Year 6 into 7 Mathematics Workbook

Working with Units

Answers

Unit 9: Working with units

9.1 Reading scales

Concept Corner

Write the following **metric** units of measure into the correct column below.

kilogram, metre, gram, litre, millimetre, kilometre, millilitre, centimetre, milligram, tonne

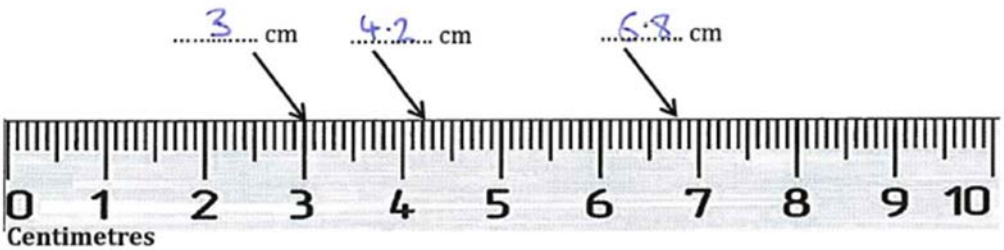
Length		Mass		Volume/Capacity	
Unit	Abbreviation	Unit	Abbreviation	Unit	Abbreviation
millimetre	mm	milligram	mg	millilitre	ml
centimetre	cm	gram	g	litre	l
metre	m	Kilogram	kg		
Kilometre	km	tonne	t		

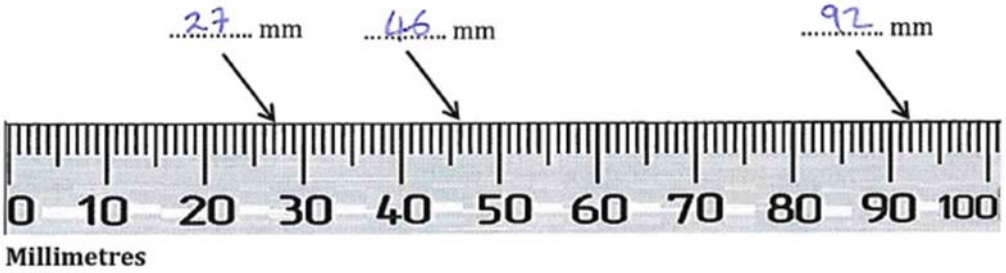
We often use the following abbreviations for the units above:

m g *l* kg km ml t mm cm mg

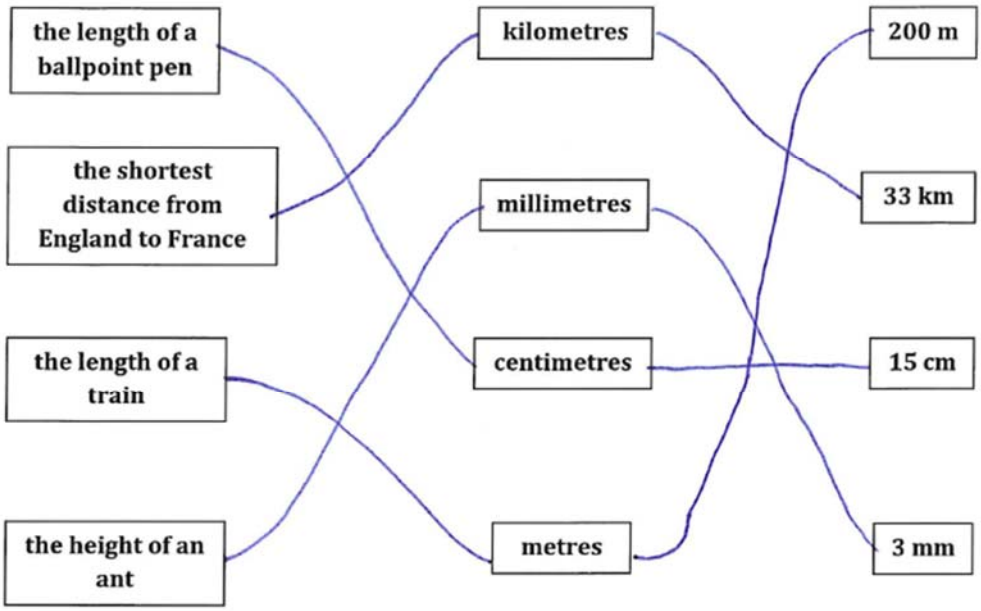
Write the correct abbreviation next to each unit in the table.

