Mathematics Level 4

Chapter 4 — Measurement

Aboriginal and Torres Strait Islander content has been excluded as accuracy cannot be guaranteed, and it is better to be respectful than cover the entire curriculum inaccurately.

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Contents

Scaled and digital instruments: length, mass, capacity, duration and temperature

Code `VC2M4M01` (Victorian Curriculum F–10 Version 2.0, Mathematics, Level 4; authority file `maths_4.json`): "use scaled and digital instruments to interpret unmarked and partial units to measure and compare lengths, masses, capacities, durations and temperatures, using appropriate units". This section draws on `VC2M4M01.E01`, `.E02`, `.E03`, `.E04`, `.E05` and `.E06`. `.E07` is not covered in this book; see the note at the front of the book about Aboriginal and Torres Strait Islander content.

What you need to know

In Year 3 you met the measuring units — metres, centimetres and millimetres for length, grams and kilograms for mass, litres and millilitres for capacity, degrees Celsius for temperature — and you read clocks to the nearest minute. This section builds on all of that. Now you will read real instruments, including ones whose marks stand for **part of a unit**.

Scaled and digital instruments. A **scaled instrument** is a measuring tool with a row or ring of marks, called a **scale**, that shows how much is being measured. A ruler, a tape measure, a measuring jug, an analog kitchen scale and a liquid thermometer are all scaled instruments. A **digital instrument** shows the measure as a number on a screen. A digital kitchen scale and a digital thermometer are digital instruments.

Unmarked and partial units. The marks on a scale stand for units. Sometimes the scale shows every unit with a mark. Sometimes it does not.

- A **partial unit** is when each small mark stands for only *part* of the big unit. If a tape measure marks the metres, the small marks between two metres might stand for quarter metres.
- An **unmarked unit** is a value that sits between two marks, with no mark of its own. If a thermometer has marks at 28 and 29, the value halfway between them has no mark — you have to read it yourself.

Reading partial and unmarked units is the whole point of this section. The decimal work you did in 2B is what makes it possible: 0.25 is one quarter, 0.5 is one half, and 5.25 means 5 and 25 hundredths.

The attribute decides the unit, and the unit decides the instrument. Before you measure anything, ask three questions.

Question	Example
What **attribute** am I measuring?	length, mass, capacity, duration or temperature
What **unit** fits this job?	millimetres for an ant, metres for a room
What **instrument** measures that unit?	a ruler, a tape measure, a jug, a scale, a clock, a thermometer

An **attribute** is the feature of a thing that you are measuring. Here are the five attributes of this section with their usual units and instruments.

Attribute	Units	Instruments
Length	millimetres (mm), centimetres (cm), metres (m)	ruler, tape measure
Mass	grams (g), kilograms (kg)	kitchen scale (analog or digital)
Capacity	millilitres (mL), litres (L)	measuring jug
Duration	minutes	clock, timer
Temperature	degrees Celsius (°C)	thermometer

The three-step read. Use these three steps every time you read a scale.

1. **Find two numbered marks.** Look for two marks on the scale that have numbers written beside them.
2. **Work out each small mark.** Count the small marks between your two numbered marks, then share the gap between them into equal parts. That tells you what each small mark is worth.

3. **Count on.** Start at the numbered mark below the pointer, the needle, the water level or the end of the object, and count on in small-mark steps.

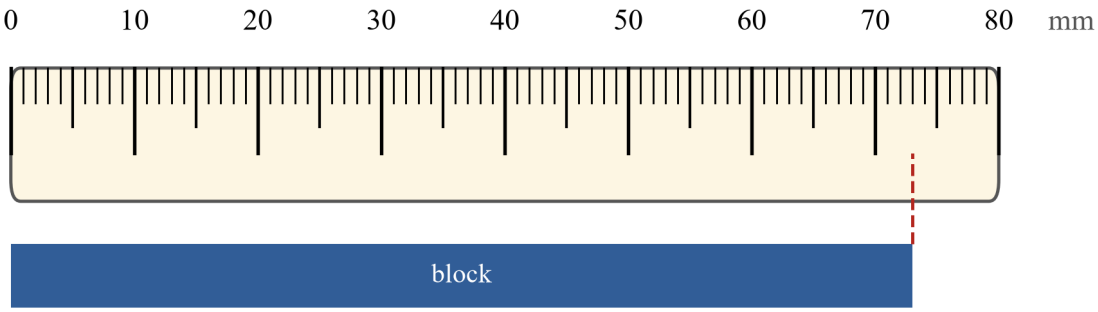
Part (i) — Length, mass and capacity

Length: millimetres, centimetres and metres

Small things are measured in millimetres or centimetres. Big things are measured in metres. Choosing a unit that fits the job is part of measuring well: nobody measures an ant in metres, and nobody measures a football ground in millimetres.

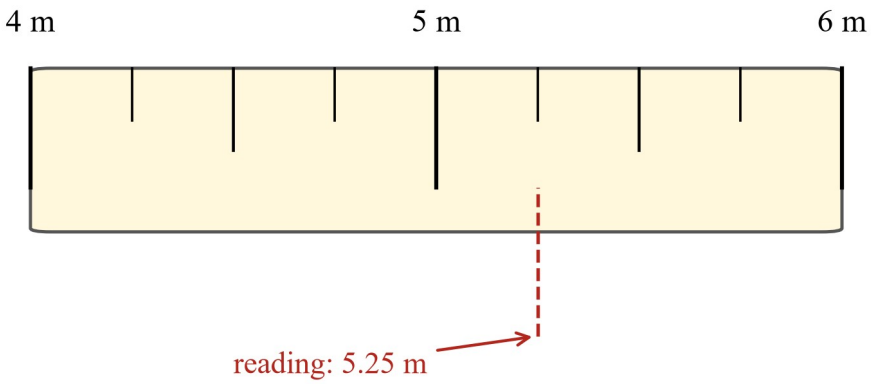
Very long things are still measured in metres, with decimal parts when the measure falls between two marks. The West Gate Bridge in Melbourne is 2582.6 metres long.

Source: Wikipedia, *West Gate Bridge*, retrieved 2026-08-20.



A ruler marked in millimetres, with tall marks and numbers every 10 millimetres. A blue block starts at 0 and ends at 73 millimetres.

The ruler above is marked in millimetres. There is a small mark every millimetre, and a tall mark with a number every 10 millimetres. The blue block starts at 0 and ends 3 small marks past 70, so the block is **73 mm** long.



A tape measure marked in metres. Between each metre there are smaller marks for half metres and quarter metres. The reading is 5.25 metres.

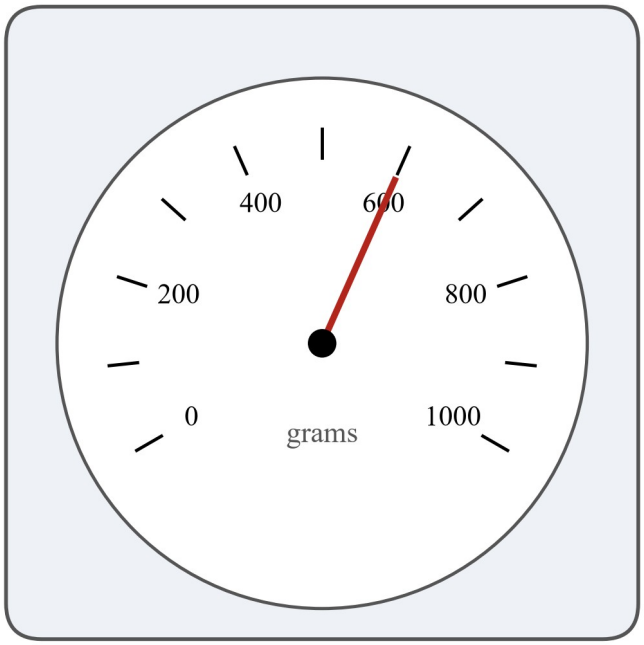
The tape measure above marks the metres, and between two metres it has smaller marks for half metres and quarter metres. Each of the smallest marks is worth one quarter of a metre, or 0.25 m. The reading shown is **5.25 m** — that is 5 metres and 25 hundredths of a metre.

When you measure a short distance and need an accurate answer, use a small unit such as millimetres. When you measure a long distance, use metres.

Mass: grams and kilograms

Mass tells you how heavy something is. Small masses are measured in grams, and big masses in kilograms.

An **analog** kitchen scale has a needle that moves around a dial. You read it with the three-step read.



An analog kitchen scale. The dial is marked in grams, with a small mark every 100 grams and numbers at 0, 200, 400, 600, 800 and 1000. The needle points to 600 grams.

On the scale above, the numbers go 0, 200, 400, 600, 800, 1000. Between 0 and 200 there are two small-mark steps, so each small mark stands for **100 grams**. The needle points exactly at 600, so the mass shown is **600 g**.

A **digital** kitchen scale shows the mass as a number on a screen, so there are no marks to count.

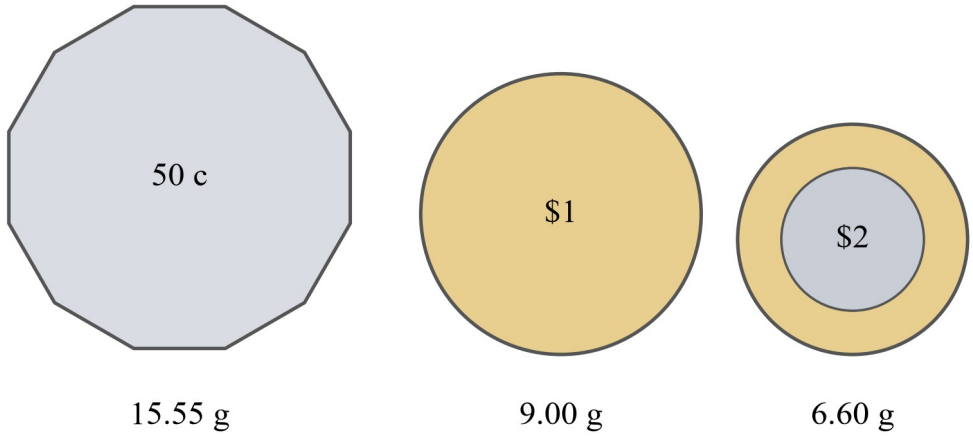
A digital kitchen scale with a flat top. The screen shows the number 640 and the letter g for grams.

Both instruments are real and useful. An analog scale lets you *see* how far the needle has moved, which helps you compare two masses at a glance. A digital scale gives you the number straight away, and it can show parts of a unit, like 6.60 grams.

Australian coins make a good mass comparison, because their masses are fixed when they are made.

Coin	Mass
50 cent	15.55 g
$1	9.00 g
$2	6.60 g

Source: Royal Australian Mint coin data, from Wikipedia, *Coins of the Australian dollar*, retrieved 2026-08-20.

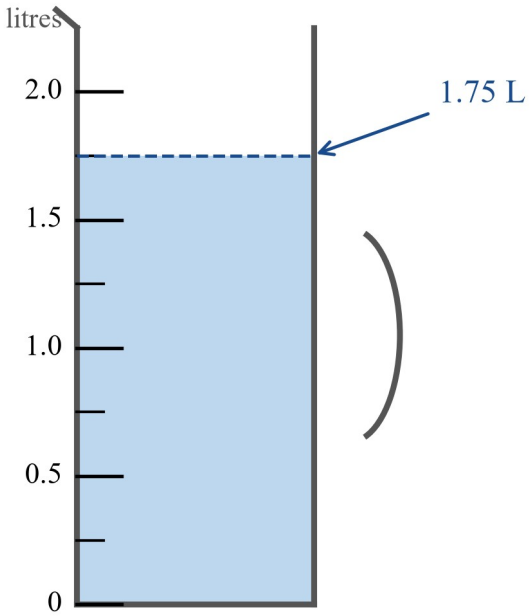


Three Australian coins drawn to size. The big 12-sided 50-cent coin is labelled 15.55 grams, the middle 1-dollar coin is labelled 9.00 grams, and the small 2-dollar coin is labelled 6.60 grams.

Notice that the $2 coin is the smallest coin of the three, and it has the smallest mass. The big 12-sided 50-cent coin has the greatest mass.

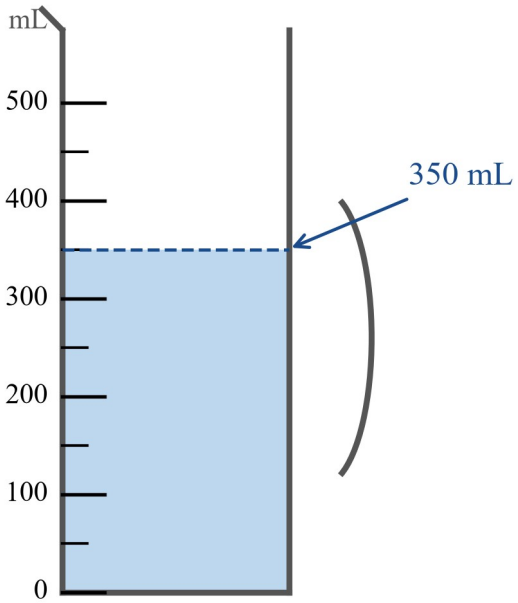
Capacity: litres and millilitres

Capacity is how much a container can hold. Small capacities are measured in millilitres, and big capacities in litres.



A measuring jug marked in litres. Numbers are shown at 0, 0.5, 1, 1.5 and 2 litres, with a smaller mark at every 0.25 L. The water level is at 1.75 litres.

The jug above is marked in litres. The numbers sit at 0, 0.5, 1, 1.5 and 2, and there is a smaller mark at every 0.25 L. The water level is at the third small mark past 1: 1.25, 1.5, **1.75**. The capacity shown is **1.75 L**.



A measuring jug marked in millilitres. Numbers are shown at 0, 100, 200, 300, 400 and 500 millilitres, with a mark every 50 millilitres. The water level is at 350 millilitres.

The jug above is marked in millilitres instead. The water level is one mark past 300, and each mark stands for 50 mL, so the capacity shown is **350 mL**.

Kitchens use small instruments too. In Australia, a tablespoon holds 20 mL and a teaspoon holds 5 mL.

Source: Wikipedia, *Tablespoon*, retrieved 2026-08-20. Source: Wikipedia, *Teaspoon*, retrieved 2026-08-20.

Part (ii) — Duration and temperature

Duration: reading a clock with no minute marks

Duration is how long something takes. You measure duration in minutes, using a clock or a timer.

Some clocks have a mark for every minute around the edge. But some analog clocks have **no minute marks** — just the numbers 1 to 12. You can still estimate the time to the nearest minute. The minute hand moves from one number to the next in 5 minutes, so count in fives to the number the minute hand is nearest, then adjust.

- Minute hand pointing at the 2 → 2 × 5 = **10 minutes** past the hour.
- Minute hand pointing at the 7 → 7 × 5 = **35 minutes** past the hour.
- Minute hand just past the 6 → a little more than 30 → **about 31 minutes** past the hour.

The hour hand tells you the hour. At 10:35, the hour hand is past the 10 and more than halfway to the 11 — but it has not reached 11 yet, so the hour is still 10.

To find the duration between two events, read both clocks, then count on from the start time to the finish time.

Duration: timers and alarms

A **timer** is a tool that counts minutes for you. You set it for a duration, start it, and it rings or beeps when that duration is up. Many clocks, phones and kitchen timers have a timer or **alarm** function.

Timers are useful when an activity must run for a set time. Say an exercise routine has three parts: warm-up for 3 minutes, skipping for 4 minutes, and stretching for 5 minutes. You set the timer for 3 minutes and start the warm-up. When it beeps, you set it for 4 minutes and start skipping. When it beeps again, you set it for 5 minutes and start stretching.

A digital timer with a screen showing 06:00. Below the screen are three buttons labelled start, stop and reset.

To work out the finish time, count on from the starting time by the duration. If the timer is set for 6 minutes and starts at 9:15 am, it beeps at 9:21 am.

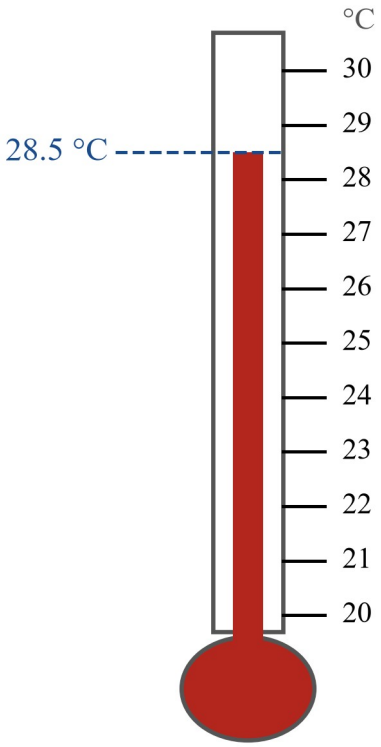
Temperature: degrees Celsius

Temperature tells you how hot or cold something is. In Australia, temperature is measured in **degrees Celsius**, written °C. You measure it with a thermometer.

Some thermometers have a thin tube of red liquid. The liquid moves up when it gets hotter and down when it gets colder, and you read the scale beside the tube. Other thermometers are digital and show the temperature as a number on a screen.

Some temperatures are worth knowing.

- Water freezes at **0 °C**. On cold winter mornings in the Victorian mountains, the temperature can fall below 0 °C.
- A healthy human body is about **37 °C**.
- Water boils at **100 °C**.



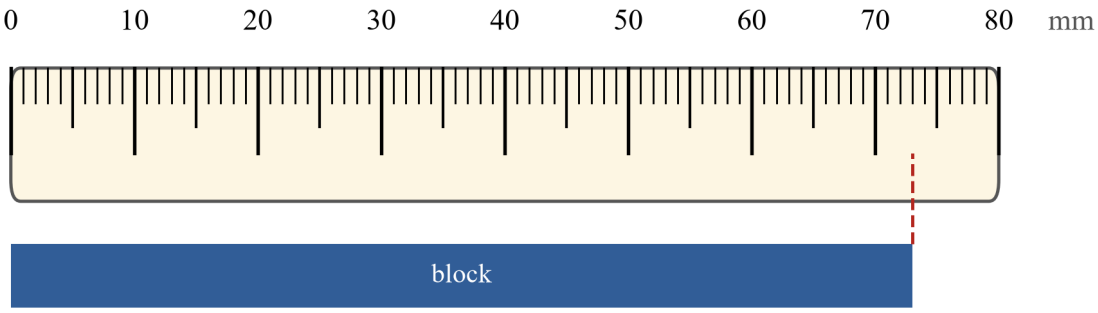
A thermometer marked in degrees Celsius from 20 to 30, with a mark at every degree. The red liquid stops halfway between 28 and 29, at 28.5 degrees.

