

20

Liquid Measurements

By studying this lesson you will be able to

- multiply liquid quantities expressed in millilitres and litres by a whole number and
- divide liquid quantities expressed in millilitres and litres by a whole number.

20.1 Units used to measure liquid quantities

There are occasions when you have to purchase liquid types such as milk, coconut oil and syrups. You have already learnt in grade 6, that millilitre and litre are two units that are used to measure liquid quantities. A quantity of one litre of a liquid is equal to a quantity of 1000 millilitres of that liquid.



$$1 \text{ l} = 1000 \text{ ml}$$

To express a liquid quantity in millilitres, which is given in litres, the quantity given in litres should be multiplied by 1000.

To express a liquid quantity in litres, which is given in millilitres, the quantity given in millilitres should be divided by 1000.

Do the following exercise to revise your grade 6 knowledge.

Review Exercise

- (i) Express 6 l in millilitres.
(ii) Express 7 l 300 ml in millilitres.
(iii) Express 3758 ml in litres and millilitres.
(iv) Express 10 065 ml in litres and millilitres.

(2) Simplify.

(i) l	ml	(ii) l	ml	(iii) l	ml	(iv) l	ml
7	250	3	50	6	50	3	45
+ 4	350	+ 7	975	- 3	875	- 2	165
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(3) Find out how much of drink can be prepared by adding 1 l 250 ml of fruit juice to 2 l 650 ml of water, and express this amount in litres and millilitres.



(4) There was 10 l 750 ml of water in a bucket. Geetha watered plants with a quantity of 5 l 850 ml of water from the bucket. How much of water is remaining in the bucket now?



20.2 Multiplication of liquid quantities expressed in millilitres and litres by a whole number

➤ Binuli drinks a 200 ml glass of *kola kenda* daily. Let us find out how much *kola kenda* she drinks in 4 days.



Amount of *kola kenda* consumed per day = 200 ml

Amount of *kola kenda* consumed in 4 days = $200 \text{ ml} \times 4$
= 800 ml

➤ 1 l 750 ml of fuel is required to operate a generator for one hour. Let us find the amount of fuel required to operate the generator for 3 hours.

Method I



$$\begin{array}{r}
 1 \text{ l } 750 \text{ ml} = 1750 \text{ ml} \quad \text{ml} \\
 1750 \text{ ml} \times 3 = 5250 \text{ ml} \quad 1750 \\
 5250 \text{ ml} = 5 \text{ l } 250 \text{ ml} \\
 \times 3 \\
 \hline
 5250 \\
 \hline
 \hline
 \end{array}$$

Method II

$$\begin{array}{r}
 1 \text{ l } 750 \text{ ml} = 1.750 \text{ l} \quad 1.75 \\
 1.75 \text{ l} \times 3 = 5.25 \text{ l} \quad \times 3 \\
 5.25 \text{ l} = 5 \text{ l } 250 \text{ ml} \\
 \hline
 5.25 \\
 \hline
 \hline
 \end{array}$$

Method III

$$\begin{array}{r} l \quad \text{ml} \\ 1 \quad 750 \\ \times \quad 3 \\ \hline 5 \quad 250 \\ \hline \hline \end{array}$$

Let us multiply the 750 ml in the millilitres column by 3.

$$750 \text{ ml} \times 3 = 2250 \text{ ml}$$

$$2250 \text{ ml} = 2000 \text{ ml} + 250 \text{ ml} = 2 \text{ l } 250 \text{ ml}$$

Let us write 250 ml in the millilitres column and carry the 2 l to the litres column.

Let us multiply the amount of litres in the litres column by 3.

$1 \text{ l} \times 3 = 3 \text{ l}$. Now let us add the 2 l we carried from the millilitres column.

$$3 \text{ l} + 2 \text{ l} = 5 \text{ l}$$

Finally let us write 5 l in the litres column.

Exercise 20.1

(1) Multiply.

$$\begin{array}{r} \text{(i) } l \quad \text{ml} \\ 4 \quad 25 \\ \times \quad 5 \\ \hline \\ \hline \hline \end{array}$$

$$\begin{array}{r} \text{(ii) } l \quad \text{ml} \\ 2 \quad 350 \\ \times \quad 4 \\ \hline \\ \hline \hline \end{array}$$

$$\text{(iii) } 5 \text{ l } 750 \text{ ml} \times 13$$

$$\text{(iv) } 8 \text{ l } 575 \text{ ml} \times 15$$

(2) Multiply the liquid quantities given below by the given number and express the answer in litres and millilitres.

$$\text{(i) } 250 \text{ ml} \times 5$$

$$\text{(ii) } 515 \text{ ml} \times 7$$

$$\text{(iii) } 750 \text{ ml} \times 16$$

(3) A bottle contains 375 ml of drink. Express the total amount of drink in 6 such bottles in litres and millilitres.



(4) A cordial bottle contains 1 l 750 ml of cordial. How much of cordial is there in 6 such bottles?

(5) A house without electricity requires 1 l 650 ml of kerosene oil per day. Find the amount of kerosene oil required by that house for a week.