1. State the lengths shown by each arrow on the ruler below:





2. Match each statement to the appropriate measure, and then to an estimate of the length.



3. Write down an estimate, with appropriate **metric** units for the measurements below.

a) The height of an 11-year-old girl

140 cm – 160 cm

b) The diagonal length of a TV screen

80 cm – 120 cm

c) The thickness of a mobile phone

3 mm – 10 mm

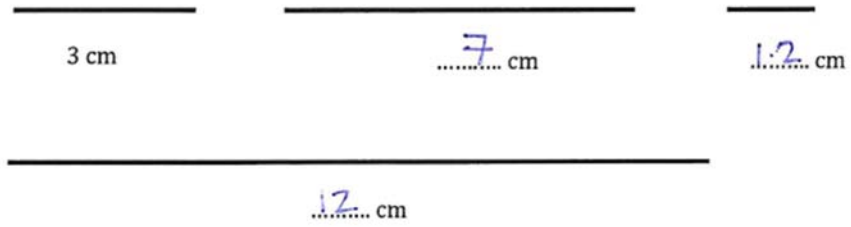
d) The height of a four-storey block of flats

10 m – 12 m

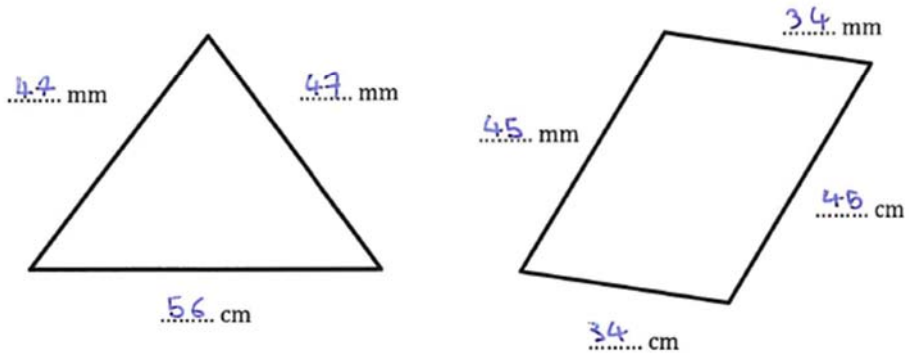
e) The distance from New York to Manchester

5000 km – 6000 km

4. The first line below is 3 cm in length. Use it to **estimate** the length of the other lines.



5. Measure the side lengths of the shapes below. Use the units stated.



6. Measure the lengths of each side of the shape below and calculate its perimeter:

The perimeter is 196 mm.

7. Estimate the mass of the following objects, giving appropriate **metric** units:

a) the mass of an average person

.....80kg.....

b) the mass of a small dog

.....20kg.....

c) the mass of a bowling ball

.....6kg.....

d) the mass of a snowflake

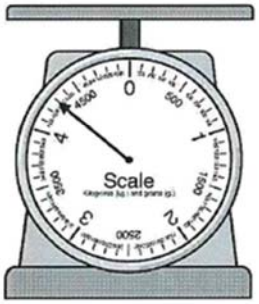
.....3mg.....

e) the mass of a fire engine

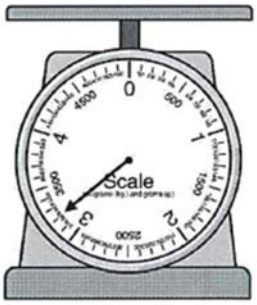
.....10t.....

8. Write down the reading on each set of scales.

.....2..... kg



.....4300..... g



.....3200..... kg

9. Write down the volume of liquid in each jug.

a)

300 ml

b)

150 ml

c)

c)

....2.8..... l

9.2 Units of length

Concept Corner

All **metric** measurements use the same prefixes; this makes it easier to interpret the relationship between units.

Prefix	Meaning
milli-	thousand**th**
centi-	hundred**th**
kilo-	thousand

×1000 ×100 ×10

number of **km** *number of* **m** *number of* **cm** *number of* **mm**

÷1000 ÷100 ÷10

Marsha's scarf is two metres long. This is the same as ..200..... cm.