The thermometer above has a mark at every degree. The red liquid has stopped between 28 and 29 — exactly halfway. There is no mark there, so this is an unmarked unit. Halfway between 28 and 29 is 28 and one half, written **28.5 °C**.

Worked examples

Example 1 — step by step: how far did the car roll?

Priya rolls a toy car down a ramp for a science investigation. She wants to compare how far the car rolls on three different surfaces. She measures the distance with a ruler marked in millimetres, like the one below.



A ruler marked in millimetres, with tall marks and numbers every 10 millimetres. A blue block starts at 0 and ends at 73 millimetres.

The end of the car's run is 3 small marks past the 70 mark. How far did the car roll?

Working	Comment
Two numbered marks: 70 and 80.	Step 1: find two numbered marks either side of the end.

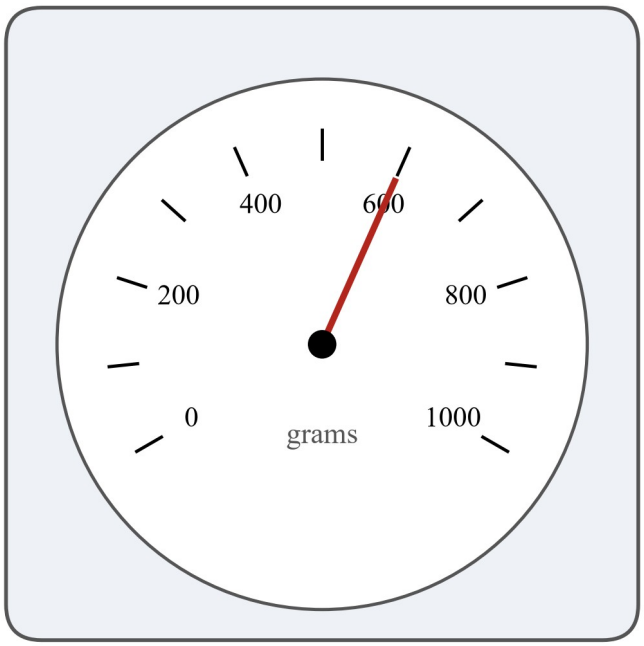
Working	Comment
There are 10 small-mark steps from 70 to 80, so each small mark is 1 mm.	Step 2: share the gap of 10 into 10 equal parts.
70, 71, 72, 73.	Step 3: count on 3 small marks from 70.

The car rolled **73 mm**.

Priya chose millimetres because the distance is short and she wants an accurate measure. If she had used metres, the whole run would be less than 1 metre, and hard to record.

Example 2 — step by step: reading kitchen scales

Ben puts a bag of apples on an analog kitchen scale. The dial is marked in grams, like the one below.



An analog kitchen scale. The dial is marked in grams, with a small mark every 100 grams and numbers at 0, 200, 400, 600, 800 and 1000. The needle points to 600 grams.

What is the mass of the apples, and what unit do the small marks stand for?

Working	Comment
Two numbered marks: 0 and 200.	Step 1: find two numbered marks.
There are 2 small-mark steps from 0 to 200, and 200 ÷ 2 = 100. Each small mark is 100 g.	Step 2: share the gap of 200 into 2 equal parts.
The needle points exactly at 600.	Step 3: no counting on is needed — the needle is on the mark.

The small marks stand for **grams** — each one is **100 g**. The mass of the apples is **600 g**.

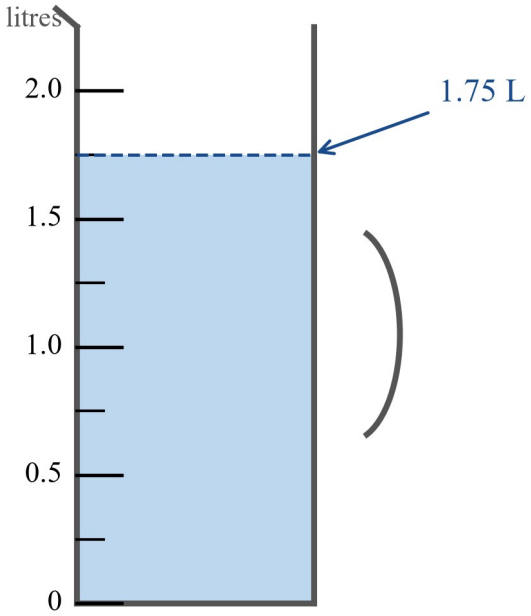
Mia puts her lunchbox on a digital kitchen scale. The screen shows **640 g**.

A digital kitchen scale with a flat top. The screen shows the number 640 and the letter g for grams.

Mia does not need the three-step read: the digital scale shows the number directly. Both readings are measures of mass in grams.

Example 3 — step by step: one and three-quarter litres

Ruby is making juice for sports day. She pours water into a measuring jug marked in litres, like the one below.



A measuring jug marked in litres. Numbers are shown at 0, 0.5, 1, 1.5 and 2 litres, with a smaller mark at every 0.25 L. The water level is at 1.75 litres.

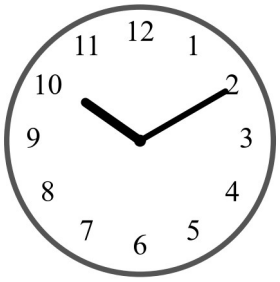
How much water is in the jug?

Working	Comment
Two numbered marks: 1 and 1.5.	Step 1: the water level sits between 1 L and 1.5 L.
There are 2 small-mark steps from 1 to 1.5, and 0.5 is two quarters, so each small mark is 0.25 L.	Step 2: each small mark is one quarter of 1 L.
1, 1.25, 1.5, 1.75.	Step 3: count on in 0.25 steps from 1. The level is at the third small mark past 1.

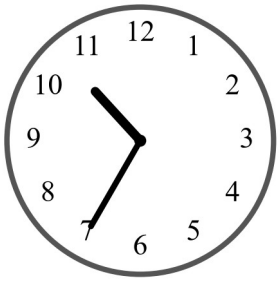
The jug holds **1.75 L** of water. That is 1 L and 75 hundredths of 1 L — the same as 1 and three-quarter litres.

Example 4 — step by step: how long was training?

Noah's swimming training starts when the pool clock shows the first time below, and finishes when it shows the second time. The clock has no minute marks.



start



finish

Two clocks with no minute marks, only the numbers 1 to 12. The first clock shows about 10:10 and is labelled start. The second clock shows about 10:35 and is labelled finish.

What time does each clock show, and how long was the training?

Working	Comment
Start clock: the hour hand is just past 10, so the hour is 10.	The hour hand has not reached 11.
The minute hand points at the 2. Count in fives: 5, 10.	The minute hand at the 2 means 10 minutes past.
Start time: about 10:10 am.	
Finish clock: the hour hand is past 10 and more than halfway to 11, so the hour is still 10.	
The minute hand points at the 7. Count in fives: 5, 10, 15, 20, 25, 30, 35.	The minute hand at the 7 means 35 minutes past.
Finish time: about 10:35 am.	
Count on from 10:10 to 10:35: ten to 10:20, ten to 10:30, five to 10:35.	10 + 10 + 5 = 25.

The training was about **25 minutes** long.

Noah could also set a timer for 25 minutes at 10:10 am. The timer would beep when the duration had elapsed — at 10:35 am — to alert him that training was over.

Investigation activity — make your own scaled instrument

Now make a scaled instrument of your own, then use it to measure things. You will need some other scaled instruments to help you mark it.

Option A — a paper-strip ruler (length).

1. Cut a strip of paper about as long as a real ruler.
2. Line your strip up with a real ruler. Copy the marks: make a mark at 0, then one mark for every centimetre, all the way to 10.
3. Write the numbers 0 to 10 beside your marks.

4. Check your strip against the real ruler. Do your marks line up? If not, fix them.

Option B — a measuring bottle (capacity).

1. Find a clear empty bottle and a cup that holds 250 mL.
2. Pour one full cup of water into the bottle. Mark the water level and write 250.
3. Pour in more cups, one at a time. Mark each new level and write 500, 750, then 1000.
4. Check your marks: is the space between your marks the same each time? If not, fix them.

Step 5 — use it (both options). Measure three things with your new instrument and record each measure with its unit. For the ruler, you might measure a pencil case, a book and a drink bottle. For the bottle, you might measure how much water a mug, a bowl and a small jug hold.

Write up your work: what you made, how you checked it, and the three measures you recorded. Your teacher may use this activity for the class practical task.

Practice questions

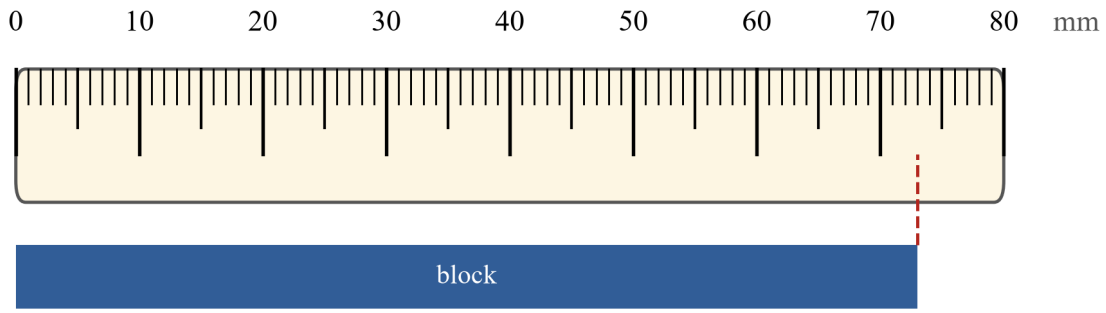
Part 1 — Length, mass and capacity: questions with help

Q1. A scaled instrument is a measuring tool with _____ that show how much is being measured.

Q2. Complete the table. The first row is done for you.

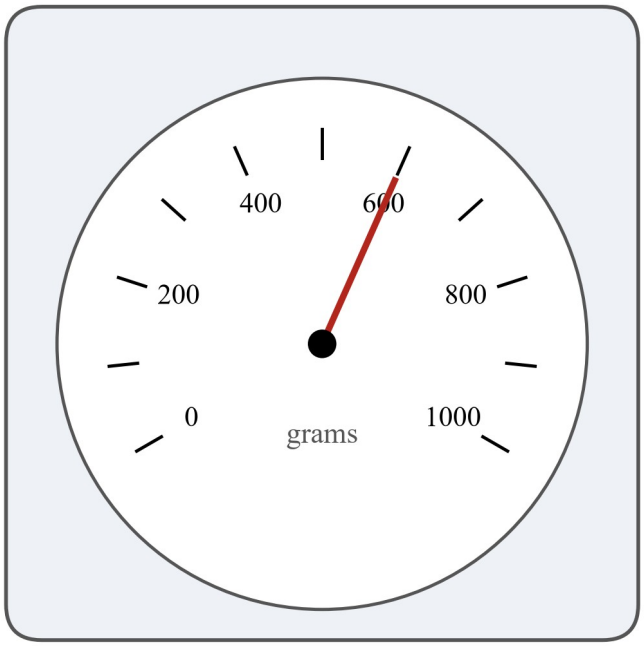
Attribute	Units
length	metres
mass	_____
capacity	_____
duration	_____
temperature	_____

Q3. Look at the ruler below. What is the length of the blue block?



A ruler marked in millimetres, with tall marks and numbers every 10 millimetres. A blue block starts at 0 and ends at 73 millimetres.

Q4. Look at the analog kitchen scale below.

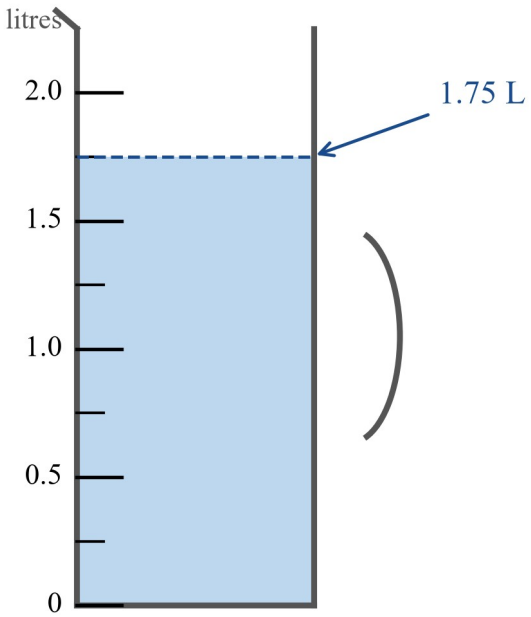


An analog kitchen scale. The dial is marked in grams, with a small mark every 100 grams and numbers at 0, 200, 400, 600, 800 and 1000. The needle points to 600 grams.

(a) What unit of mass do the small marks stand for?
(b) What is the mass shown?

Q5. Mia puts her lunchbox on a digital scale and the screen shows 640 g. What is the mass of the lunchbox?

Q6. Look at the measuring jug below. What is the capacity of the water in the jug?



A measuring jug marked in litres. Numbers are shown at 0, 0.5, 1, 1.5 and 2 litres, with a smaller mark at every 0.25 L. The water level is at 1.75 litres.

Q7. Circle the better unit for each job.

(a) the length of an ant — millimetres or metres
(b) the mass of a car — grams or kilograms

(c) the capacity of a teaspoon — millilitres or litres

Q8. Look at the coin table and the picture of the coins. Which coin has the greatest mass?

Coin	Mass
50 cent	15.55 g
$1	9.00 g
$2	6.60 g

Source: Royal Australian Mint coin data, from Wikipedia, *Coins of the Australian dollar*, retrieved 2026-08-20.

Part 1 — Length, mass and capacity: questions on your own

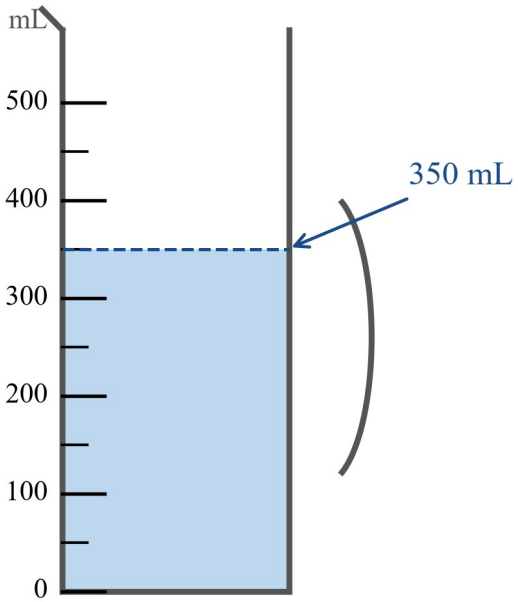
Q9. A pencil starts at 0 on a ruler marked in centimetres, with ten small marks between each centimetre. The tip of the pencil stops 4 small marks past the 5 cm mark. How long is the pencil?

Q10. On a tape measure marked in metres and quarter metres, the end of the classroom wall sits three small marks past the 7 m mark. What is the length of the wall?

Q11. On an analog kitchen scale with a small mark every 100 grams, the needle points 3 marks past 500 grams. What is the mass?

Q12. A digital scale shows the mass of a bag of oranges as 3.75 kg. Write down the mass, and say what the 75 part means.

Q13. Look at the measuring jug below. What is the capacity of the water in the jug?



A measuring jug marked in millilitres. Numbers are shown at 0, 100, 200, 300, 400 and 500 millilitres, with a mark every 50 millilitres. The water level is at 350 millilitres.

Q14. A measuring jug has marks only at 0, 0.5, 1, 1.5 and 2 litres. The water level sits halfway between 1 and 1.5. What is the capacity of the water?

Q15. Use the coin masses to order the three coins from lightest to heaviest.

Coin	Mass
50 cent	15.55 g
$1	9.00 g

Coin	Mass
$2	6.60 g

Source: Royal Australian Mint coin data, from Wikipedia, *Coins of the Australian dollar*, retrieved 2026-08-20.

Q16. Which is longer: 3.5 m or 3.25 m? By how much?

Q17. Jug A holds 1.5 L of water. Jug B holds 1.75 L of water. Which jug holds more? How much more?

Q18. Tom flies two paper planes and wants to find which one flies further.

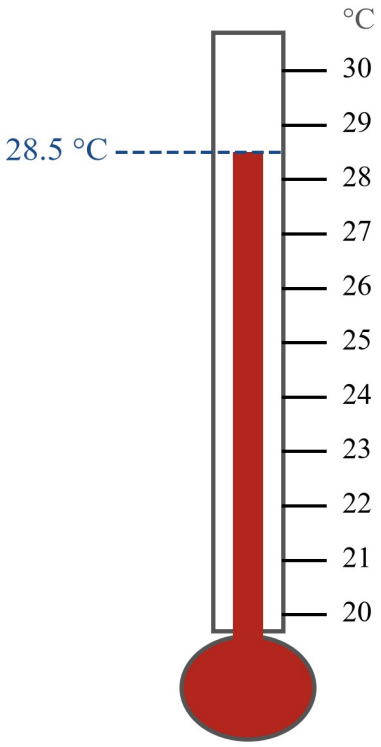
(a) What attribute will he measure?
(b) Name a unit he could use.
(c) Name an instrument he could use.

Q19. Describe how you would make your own 10-centimetre ruler from a strip of paper, using a real ruler to help you. Include how you would check it.

Q20. A kitchen scale has a small mark every 20 grams. The needle points 3 marks past 300 grams. What is the mass?

