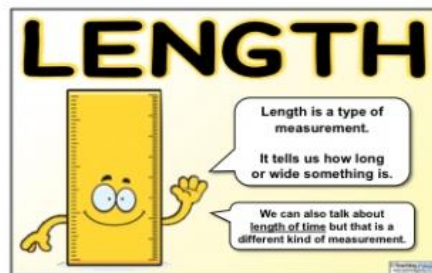Chapter- 12

Measurement

STUDY NOTES

LEARN ABOUT:

- **Length and conversion of length**
- **Addition and subtraction of lengths**
- **Weight and conversion of weight**
- **Addition and subtraction of weight**
- **Capacity and conversion of capacity**
- **Addition and subtraction of capacity**

❖ **LENGTH AND CONVERSION OF LENGTH-**
   Length is the measurement of something from its one end to the other, such as the length of a room, the length of a stick, etc.

(Note: The standard unit used for measuring length is called the metre (m). Largest unit for measuring length is kilometre and smallest unit is millimetre.)
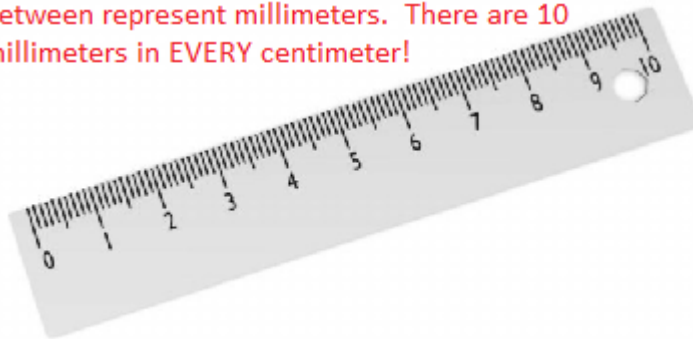
10 mm = 1 cm

100 cm = 1 m

1000 m = 1 km

On this ruler, the long marks (with the numbers) represent centimeters, and the short marks in between represent millimeters. There are 10 millimeters in EVERY centimeter!

CONVERSION-

A. Metres into centimetres - 1m = 100 cm

1. To convert into centimetres, multiply the number of metres by 100. (To multiply a number by 100, just put two zeroes to the right of the number).
2. To convert metres and centimetres into centimetres, multiply the number of metres by 100 and then add the number of centimetres to it.

EXAMPLES-

1. Convert 35 metres into centimetres.

SOLUTION-

35 x 100 = 3,500 cm.

2. Convert 225m 85cm into centimetres.

SOLUTION-

225m 85cm = 225 x 100 cm + 85 cm = 22,585 cm

B. Centimetres into metres- 100 cm = 1 m

To convert centimetres into metres, divide the number of centimetres by 100.

EXAMPLES-

1. Convert 545 centimetres into metres.

SOLUTION-

545 cm = 500 cm + 45 cm = 5 m 45 cm

2. Convert 3758 cm into metres and centimetres.

SOLUTION-

3758 CM = 3700 cm + 58 cm = 37 m 58 cm

(Note: When centimetres are converted into metres and centimetres, the number formed by the last two digits on the right gives the number of centimetres and the number formed by the remaining digits give the number of metres.

C. **Kilometres into metres- 1m = 1000 metres**

1. To convert kilometres into metres, multiply the number of kilometres by 1000.
2. To convert kilometres and metres into metres, multiply the number of kilometres by 1000 and then add the number of metres to it.

   EXAMPLES-
   1. 9 km = 9 x 1000 = 9,000 m
   2. 12 km 625 m = 12 x 1000 m + 625 m = 12,000 m + 625 m = 12,625 m

D. **Metres into kilometres- 1000 m = 1 km**
   To convert metres into kilometres, divide the number of metres by 1000.
   EXAMPLES-
   1. Convert 1,775m into kilometres.

   SOLUTION-
   1,775 m = 1000 m + 775 m = 1 km 775 m

   2. Convert 12,580 m into kilometres.

   SOLUTION-
   12,580 m = 12,000 m + 580 m = 12 km 580 m

(Note: When metres are converted into kilometres and metres, the number formed by the last three digits on the right gives the metres and the remaining digit gives the kilometres.)

❖ ADDITION AND SUBTRACTION OF LENGTHS-

EXAMPLE- 1

Add 15m 5cm and 24m 95cm.

	m	cm
	1	1
	15	5
+	24	95
	40	00

SOLUTION-

Step-1 Add the centimetres first. 5 + 95 = 100 cm = 1m.

Write 00 under the centimetres

and column and carry 1 to the metre's column.

Step-2 Add the metres. 15 + 24 + 1 = 40m.

EXAMPLE- 2

Subtract 9 m 57 cm from 15 m 26 cm.

SOLUTION-

m	cm
15	25
- 9	57
5 m	69cm

Or

m	cm
14	126
- 9	57
5 m	69cm

Step-1 Subtract the centimetres. As 57 > 26, we cannot subtract 57 from 26. So, borrow

1m from 15m. 1m = 100 cm.

100 cm + 26 cm = 126 cm.

Subtract 57 cm from 126 cm. 126 – 57 = 69 cm.

Write 69 in the centimetre's column.

Step-2 Subtract the metres.

Subtract 9m from 14 m – 9m = 5m.

Write 5 in the metre's column.