(6) 2 l 225 ml of diesel is required to operate a generator for one hour. Find the amount of diesel required to operate the generator for 8 hours.

- (7) 50 ml of milk is used to produce one cup of yoghurt. Find the total amount of milk required to produce 150 such cups of yoghurt.



- (8) A bucket used for bathing can be filled completely with 5 l 650 ml of water. If a person pours water from this bucket (completely filled) 60 times whenever he bathes, find how much of water he uses on each occasion that he bathes.

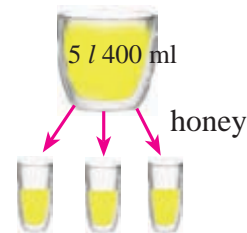
- (9) A 540 l water tank is filled with water. Due to a crack in a pipe, water leaks out at a speed of 6 l 750 ml per minute.



- What is the total amount of water that leaks during 8 minutes?
- Show that the tank will be empty if the leakage continues for 80 minutes.

20.3 Division of liquid quantities expressed in millilitres and litres by a whole number

- The total amount of honey collected from a honeycomb is 5 l 400 ml. If this amount is divided equally among 3 people, how much of honey will one person receive?



Amount of honey received by one person = 5 l 400 ml \div 3

Method I



$$\begin{aligned}
 5 \text{ l } 400 \text{ ml} &= 5400 \text{ ml} \\
 5400 \text{ ml} \div 3 &= 1800 \text{ ml} \\
 5 \text{ l } 400 \text{ ml} \div 3 &= 1800 \text{ ml} \\
 &= 1 \text{ l } 800 \text{ ml}
 \end{aligned}$$

$$\begin{array}{r}
 1800 \text{ ml} \\
 3 \overline{) 5400 \text{ ml}} \\
 \underline{3} \\
 24 \\
 \underline{24} \\
 00 \\
 00 \\
 00
 \end{array}$$

Method II

$$\begin{array}{r} \text{l} \quad \text{ml} \\ 1 \quad 800 \\ 3 \overline{) 5 \quad 400} \\ \underline{3} \\ 2 \rightarrow \underline{2000} \\ \underline{2400} \\ \underline{2400} \\ \underline{0000} \end{array}$$

When 5 l is divided by 3, the remainder is 2 l.

When this remainder of 2 l is taken to the millilitres column, it is 2000 ml.

$$2 \text{ l} = 2000 \text{ ml}$$

When 2000 ml is added to 400 ml we get 2400 ml.

$$2400 \text{ ml} \div 3 = 800 \text{ ml}$$

One person receives 1 l 800 ml of honey.

Exercise 20.2

(1) Evaluate the following.

- (i) $750 \text{ ml} \div 3$ (ii) $9 \text{ l } 750 \text{ ml} \div 3$ (iii) $2 \text{ l } 200 \text{ ml} \div 5$
(iv) $4 \text{ l } 50 \text{ ml} \div 3$ (v) $18 \text{ l } 900 \text{ ml} \div 6$ (vi) $13 \text{ l } 50 \text{ ml} \div 3$

(2) The 45 000 litres of fuel in a bowser is issued in equal amounts to six filling stations. Find the amount issued to one filling station.

(3) 10 l 728 ml of milk is poured in equal quantities into 12 pots for curdling. Find how much of milk is poured into one pot.



(4) A motor vehicle requires 1 l 560 ml of fuel to travel a distance of 24 km. Find how much fuel it requires to travel a distance of 1 km.

(5) If 4 l 50 ml of a drink is poured equally into 9 glasses, how many milliliters of drink will one glass contain?



(6) A quantity of 1 l 950 ml of a perfume is put into 30 small bottles in equal amounts and issued to the market. What quantity of perfume is there in one bottle in millilitres?



(7) When the drink prepared by mixing 1.54 l of fruit juice with 1.7 l of water is poured in equal amounts into 12 tumblers, how many litres of drink will one tumbler contain?

- (8) A soft drink manufacturing company produces 800 bottles of drink of regular size in a day. If the total amount of drink produced in a day is 300 l, how much drink is included in one bottle?

Miscellaneous Exercise

- (1) An Ayurvedic syrup is issued to the market in 80 bottles containing 750 ml of syrup in a day.

- (i) Find the total volume of syrup issued in a day.
- (ii) A customer uses a bottle of syrup he purchased for 30 days. He drinks an equal amount twice a day.
- (a) Find the amount of syrup he consumes in a day.
- (b) Find the amount of syrup he consumes on each occasion.



- (iii) If the daily production of syrup is increased to 86 l 250 ml, how many bottles can be issued in a day?

- (2) A motor vehicle can be driven 16 km on one litre of fuel. A person spends 1.5 l of fuel daily to go to office and return home.

- (i) Find the total distance travelled by the vehicle in a day.
- (ii) Find the amount of fuel required by him for 22 working days.
- (iii) If the total distance he travelled during a certain month is 480 km, find the total number of litres of fuel that was consumed during that month.



Summary

- 1 l = 1000 ml
- To express a liquid quantity in litres, which is given in millilitres, the quantity given in millilitres should be divided by 1000.
- To express a liquid quantity in millilitres, which is given in litres, the quantity given in litres should be multiplied by 1000.