

Chapter 9: Measurement

Warm-up

2. 27 mm 21 mm 2.6 cm 23 mm 2.3 cm
3. (a) Total weight = $6.74\text{ g} + 7.74\text{ g} + 8.54\text{ g} = 23.02\text{ g}$
(b) Difference = $4.07\text{ g} - 3.09\text{ g} = 0.98\text{ g}$

Class Work (Pg 144)

1. $8\text{ km} = 8 \times 1000\text{ m} = 8000\text{ m}$
3. $4.5\text{ m} = 4.5 \times 100\text{ cm} = 450\text{ cm}$
5. $7000\text{ mm} = 7000 \div 1000\text{ m} = 7\text{ m}$
7. $3400\text{ m} = 3400 \div 100\text{ hm} = 34\text{ hm}$

Exercise 9A

1. (a) $1\text{ km} = 1 \times 10\text{ hm} = 10\text{ hm}$
(c) $1\text{ hm} = 1 \times 1000\text{ dm} = 1000\text{ dm}$
(e) $1\text{ cm} = 1 \div 1000\text{ dam} = \frac{1}{1000}\text{ dam}$
(g) $1\text{ dm} = 1 \div 1000\text{ hm} = \frac{1}{1000}\text{ hm}$
2. (a) $11.8\text{ km} = 11.8 \times 100 = 1180\text{ dam}$
(c) $6.25\text{ dam} = 6.25 \times 1000\text{ cm} = 6250\text{ cm}$
(e) $15.3\text{ cm} = 15.3 \div 1000\text{ dam} = 0.0153\text{ dam}$
(g) $25\text{ hm} = 25 \times 100 = 2500\text{ m}$
(i) $14\text{ mm} = 14 \div 10\text{ cm} = 1.4\text{ cm}$
(k) $19\text{ hm} = 19 \div 10\text{ km} = 1.9\text{ km}$
(m) $1.26\text{ hm} = 1.26 \times 100\text{ m} = 126\text{ m}$
- (b) $16.5\text{ dam} = 16.5 \times 10\text{ m} = 165\text{ m}$
4. $9.25\text{ cm} = 9.25 \times 10\text{ mm} = 92.5\text{ mm}$
6. $2\text{ dm} = 2 \div 10\text{ m} = 0.2\text{ m}$
8. $25\text{ m} = 25 \div 10\text{ dam} = 2.5\text{ dam}$
(b) $1\text{ dam} = 1 \times 100\text{ dm} = 100\text{ dm}$
(d) $1\text{ dm} = 1 \times 100\text{ mm} = 100\text{ mm}$
(f) $1\text{ mm} = 1 \div 100\text{ dm} = \frac{1}{100}\text{ dm}$
(h) $1\text{ hm} = 1 \div 10\text{ km} = \frac{1}{10}\text{ km}$
(b) $15\text{ hm} = 15 \times 1000\text{ dm} = 15000\text{ dm}$
(d) $1800\text{ mm} = 1800 \div 100\text{ dm} = 18\text{ dm}$
(f) $9250\text{ dm} = 9250 \div 1000\text{ hm} = 9.250\text{ hm}$
(h) $2.5\text{ dm} = 2.5 \times 10\text{ cm} = 25\text{ cm}$
(j) $1.85\text{ hm} = 1.85 \times 10\text{ dam} = 18.5\text{ dam}$
(l) $41.9\text{ dam} = 41.9 \div 100\text{ km} = 0.419\text{ km}$
(n) $25\text{ m} = 25 \div 10\text{ dam} = 2.5\text{ dam}$

Class Work (Pg 147)

1. (a) $412.92\text{ m} = 412\text{ m } 92\text{ cm}$
(c) $6.893\text{ km} = 6\text{ km } 8\text{ hm } 9\text{ dam } 3\text{ m}$
2. (a) $12\text{ m } 45\text{ cm} = 12.45\text{ m}$
(c) $160\text{ km } 8\text{ hm } 9\text{ dam } 5\text{ m} = 160.895\text{ km}$
- (b) $27.893\text{ m} = 27\text{ m } 8\text{ dm } 9\text{ cm } 3\text{ mm}$
(b) $2\text{ m } 6\text{ dm } 5\text{ cm } 3\text{ mm} = 2.653\text{ m}$