❖ WEIGHTS AND CONVERSION OF WEIGHTS –

We measure the weight of objects in grams and kilograms. We measure ourselves in kilograms, we buy rice, wheat, fruit etc. in kilograms, while smaller quantities, light objects, or precious objects such as gold, silver, medicines etc. are weighed in grams.

1 kilogram = 1000 grams

The short form of gram is 'g' and of kilogram is 'kg'.

CONVERSION-

A. Grams into kilograms- 1000 g = 1 kg

To convert grams into kilograms, we divide the number of grams by 1000.

EXAMPLES-

1. 7000g = 7000 ÷ 1000 = 7 kg
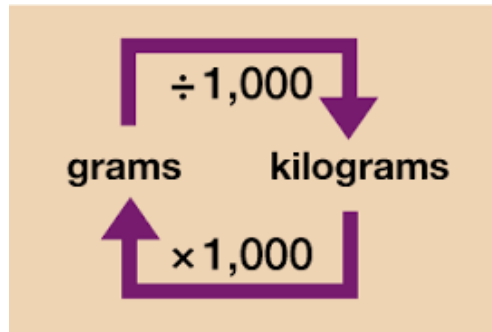2. 24,728g = 24,000g + 728g = 24kg + 728g = 24kg 728g

(Note: When grams are converted into kilograms and grams, the number formed by the last three digits on the right gives the number of grams, and the number formed by the remaining digits gives the number of kilograms.)

B. Kilograms into grams- 1 kg = 1000 g

To convert kilograms into grams, we multiply the number of kilograms by 1000 and then add the grams, if any, to it.

EXAMPLES-

1. 5 kg = 5 x 1000g =5,000 g
2. 8 kg 750 g = 8 x 1000 g + 750 g = 8000 g + 750 g = 8,750 g

$$\div 1,000$$

grams   kilograms

$$\times 1,000$$

❖ **ADDITION AND SUBTRACTION OF WEIGHTS-**

EXAMPLE-1

Add 128 kg 75 g and 244 kg 686 g.

SOLUTION-

Method

Step 1 :

kg	g
1	11
128	75
+ 244	686
372	761

Add the grams first.
75 + 686 = 761. write 761g under the grams' column.

Step 2 :

Add the kilograms.
128 + 244 = 372. write 372kg under kilograms' column.
Ans : 372kg 761g

EXAMPLE-2

Subtract 48 kg 85 g from 95 kg 250 g.

SOLUTION-

Method

Step 1 :

kg	g
95	250
- 48	85
47kg	165g

Subtract the grams first.
250 – 85 = 165 g.
Write 165 under grams' column.

Step 2 :

Subtract the kilograms.
95 – 48 = 47 kg. write 47 under kilograms' column.
Ans : 47 kg 165 g.

❖ CAPACITIES AND COVERSION OF CAPACITIES-

We measure capacity in litres and millilitres. Liquids like milk, water, petrol, etc. are measures in litres. Smaller quantities like medicinal liquids such as cough syrups, tonics etc. are measured in millilitres.

1 litre = 1000 millilitres

'L' is the short form of litre and 'Ml' is the short form of millilitres.

(Note: Litre is the standard unit of capacity.)

❖ CONVERSION-

A. Litres into millilitres – 1 ℓ = 1000 mℓ

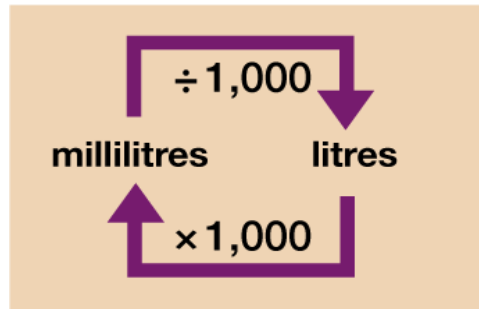To convert litres into mℓ, multiply the quantity by 1000.

EXAMPLE-
1. 7 litres = 7 x 1000 = 7,000 mℓ
2. 6 ℓ 224 mℓ = 6 x 1000 + 224 = 6,000 mℓ + 224 mℓ = 6,224 mℓ

B. Millilitres into litres- 1000 mℓ = 1 ℓ

To convert mℓ into litres, divide the quantity by 1000.

EXAMPLES-
1. 2,000 mℓ = 2000 ÷ 1000 = 2 ℓ
2. 6,025 mℓ = 6,000 mℓ + 025 mℓ = 6 L + 025 mℓ

❖ **ADDITION AND SUBTRACTION OF CAPACITIES-**

EXAMPLE-1

Add 6 ℓ 225 mℓ and 4 ℓ 383 mℓ.

SOLUTION-

Method

ℓ	mℓ
1	11
6	025
+ 4	383
10	408

Step 1 :

Add the millilitres first.
025 + 383 = 408 mℓ.
Write 408 under millilitres' column.

Step 2 :

Add the litres.
6 + 4 = 10 ℓ.
Write 10 under the litres' column.
Ans : 10 ℓ 408 mℓ

EXAMPLE-2

Subtract 9 ℓ 48 mℓ FROM 14 ℓ 374 mℓ.

SOLUTION-

Method

ℓ	mℓ
14	374
- 9	048
5	326

Step 1 :

Subtract the millilitres first.
374 − 048 = 326 mℓ.
Write 326 under millilitres' column.

Step 2 :

Subtract the litres.
14 − 9 = 5 litres. write 5 under litres' column.
Ans : 5 ℓ 326 mℓ.