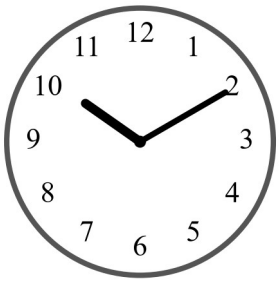
Part 2 — Duration and temperature: questions with help

Q21. Look at the thermometer below. What is the temperature?

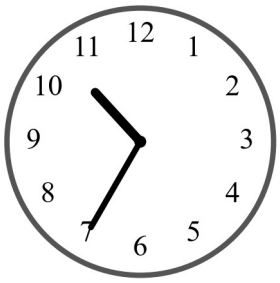


A thermometer marked in degrees Celsius from 20 to 30, with a mark at every degree. The red liquid stops halfway between 28 and 29, at 28.5 degrees.

Q22. Look at the start clock below. About what time does it show?



start



finish

Two clocks with no minute marks, only the numbers 1 to 12. The first clock shows about 10:10 and is labelled start. The second clock shows about 10:35 and is labelled finish.

Q23. Using the same two clocks, what is the duration between the start time and the finish time?

Q24. Sam sets a timer for 8 minutes at 9:15 am. At what time will the timer beep?

Part 2 — Duration and temperature: questions on your own

Q25. On a thermometer marked every 1 °C, the red liquid stops 3 marks above 20 °C. What is the temperature?

Q26. On a cold winter morning in the Victorian mountains, the red liquid in a thermometer stops halfway between −3 °C and −2 °C. What is the temperature?

Q27. A clock has no minute marks. The minute hand points just past the 6. About how many minutes past the hour is it?

Q28. Soccer training starts at 4:15 pm and finishes at 4:50 pm. How long is the training?

Q29. Ruby sets a timer for 15 minutes at 11:50 am. At what time will the timer beep?

Q30. For each job, choose the better unit and the better instrument.

(a) the length of the school oval — centimetres or metres; ruler or tape measure
(b) the mass of a strawberry — grams or kilograms; kitchen scale or measuring jug
(c) the capacity of a milk bottle — millilitres or litres; measuring jug or ruler
(d) the duration of a song — minutes or grams; clock or thermometer

Applied

Q31. Winter at Melbourne Airport. The table shows the temperatures that Melbourne Airport usually reaches on winter days.

	July	August
Usual afternoon temperature	13.4 °C	14.7 °C
Usual temperature at night	5.8 °C	6.0 °C

Source: Australian Bureau of Meteorology, *Climate statistics for Melbourne Airport*, from Wikipedia, *Melbourne*, retrieved 2026-08-20.

(a) What is the usual afternoon temperature in August?
(b) Which month usually has the colder temperature at night?
(c) How much hotter is the usual afternoon temperature in August than in July?

(d) One July morning, the temperature went down to 3.5 °C during the night. Was that colder or hotter than the usual 5.8 °C at night? By how much?

Answers

Q1. marks **Q2.** mass → grams; capacity → litres; duration → minutes; temperature → degrees Celsius. **Q3.** 73 mm. **Q4.** (a) grams — each small mark is 100 g; (b) 600 g. **Q5.** 640 g. **Q6.** 1.75 L. **Q7.** (a) millimetres; (b) kilograms; (c) millilitres. **Q8.** the 50-cent coin (15.55 g). **Q9.** 5.4 cm. **Q10.** 7.75 m. **Q11.** 800 g. **Q12.** 3.75 kg; the 75 means 75 hundredths of 1 kg. **Q13.** 350 mL. **Q14.** 1.25 L. **Q15.** $2 coin (6.60 g), $1 coin (9.00 g), 50-cent coin (15.55 g). **Q16.** 3.5 m is longer, by 0.25 m. **Q17.** Jug B, by 0.25 L. **Q18.** (a) length (the distance flown); (b) metres (or centimetres); (c) a tape measure (or a ruler). **Q19.** Answers may vary; see the worked answer below. **Q20.** 360 g. **Q21.** 28.5 °C. **Q22.** about 10:10 am. **Q23.** 25 minutes. **Q24.** 9:23 am. **Q25.** 23 °C. **Q26.** −2.5 °C. **Q27.** about 31 minutes. **Q28.** 35 minutes. **Q29.** 12:05 pm. **Q30.** (a) metres, tape measure; (b) grams, kitchen scale; (c) litres, measuring jug; (d) minutes, clock. **Q31.** (a) 14.7 °C; (b) July; (c) 1.3 °C; (d) colder, by 2.3 °C.

Worked answers

Q1. A scaled instrument is a measuring tool with **marks** that show how much is being measured. The marks form a scale.

Q2. The units are:

Attribute	Units
length	metres
mass	**grams**
capacity	**litres**
duration	**minutes**
temperature	**degrees Celsius**

Q3. The ruler is marked in millimetres, with a tall mark every 10. The block starts at 0 and ends 3 small marks past 70: 70, 71, 72, 73. The block is **73 mm** long.

Q4. (a) The numbers on the dial go 0, 200, 400, 600, 800, 1000. Between 0 and 200 there are 2 small-mark steps, so each small mark stands for 100 **grams**. (b) The needle points exactly at 600, so the mass is **600 g**.

Q5. A digital scale shows the measure as a number. The screen shows 640 g, so the mass of the lunchbox is **640 g**.

Q6. The jug is marked in litres, with a small mark at every 0.25 L. The water level is at the third small mark past 1: 1.25, 1.5, 1.75. The capacity is **1.75 L**.

Q7. (a) An ant is very small, so **millimetres** fit the job. Metres are far too big. (b) A car is very heavy, so **kilograms** fit the job. Grams are too small — it would take many thousands of them. (c) A teaspoon holds only a little, so **millilitres** fit the job. Litres are too big.

Q8. Compare the masses: 15.55 g, 9.00 g and 6.60 g. The greatest is 15.55 g, so the **50-cent coin** has the greatest mass.

Q9. Each centimetre has ten small marks, so each small mark is one-tenth of a centimetre (0.1 cm). Count on 4 small marks from 5: 5.1, 5.2, 5.3, 5.4. The pencil is **5.4 cm** long.

Q10. Each quarter metre is 0.25 m. Count on 3 small marks from 7: 7.25, 7.5, 7.75. The wall is **7.75 m** long.

Q11. Each small mark is 100 g. Count on 3 marks from 500: 600, 700, 800. The mass is **800 g**.

Q12. The mass is **3.75 kg**. The 75 stands for 75 hundredths of 1 kg — that is, three quarters of 1 kg.

Q13. The jug is marked every 50 mL. The water level is one mark past 300: 300 + 50 = 350. The capacity is **350 mL**.

Q14. Halfway between 1 and 1.5 is 1 and one quarter. The capacity is **1.25 L**. This is an unmarked unit — there is no mark at 1.25, so you have to find the halfway place yourself.

Q15. Order the masses from smallest to largest: 6.60 g, 9.00 g, 15.55 g. So the order from lightest to heaviest is: **$2 coin, $1 coin, 50-cent coin**. Notice that the biggest coin is the heaviest and the smallest coin is the lightest.

Q16. Write both measures the same way: 3.5 m is 3.50 m. Compare 3.50 and 3.25: 3.50 is more than 3.25. 3.50 − 3.25 = 0.25. So **3.5 m is longer, by 0.25 m** (one quarter of a metre).

Q17. Compare 1.5 L and 1.75 L: 1.75 is more than 1.5. 1.75 − 1.5 = 0.25. **Jug B holds more, by 0.25 L** (one quarter of 1 L).

Q18. (a) Tom wants to know which plane flies further, so he will measure **length** — the distance each plane travels. (b) A good unit is **metres** (centimetres would also work for short flights). (c) A good instrument is a **tape measure** (a ruler would work for short flights too).

Q19. One correct answer: 1. Cut a strip of paper about as long as a real ruler. 2. Line the strip up with the real ruler, mark at 0, then copy a mark at every centimetre up to 10. 3. Write the numbers 0 to 10 beside the marks. 4. Check the strip against the real ruler again: put the two together and see if every mark lines up. Fix any mark that is out of place.

The check matters — it compares your new instrument against a real one by direct comparison.

Q20. Each small mark is 20 g. Count on 3 marks from 300: 320, 340, 360. The mass is **360 g**.

Q21. The thermometer has a mark at every degree. The red liquid stops halfway between 28 and 29. Halfway means one half, so the temperature is **28.5 °C**.

Q22. On the start clock, the hour hand is just past 10, so the hour is 10. The minute hand points at the 2. Count in fives: 5, 10. The time is about **10:10 am**.

Q23. The start is about 10:10 am and the finish is about 10:35 am. Count on from 10:10: ten to 10:20, ten to 10:30, five to 10:35. That is 10 + 10 + 5 = 25. The duration is **25 minutes**.

Q24. Count on 8 minutes from 9:15 am: 9:16, 9:17, 9:18, 9:19, 9:20, 9:21, 9:22, 9:23. The timer beeps at **9:23 am**.

Q25. Count on 3 marks from 20: 21, 22, 23. The temperature is **23 °C**.

Q26. Halfway between −3 and −2 is −2.5. The temperature is **−2.5 °C**. That is colder than −2 °C and not as cold as −3 °C.

Q27. The minute hand at the 6 means 6 × 5 = 30 minutes past the hour. Just past the 6 is a little more than 30, so it is about **31 minutes** past the hour.

Q28. Count on from 4:15 pm to 4:50 pm: ten to 4:25, ten to 4:35, ten to 4:45, five to 4:50. That is 10 + 10 + 10 + 5 = 35. The training is **35 minutes** long.

Q29. Count on 15 minutes from 11:50 am: ten to 12:00 pm, then five more to 12:05 pm. The timer beeps at **12:05 pm**.

Q30. (a) A school oval is long, so **metres** fit the job, and a **tape measure** is the instrument for measuring metres over a long distance. (b) A strawberry is light, so **grams** fit the job, and a **kitchen scale** measures mass. (c) A milk bottle holds more than a litre, so **litres** fit the job, and a **measuring jug** measures capacity. (d) A song lasts a few minutes, so **minutes** fit the job, and a **clock** (or timer) measures duration.

Q31. (a) Read the table: the usual afternoon temperature in August is **14.7 °C**. (b) Compare the night row: 5.8 °C in July and 6.0 °C in August. 5.8 is less than 6.0, so **July** usually has the colder temperature at night. (c) 14.7 − 13.4 = 1.3. The usual afternoon temperature in August is hotter than in July by **1.3 °C**. (d) 3.5 °C is less than 5.8 °C, so that morning was **colder** than usual. 5.8 − 3.5 = 2.3. It was colder by **2.3 °C**.

Perimeter and area with formal and informal units

Code VC2M4M02 (Victorian Curriculum F–10 Version 2.0, Mathematics, Level 4; authority file `maths_4.json`): "recognise ways of measuring and approximating the perimeter and area of shapes and enclosed spaces, using appropriate formal and informal units". This section draws on `VC2M4M02.E01`, `.E02`, `.E03` and `.E04`. `.E05` is not covered in this book; see the note at the front of the book about Aboriginal and Torres Strait Islander content.

What you need to know

In Year 3 you measured length using metres and centimetres, and you added numbers with two or three digits. This section builds on both ideas. You will measure two new things about shapes: the distance **around** a shape, and the space **inside** a shape.

The boundary. The **boundary** of a shape is its edge — the line that goes around the outside of the shape. A rectangle has a boundary made of four straight sides. A leaf shape has a boundary that curves.

Perimeter. The **perimeter** is the total length around the boundary of a shape or an enclosed space. Perimeter is a length, so it is measured in length units such as centimetres and metres.

Area. The **area** is the space enclosed by the boundary of a shape, or the size of the surface of an object. Area is measured by covering the space with equal squares. The count of squares is the area, written in **square units**.

Formal and informal units. A **formal unit** is a unit everyone agrees on, like the metre, the centimetre and the square centimetre. An **informal unit** is an everyday object used as a unit, like a button, a straw, a counter or a paper tile. Both kinds of unit are used in this section.

How do you know which one you are measuring? Ask what the job is.

The job	You are measuring
Walking around the edge of the school yard	perimeter
Covering a book cover with paper tiles	area
Finding the length of fence around a paddock	perimeter
Finding how many tiles cover a floor	area

A paddock is a fenced field on a farm.

Part (i) — Perimeter

Adding the side lengths

The perimeter is the sum of the side lengths. The **sum** is the answer you get when you add numbers.

A triangle has side lengths 3 cm, 4 cm and 5 cm.

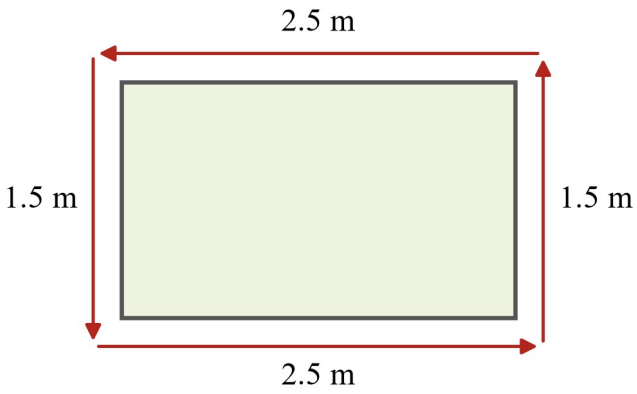
3 + 4 + 5 = 12, so the perimeter is **12 cm**.

A rectangle has two long sides that are the same length and two short sides that are the same length. A rectangle with long sides of 6 cm and short sides of 4 cm has perimeter:

6 + 4 + 6 + 4 = **20 cm**.

A square has four sides that are all the same length. A square with sides of 5 cm has perimeter:

5 + 5 + 5 + 5 = **20 cm**.

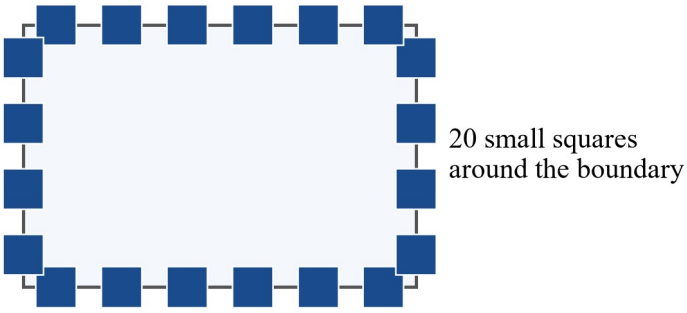


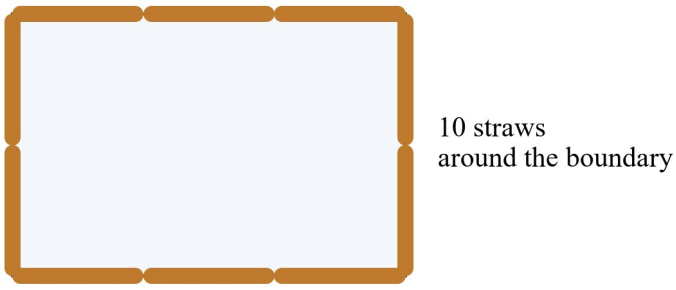
A rectangular garden bed. The top and bottom sides are labelled 2.5 metres and the other two sides are labelled 1.5 metres. An arrow shows the direction around the boundary.

The garden bed above is a rectangle. Its long sides are 2.5 m and its short sides are 1.5 m. To find the distance around the bed, add the four sides. Metres are a good unit here because the bed is quite long.

Choosing units that fit

You can measure a perimeter with formal units or with informal units. Choosing a unit that fits the job matters.





The same rectangle measured two ways. On top, small squares sit edge to edge along the boundary and there are 20 of them. Below, straws lie end to end along the boundary and there are 10 of them.

The rectangle above is measured two ways. Small squares are laid edge to edge along the boundary. There are **20** squares around it. Then straws are laid end to end along the same boundary. Each straw is as long as 2 squares, and there are **10** straws.

Both counts measure the same perimeter. The short unit gives a large count, and the long unit gives a small count.

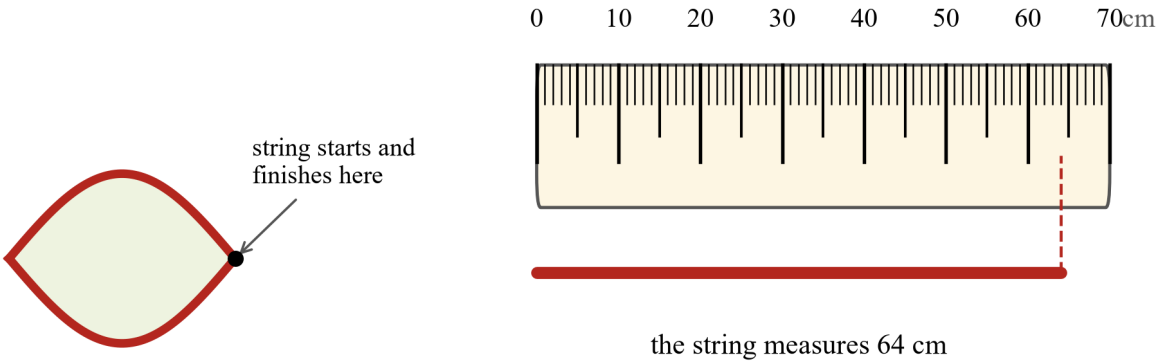
Which unit was the suitable choice? Think about the job:

- A unit that is too short means a very long count, which is slow and easy to get wrong.
- A unit that is too long may not fit around the shape.
- A good unit fits the shape and gives a count you can manage.

For the boundary of a classroom desk, straws or paper strips work well. For the boundary of the school oval, use metres and a tape measure.

Curved boundaries: use a string

Some boundaries have curved parts. A ruler is straight, so it cannot follow a curve. A piece of string can.



Two panels. On the left, a piece of string follows the curved boundary of a leaf shape. On the right, the same string is straightened under a ruler and its length is 64 centimetres.