Exercise 9B

1. (a) $382.14\text{ m} = 382\text{ m } 14\text{ cm}$
2. (a) $5\text{ m } 13\text{ cm} = 5.13\text{ m}$
(c) $4\text{ cm } 4\text{ mm} = 0.044\text{ m}$
(e) $6\text{ m } 4\text{ dm } 7\text{ mm} = 6.407\text{ m}$
- (b) $15.08\text{ m} = 15\text{ m } 8\text{ cm}$
(b) $173\text{ m } 2\text{ cm} = 173.02\text{ m}$
(d) $327\text{ m } 5\text{ dm } 6\text{ cm } 8\text{ mm} = 327.568\text{ m}$
(f) $402\text{ m } 7\text{ cm } 9\text{ mm} = 402.079\text{ m}$



3. (a) $549.321 \text{ m} = 549 \text{ m } 3 \text{ dm } 2 \text{ cm } 1 \text{ mm}$
 (c) $0.759 \text{ m} = 7 \text{ dm } 5 \text{ cm } 9 \text{ mm}$
 (e) $935.001 \text{ m} = 935 \text{ m } 1 \text{ mm}$
4. (a) $430.756 \text{ km} = 430 \text{ km } 7 \text{ hm } 5 \text{ dam } 6 \text{ m}$
 (c) $902.405 \text{ km} = 902 \text{ km } 4 \text{ hm } 5 \text{ m}$
 (e) $603.001 \text{ km} = 603 \text{ km } 1 \text{ m}$
5. (a) $540 \text{ km } 7 \text{ hm } 3 \text{ dam } 6 \text{ m} = 540.736 \text{ km}$
 (c) $857 \text{ km } 2 \text{ m} = 857.002 \text{ km}$
 (e) $703 \text{ km } 8 \text{ dam } 5 \text{ m} = 703.085 \text{ km}$
- (b) $605.203 \text{ m} = 605 \text{ m } 2 \text{ dm } 3 \text{ mm}$
 (d) $354.018 \text{ m} = 354 \text{ m } 1 \text{ cm } 8 \text{ mm}$
 (b) $0.807 \text{ km} = 8 \text{ hm } 7 \text{ m}$
 (d) $0.078 \text{ km} = 7 \text{ dam } 8 \text{ m}$
 (b) $5 \text{ m} = 0.005 \text{ km}$
 (d) $6 \text{ hm } 3 \text{ m} = 0.603 \text{ km}$
 (f) $839 \text{ km } 4 \text{ hm } 1 \text{ m} = 839.401 \text{ km}$

Exercise 9C

1. (a) $1 \text{ kg} = 1 \times 1000 \text{ g} = 1000 \text{ g}$
 (c) $1 \text{ dag} = 1 \times 10 \text{ g} = 10 \text{ g}$
 (e) $1 \text{ dag} = 100 \text{ dg}$
 (g) $1 \text{ g} = \frac{1}{1000} \text{ kg}$
 (i) $1 \text{ hg} = \frac{1}{10} \text{ kg}$
- (b) $1 \text{ g} = 1 \times 1000 \text{ mg} = 1000 \text{ mg}$
 (d) $1 \text{ hg} = 1 \times 1000 \text{ dg} = 1000 \text{ dg}$
 (f) $1 \text{ dg} = 10 \text{ cg}$
 (h) $1 \text{ mg} = \frac{1}{10} \text{ cg}$
 (j) $1 \text{ dg} = \frac{1}{100} \text{ dag}$

2.

kg	hg	dag	g	dg	cg	mg
13.7	137	—	13700	137000	—	13700000
—	45	450	4500	—	450000	4500000
0.02178	—	2.178	21.78	217.8	2178	—
0.7002	7.002	70.02	700.2	—	70020	—
0.0014572	0.014572	—	1.4572	—	145.72	1457.2