I calculated this by **multiplying/dividing** the number of metres by ..100....

Winston's mobile phone screen is 53 mm long. This is the same as ..5.3.. cm.

I calculated this by **multiplying/dividing** the number of millimetres by ..10....

1. Answer the following questions:

a) $48 \times 10 =$ ....480....

b) $6400 \div 100 =$ ....64....

c) $2.7 \times 10 =$ ....27....

d) $31 \div 10 =$ ....3.1....

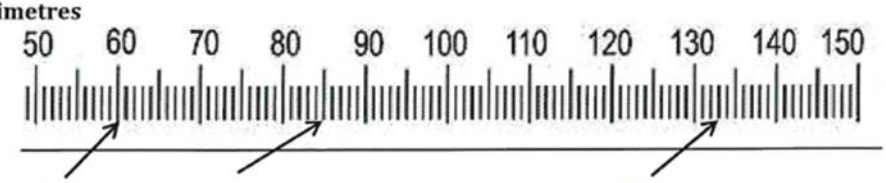
e) $0.12 \times 1000 =$ ....120....

f) $19.8 \div 100 =$ ....0.198....

g) $0.046 \times 100 =$ ....4.6....

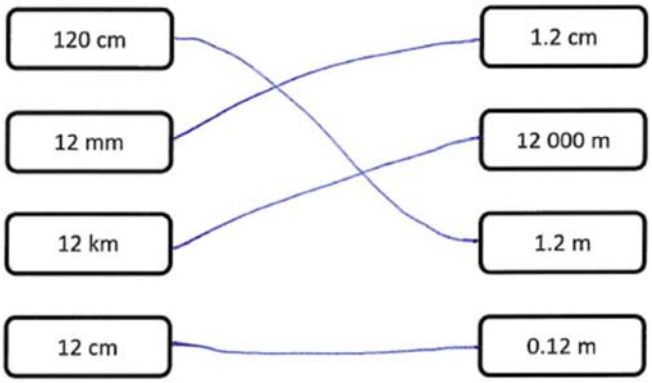
2. State the lengths (in centimetres) shown by each arrow on the ruler below.

Millimetres



....6.... cm ....8.5.... cm ....13.3.... cm

3. Match up the equivalent measurements.



4. Convert each measurement into the units stated.

a) 300 cm = ...3..... m

b) 42 mm = ...4.2..... cm

c) 17 km = ...17000..... m

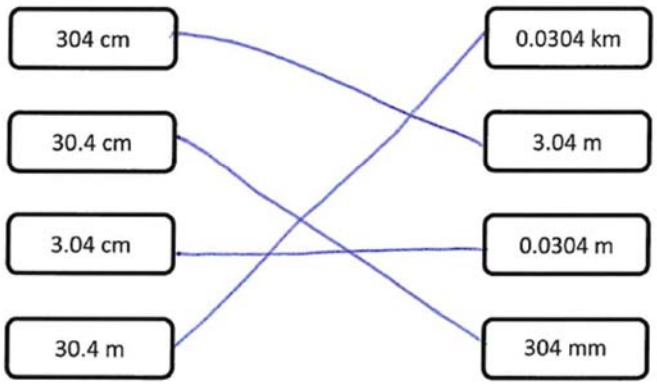
d) 3240 m = ...3.24..... km

e) 362 mm = ...0.362..... m

f) 1.03 m = ...1030..... mm

g) 1.23 km = ...123000..... cm

5. Match up the equivalent measurements.



6. Jose and Pam are measuring the distance of their journey to school. The distance from their house to the bus stop is 320 m, then the bus journey is 2.85 km. They each work out the total distance in a different way.

Fill in the gaps in their working out.

Jose's method:	Pam's method:
Writes both distances in metres:	Writes both distances in kilometres:
Distance to bus stop: 320 m	Distance to bus stop: 320 ÷ 1000 = 0·32 km
Distance on bus: 2.85 × 1000 = 2850 m	Distance on bus: 2.85 km
Total distance = 320 m + 2850 m	Total distance = 0·32 km + 2.85 km
= 3170 m	= 3·17 km

7. Answer the following questions:

a) Kim's hair was 42.5 cm long. She had 43 mm cut off. How long is her hair now?

38·2cm = 382mm

b) A 3.2 m long car is towing a 425 cm trailer. Calculate the total length of the car and trailer.