To find the perimeter of a shape with a curved boundary:

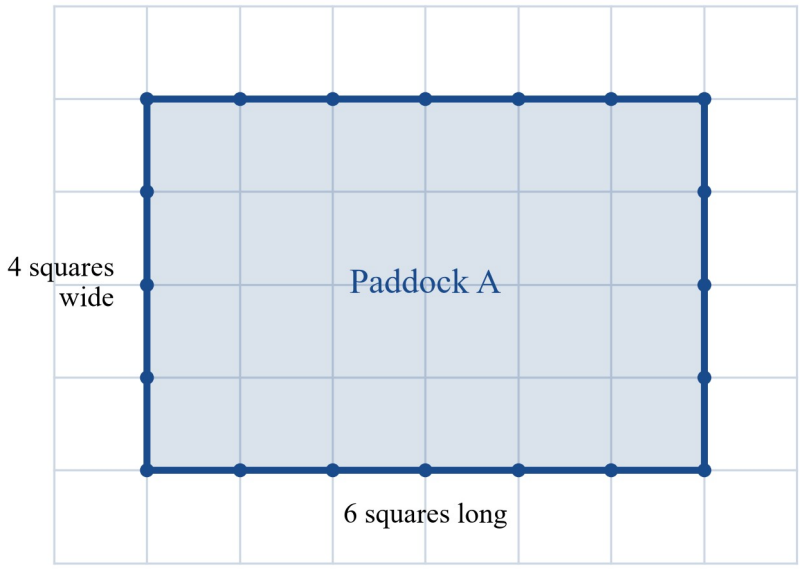
1. Lay a piece of string along the boundary, all the way around the shape.
2. Mark the spot on the string where it meets the start.
3. Straighten the string and measure it with a ruler or a tape measure.

The length of the string is the perimeter. The leaf shape above has a perimeter of about **64 cm**.

You can use a rope the same way for large enclosed spaces with curved edges, like a garden bed with rounded corners.

Perimeters on grid paper

On grid paper, each side of a small square is the same length. You can use the sides of the squares as your unit.



Grid paper with a rectangle that is 6 squares long and 4 squares wide. The boundary of the rectangle is drawn as a thick fence line. The rectangle is labelled Paddock A.

The paddock above is drawn on grid paper. It is 6 squares long and 4 squares wide. The fence runs along the boundary.

One way to find the perimeter is to count the square sides along the boundary, one by one. That works, but there is a faster way. Add the side lengths instead:

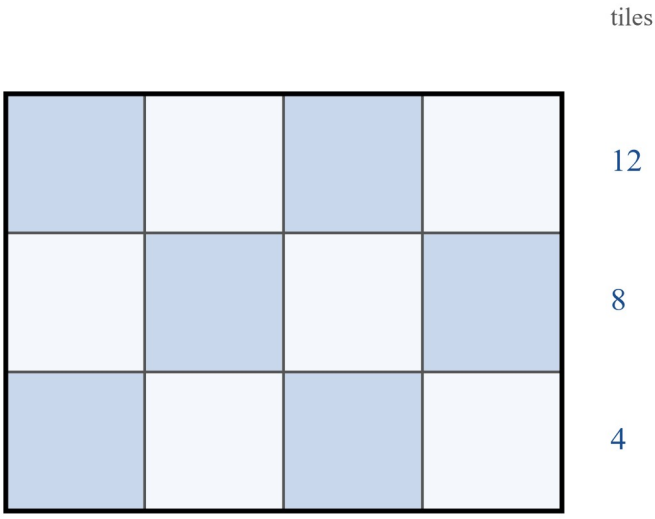
6 + 4 + 6 + 4 = **20 units**.

Adding the side lengths is more **efficient** — it means doing the same job in less time or with less work. On grid paper you can read the side lengths from the grid, so you do not need to count every side one by one.

Part (ii) — Area

Covering the space with tiles

The area of a shape is the space inside its boundary. To measure area, cover the space with equal squares and count them.



A rectangle covered by an array of square tiles. There are 3 rows of 4 tiles, making 12 tiles in total.

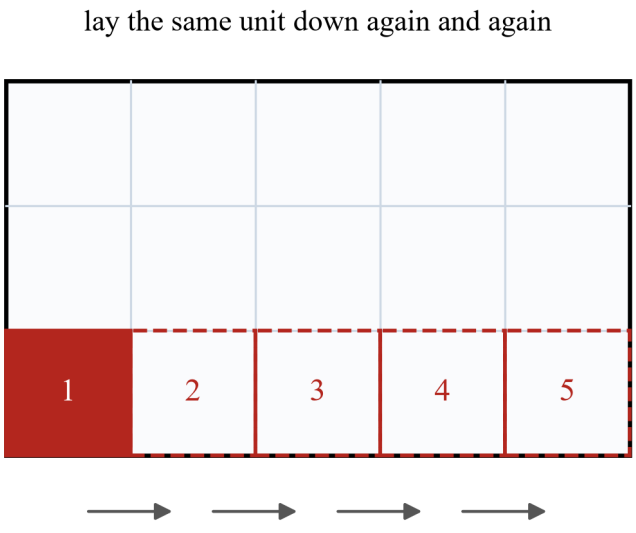
The rectangle above is covered with square paper tiles. The tiles are in an array: 3 rows of 4. Count the tiles: 4, 8, 12. The rectangle is covered by **12 tiles**, so its area is **12 square units**.

Paper tiles and mosaic squares are good informal units for area. Mosaic squares are small square tiles, like the pieces that make a mosaic picture.

A **square centimetre** is a square with sides of 1 cm. It is written **cm²**. Square centimetres are a formal unit for area. Grid paper is ruled into small squares, so it is a handy way to count area.

Using one unit again and again

You do not need a pile of tiles to measure area. You can use **one** square unit and move it into place again and again.



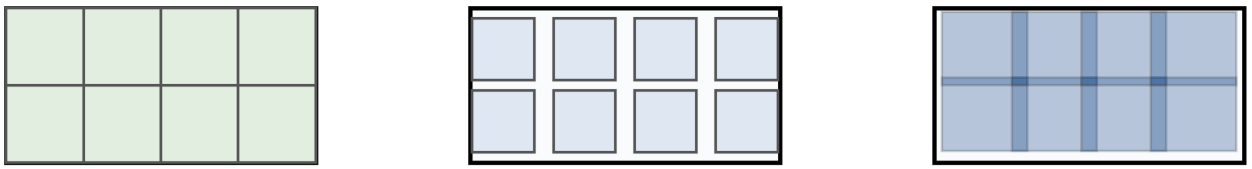
A rectangle 5 squares long and 3 squares wide. One red square unit is shown moving along the bottom row, with dashed outlines at the places it moves to and arrows between them.

The picture above shows the idea. One red square unit is placed in the bottom-left corner. It is moved along the row, and each new place is counted: 1, 2, 3, 4, 5. Then it moves up to the next row and the count goes on. When every place in the shape has been counted, the count is the area.

This works because the same unit is used every time. The unit never changes, so the count is fair.

No gaps, no overlaps

When you tile a shape, the tiles must fit snugly. There must be no gaps and no overlaps.



(a) no gaps, no overlaps ✔

(b) gaps between the tiles ✘

(c) tiles overlap ✘

Three ways of laying tiles in the same rectangle. The first has no gaps and no overlaps and is marked correct. The second has gaps between the tiles and is marked wrong. The third has tiles that overlap and is marked wrong.

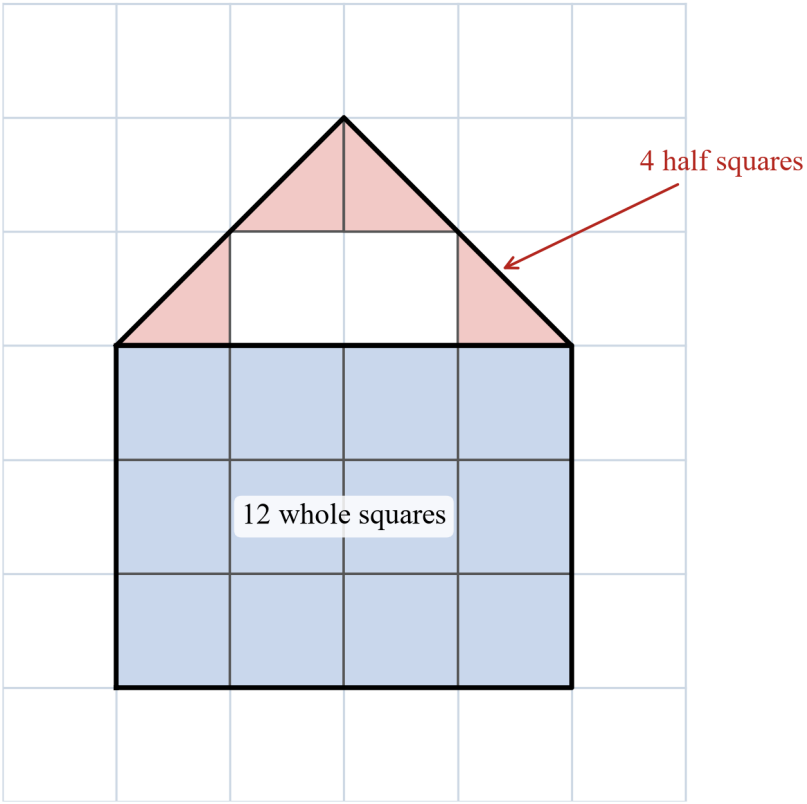
Why does this matter?

- A **gap** leaves some of the space uncovered. The count misses that space, so the area comes out too small.
- An **overlap** covers some of the space twice. The count counts that space twice, so the area comes out too big.

Tiles with no gaps and no overlaps cover the shape exactly once. That is what makes the count a true measure of the area.

Part units at the edge

Sometimes a whole tile does not fit at the edge of a shape. Then you use **part units**.



A house shape on grid paper. The body of the house covers 12 whole squares and the roof is made of 4 half squares shaded a different colour.

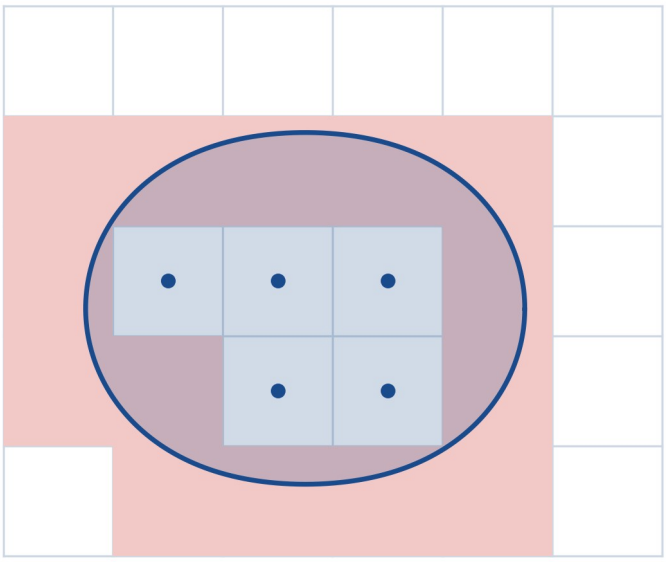
The house shape above is drawn on grid paper. Each square is 1 square unit.

- Count the whole squares inside the shape: **12**.
- Count the part squares at the edge. The roof is made of **4 half squares**.
- Combine the halves to make whole units: 2 halves make 1 whole, so 4 halves make **2 whole units**.

12 + 2 = **14**. The area of the house shape is **14 square units**.

Finding an area that is close

Shapes with curved boundaries do not line up with the grid. You can still find an area that is close to the true one. To **approximate** means to find a number that is close to the right amount.



5 whole squares and 14 half squares

An irregular shape with a curved boundary drawn on grid paper. Whole squares inside the shape are marked with a dot and the squares at the edge are shaded to show they are about half inside.

For the shape above:

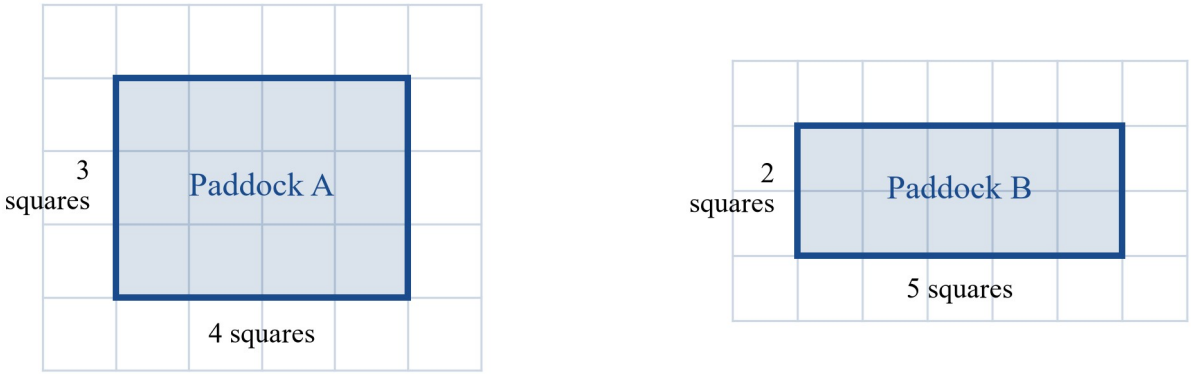
1. Count the whole squares inside the shape. There are **5**.
2. Look at the squares at the edge. Each one is about half inside the shape. Count them as half squares. There are **14** of them.
3. Combine the halves: 2 halves make 1 whole, so 14 halves make **7 whole units**.

5 + 7 = **12**. The area is about **12 square units**.

The answer is not exact, because the edge squares are not exactly halves. It is a good approximation.

Same perimeter, different area

Perimeter and area measure different things. Two shapes can have the same perimeter but different areas.

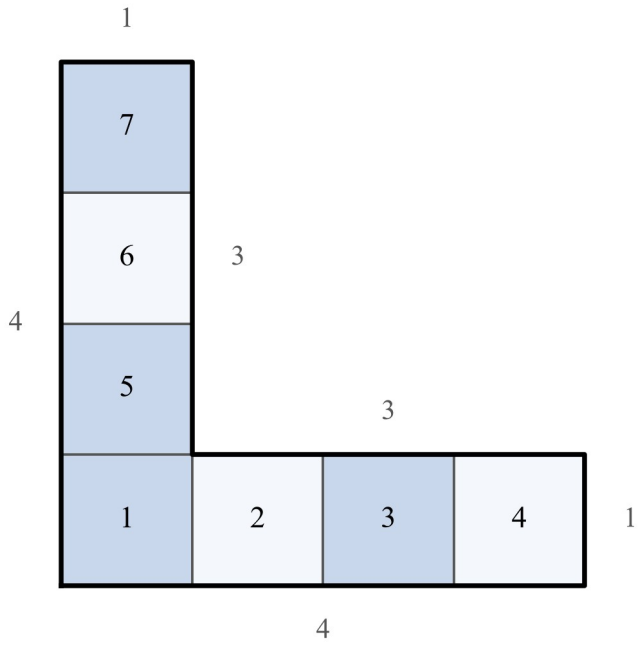


Two paddocks on grid paper. Paddock A is 4 squares by 3 squares. Paddock B is 5 squares by 2 squares.

Paddock A is 4 squares by 3 squares. Its perimeter is 4 + 3 + 4 + 3 = **14 units**, and its area is **12 squares**.

Paddock B is 5 squares by 2 squares. Its perimeter is 5 + 2 + 5 + 2 = **14 units**, and its area is **10 squares**.

Both paddocks have the same perimeter, but paddock A has the greater area. You cannot tell the area of a shape from its perimeter alone.



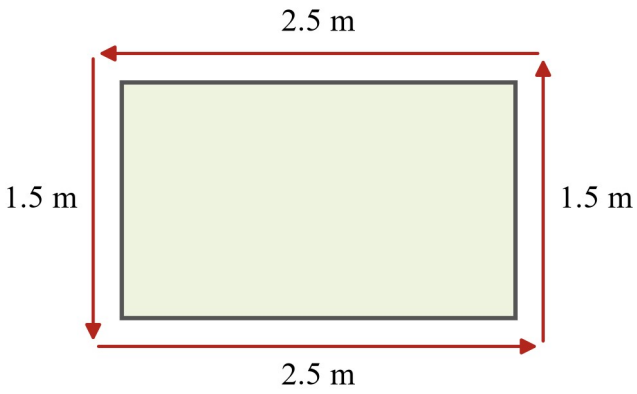
An L-shape on grid paper made of 7 squares.

The L-shape above is made of **7 squares**, so its area is **7 square units**. Its perimeter is 16 units. Check it by adding the side lengths.

Worked examples

Example 1 — step by step: the distance around the garden bed

Ava measures the rectangular garden bed in the school garden. The long sides are 2.5 m and the short sides are 1.5 m, like the bed below.



A rectangular garden bed. The top and bottom sides are labelled 2.5 metres and the other two sides are labelled 1.5 metres. An arrow shows the direction around the boundary.

What is the perimeter of the garden bed?

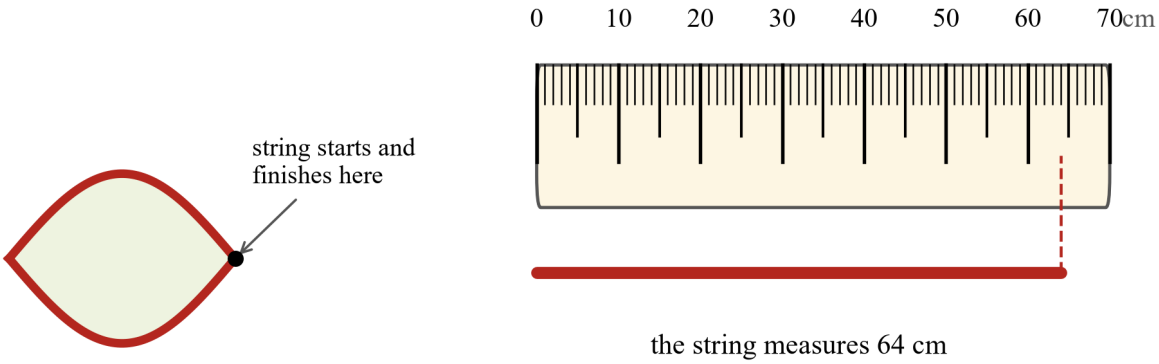
Working	Comment
The garden bed is a rectangle.	A rectangle has two long sides that are the same length and two short sides that are the same length.
The four sides are 2.5 m, 1.5 m, 2.5 m and 1.5 m.	Ava only needed to measure two sides. The other two sides are the same length.
2.5 + 1.5 + 2.5 + 1.5 = 8	Add the four side lengths.