3. The weight of an adult male lion $= 190 \text{ kg} = 190 \times 1000 \text{ g} = 190000 \text{ g}$

4. Weight of cake $= 3250 \text{ g} = 3250 \times \frac{1}{1000} \text{ kg} = 3.25 \text{ kg}$

5. Dosage of 1 day $= 650 \text{ mg} \times 3 = 1950 \text{ mg} = 1.950 \text{ g}$

6. (a) $451.378 = 451 \text{ kg } 3 \text{ hg } 7 \text{ dag } 8 \text{ g}$
 (b) $0.602 \text{ kg} = 6 \text{ hg } 2 \text{ g}$
7. (a) $418 \text{ kg } 2 \text{ hg } 5 \text{ dag } 9 \text{ g} = 418.259 \text{ kg}$
 (b) $4 \text{ hg } 8 \text{ dag } 7 \text{ g} = 0.487 \text{ kg}$
 (c) $23 \text{ kg } 8 \text{ g} = 23.008 \text{ kg}$
 (d) $4 \text{ dag } 2 \text{ g} = 0.042 \text{ kg}$
8. (c) $(25 \text{ hg } 9 \text{ dag} = 2.59 \text{ kg})$

Exercise 9D

1. (a) $1 \text{ kL} = 1000 \text{ mL}$ — False
 (c) $1 \text{ dL} = \frac{1}{100} \text{ L}$ — False
- (b) $1 \text{ L} = 100 \text{ cL}$ — True
 (d) $1 \text{ hL} = \frac{1}{10} \text{ kL}$ — True

(e) $1 \text{ daL} = 100 \text{ dL}$ — True

(g) $1 \text{ cL} = 100 \text{ L}$ — False

(f) $1000 \text{ mL} = 1 \text{ L}$ — True

(h) $1 \text{ L} = \frac{1}{1000} \text{ kL}$ — True

(b) $150 \text{ dL} = 150 \times \frac{1}{100} \text{ daL} = 1.5 \text{ daL}$

(d) $1875 \text{ L} = 1875 \times \frac{1}{1000} \text{ kL} = 1.875 \text{ kL}$

(f) $15 \text{ hL} = 15 \times 1000 \text{ dL} = 15000 \text{ dL}$

(h) $19.4 \text{ cL} = 19.4 \times \frac{1}{10} \text{ dL} = 1.94 \text{ dL}$

2. (a) $8 \text{ L} = 8000 \text{ mL}$

(c) $16 \text{ kL} = 1600 \text{ daL}$

(e) $6.254 \text{ kL} = 6254 \text{ L}$

(g) $2.5 \text{ L} = 2.5 \times 10 \text{ dL} = 25 \text{ dL}$

3. A tanker has a capacity of $30 \text{ L} = 30 \times 1000 \text{ mL} = 30000 \text{ mL}$

4. Capacity of a tanker $= 12000 \text{ L} = 12000 \times \frac{1}{1000} \text{ kL} = 12 \text{ kL}$

5. (a) $529.183 \text{ L} = 529 \text{ L } 1 \text{ dL } 8 \text{ cL } 3 \text{ mL}$

(b) $0.308 \text{ L} = 3 \text{ dL } 8 \text{ mL}$

6. (a) $12 \text{ L } 4 \text{ dL } 5 \text{ cL } 2 \text{ mL} = 12.452 \text{ L}$

(b) $40 \text{ L } 6 \text{ cL } 9 \text{ mL} = 40.069 \text{ L}$

(c) $1 \text{ dL } 9 \text{ cL} = 0.190 \text{ L}$

(d) $215 \text{ L } 5 \text{ mL} = 215.005 \text{ L}$

Exercise 9E

1. (a)

m	dm
①	
5	8
+ 11	9
17	7

(b)

cm	mm
① ①	
1 6	3
+ 1 5	8
3 2	1

(c)

dm	cm
① ①	
9	6
+ 2 3	7
3 3	3

(d)

km	m
①	
4 5	7 5 0
+ 9 2	5 1 2
1 3 8	2 6 2

(e)

cm	mm
④	⑮
1 8	8
- 4 9	
1 0	9

(f)

m	cm
③	⑮
1 4	6 5
- 2 8 0	
1 1	8 5

(g)

km	m
⑦ ② ⑫	
1 8 8	2 5 0
- 1 0 6	5 0 0
7 6	7 5 0

(h)