745m = 745cm

c) A building is eight storeys high. Each storey is 320 cm tall. How tall is the building? Give your answer in centimetres and metres.

2560cm = 25·6m

d) A brick is 65 mm tall. How high would 30 bricks stacked on top of each other be? Give your answer in metres.

1·95m

e) A 20p coin is 1.7 mm thick. How many 20p coins would it take to make a pile 17 cm high?

100

8. Decide if these statements are true or false.

a) 7000 km = 7 m — True / False

b) 850 cm = 8.5 m — True / False

c) 300 mm = 3 cm — True / False

d) 11.8 m = 1180 cm — True / False

9. Enter either <, > or = in the gaps below to make each statement correct.

a) 5 mm ...=...0.5 cm

b) 6 m ...>...65 cm

c) 10 m ...>...120 cm

d) 400 mm ...<...0.41 m

e) 0.75 cm ...>...7 mm

f) 0.5 mm ...<...0.06 cm

g) 1500 mm ...<...1.6 m

h) 32 mm ...<...0.3 metres

10. Write the following lengths in ascending order:

320 m, 4.85 km, 0.024 km, 423 050 cm, 7823 m

0·024km, 320m, 423050cm, 4·85km, 7823m

9.3 Units of mass

Concept Corner

The metric system for measuring mass uses the same prefixes used for length.

×1000 ×1000 ×1000

number of **t** *number of* **kg** *number of* **g** *number of* **mg**

÷1000 ÷1000 ÷1000

Kieran weighs 80 kg. This is the same as 80000 g.

The recommended daily allowance of vitamin C is 60 mg. This is the same as 0.06 g.

The mass of a football is 430 g. This is the same as 0.43 kg or 430000 mg.

A double decker bus weighs 12 t. This is the same as 12000 kg.

1. Match each image to the correct mass below:

An estate car A chocolate bar A fox A feather

65 grams 8.9 kilograms 8 milligrams 1.5 tonnes

2. Match up the following equivalent measurements

217 g	21.7 kg
2170 mg	0.217 kg
21.7 g	0.0217 kg
21 700 g	2.17 g

3. Circle the **two correct values** for each statement below:

a) 1 kilogram is equal in mass to:

1000 milligrams | 1000 grams | 100 grams | 1 000 000 milligrams

b) 360 grams is equal in mass to:

0.36 milligrams | 3.6 kilograms | 0.36 kilograms | 360 000 milligrams

c) 940 milligrams is equal in mass to:

0.94 grams | 0.94 kilograms | 0.00094 kilograms | 9.4 grams

4. A large box of cereal weighs 1.3 kg and a medium box of cereal weighs 800 g. What is their total mass?

2.1kg = 2 100g

5. A bike weighs 8.2 kg and a helmet weighs 383 g. What is their total mass?

8.583kg = 8583g

6. Pete is doing a chemistry experiment. He uses 0.34 g of sulphur and 28 mg of magnesium. What is the total mass of chemicals?

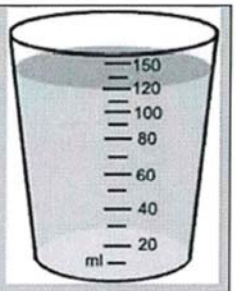
368mg = 0.368g

7. Hannah is going on holiday. She has two bags. One weighs 2450 g, and the other weighs 15.8 kg. If the maximum total baggage allowance is 18 kg, will her bags be within this limit?

18.25 > 18 so no.

9.4 Units of volume and capacity

Concept Corner



Volume is the amount of three dimensional space an object takes up.

Capacity is the amount of three dimensional space inside a container.

The capacity of the beaker is 150 ml. The volume of water in the beaker is 120 ml.

The metric system for measuring volume and capacity uses the same prefixes used for length.