The perimeter of the garden bed is **8 m**.

Ava used metres, a formal unit, because the bed is long. She could have used a tape measure to check each side.

Example 2 — step by step: string around a leaf shape

Leo's class cuts a large leaf shape from cardboard. The boundary curves, so a ruler cannot follow it. They use a piece of string, like the one below.



Two panels. On the left, a piece of string follows the curved boundary of a leaf shape. On the right, the same string is straightened under a ruler and its length is 64 centimetres.

What is the perimeter of the leaf shape?

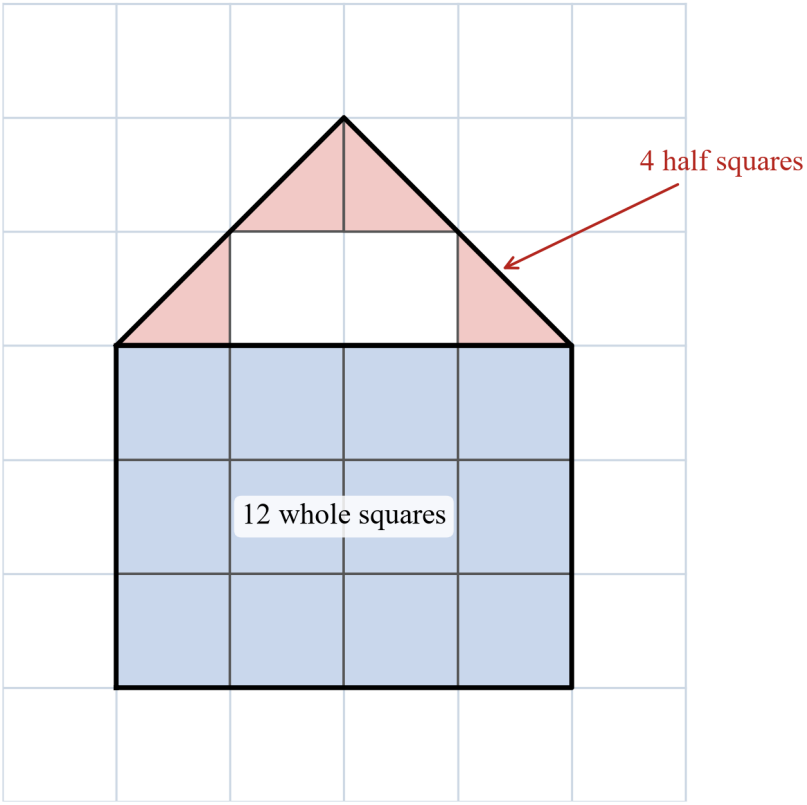
Working	Comment
Lay the string along the boundary, all the way around the leaf.	The string bends, so it can follow the curve.
Mark the string where it meets the start.	The marked piece of string is as long as the boundary.
Straighten the string and measure it with a ruler.	The string measures 64 cm.

The perimeter of the leaf shape is about **64 cm**.

The string works because it keeps the same length when it is straightened. The length of the string is the distance around the shape.

Example 3 — step by step: the area of the house shape

Zoe draws a house shape on grid paper. Each square of the grid is 1 square unit. The shape is shown below.



A house shape on grid paper. The body of the house covers 12 whole squares and the roof is made of 4 half squares shaded a different colour.

What is the area of the house shape?

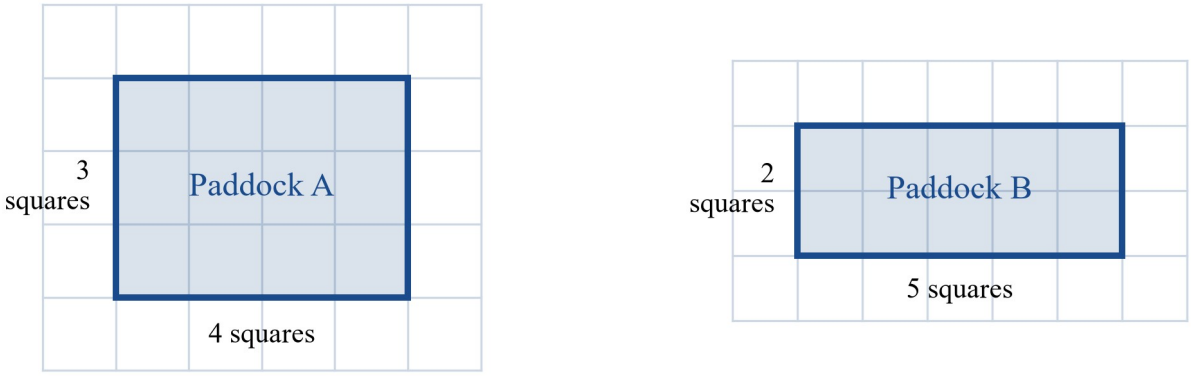
Working	Comment
Count the whole squares: 12.	The body of the house covers 12 whole squares.
Count the part squares: 4 half squares.	The roof is made of 4 halves. There are no gaps and no overlaps.
Combine the halves: 4 halves = 2 wholes.	2 halves make 1 whole, so 4 halves make 2 wholes.
12 + 2 = 14	Add the whole squares and the combined halves.

The area of the house shape is **14 square units**.

Zoe used the grid squares as her unit. Each square is the same size, so the count is fair.

Example 4 — step by step: two paddocks, one fence length

Sam draws two paddocks on grid paper, like the ones below. He wants to know about the fence around each paddock and the space inside each one.



Two paddocks on grid paper. Paddock A is 4 squares by 3 squares. Paddock B is 5 squares by 2 squares.

Find the perimeter and the area of each paddock. Which paddock has the greater area?

Working	Comment
Paddock A: sides 4, 3, 4, 3.	Paddock A is 4 squares by 3 squares.
Perimeter of A: 4 + 3 + 4 + 3 = 14 units.	Add the side lengths.
Area of A: count the squares — 12 squares.	Cover the space and count.
Paddock B: sides 5, 2, 5, 2.	Paddock B is 5 squares by 2 squares.
Perimeter of B: 5 + 2 + 5 + 2 = 14 units.	Add the side lengths.
Area of B: count the squares — 10 squares.	Cover the space and count.

Both paddocks have a perimeter of **14 units**, but paddock A has an area of **12 squares** and paddock B has an area of **10 squares**. **Paddock A has the greater area.**

The fence length is the same for both paddocks. The space inside is not. Perimeter and area are different measures.

Investigation activity — string, sides and tiles

Now measure some perimeters and areas yourself. You will need:

- a piece of string, about as long as your arm
- a ruler or a tape measure
- grid paper
- small paper squares (tiles), cut from paper
- scissors

Part A — perimeters.

1. Choose three objects: one with straight sides (a book or a desk), one with a curved edge (a lid or a plate), and one more of your own choice.
2. For each object, first predict the perimeter. Write your guess down.
3. Measure the perimeter. Use side lengths and a ruler for straight sides. Use string for curved edges: lay the string around the object, mark it, straighten it and measure it.
4. Record your work in a table with three columns: object, guess, measure.

Part B — areas.

1. Draw two shapes on grid paper. Make one shape with only straight sides, and one shape with a curved boundary.
2. Cover each shape with paper squares. Where a whole square does not fit at the edge, cut a square in half and use the half.
3. Count the whole squares, then combine the halves to make whole units. Record the area of each shape in square units.
4. Did your tiles fit with no gaps and no overlaps? If not, fix them and count again.

Write up your work: what you measured, the units you used, and the measures you recorded. Your teacher may use this activity for the class practical task.

Practice questions

Questions with help

Q1. The perimeter of a shape is the total length around its _____.

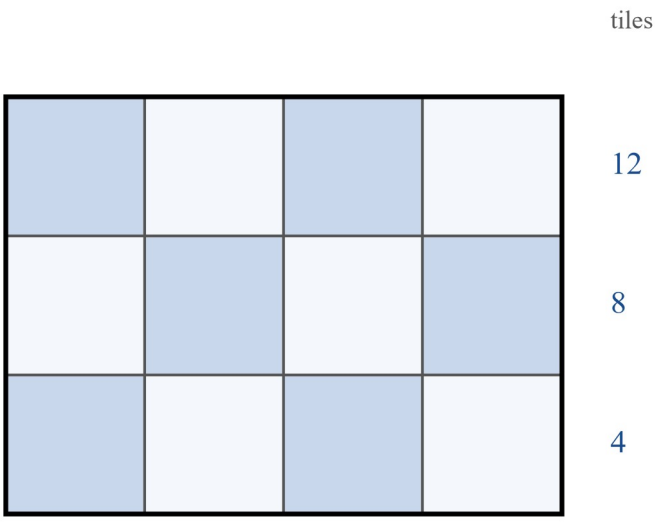
Q2. The area of a shape is the _____ enclosed by the boundary of the shape.

Q3. Complete the table. The first row is done for you.

The job	You are measuring
walking around the edge of the school yard	perimeter
covering a book cover with paper tiles	_____
finding the length of fence around a paddock	_____
finding how many tiles cover a floor	_____

Q4. A rectangle has long sides of 8 cm and short sides of 3 cm. Add the four side lengths to find the perimeter.

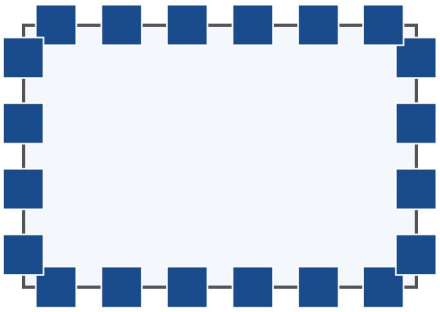
Q5. Look at the tiles below. How many tiles cover the rectangle? What is the area in square units?



A rectangle covered by an array of square tiles. There are 3 rows of 4 tiles, making 12 tiles in total.

Q6. A square has sides of 6 m. What is the perimeter of the square?

Q7. Look at the rectangle measured two ways below.



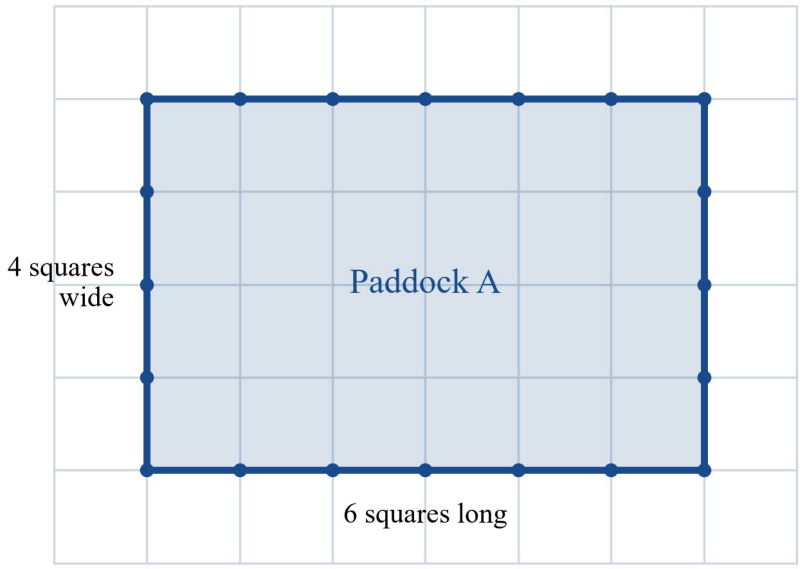
20 small squares
around the boundary

10 straws
around the boundary

The same rectangle measured two ways. On top, small squares sit edge to edge along the boundary and there are 20 of them. Below, straws lie end to end along the boundary and there are 10 of them.

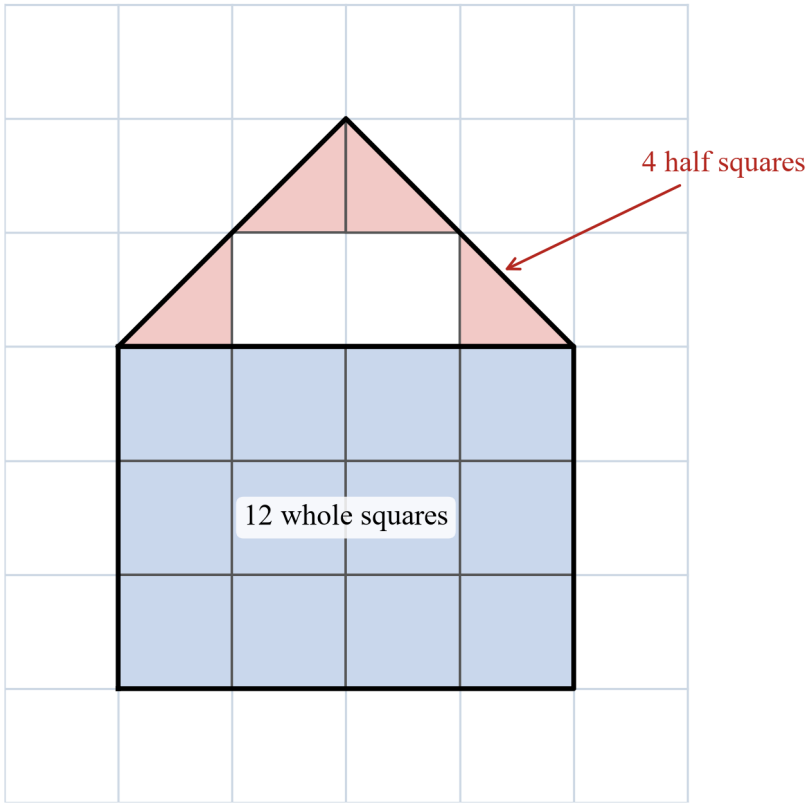
(a) How many small squares are there along the boundary?
(b) How many straws are there along the boundary?
(c) Which unit is longer, the square or the straw?

Q8. Look at the paddock on grid paper below. It is 6 squares long and 4 squares wide. Add the side lengths to find the perimeter.



Grid paper with a rectangle that is 6 squares long and 4 squares wide. The boundary of the rectangle is drawn as a thick fence line. The rectangle is labelled Paddock A.

Q9. Look at the house shape on grid paper below.



A house shape on grid paper. The body of the house covers 12 whole squares and the roof is made of 4 half squares shaded a different colour.

(a) How many whole squares are inside the shape?

(b) How many half squares are at the edge?

Q10. Four half squares can be combined to make whole units. How many whole units do 4 halves make?

Q11. Name two informal units you could use to measure the perimeter of a shape.

Q12. When you tile a shape to find its area, why must there be no gaps and no overlaps?

Questions on your own

Q13. A rectangle has long sides of 9 cm and short sides of 3 cm. What is the perimeter of the rectangle?

Q14. A square has sides of 7 m. What is the perimeter of the square?

Q15. A triangle has side lengths 5 cm, 5 cm and 6 cm. What is the perimeter of the triangle?

Q16. A five-sided shape has side lengths 2 m, 3 m, 4 m, 5 m and 6 m. What is the perimeter of the shape?

Q17. A paddock drawn on grid paper is 7 squares long and 3 squares wide. What is the perimeter of the paddock, in units?

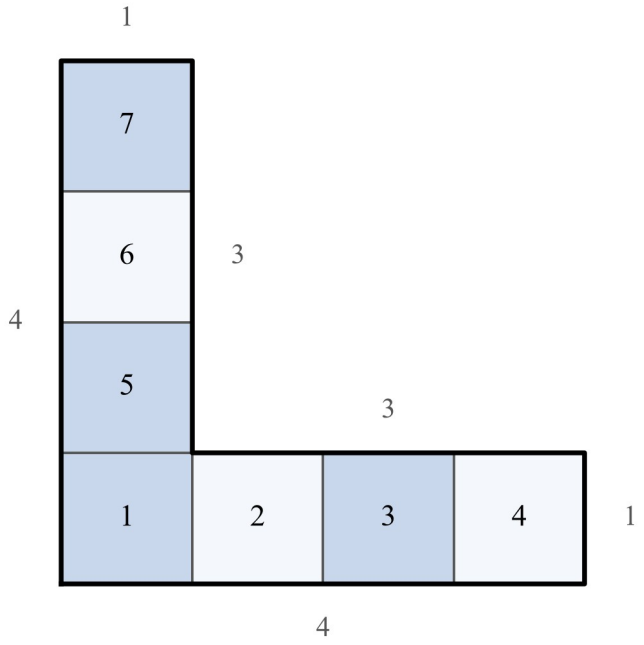
Q18. A shape with 6 sides has sides that are all 4 cm long. What is the perimeter of the shape?

Q19. Mia wraps a piece of string around a cardboard shape with a curved boundary. She marks the string where it meets the start, straightens it and measures it. The string is 38 cm long. What is the perimeter of the shape?

Q20. Why is a piece of string useful for measuring the perimeter of a shape with curved parts?

Q21. Rectangle A is 6 m long and 2 m wide. Square B has sides of 4 m. Find the perimeter of each shape. Are they the same, or is one longer?

Q22. Look at the L-shape on grid paper below. What is the area of the shape in square units?



An L-shape on grid paper made of 7 squares.

Q23. A rectangle is covered with paper tiles in 5 rows of 6. How many tiles cover the rectangle? What is the area in square units?

Q24. A shape on grid paper covers 9 whole squares and 2 half squares. What is the area of the shape in square units?

Q25. A shape on grid paper covers 5 whole squares and 6 half squares. What is the area of the shape in square units?

Q26. Shape A covers 8 squares. Shape B covers 10 squares. Which shape has the greater area? How many more squares does it cover?