dm	cm
⑪	⑫
1 2	2
- 5 8	
6	4

(i)

kg	g
① ① ① ①	
8 5	1 9 6
+ 1 5	9 2 4
1 0 1	1 2 0

(j)

g	mg
①	
5	7 5 0
+ 6	5 2 3
1 2	2 7 3

(k)

kg	g
① ⑫ ⑬	⑮ ⑭ ⑩
2 8 4	7 8 0
- 9 6	8 9 3
1 3 7	8 5 7

(l)

g	mg
⑤ ⑩ ⑩	
1 6	1 0 5
- 1 2	3 7 5
3	7 3 0

$$\begin{array}{r}
 \text{(m)} \quad \begin{array}{c} \text{L} \quad \text{mL} \\ \text{① ① ①} \\ 1 \ 1 \ 8 \ 2 \ 2 \ 5 \\ + \quad 5 \ 6 \quad 7 \ 8 \ 0 \\ \hline 1 \ 7 \ 5 \ 0 \ 0 \ 5 \end{array}
 \end{array}$$

$$\begin{array}{r}
 \text{(n)} \quad \begin{array}{c} \text{kL} \quad \text{L} \\ \text{① ①} \\ 1 \ 2 \ 5 \ 2 \ 5 \\ + \quad 1 \ 5 \ 4 \ 9 \ 0 \\ \hline 2 \ 8 \ 0 \ 1 \ 5 \end{array}
 \end{array}$$

$$\begin{array}{r}
 \text{(o)} \quad \begin{array}{c} \text{kL} \quad \text{L} \\ \text{④ ⑨ ⑨ ⑮} \\ 3 \ 5 \ 8 \ 8 \ 5 \\ - \quad 1 \ 2 \quad 1 \ 2 \ 6 \\ \hline 2 \ 2 \quad 8 \ 7 \ 9 \end{array}
 \end{array}$$

2. The length of an adult blue whale = 24 m 86 cm
 The length of an adult whale shark = 17 m 08 cm
 Adult blue whale is longer by 7 m 78 cm.

$$\begin{array}{r}
 \text{m} \quad \text{cm} \\
 24 \quad 86 \\
 - \quad 17 \quad 08 \\
 \hline
 7 \quad 78
 \end{array}$$

3. A family consumed flour in March = 30 kg 450 g
 In April they consumed less by = 5 kg 25 g
 In April they consumed flour = 25 kg 425 g
 In March they had consumed = 30 kg 450 g
 Total weight of flour consumed = 55 kg 875 g

$$\begin{array}{r}
 \text{kg} \quad \text{g} \\
 30 \quad 450 \\
 - \quad 5 \quad 025 \\
 \hline
 25 \quad 425 \\
 + \quad 30 \quad 450 \\
 \hline
 55 \quad 875
 \end{array}$$

4. One car can hold petrol = 36 L 50 mL
 8 cars need petrol = 288 L 400 mL = 288.400 L

$$\begin{array}{r}
 \text{L} \quad \text{mL} \\
 36 \quad 050 \\
 \times \quad 8 \\
 \hline
 288 \quad 400
 \end{array}$$

5. One jug contains lemonade = 1 L 569 mL
 Other jug contains lemonade = 1 L 719 mL
 Total lemonade = 3 L 288 mL
 1 jug will contain lemonade = $3 \text{ L } 288 \text{ mL} \div 12 = 3288 \text{ mL} \div 12 = \underline{274 \text{ mL}}$

$$\begin{array}{r}
 \text{L} \quad \text{mL} \\
 1 \quad 569 \\
 + \quad 1 \quad 719 \\
 \hline
 3 \quad 288
 \end{array}$$

6. Weight of condensed milk = 215 g
 Weight of tin = 48 g
 Total weight of pack = 263 g
 Weight of 8 packs = $263 \text{ g} \times 8 = 2104 \text{ g} = 2 \text{ kg } 104 \text{ g}$
 7. (b) $(1 \text{ m } 144 \text{ mm} = 1144 \text{ mm} \div 44 \text{ mm} = 26 \text{ books})$

$$\begin{array}{r}
 215 \text{ g} \\
 + \quad 48 \text{ g} \\
 \hline
 263 \text{ g}
 \end{array}$$

