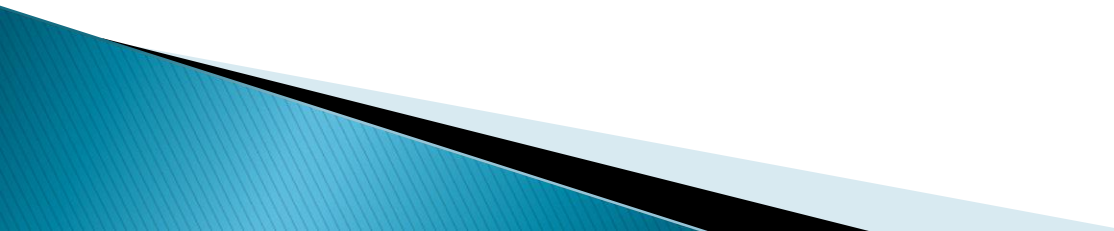
# PRIME NUMBERS & COMPOSITE NUMBERS

- ▶ Prime numbers are those numbers that have only two factors 1 and the number itself. 1 is not a prime number. Every prime number except 2 is odd.

Example: 2, 3, 5, 7, 11, 13, 17, 19 etc.

- ▶ Composite numbers are those numbers that have more than two factors.

Example: 4, 6, 8, 9, 10, 12, 14, 15 etc.



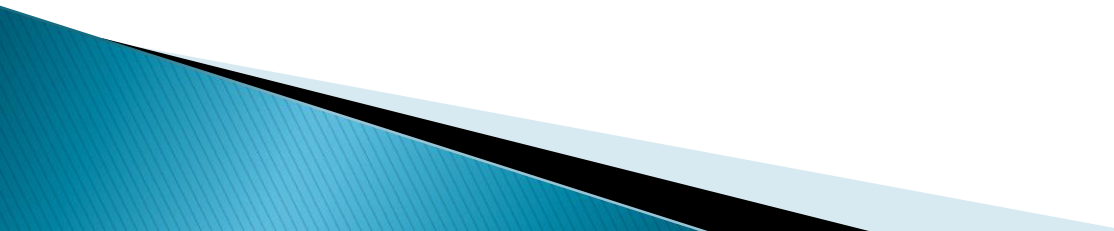
# EVEN NUMBER AND ODD NUMBER

- ▶ Even numbers are those numbers that are divisible by 2 and always end with 0,2,4,6 & 8.

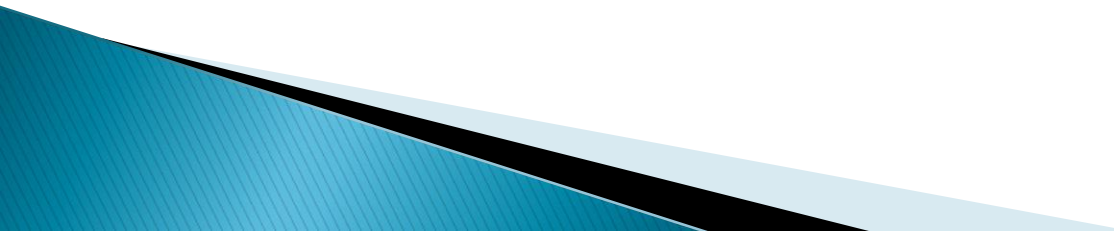
Example: 2,4,6,8,10 &12 etc

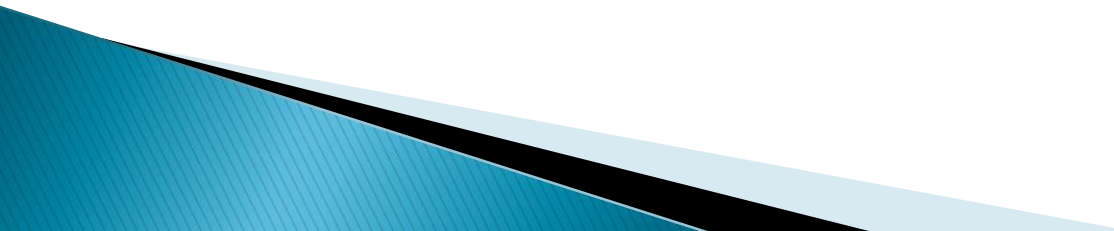
- ▶ Odd numbers are those numbers that are not divisible by 2 and always end with 1,3,5,7 and 9.

Example: 1,3,5,7,9 &11 etc



# RULES OF DIVISIBILITY

- ▶ Divisibility by 2: If a number has any of the digits 0,2,4,6 or 8 in its one place then it is divisible by 2.
  - ▶ Divisibility by 3: If the sum of the digits is a multiple of 3, then the number is divisible by 3.
  - ▶ Divisibility by 4: A number with 3 or more digits is divisible by 4 if the number formed by its last two digits (i.e. ones & tens) is divisible by 4.
  - ▶ Divisibility by 5: A number which has either 0 or 5 in its ones place is divisible by 5.
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- ▶ Divisibility by 6: If a number is divisible by 2 and then it is divisible by 6 also.
  - ▶ Divisibility by 8: A number with 4 or more digit is divisible by 8, if the number formed by the last three digits is divisible by 8.
  - ▶ Divisibility by 9: If the sum of the digits of a number is divisible by 9, then the number itself is divisible by 9.
  - ▶ Divisibility by 10: If a number has 0 in the ones place then it is divisible by 10.
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- ▶ Divisibility by 11: Find the difference between the sum of the digits at odd places (from the right) and the sum of the digits at even places (from the right) of the number. If the difference is either 0 or divisible by 11, then the number is divisible by 11.

| Number | Divisible by |     |     |     |     |     |     |     |     |
|--------|--------------|-----|-----|-----|-----|-----|-----|-----|-----|
|        | 2            | 3   | 4   | 5   | 6   | 8   | 9   | 10  | 11  |
| 128    | Yes          | No  | Yes | No  | No  | Yes | No  | No  | No  |
| 990    | Yes          | Yes | No  | Yes | Yes | No  | Yes | Yes | Yes |
| 1586   | Yes          | No  | No  | No  | No  | No  | No  | No  | No  |
| 275    | No           | No  | No  | Yes | No  | No  | No  | No  | Yes |
| 6686   | Yes          | No  | No  | No  | No  | No  | No  | No  | No  |
| 639210 | Yes          | Yes | No  | Yes | Yes | No  | No  | Yes | Yes |
| 429714 | Yes          | Yes | No  | No  | Yes | No  | Yes | No  | No  |
| 2856   | Yes          | Yes | Yes | No  | Yes | Yes | No  | No  | No  |
| 3060   | Yes          | Yes | Yes | Yes | Yes | No  | Yes | Yes | No  |
| 406839 | No           | Yes | No  | No  | No  | No  | No  | No  | No  |

Example of co- prime Numbers

6 and 35 are coprime as the  
divisors of these are:

**6** : 1, 2, 3, 6

**35** : 1, 5, 7, 35

**H.C.F.** : The highest common factor (H.C.F.) of two or more given numbers is the greatest number which divides each of given numbers exactly .

**L.C.M.** : The least common multiple (L.C.M.) of two given numbers is that lowest number which is divisible exactly by each of the given numbers.

**Note:** Product of two numbers = Product of their H.C.F. and L.C.M.