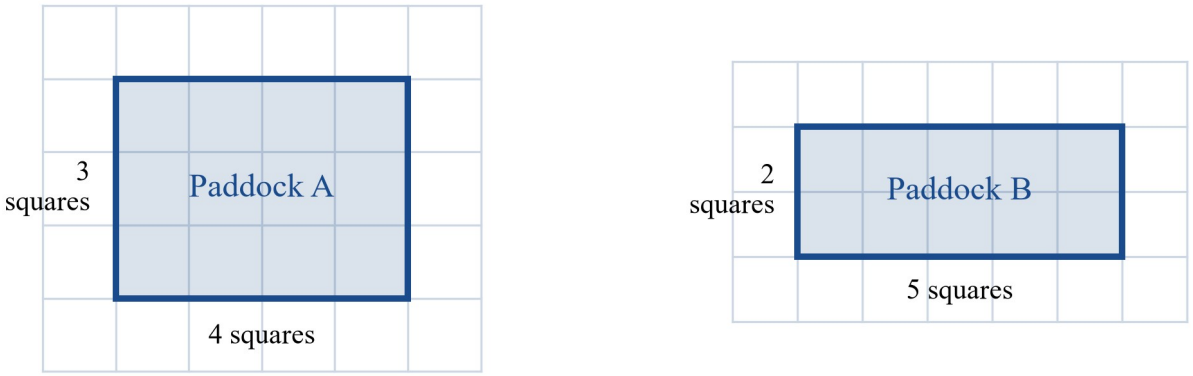
Q27. On grid paper, draw two different rectangles that each have a perimeter of 12 units. Write the side lengths of each rectangle.

Q28. A square has a perimeter of 20 cm. The four sides are the same length. What is the length of one side?

Q29. For each job, choose the better unit and the better tool.

(a) the perimeter of the school oval — centimetres or metres; ruler or tape measure
(b) the area of a book cover — paper tiles or straws
(c) the perimeter of a leaf cut from cardboard — string and ruler, or metre stick only

Q30. Ben says: "A shape with a longer perimeter always has a greater area." Look at the two paddocks below. Is Ben right? Explain your answer.



Two paddocks on grid paper. Paddock A is 4 squares by 3 squares. Paddock B is 5 squares by 2 squares.

Applied

Q31. Netball is played on a rectangular court. The court is 30.5 m long and 15.25 m wide.

Source: World Netball, *Rules of Netball*, worldnetball.org, retrieved 2026-08-20.

(a) Find the perimeter of the netball court.
(b) A rectangle has two long sides that are the same length and two short sides that are the same length. Write the lengths of the four sides of the court.
(c) Mia runs around the outside of the court twice. How far does she run?
(d) A tennis court is a rectangle 23.77 m long and 10.97 m wide. Find the perimeter of the tennis court. How much longer is the perimeter of the netball court than the perimeter of the tennis court?

Source: International Tennis Federation, *Rules of Tennis*, itftennis.com, retrieved 2026-08-20.

Answers

Q1. boundary **Q2.** space **Q3.** area; perimeter; area. **Q4.** 22 cm. **Q5.** 12 tiles; the area is 12 square units. **Q6.** 24 m. **Q7.** (a) 20 squares; (b) 10 straws; (c) the straw. **Q8.** 20 units. **Q9.** (a) 12 whole squares; (b) 4 half squares. **Q10.** 2 whole units. **Q11.** Any two of: buttons, straws, paperclips, paper strips, counters laid along the edge. **Q12.** A gap leaves space uncovered, so the count is too small. An overlap counts some space twice, so the count is too big. **Q13.** 24 cm. **Q14.** 28 m. **Q15.** 16 cm. **Q16.** 20 m. **Q17.** 20 units. **Q18.** 24 cm. **Q19.** About 38 cm. **Q20.** The string can bend to follow the curve; a ruler is straight and cannot. **Q21.** Rectangle A: 16 m. Square B: 16 m. They are the same. **Q22.** 7 square units. **Q23.** 30 tiles; the area is 30 square units. **Q24.** 10 square units. **Q25.** 8 square units. **Q26.** Shape B, by 2 squares. **Q27.** For example, 5 units by 1 unit, and 4 units by 2 units. **Q28.** 5 cm. **Q29.** (a) metres, tape measure; (b) paper tiles; (c) string and ruler. **Q30.** No. Both paddocks have a perimeter of 14 units, but paddock A has an area of 12 squares and paddock B has an area of 10 squares. The same perimeter can go with different areas. **Q31.** (a) 91.5 m; (b) 30.5 m, 15.25 m, 30.5 m, 15.25 m; (c) 183 m; (d) 69.48 m; the netball court's perimeter is 22.02 m longer.

Worked solutions

Q1. The perimeter of a shape is the total length around its **boundary**. The boundary is the edge that goes around the outside of the shape.

Q2. The area of a shape is the **space** enclosed by the boundary of the shape.

Q3. Covering a surface with tiles measures area. The length of a fence around a paddock measures perimeter. The number of tiles that cover a floor measures area.

The job	You are measuring
walking around the edge of the school yard	perimeter
covering a book cover with paper tiles	**area**
finding the length of fence around a paddock	**perimeter**
finding how many tiles cover a floor	**area**

Q4. The four sides are 8 cm, 3 cm, 8 cm and 3 cm. 8 + 3 + 8 + 3 = 22. The perimeter is **22 cm**.

Q5. The tiles are in 3 rows of 4. Count them: 4, 8, 12. There are **12 tiles**, so the area is **12 square units**.

Q6. A square has four sides that are the same length. 6 + 6 + 6 + 6 = 24. The perimeter is **24 m**.

Q7. (a) Count the small squares along the boundary: there are **20**. (b) Count the straws along the boundary: there are **10**. (c) Each straw is as long as 2 squares, so **the straw is longer**. The longer unit gives the smaller count.

Q8. The paddock is 6 squares long and 4 squares wide. The four sides are 6, 4, 6 and 4. 6 + 4 + 6 + 4 = 20. The perimeter is **20 units**.

Q9. (a) Count the whole squares inside the shape: **12**. (b) Count the half squares at the edge of the shape: **4**.

Q10. Two halves make one whole. So 4 halves make **2 whole units**.

Q11. Informal units are everyday objects used as units. Two that work for perimeter are **buttons** and **straws** (paperclips or strips of paper also work). They are laid end to end along the boundary and counted.

Q12. A gap leaves some of the space uncovered, so the count misses that space and the area comes out too small. An overlap covers some space twice, so the count counts that space twice and the area comes out too big. With no gaps and no overlaps, the tiles cover the shape exactly once.

Q13. The four sides are 9 cm, 3 cm, 9 cm and 3 cm. 9 + 3 + 9 + 3 = 24. The perimeter is **24 cm**.

Q14. 7 + 7 + 7 + 7 = 28. The perimeter is **28 m**.

Q15. Add the three sides: 5 + 5 + 6 = 16. The perimeter is **16 cm**.

Q16. Add the five sides: 2 + 3 + 4 + 5 + 6 = 20. The perimeter is **20 m**.

Q17. The four sides are 7, 3, 7 and 3. 7 + 3 + 7 + 3 = 20. The perimeter is **20 units**.

Q18. The shape has 6 sides, and each side is 4 cm. 4 + 4 + 4 + 4 + 4 + 4 = 24. The perimeter is **24 cm**.

Q19. The string followed the boundary, so the length of the string is the distance around the shape. The perimeter is about **38 cm**.

Q20. A piece of string can **bend**, so it can follow a curved boundary all the way around the shape. A ruler is straight, so it cannot follow a curve. After the string goes around the shape, it is straightened and measured.

Q21. Rectangle A: the four sides are 6 m, 2 m, 6 m and 2 m. 6 + 2 + 6 + 2 = 16. The perimeter is **16 m**. Square B: 4 + 4 + 4 + 4 = 16. The perimeter is **16 m**. The two perimeters are **the same**.

Q22. Count the squares that make the L-shape: 4 in the long part and 3 in the short part. 4 + 3 = 7. The area is **7 square units**.

Q23. There are 5 rows of 6 tiles. 5 × 6 = 30. There are **30 tiles**, so the area is **30 square units**.

Q24. Two halves make one whole, so 2 half squares make 1 whole unit. 9 + 1 = 10. The area is **10 square units**.

Q25. Six halves make 3 whole units. 5 + 3 = 8. The area is **8 square units**.

Q26. 10 is more than 8, so **shape B** has the greater area. 10 − 8 = 2. Shape B covers **2 more squares** than shape A.

Q27. The perimeter is 12 units, so the four sides must add to 12. Two rectangles that work:

- 5 units by 1 unit: 5 + 1 + 5 + 1 = 12.
- 4 units by 2 units: 4 + 2 + 4 + 2 = 12.

A square of 3 units by 3 units also works: 3 + 3 + 3 + 3 = 12.

Q28. The four sides of a square are the same length, and they add to 20 cm. Share 20 between 4 sides: 20 ÷ 4 = 5. One side is **5 cm**. Check: 5 + 5 + 5 + 5 = 20.

Q29. (a) The school oval is long, so **metres** fit the job, and a **tape measure** measures around it. (b) **Paper tiles** cover a surface, so they measure area. Straws measure along a line, so they suit perimeter, not area. (c) The leaf has a curved boundary, so **string and a ruler** fit the job. The string follows the curve, then it is straightened and measured. A metre stick is straight and cannot follow the curve.

Q30. Ben is **not right**. Paddock A and paddock B both have a perimeter of 14 units, but paddock A has an area of 12 squares and paddock B has an area of 10 squares. Two shapes can have the same perimeter and different areas. Perimeter and area measure different things, so you cannot tell the area from the perimeter alone.

Q31. (a) The four sides are 30.5 m, 15.25 m, 30.5 m and 15.25 m. 30.5 + 15.25 + 30.5 + 15.25 = 91.5. The perimeter of the netball court is **91.5 m**. (b) A rectangle has two long sides that are the same length and two short sides that are the same length. The four sides are **30.5 m, 15.25 m, 30.5 m and 15.25 m**. (c) One trip around the court is 91.5 m. Two trips: 91.5 + 91.5 = 183. Mia runs **183 m**. (d) The four sides of the tennis court are 23.77 m, 10.97 m, 23.77 m and 10.97 m. 23.77 + 10.97 + 23.77 + 10.97 = 69.48. The perimeter of the tennis court is **69.48 m**. Compare the two perimeters: 91.5 − 69.48 = 22.02. The netball court's perimeter is **22.02 m longer**.

Duration, am and pm, and converting between units of time

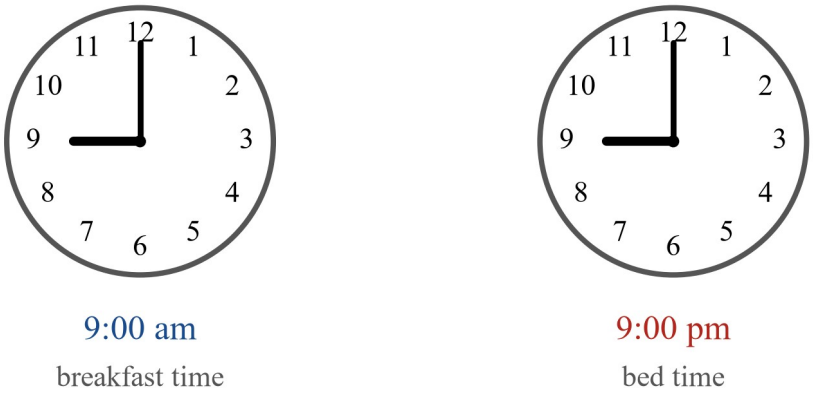
Code VC2M4M03 (Victorian Curriculum F–10 Version 2.0, Mathematics, Level 4; authority file `maths_4.json`): "solve problems involving the duration of time including situations involving 'am' and 'pm' and conversions between units of time". This section draws on `VC2M4M03.E01` and `.E02`. `.E03` is not covered in this book; see the note at the front of the book about Aboriginal and Torres Strait Islander content.

What you need to know

In Year 3 you met the units of time — days, hours, minutes and seconds — and you read clocks to the nearest minute. This section builds on all of that. Now you will find how much time passes between two events, and you will change between units of time.

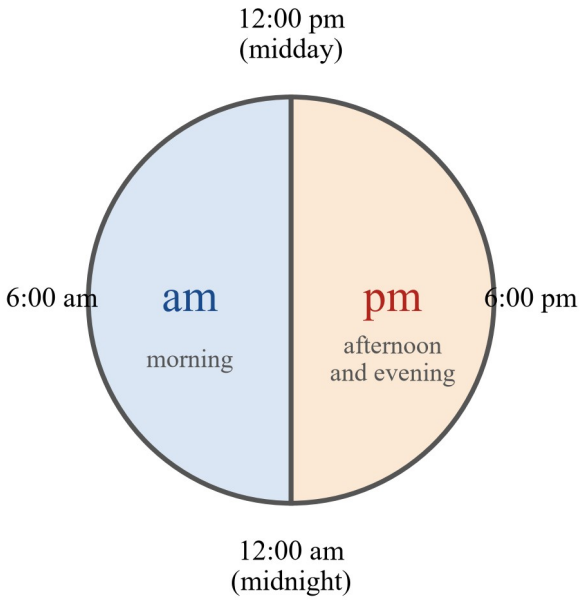
Duration. A **duration** is how long something takes — the time from the start of an event to its finish. The duration of a movie is the time from when it starts to when it finishes. Durations are counted in seconds, minutes, hours and days.

am and pm. The same clock face shows up twice in every day. The clock below shows 9:00 at breakfast time and 9:00 again at bed time.



Two analog clocks with identical hands, both showing nine o'clock. The first is labelled 9:00 am, breakfast time, and the second is labelled 9:00 pm, bed time.

To show which nine we mean, we add **am** or **pm** after the time. The day splits into two halves at midday and midnight.



One whole day is 24 hours.

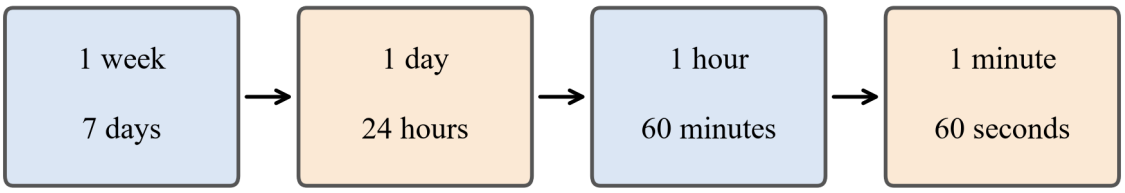
A circle showing one whole day of 24 hours. The left half is labelled am and morning, from 12:00 am at the bottom, through 6:00 am on the left, to 12:00 pm at the top. The right half is labelled pm and afternoon and evening, from 12:00 pm at the top, through 6:00 pm on the right, back to 12:00 am at the bottom. A caption reads: one whole day is 24 hours.

- **am** runs from 12:00 am (midnight) to 12:00 pm (midday). Breakfast, school and lunch happen in the am half of the day.
- **pm** runs from 12:00 pm (midday) to 12:00 am (midnight). After lunch, dinner and bed time happen in the pm half of the day.

Two clock times need care, because the number on the clock is 12:

- **12:00 pm is midday**, the start of the pm half of the day.
- **12:00 am is midnight**, the start of a new day.

Units of time. Each unit of time breaks into smaller units.

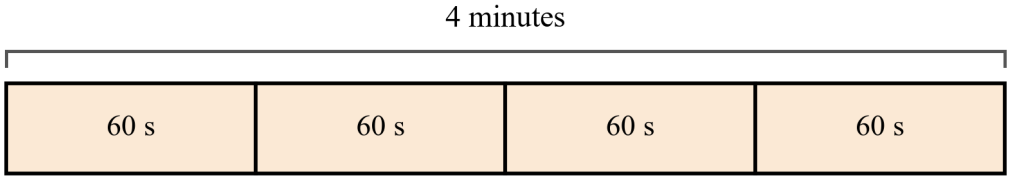


Each unit breaks into smaller units.

A chain of four boxes joined by arrows. The first box says 1 week breaks into 7 days, the second says 1 day breaks into 24 hours, the third says 1 hour breaks into 60 minutes, and the fourth says 1 minute breaks into 60 seconds. A caption reads: each unit breaks into smaller units.

Big unit	Breaks into
1 week	7 days
1 day	24 hours
1 hour	60 minutes
1 minute	60 seconds

Changing units. To change a big unit into a small unit, think how many of the small unit fit in each big one. 1 minute holds 60 seconds, so 3 minutes hold 3 lots of 60 seconds: 3 × 60 = 180, and 3 minutes = 180 seconds.



4 × 60 = 240, so 4 minutes = 240 seconds.

A bar showing 4 minutes split into four equal blocks of 60 seconds each. A line over the top of the whole bar is labelled 4 minutes, and the caption reads: 4 × 60 = 240, so 4 minutes = 240 seconds.

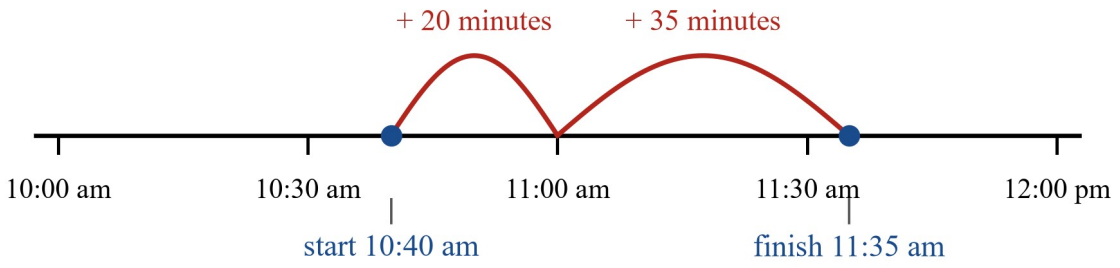
To change a small unit into a big one, group it. 240 seconds holds 4 lots of 60 seconds, because 240 ÷ 60 = 4, so 240 seconds = 4 minutes.

Finding a duration by counting on. To find the duration between a start time and a finish time, count on from the start to the finish. A good way is to jump to the next hour, then keep going, and add the jumps.

Worked examples

Example 1 — step by step: how long was the movie?

Ava goes to the movies with her family. The movie starts at 10:40 am and finishes at 11:35 am. How long is the movie?



20 + 35 = 55, so the duration is 55 minutes.

A timeline from 10:00 am to 12:00 pm with half-hour tick marks. A blue dot at 10:40 am is labelled start, and a blue dot at 11:35 am is labelled finish. A red jump from 10:40 am to 11:00 am is labelled +20 minutes, and a red jump from 11:00 am to 11:35 am is labelled +35 minutes. The caption reads: 20 + 35 = 55, so the duration is 55 minutes.