×10 ×10

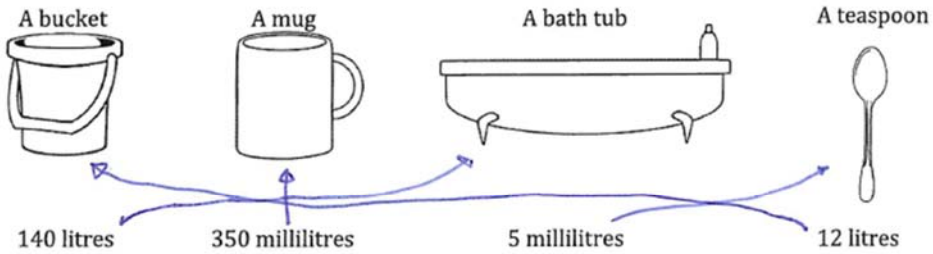
number of **l** *number of* **cl** *number of* **ml**

÷10 ÷10

A glass contains 300 ml of orange juice. This is the same as 0.3 *l* or 30 cl.

The capacity of a bucket is 23 *l*. This is the same as 2300 cl or 23000 ml.

1. Match the container to the correct capacity for each image below:



2. Decide whether each of these quantities refers to a volume or a capacity

a) 330 ml of fizzy pop — volume / capacity

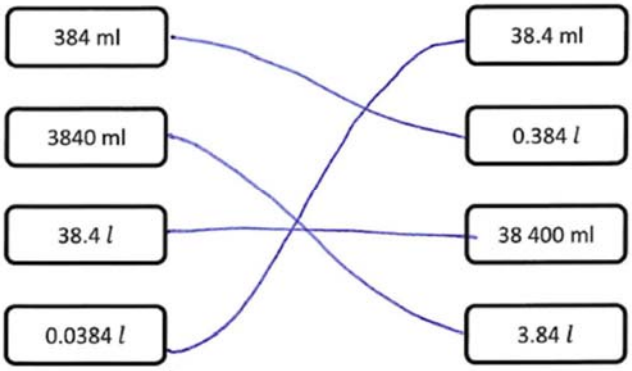
b) 320 *l* bathtub — volume / capacity

c) 75 cl wine bottle — volume / capacity

d) 60 *l* of water in a bucket — volume / capacity

e) 10 ml of medicine in a spoon — volume / capacity

3. Match up the equivalent measures

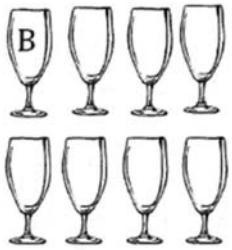


4. Write these measures in descending order:
302 ml, 3.4 *l*, 84 cl, 0.381 *l*, 120 cl

3·4 l, 120cl, 84cl, 0·381 l, 302ml

5.

Five of these glasses can hold 1375 millilitres



Eight of these glasses can hold 2.48 litres

a) Calculate the volume of liquid that one of each glass can hold.

Glass A 275ml Glass B 310ml

b) Which glass has the greater capacity, and by how much? B by 35 ml

6. Samuel buys eight 450 ml bottles of washing-up liquid.
   How many litres is this?

   3.6 l

7. How many complete 330 ml glasses of ginger beer can be poured from a 45 litre barrel?
   How much ginger beer would be left in the barrel?

   136 glasses
   120ml left in barrel

8. A drinks company claims that the mean volume of lemonade in a can is 0.3 l. Isla buys four cans and measures the quantity of lemonade in each one. The cans contained 293, 303, 301 and 299 millilitres. Did these cans support the company's claim?

   The mean is equal to 299ml, which is 0.3l rounded to one decimal place.

9. The mean mass of sweets in six packets is 65 g.
   The mass of sweets in five of the packets are 65 g, 67.5 g, 61 g, 63.2 g and 62.8 g.
   a) What is the mass of sweets in the sixth packet?

   70.5g

b) Each sweet weighs 1200 mg. What is the mean number of sweets per pack?

54.2 = 54 sweets.

10. Gemma swims a 200 m race. This is four lengths of a swimming pool. Her mean time for each length is 32.8 seconds.

a) What was Gemma's total time for the race?

131.2 sec.

b) The first three lengths took Gemma a total of 1 minute 40 seconds. Was her last length faster or slower than the others?

- 31.2 sec.
- Don't know if this is faster or slower

11. Kassandra is making 50 litres of orange squash for a summer party.
She will need 5 litres of orange squash concentrate and 45 litres of water.

a) Orange squash concentrate comes in 750 ml bottles.
How many bottles will Kassandra need to buy?

7

b) 240 people attend the party. They each want to drink one 200 ml cup of orange squash.
Has Kassandra made enough squash?

Yes. (0.2 × 240 = 48ℓ)