Class Work (Pg 159)

1. (a) Length of teaspoon – cm
 (c) Weight of a stack of newspapers – kg
 (e) Perfume in a bottle – mL
 (g) Width of an eraser – mm
 (i) A loaf of bread – g
 (k) The length of sixer hit by a batsman – m
2. (a) The thickness of this page – mm
 (c) The mass of an egg – g
 (b) Width of a table – m
 (d) Weight of hairbrush – g
 (f) Distance of a train trip – km
 (h) A tablet of Vitamin C – mg
 (j) Water in a fish bowl – L
 (b) The diameter of earth – km
 (d) The capacity of a tea cup – mL

- (e) The amount of water drawn from a well – L
 (g) The weight of a bus – t
 (i) The mass of a ceiling fan – kg
 (f) The weight of a pinch of salt – mg
 (h) The capacity of a fridge – L
 (j) The height of Mount Everest – m

Exercise 9F

1. (a) $\frac{1}{2} \text{ g} = \frac{1}{2} \times \frac{500}{1000} \text{ mg} = 500 \text{ mg}$

(c) $\frac{4}{5} \text{ kg} = \frac{4}{5} \times \frac{200}{1000} \text{ g} = 800 \text{ g}$

(e) $\frac{1}{5} \text{ kL} = \frac{1}{5} \times \frac{20}{100} \text{ daL} = 20 \text{ daL}$

(g) $\frac{3}{4} \text{ dL} = \frac{3}{4} \times \frac{25}{100} \text{ mL} = 75 \text{ mL}$

(b) $\frac{3}{5} \text{ L} = \frac{3}{5} \times \frac{20}{100} \text{ cL} = 60 \text{ cL}$

(d) $\frac{3}{4} \text{ km} = \frac{3}{4} \times \frac{250}{1000} \text{ m} = 750 \text{ m}$

(f) $\frac{2}{5} \text{ kL} = \frac{2}{5} \times \frac{2}{10} \text{ hL} = 4 \text{ hL}$

(h) $\frac{1}{2} \text{ hm} = \frac{1}{2} \times \frac{50}{100} \text{ m} = 50 \text{ m}$

2. Aryan spilt milk = $\frac{3}{4} \times \frac{4}{5} \text{ L} = \frac{3}{5} \times \frac{200}{1000} \text{ mL} = 600 \text{ mL}$

3. A basket contains $3 \text{ kg } 705 \text{ g} = 3705 \text{ g}$ mangoes

Mangoes eaten = $\frac{2}{3} \times \frac{1235}{3705} \text{ g} = 2470 \text{ g}$

Remaining mangoes = $3705 \text{ g} - 2470 \text{ g} = 1235 \text{ g}$

Rinki gets mangoes = $\frac{2}{3} \times \frac{247}{1235} \text{ g} = 494 \text{ g}$

4. (a) Total distance travelled by Vedant = $\frac{7}{10} \text{ km} + \frac{3}{4} \text{ km} = \frac{14 \text{ km} + 15 \text{ km}}{20}$

$= \frac{29}{20} \text{ km} = \frac{29}{20} \times \frac{50}{1000} \text{ m} = 1450 \text{ m}$

(b) $\frac{29}{20} \text{ km} = 1.45 \text{ km}$

5. (d) $\left(\frac{4}{5} \text{ kg} = \frac{4}{5} \times \frac{200}{1000} \text{ g} = 800 \text{ g} \div 5 = 160 \text{ g in each packet} \right)$