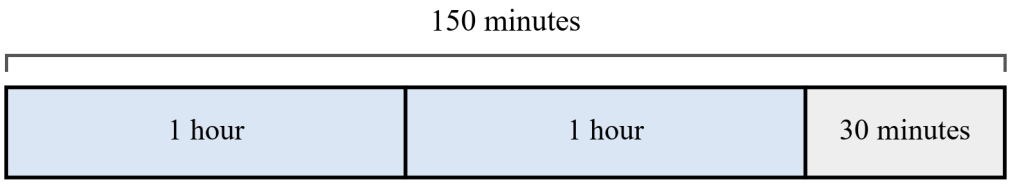
Working	Comment
Jump 10:40 am → 11:00 am. That is 20 minutes.	Count on to the next hour.
Jump 11:00 am → 11:35 am. That is 35 minutes.	Count on to the finish.
20 + 35 = 55	Add the jumps.

The movie is **55 minutes** long.

Example 2 — step by step: changing units of time

(a) Change 2 hours 30 minutes into minutes.

(b) Change 4 minutes into seconds.



150 minutes = 2 hours 30 minutes.

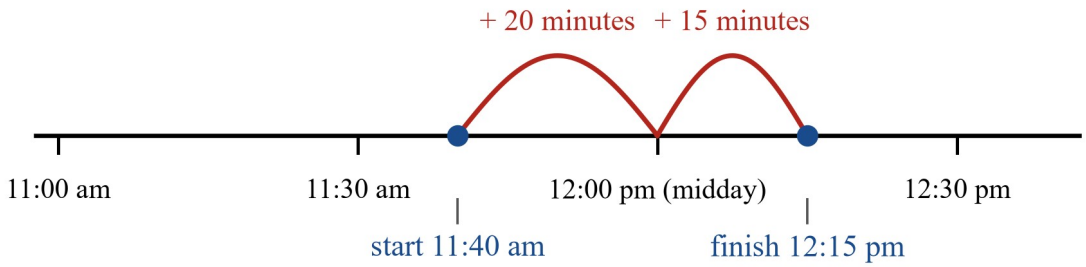
A bar showing 150 minutes. Two long blocks are each labelled 1 hour, then a short block is labelled 30 minutes. A line over the top of the whole bar is labelled 150 minutes, and the caption reads: 150 minutes = 2 hours 30 minutes.

Working	Comment
(a) 2 hours = 2 × 60 = 120 minutes.	Each hour is 60 minutes.
120 + 30 = 150 minutes.	Add the extra 30 minutes.
(b) 4 minutes = 4 × 60 = 240 seconds.	Each minute is 60 seconds.

2 hours 30 minutes is **150 minutes**, and 4 minutes is **240 seconds**.

Example 3 — step by step: counting through midday

Zara's school concert starts at 11:40 am and finishes at 12:15 pm. How long is the concert?



20 + 15 = 35, so the duration is 35 minutes.

A timeline from 11:00 am to 12:40 pm with half-hour tick marks, and the middle tick labelled 12:00 pm (midday). A blue dot at 11:40 am is labelled start, and a blue dot at 12:15 pm is labelled finish. A red jump from 11:40 am to 12:00 pm is labelled +20 minutes, and a red jump from 12:00 pm to 12:15 pm is labelled +15 minutes. The caption reads: 20 + 15 = 35, so the duration is 35 minutes.

Working	Comment
Jump 11:40 am → 12:00 pm. That is 20 minutes.	12:00 pm is midday. Count on to midday.
Jump 12:00 pm → 12:15 pm. That is 15 minutes.	Count on from midday.
20 + 15 = 35	Add the jumps.

The concert is **35 minutes** long. The start is am and the finish is pm, and the count still works — you just count straight on through midday.

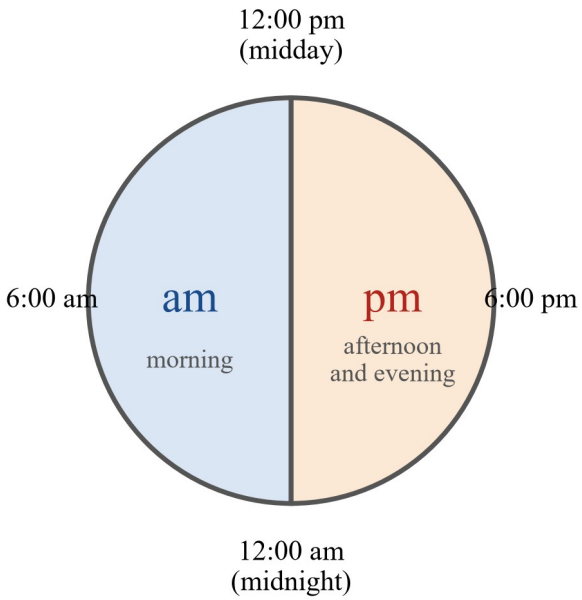
Practice questions

Questions with help

Q1. Complete the table. The first row is done for you.

Big unit	Breaks into
1 minute	60 seconds
1 hour	_____
1 day	_____
1 week	_____

Q2. Look at the picture of the day below.



One whole day is 24 hours.

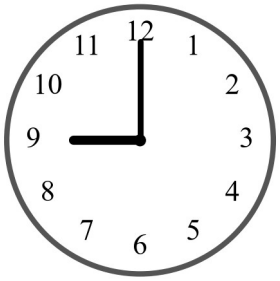
A circle showing one whole day of 24 hours. The left half is labelled am and morning, from 12:00 am at the bottom, through 6:00 am on the left, to 12:00 pm at the top. The right half is labelled pm and afternoon and evening, from 12:00 pm at the top, through 6:00 pm on the right, back to 12:00 am at the bottom. A caption reads: one whole day is 24 hours.

(a) Which half of the day is the morning — the am half or the pm half?

(b) Write 7:30 in the morning using am or pm.

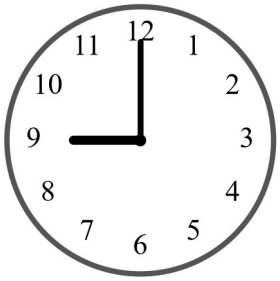
(c) Write 7:30 at night using am or pm.

Q3. Look at the two clocks below. The same clock face shows two different times of day. Write both times using am and pm.



9:00 am

breakfast time



9:00 pm

bed time

Two analog clocks with identical hands, both showing nine o'clock. The first is labelled 9:00 am, breakfast time, and the second is labelled 9:00 pm, bed time.

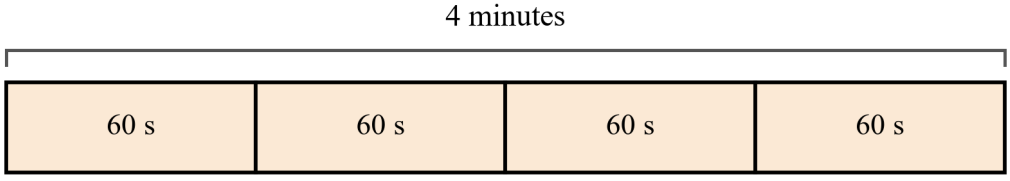
Q4. Write am or pm after each time.

(a) The sun comes up at 7:00 in the morning.
(b) The sun goes down at 5:45 in the afternoon.
(c) Lunch is at 12:30, just after midday.
(d) Dad reads a story at 8:00 at night.

Q5. Change the units. Remember: 1 hour holds 60 minutes, and 1 minute holds 60 seconds.

(a) 3 hours = _____ minutes
(b) 5 minutes = _____ seconds

Q6. Look at the bar below.



4 × 60 = 240, so 4 minutes = 240 seconds.

A bar showing 4 minutes split into four equal blocks of 60 seconds each. A line over the top of the whole bar is labelled 4 minutes, and the caption reads: 4 × 60 = 240, so 4 minutes = 240 seconds.

(a) How many seconds are in 4 minutes?
(b) Use the same bar to write 240 seconds in minutes.

Q7. Soccer training starts at 3:50 pm and finishes at 4:20 pm. Jump to 4:00 pm, then count on. How long is the training?

Q8. A tour starts at 9:10 am and finishes at 9:45 am. Count on in fives: 9:15, 9:20, and so on. How long is the tour?

Questions on your own

Q9. Change into minutes.

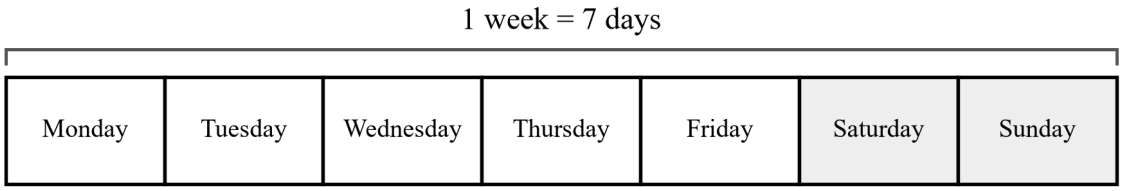
(a) 5 hours

(b) 2 hours 15 minutes
(c) 1 hour 5 minutes

Q10. Change into hours and minutes.

(a) 90 minutes
(b) 130 minutes
(c) 200 minutes

Q11. Look at the week strip below, then change the units.



Count the days to change weeks into days.

A strip of seven boxes labelled Monday to Sunday, with Saturday and Sunday shaded. A line over the top of the whole strip is labelled 1 week = 7 days, and the caption reads: count the days to change weeks into days.

(a) 4 weeks = _____ days
(b) 3 days = _____ hours
(c) 48 hours = _____ days
(d) 21 days = _____ weeks

Q12. Change the units.

(a) 6 minutes = _____ seconds
(b) 7 hours = _____ minutes
(c) 180 seconds = _____ minutes
(d) 240 minutes = _____ hours

Q13. A movie starts at 2:10 pm and finishes at 3:45 pm. How long is the movie?

Q14. A lunch break starts at 11:50 am and finishes at 12:20 pm. How long is the break?

Q15. A family leaves home at 10:30 am and arrives at the beach at 1:30 pm. How many hours did the trip take?

Q16. Swimming training goes for 40 minutes and finishes at 4:10 pm. What time did it start?

Q17. Which is longer: 3 hours or 170 minutes? How much longer is it?

Q18. True or false? Fix the false ones.

(a) 2 hours 20 minutes = 220 minutes
(b) 1 minute 40 seconds = 100 seconds

Q19. A museum tour starts at 9:50 am and goes for 45 minutes. What time does it finish?

Q20. Sam wrote 3 hours = 300 minutes. Is Sam right? Explain your answer.

Q21. An Australian rules football match has four quarters, and each quarter runs for 20 minutes of playing time.

(a) How many minutes of playing time are there in a whole match?
(b) Is that playing time more or less than 2 hours? By how much?

Source: Wikipedia, *Laws of Australian rules football*, retrieved 2026-08-20.

Applied

Q22. Melbourne Cup Day. In Victoria, Melbourne Cup Day falls on the first Tuesday of November — in 2026, that is Tuesday 3 November. The race covers 3200 m, starts at 3:00 pm and is called “the race that stops a nation”. The fastest winning time is 3 minutes 16.3 seconds, set by Kingston Rule in 1990.

Source: Wikipedia, *Melbourne Cup*, retrieved 2026-08-20.

(a) The fastest winning time is 3 minutes 16.3 seconds. How many seconds is that?

(b) The race starts at 3:00 pm, and the winner finishes about 3 minutes later. About what time does the winner get home?

(c) Mia’s family watches the race on TV from 2:45 pm to 3:15 pm. How long do they watch?

(d) Melbourne Cup Day is Tuesday 3 November. One week is 7 days. What is the date of the next Tuesday?

Answers

Q1. 1 hour → 60 minutes; 1 day → 24 hours; 1 week → 7 days. **Q2.** (a) the am half; (b) 7:30 am; (c) 7:30 pm. **Q3.** 9:00 am and 9:00 pm. **Q4.** (a) am; (b) pm; (c) pm; (d) pm. **Q5.** (a) 180 minutes; (b) 300 seconds. **Q6.** (a) 240 seconds; (b) 4 minutes. **Q7.** 30 minutes. **Q8.** 35 minutes. **Q9.** (a) 300 minutes; (b) 135 minutes; (c) 65 minutes. **Q10.** (a) 1 hour 30 minutes; (b) 2 hours 10 minutes; (c) 3 hours 20 minutes. **Q11.** (a) 28 days; (b) 72 hours; (c) 2 days; (d) 3 weeks. **Q12.** (a) 360 seconds; (b) 420 minutes; (c) 3 minutes; (d) 4 hours. **Q13.** 95 minutes — that is 1 hour 35 minutes. **Q14.** 30 minutes. **Q15.** 3 hours. **Q16.** 3:30 pm. **Q17.** 3 hours is longer, by 10 minutes. **Q18.** (a) false — 2 hours 20 minutes = 140 minutes; (b) true — 60 + 40 = 100. **Q19.** 10:35 am. **Q20.** No — 3 hours = 180 minutes, not 300 minutes. **Q21.** (a) 80 minutes; (b) less than 2 hours, by 40 minutes. **Q22.** (a) 196.3 seconds; (b) about 3:03 pm; (c) 30 minutes; (d) Tuesday 10 November.

Worked answers

Q1. From the chain: 1 hour breaks into 60 minutes, 1 day breaks into 24 hours and 1 week breaks into 7 days.

Q2. (a) Morning is in the **am half** of the day. (b) Morning is am, so 7:30 in the morning is **7:30 am**. (c) Night is pm, so 7:30 at night is **7:30 pm**.

Q3. The clock face reads 9:00. At breakfast time that is **9:00 am**, and at bed time that is **9:00 pm**. The same face, two different times of the day.

Q4. (a) Morning is am: **7:00 am**. (b) Afternoon is pm: **5:45 pm**. (c) Just after midday is pm: **12:30 pm**. (d) Night is pm: **8:00 pm**.

Q5. (a) 3 hours = 3 × 60 = **180 minutes**. (b) 5 minutes = 5 × 60 = **300 seconds**.

Q6. (a) The bar holds four blocks of 60 seconds: 4 × 60 = 240, so 4 minutes = **240 seconds**. (b) 240 seconds is the same bar counted the other way: 240 ÷ 60 = 4, so 240 seconds = **4 minutes**.

Q7. Jump 3:50 pm → 4:00 pm, which is 10 minutes, then 4:00 pm → 4:20 pm, which is 20 minutes. 10 + 20 = 30. The training is **30 minutes** long.

Q8. Count on in fives from 9:10: 9:15, 9:20, 9:25, 9:30, 9:35, 9:40, 9:45. That is 7 jumps of 5: 7 × 5 = 35. The tour is **35 minutes** long.

Q9. (a) 5 hours = 5 × 60 = **300 minutes**. (b) 2 hours = 120 minutes, and 120 + 15 = **135 minutes**. (c) 1 hour = 60 minutes, and 60 + 5 = **65 minutes**.

Q10. (a) 90 minutes is 60 minutes + 30 minutes = **1 hour 30 minutes**. (b) 130 minutes is 120 minutes + 10 minutes = **2 hours 10 minutes**. (c) 200 minutes is 180 minutes + 20 minutes = **3 hours 20 minutes**.

Q11. (a) 4 weeks = 4 × 7 = **28 days**. (b) 3 days = 3 × 24 = **72 hours**. (c) 48 hours holds 2 lots of 24: 48 ÷ 24 = **2 days**. (d) 21 days holds 3 lots of 7: 21 ÷ 7 = **3 weeks**.

Q12. (a) 6 × 60 = **360 seconds**. (b) 7 × 60 = **420 minutes**. (c) 180 ÷ 60 = **3 minutes**. (d) 240 ÷ 60 = **4 hours**.

Q13. Jump 2:10 pm → 3:10 pm, which is 1 hour (60 minutes), then 3:10 pm → 3:45 pm, which is 35 minutes. 60 + 35 = 95. The movie is **95 minutes** long — that is 1 hour 35 minutes.

Q14. Jump 11:50 am → 12:00 pm, which is 10 minutes, then 12:00 pm → 12:20 pm, which is 20 minutes. 10 + 20 = 30. The break is **30 minutes** long. The start is am and the finish is pm, and we counted straight through midday.

Q15. Jump by hours: 10:30 am → 11:30 am → 12:30 pm → 1:30 pm. That is 3 jumps of 1 hour, so the trip took **3 hours**.

Q16. Count back 40 minutes from 4:10 pm: back 10 to 4:00 pm, then back 30 more to 3:30 pm. The training started at **3:30 pm**.

Q17. Change 3 hours into minutes: 3 × 60 = 180 minutes. 180 is more than 170, so **3 hours is longer**. 180 − 170 = 10, so it is longer by **10 minutes**.

Q18. (a) **False.** 2 hours = 120 minutes, and 120 + 20 = 140, so 2 hours 20 minutes = **140 minutes**, not 220. (b) **True.** 1 minute = 60 seconds, and 60 + 40 = **100 seconds**.

Q19. Jump 9:50 am → 10:00 am, which is 10 minutes, leaving 45 − 10 = 35 minutes to count on from 10:00 am. The tour finishes at **10:35 am**.

Q20. Sam is **not right**. 1 hour holds 60 minutes, not 100, so 3 hours = 3 × 60 = **180 minutes**. Sam counted as if 1 hour were 100 minutes.

Q21. (a) 4 quarters × 20 minutes = **80 minutes** of playing time. (b) 2 hours = 120 minutes, and 80 is less than 120, so the playing time is **less than 2 hours**. 120 − 80 = 40, so it is less by **40 minutes**.

Q22. (a) 3 minutes = 3 × 60 = 180 seconds, and 180 + 16.3 = **196.3 seconds**. (b) 3:00 pm + 3 minutes is about **3:03 pm**. (c) Jump 2:45 pm → 3:00 pm, which is 15 minutes, then 3:00 pm → 3:15 pm, which is 15 minutes. 15 + 15 = 30. The family watches for **30 minutes**. (d) One week after Tuesday 3 November is **Tuesday 10 November**.

