MATHS FIELD GUIDE · GRADE 4

Measurement units, area and time

OPENING PROBLEM

How long is 1½ m in centimetres?

Metres	Centimetres
1	100
3	300
1½	150

02 Follow the unit through the calculation
03 Rules and worked cases
04 The water station
05 Separate mass, capacity and time
06 Check your reasoning

ILLUSTRATED PROBLEM SHEET

Follow the unit through the calculation

Write the unit with the number. Match units before adding or subtracting.

1

Metres	Centimetres
1	100
3	300
1½	150

How long is 1½ m in centimetres?

One metre is 100 cm and half a metre is 50 cm. Together they give 150 cm.

2

Mass	In grams
1 kg	1000
1 kg 8 g	1008

Which zero matters?

Eight grams adds eight ones, not eight hundreds.

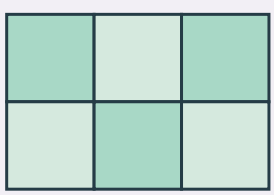
3

10:45 → 11:00
↓
15 min + 20 min
↓
11:20

How long from 10:45 to 11:20?

Thirty-five minutes. Split at the hour so the minutes can be added.

4



Each square has side 1 m. What is its area in cm²?

Each small square has 100 × 100 cm². Six of them have 60,000 cm².

1 m = 100 cm
length factor 100.

1 m² = 10,000 cm²
area factor 100 × 100.

CHAPTER PROBLEM

Why is 2 hours 120 minutes rather than 200 minutes?

An hour contains sixty minutes, so two hours contain two groups of sixty.

MATHS REFERENCE · GRADE 4

Measurement units, area and time

A measurement is a number together with a unit. Length, mass, capacity, area and time describe different attributes.

A conversion renames the same amount using a different unit. It does not physically change the object or duration.

Four cases to recognise

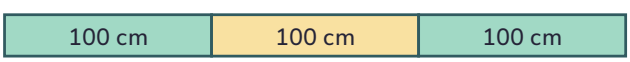
Situation	What to do and why
3 m 8 cm in centimetres	300 cm + 8 cm = 308 cm.
2,040 g in kilograms and grams	Two full kilograms and 40 g remain.
1 L minus 275 mL	Convert to 1,000 mL and subtract to get 725 mL.
Start 10:45, finish 11:20	Fifteen minutes to eleven, then twenty more: 35 minutes.

Read the model

Build the idea

One metre equals one hundred centimetres. Lay out three metre lengths: each contains one hundred centimetres.

For area, a square metre is a square with metre-long sides. It contains 100 rows of 100 square-centimetre cells, not just 100 cells.



1 m + 1 m + 1 m = 300 cm

Why it works

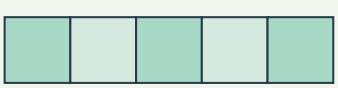
A unit relationship determines the calculation. Three metres equals 300 cm because each metre contributes 100 cm.

Time uses different group sizes: one hour is sixty minutes. Do not assume every conversion uses groups of ten.

attribute The feature being measured.

conversion A different unit name for the same amount.

duration How much time passes.



A strip covers five blocks from edge to edge. How long is it?

Five block lengths. The blocks meet without gaps.

WORKED INVESTIGATION

The water station

A jug holds 1 L 250 mL. Convert the litre into 1,000 mL before sharing the water among five cups.

Look at this part	What it tells you
1 L	1,000 mL
1 L 250 mL	1,250 mL
One of five shares	250 mL

Work it through

To refill the same jug using a 200 mL cup, six full cups supply 1,200 mL. Another 50 mL completes it.

Catch the mistake

Writing 1 L 25 mL as 1.25 L makes the extra part ten times too large. Twenty-five millilitres is 0.025 L.

Compare the cases

Follow an example

A task starts at 10:45 and ends at 11:20. Count fifteen minutes to 11:00, then twenty more to 11:20.

The duration is 35 minutes. Crossing the hour does not mean subtracting clock numerals as if they were a decimal.



What changes? What stays true?

Use the attribute and unit together: a mass cannot be compared directly with a length.

For a perimeter, add matching length units. For an area, count square units. Explain the conversion before choosing an operation.

Change one condition

A 2 L bottle can fill the original jug once, leaving 750 mL. Check by adding 1,250 and 750.



A ribbon runs from 2 cm to 7 cm. Length?

Five centimetres. Start at two and count five intervals.

ILLUSTRATED PROBLEM SHEET

Separate mass, capacity and time

Write the unit beside every reading and convert before comparing.

1

Container	Capacity
A	1 L 50 mL
B	950 mL

Which holds more?

A holds 1050 mL. The difference is 100 mL.

2

Parcel	Mass
A	2 kg 5 g
B	2050 g

Which is heavier?

B. Its 2050 g exceeds A's 2005 g by 45 g.

3

1 h 15 min
↓
60 min + 15 min
↓
75 min

Why is 1.15 hours different?

The digits after a decimal count tenths and hundredths. Clock minutes count sixtieths of an hour.

4

2 m 8 cm
↓
200 cm + 8 cm
↓
208 cm

What mistake gives 280 cm?

Treating 8 cm as eight tenths of a metre. It is eight hundredths.

100 min
1 h 40 min.

1.5 h
90 min.

CHAPTER PROBLEM

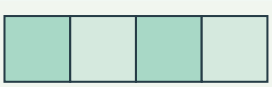
A rectangle is 5 cm long and 3 cm wide. Explain how unit squares give its area. Why is the answer in square centimetres?

There are three rows of five 1 cm by 1 cm squares, so 5 × 3 = 15 square centimetres. Area counts squares covering the inside, not centimetres along the boundary.

QUESTION BANK · FOLD OR COVER THE RIGHT COLUMN

Check your reasoning

Try the problem	Solution and reasoning
01 Which holds more, 2 L 50 mL or 2200 mL?	2050 mL is 150 mL less than 2200 mL.
02 Which unit suits the capacity of a small spoon: mL or kg?	mL measures the volume it holds. kg measures mass.
03 A mat measures 2 m by 30 cm. Find its area in square centimetres.	Convert the length to 200 cm first. The area is 200 × 30 = 6,000 cm².
04 Which is larger, 1 L 90 mL or 1,009 mL, and by how much?	1 L 90 mL equals 1,090 mL. It exceeds 1,009 mL by 81 mL.
05 How many 250 mL cups fill 2.5 L?	2,500 ÷ 250 = ten cups.
06 Which is heavier, 3 kg 4 g or 3,040 g?	3,004 g is lighter than 3,040 g. The second is heavier by 36 g.



Four equal blocks fill the same length as eight shorter blocks. Which unit is longer?

Each long block is two short blocks long.

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