Mental Maths

1. $1 \text{ dg} = 100 \text{ mg}$

2. $1 \text{ km} = 10000 \text{ dm}$

3. $1 \text{ hL} = 100000 \text{ mL}$

4. $80 \text{ g} = 80 \div 1000 \text{ kg} = 0.080 \text{ kg}$

5. $5.62 \text{ hm} = 5.62 \times 10000 \text{ cm} = 56200 \text{ cm}$

$$6. \frac{1}{4} \text{ of } 1 \text{ L} = \frac{1}{4} \times 10 \text{ dal} = 2.5 \text{ dal}$$

$$7. \frac{2}{5} \text{ of } 1 \text{ g} = \frac{2}{5} \times 10 \text{ dg} = 4 \text{ dg}$$

$$8. 0.728 \text{ dag} = 0.728 \times 100 \text{ dg} = 72.8 \text{ dg}$$

Chapter Test

$$1. (a) 42.195 \text{ km} = 42.195 \times 10000 \text{ dm} = 421950 \text{ dm}$$

$$(b) (i) 163 \text{ g} = \frac{163}{100} \text{ hg} = 1.63 \text{ hg}$$

$$(ii) 163 \text{ g} = 163 \times 1000 \text{ mg} = 163000 \text{ mg}$$

$$(c) 25 \text{ lakh L} = 2500000 \text{ L} = 2500000 \times \frac{1}{1000} \text{ kL} = 2500 \text{ kL}$$

$$2. (a) 1 \text{ kg}$$

$$(b) 8050 \text{ m}$$

$$(c) 700 \text{ hL}$$

$$3. (a) 4.25 \text{ km} = 425 \text{ dam}$$

$$(b) 17.08 \text{ m} = 17080 \text{ mm}$$

$$(c) 6.58 \text{ cm} = 0.658 \text{ dm}$$

$$(d) 348 \text{ hg} = 34.8 \text{ kg}$$

$$(e) 6.17 \text{ dag} = 61700 \text{ mg}$$

$$(f) 45 \text{ mL} = 0.45 \text{ dL}$$

$$(g) 22.09 \text{ daL} = 0.2209 \text{ kL} \quad (h) 785 \text{ L} = 7.85 \text{ hL}$$

$$4. (a) \text{ Weight of Box A} = 6 \text{ kg } 35 \text{ g}$$

$$\text{Weight of Box B} = 6 \text{ kg } 35 \text{ g} \times 3 = 18 \text{ kg } 105 \text{ g}$$

$$\text{Total weight of 2 boxes} = 24 \text{ kg } 140 \text{ g.}$$

kg	g
6	035
18	105
24	140

$$(b) \text{ Weight of biscuits} = 15 \text{ kg } 097 \text{ g} = 15097 \text{ g}$$

kg	g
18	105
- 3	008
15	097

$$5. \text{ Length of 1 bookmark} = 2 \text{ m } 55 \text{ cm} = 255 \text{ cm} \div 17 = 15 \text{ cm}$$

$$\text{Length of 68 such bookmarks} = 1020 \text{ cm} = 10.20 \text{ m}$$

15
$\times 68$
120
90
1020

$$6. (c)$$

$$7. (d)$$

$$8. (d) \left(\frac{3}{4} \times 5 \text{ L} = \frac{3}{4} \times 50 \text{ dL} = \frac{75}{2} \text{ dL} = 37.5 \text{ dL} \right)$$

$$9. (c) \{ 5 \text{ m } 40 \text{ cm} = 540 \text{ cm} \times \frac{1}{3} = 180 \text{ cm}, 360 \times \frac{1}{5} = 72 \text{ cm} \}$$

$$\begin{aligned} \text{Painted green} &= 540 \text{ cm} - (180 \text{ cm} + 72 \text{ cm}) = 540 \text{ cm} - 252 \text{ cm} \\ &= 288 \text{ cm} = 288 \times 10 \text{ mm} = 2880 \text{ mm} \end{aligned}$$

10. (b) Capacity of 2 bottles = 1 L 120 mL = 1120 mL $\times 2 = 2240$ mL,
Oil in 1 bottle = $2240 \text{ mL} \div 5 = 448 \text{ mL}$

Challenge!

Mr. Madan gave honey to her friend = $1 \text{ L } 160 \text{ mL} = 1160 \text{ mL} \times \frac{5}{8} = 725 \text{ mL}$

Remaining honey = $1160 \text{ mL} - 725 \text{ mL} = 435 \text{ mL}$

Honey spread over sandwiches = $435 \text{ mL} \times \frac{4}{5} = 348 \text{ mL}$

Remaining honey = $435 \text{ mL} - 348 \text{ mL} = 87 \text{ mL} = 0.087 \text{ L}$