**Class: 4th** **Subject: Mathematics** **IA3**

# CHAPTER :6 MULTIPLES AND FACTORS

## MULTIPLES

Multiples of a number can be formed by multiplying the two numbers. The multiples will be unlimited.

**E.g.**

**2** × 1= 2

**2** × 2 = 4

**2** × 3 = 6

**2** × 4 = 8

- Multiples of 2 are : 2, 4, 6, 8, 10, 12, 14……..
- Multiples of 7 are : 7, 14, 21, 28, 35, 42……..
- Multiples of 10 are : 10, 20, 30, 40, 50, 60, 70,……..

### Facts of Multiples:

- Every number is a multiple of **itself**.
  E.g. 1 × 34 = 34 , 1 × 670 = 670
- Every number is a multiple of **1**.
  E.g.6 × 1 = 6 , 687 × 1 = 687.
- The product of two numbers is the multiple of each of these two numbers.
  E.g. 6 × 7 = 42 (**So, 42 is a multiple of both 6 and 7)**
- **Zero** is the multiple of every number.
- Every multiple of a non-zero number is either **greater than** or **equal** to the number
  E.g multiples of 8 are 8, 16, 24, 32, 40, 48 and soon
- A multiple of a number is exactly divisible by that number.
  E.g 24 is a multiple of 6. 24 is exactly divisible by 6.
- The smallest multiple of a number is number **itself**.
- Multiples of many numbers are **Countless** and **endless (infinite)**.

**Exercise 6.1 (Q6, Q7) BOOKWORK.**

**Common Multiples:**

The numbers which are common among the multiples of two or more numbers are called **common multiples.**

**e.g.** Common multiples of 6 and 8

**Multiples of 6 are** 6, 12, 18, 24, 30, 36, 42, 48…

**Multiples of 8 are** 8, 16, 24, 32, 40, 48, 56, 64….

**Common Multiples** of 6 and 8 are 24,48…..

**Lowest Common Multiple (LCM):**

The smallest multiple among the common multiples of two or more numbers is called **lowest common multiples** or **LCM** of the numbers.

# FACTORS:

**Factors** :

- The two numbers we multiply to get the product are called factors
- Factors of a number divide the number completely.

E.g 2 × 3 = 6

4 × 10 = 40

## Facts of Factors:

1. 1 is a factor of every number. It is also the smallest factor of a number.
   **Example:** 1 is a factor of 1, 2, 3, 4, 5 ….
2. Every number (other than 1) has at Least 2 factors, 1 and the number itself.
   **Example :** 2 has 2 factors, 1 and 2.
3. The factor of a number is less than or equal to the number.
4. A number is its own largest factor.
   **Example:** `15 is the largest factor of 15.
5. A number has limited number of factors.
   **Example:** 6 has 4 factors, 1, 2, 3 and 6. It has no more factors.

## Finding Factors:

We can find the factors of a number by any two methods:

1. **By Multiplication.**
2. **By Division.**

**Example: Factors of 24**

1. **By Multiplication:**
   We have:
   $1 \times 24 = 24$ , $2 \times 12 = 24$ , $3 \times 8 = 24$, $4 \times 6 = 24$.
   So, 1, 2, 3, 4, 6,8,12 and 24 are all the factors of 24 in ascending order.
2. **By Division:**
   $24 \div 1 = 24$, $24 \div 2 = 12$, $24 \div 3 = 8$ , $24 \div 4 = 6$, $24 \div 6 = 4$, $24 \div 8 = 3$, $24 \div 12 = 2$, $24 \div 24 = 1$.
   The number 1 ,2, 3, 4, 6,8,12, and 24 divide the number 24 exactly. So, 1, 2, 3, 4, 6, 8, 12, and 24 are all factors of 24

**PRIME AND COMPOSITE NUMBERS:**

1. **Prime Numbers:**
   A **prime number** is a number that has only two factors 1 and the number itself.
   **Example:** 2, 3, 5, 7 are prime numbers as they have only two factors.
2. **Composite Numbers:**
   A number that has more than two factors is called a **composite number**.
   **Example** 4, 6, 8 are composite numbers as they have more than two factors.

**PRIME FACTORISATION**

When a number is written as a product of its prime factors only, then it is called **prime factorization.**

Example prime factorization of 12 = **2** × **2** × **3.**

## Common Factors

The numbers which are common among the factors of two or more numbers are called the **common factors.**

**Example** Factors of 9 are **1**, **3** and 9

Factors of 15 are **1**, **3**, 5 and 15.

Here, the number **1 and 3** appear in both the list of factors .

So, **1 and 3** are common factors of 9 and 15.

**Highest Common Factor:**

The highest factor among the common factors of two or more numbers is called **Highest common factor or HCF.**

Example HCF of 12 and 20

Factors of 12= **1, 2**, 3, **4,** 6 and 12.

Factors of 20 =**1, 2, 4**, 5, 10 and 20.

Common factors of 12 and 20 are **1, 2, 4**

So, the HCF of 12 and 20 is **4**

# Test Of Divisibility

The test of divisibility tells us that whether a number is divisible by another number or not, without actually doing division of that number.

| Divisible by | Divisibility rule | Examples |
|---|---|---|
| **2** | Every number that ends in even number i.e. 0,2,4,6 or 8 is divisible by 2. | 26,92,200,398 |
| **3** | If the sum of digits of the given number is divisible by 3, then the given number is also divisible by 3. | 414=4 +1 + 4=9<br>9 is divisible by3, so 414 is also divisible by 3. |
| **4** | If the number formed by last two digits of the given number is divisible by 4 then the given number is divisible by 4 | 124,7844,1324 are divisible by 4 |
| **5** | Number that ends in 5 or 0 is divisible by 5 | 160,145, 70,25 are divisible by 5 |
| **6** | If the given number is divisible by 2 as well as by 3 then the number is divisible by 6 | 168 is divisible by both 2 and 3. So it is divisible by 6 |
| **9** | If the sum of all the digits of the given number is divisible by 9 then the given number is divisible by 9 | 18, 54, 1395 are divisible by 9 |
| **10** | Any number that ends in 0are divisible by 10. | 450,2470 are divisible by 10 |

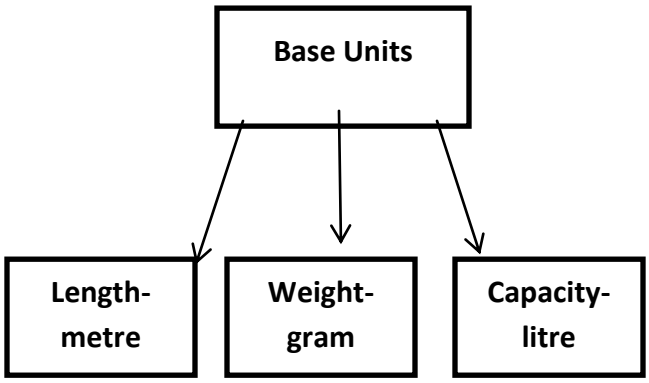
**Exercice6.6 (Q6) bookwork**

## Chapter 9

## Measurement

### Metric System:

The Metric system is a system of measuring things. It is an international system of standard units of measurement. In the metric system, the base units are used for the measurement of quantities.




To measure smaller or larger quantities , we use units derived from the metric units.

| Kilo | Hecto | Deca | **Base Unit** | Deci | Centi | Milli |
|---|---|---|---|---|---|---|

**Bigger Units** **Smaller Units**

- The given figure shows the arrangement of the metric units, which are smaller or bigger than the base unit.
- The units to the right of the base unit are smaller than the base unit. As we move to the right , each unit is 10 times smaller or one –tenth of the unit to its left. So, a ‘deci’ means one-tenth of the base unit, ‘centi’ is one-tenth of ‘deci’ or one – hundredth of the base unit and ‘milli’ is one –tenth of ‘centi’ or one-hundredth of the base unit.
- The units to the left of the base unit are bigger than the base unit.As we move to the left , each unit is 10 times greater than the units to its right.So, a ‘deca’ means ten times of the base unit, ‘hecto’ is ten times of ‘deca’ or hundred times of the base unit and ‘kilo’ is ten times of ‘hecto’ or thousand times of the base unit.

### Metric Measure of Length:

- Measurement of something from its one end to the other is called its length.
- The standard unit of length is metre.
- We use different units to measure different lengths.

- Millimetre (mm), Decimetre (dm),Centimetre (cm) are smaller units used to measure smaller distance.
- Metre (m) is used to measure average distance.
- Units like decametre, hectometer and Kilometre (km) are used to measure longer distance.

**E.g.** length of cloth, distance between two cities.

**Changing metric Units of Length:**

| Kilometer | Hectometer | Decameter | Meter | Decimeter | Centimeter | Millimeter |
|---|---|---|---|---|---|---|
| 1km<br>= 1000m | 1hm<br>=100m | 1 dam<br>= 10 m | 1 m | 1 dm<br>= 1/10m<br>=0.1m | 1cm<br>=1/100m<br>=0.01m | 1mm<br>=1/1000m<br>=0.001m |

**Metric Measure of Weight(mass)**

- Measurement of heaviness of a thing or a person is called weight
- The basic unit of weight is gram.
- Gram and kilogram are commonly used to measure weight.
- Milligram, centigram, decigram, are smaller units used to measure lighter things.
- Units like decagram, hectogram, and kilogram are used to measure heavier things.

**Changing metric Units of Weight:**

| Kilogram | Hectogram | Decagram | Gram | Decigram | Centigram | Milligram |
|---|---|---|---|---|---|---|
| 1kg<br>= 1000g | 1hg<br>=100g | 1 dag<br>= 10 g | 1 g | 1 dg<br>= 1/10g<br>=0.1g | 1cg<br>=1/100g<br>=0.01g | 1mg<br>=1/1000g<br>=0.001g |

**Metric Measure of Capacity(Volume)**

- The maximum amount that something can hold is called capacity.
- The standard unit of capacity is litre.
- Milliliter, centiliter, deciliter are smaller units used to measure smaller capacity.
- Units like decalitre, hectoliter, and kiloliter are used to measure larger capacity.

**Changing metric Units of Capacity:**

| Kilolitre | Hectolitre | Decalitre | litre | Decilitre | Centilitre | Millilitre |
|---|---|---|---|---|---|---|
| 1kl<br>= 1000l | 1hl<br>=100l | 1 dal<br>= 10 l | 1 l | 1 dl<br>= 1/10l<br>=0.1l | 1cl<br>=1/100l<br>=0.01l | 1ml<br>=1/1000l<br>=0.001l |

**Addition and Subtraction of Metric Measures**.

For addition and subtraction of metric measures , we follow these steps:

**Step1:** write the units on the top.

**Step2:**write the numbers in proper place below the units. Write zero in empty place.

**Example1. Add 45m 34cm and 34m 5cm**

| | m | cm |
|---|---|---|
| | 45 | 34 |
| + | 34 | 05 |
| | 79 | 39 |

**Example2. Subtract 35km 4 m - 6km 2 m**

| | Km | m |
|---|---|---|
| | 35 | 004 |
| - | 06 | 002 |
| | 29 | 002 |