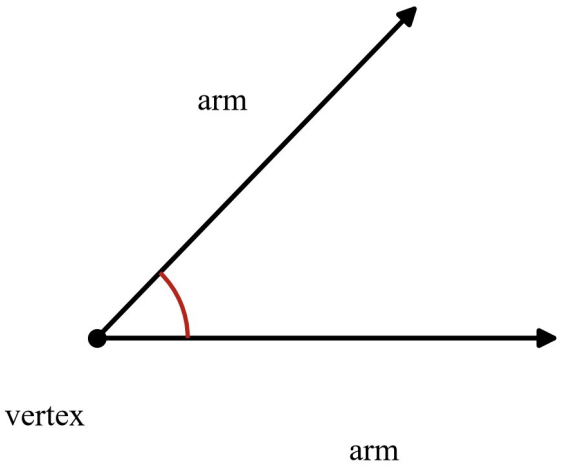
Naming and comparing angles: acute, obtuse, right, straight, reflex, revolution

Code VC2M4M04 (Victorian Curriculum F–10 Version 2.0, Mathematics, Level 4; authority file `maths_4.json`): "estimate and compare angles using angle names including acute, obtuse, straight angle, reflex and revolution, and recognise their relationship to a right angle". This section draws on `VC2M4M04.E01`, `.E02`, `.E03` and `.E04`.

What you need to know

In Year 3 you met angles as turns, and you compared angles with a right angle. This section names the angles, and puts them in order from the least turn to the most turn.

The parts of an angle. An angle is made where two **arms** meet at a point called the **vertex**. The amount of turn between the two arms is the angle.



Two straight arms with arrow tips meeting at a point labelled the vertex. A red curve marks the turn between the arms, and each line is labelled arm.

An angle is about the *turn*, not about how long the arms are. Longer arms do not change the turn — the turn stays the same.

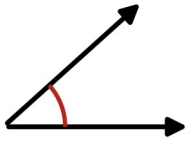
The right angle — the angle everything is compared with. A **right angle** is one quarter of a full turn. It is the corner of a square, and it is marked with a small square corner mark.

a right angle — one quarter of a full turn the four corners of a square are right angles

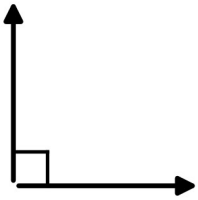
Left: two arms meeting at a right angle, with a small square corner mark; the caption says a right angle is one quarter of a full turn. Right: a square with a small square corner mark in each of its four corners.

In this section, every angle is named by comparing its turn with a right angle.

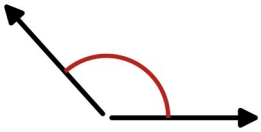
The six names, from the least turn to the most turn.



acute

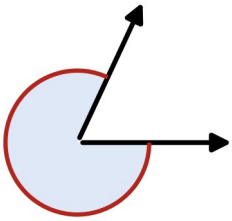


right

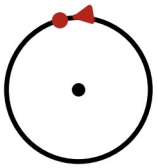


obtuse

straight angle



reflex



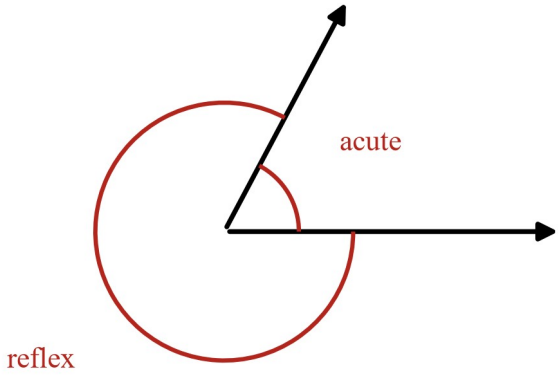
revolution

Six angles in turn order, each with its name below: acute, a turn less than a right angle; right, with a square corner mark; obtuse, a turn more than a right angle; straight angle, two arms making a straight line; reflex, the turn shaded all the way past a straight angle; and revolution, a full turn back to the start, shown as a circle with an arrow.

- **acute** — less than a right angle.
- **right** — exactly one quarter of a full turn; the corner of a square.
- **obtuse** — more than a right angle, and less than a straight angle.
- **straight angle** — one half of a full turn; the two arms make a straight line.
- **reflex** — more than a straight angle, and less than a full turn.
- **revolution** — a full turn, back to where the turn started.

Notice the relationship to a right angle: **two right angles make a straight angle, and four right angles make a revolution.**

The same two arms make two angles. When two arms meet at a vertex, there are two turns between them — the short way round and the long way round. The marked turn tells you which angle is being named.

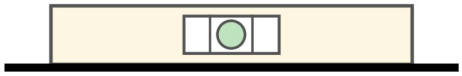


the same two arms make two angles

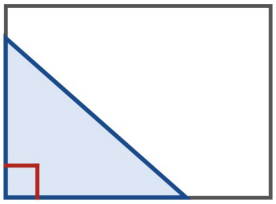
The same two arms making two angles: a small red curve marks the acute angle between the arms, and a large red curve the long way round marks the reflex angle.

In the picture above, the two arms make an acute angle one way round and a reflex angle the other way round.

Tools that check straight and square. Some tools use the right angle to check things in the world. A **spirit level** has a bubble in a tube: when the bubble sits in the middle, the line or shelf the level rests on is straight. A **set square** has a right-angle corner: fit it into a corner to check whether the corner is a right angle, so the two edges are at right angles.



the bubble sits in the middle — the shelf is straight



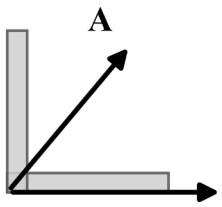
the set square checks that the corner is a right angle

Left: a spirit level sitting on a shelf with the bubble in the middle of the tube, showing the shelf is straight. Right: a set square fitted into the corner of a book, with a red square corner mark showing the corner is a right angle.

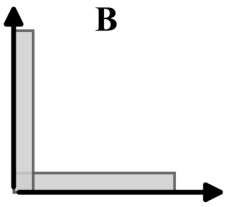
Worked examples

Example 1 — step by step: naming angles with a right-angle template

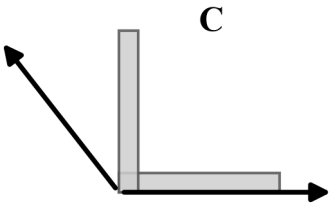
A **right-angle template** is a card or folded paper corner you lay over an angle to compare it with a right angle. Three angles are tested against the grey template below.



fits inside the corner of the template
less than a right angle — acute



matches the corner of the template exactly
equal to a right angle — right



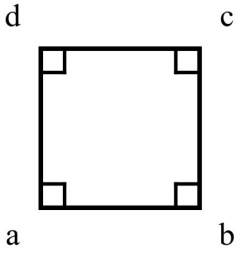
goes past the corner of the template
more than a right angle — obtuse

A grey right-angle template shown three times, each time with a black angle laid on it. Angle A fits inside the corner of the template. Angle B matches the corner of the template exactly. Angle C goes past the corner of the template.

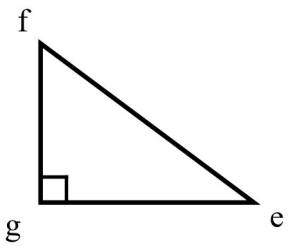
Working	Comment
Angle A: the arm fits inside the corner of the template	the turn is less than a right angle — **acute**
Angle B: the arm matches the corner of the template	the turn is exactly a right angle — **right**
Angle C: the arm goes past the corner of the template	the turn is more than a right angle and less than a straight angle — **obtuse**

Example 2 — step by step: naming the angles inside shapes

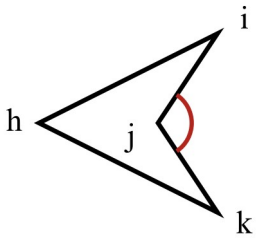
The corners of the shapes below are lettered. Each corner is tested against the square corner mark of a right angle.



square



triangle



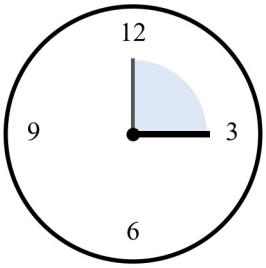
arrowhead shape

Three shapes with lettered corners. A square with corners a, b, c and d, each with a square corner mark. A triangle with a square corner mark at g, and corners e and f. An arrow shape with the turn marked the long way round at the folded-in corner j, and corners h, i and k.

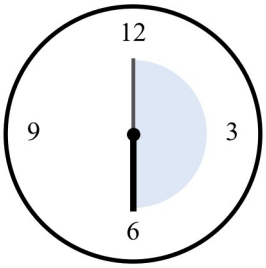
Working	Comment
Square, corners a, b, c, d	each corner matches the square corner mark — four **right** angles
Triangle, corner g	matches the square corner mark — a **right** angle
Triangle, corners e and f	each is less than a right angle — **acute**
Arrow shape, corner j	the marked turn goes past a straight angle — **reflex**
Arrow shape, corners h, i, k	each is less than a right angle — **acute**

Example 3 — step by step: naming turns on a clock face

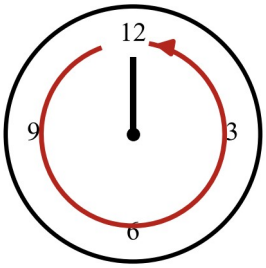
The minute hand of a clock turns around the face. Each turn below is named by comparing it with a right angle.



from 12 to 3:
a right angle



from 12 to 6:
a straight angle



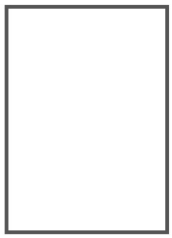
from 12, all the way round
and back to 12: a revolution

Three clock faces. First: the minute hand turned from 12 to 3 with the quarter of the face shaded, a right angle. Second: the minute hand turned from 12 to 6 with the half of the face shaded, a straight angle. Third: the minute hand back at 12 with a red arrow showing one full turn around the face, a revolution.

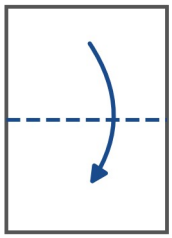
Working	Comment
From 12 to 3	one quarter of the way round — one right angle, a **right angle**
From 12 to 6	one half of the way round — two right angles, a **straight angle**
From 12, all the way round and back to 12	a full turn — four right angles, a **revolution**

Investigation activity

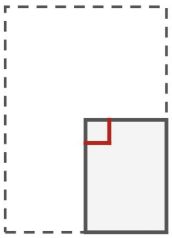
Make a right-angle template, then test angles around you.



1 start with a piece of paper



2 fold it — the fold makes a straight edge



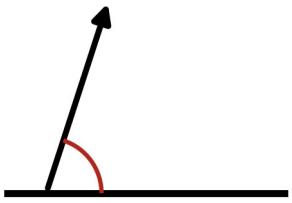
3 fold it again — this corner is a right angle

Three steps for folding a paper right-angle template. Step 1: a piece of paper. Step 2: the paper folded once, so the fold makes a straight edge. Step 3: the paper folded again, so the folded corner is a right angle, marked with a small red square corner mark.

1. Start with a piece of paper or thin cardboard.
2. Fold it once. The fold makes a straight edge.
3. Fold it again, so the new fold meets the first fold. The corner where the two folds meet is a **right angle**. That corner is your template.

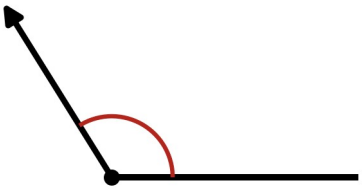
Now use your template on angles in the environment, the way Example 1 does. Try the four pictures below first: estimate whether each angle is less than, equal to, or more than a right angle, then check with your template and name each angle.

A



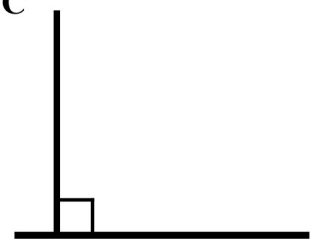
an open laptop

B



an open gate

C



where a wall meets the floor

D

a ramp

Four pictures of angles in everyday objects, lettered A to D. A: an open laptop, with the turn between the screen and the base marked. B: an open gate, with the turn between the gate and the fence marked. C: a wall meeting the floor, with a square corner mark. D: a ramp, with the turn between the ramp and the ground marked.

Then walk around your classroom or your home and test five more corners or openings of your own choice — a door, a book, a chair, an open laptop lid, the corner of a page. For each one, record: what you tested, whether the angle was less than, equal to, or more than a right angle, and its name. Write up your work: which angles did you find, and how many of each name?

Practice questions

Questions with help

Q1. An angle that is less than a right angle is called an _____ angle.

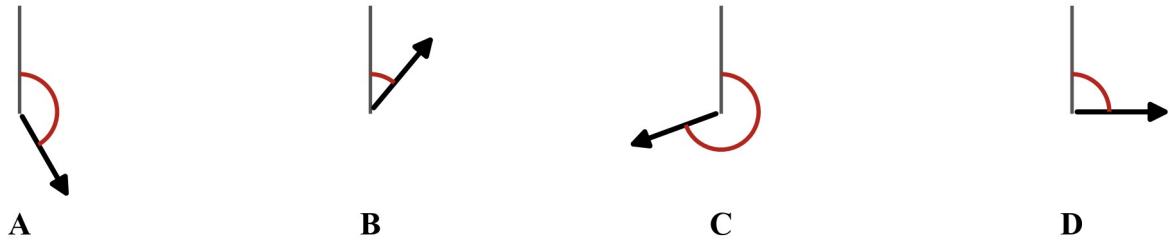
Q2. Complete the table. The first row is done for you.

Turn	Name
a quarter of a full turn	right angle
a half of a full turn	_____
a full turn	_____
less than a quarter of a full turn	_____

Q3. The minute hand of a clock turns from 12 to 3. That is one quarter of the way round the face. Name the angle.

Q4. True or false: a straight angle is two right angles.

Q5. Look at the four turns below. Which letter shows a right angle?



Four turns, each starting from a grey arm pointing straight up. A shows a turn more than a right angle. B shows a turn less than a right angle. C shows a turn past a straight angle. D shows exactly a right angle.

Q6. An angle is more than a straight angle and less than a full turn. Name it.

Q7. In Example 1, angle C goes past the corner of the template. Circle its name: acute or obtuse.

Q8. How many right angles make a revolution?

Questions on your own

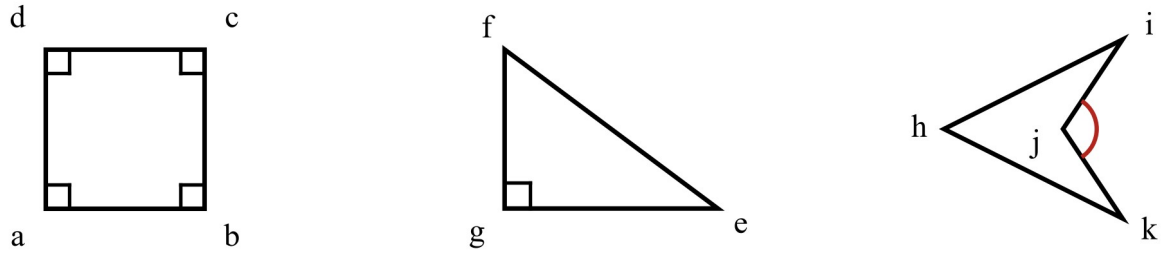
Q9. Name each angle.

(a) less than a right angle
(b) a half of a full turn
(c) more than a right angle and less than a straight angle
(d) a full turn

Q10. Look at the four turns in the figure at Q5. Name the angle shown by each letter A, B, C and D.

Q11. Look at the four turns in the figure at Q5. Write the letters in order, from the least turn to the most turn.

Q12. Look at the shapes below. Name the angle at each lettered corner, a to k.

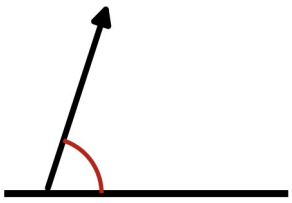


square triangle arrowhead shape

Three shapes with lettered corners. A square with corners a, b, c and d, each with a square corner mark. A triangle with a square corner mark at g, and corners e and f. An arrow shape with the turn marked the long way round at the folded-in corner j, and corners h, i and k.

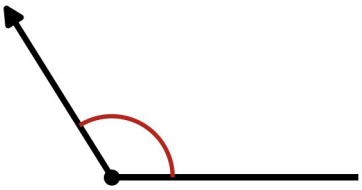
Q13. Look at the four pictures below. Estimate whether each angle is less than, equal to, or more than a right angle, then name it.

A



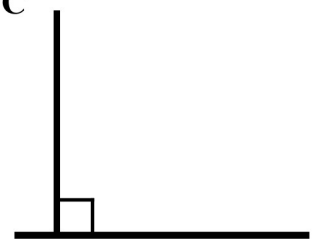
an open laptop

B



an open gate

C



where a wall meets the floor

D

a ramp

Four pictures of angles in everyday objects, lettered A to D. A: an open laptop, with the turn between the screen and the base marked. B: an open gate, with the turn between the gate and the fence marked. C: a wall meeting the floor, with a square corner mark. D: a ramp, with the turn between the ramp and the ground marked.

Q14. The minute hand of a clock turns from 12 to 6. Name the angle.

Q15. True or false, with a reason: every reflex angle is more than a straight angle.

Q16. True or false: a right angle is half of a straight angle.

Q17. How many right angles make a straight angle?

Q18. The two arms of an angle make a straight line, like the clock hands at 6:00. Name the angle.

Q19. In your notebook, draw one acute angle and one obtuse angle. Check each one with your paper template, and write down what you found.

Q20. Which tool would you choose to check:

(a) whether a shelf is straight?
(b) whether the corner of a book is a right angle?

Applied

Q21. Under the clocks, Melbourne. The row of clocks above the main entrance of Flinders Street railway station is a famous meeting place — "I'll meet you under the clocks." At 3:00 pm the hour hand points to 3 and the minute hand points to 12, and the hands make a right angle.

Source: Wikipedia, *Flinders Street railway station*, retrieved 2026-08-20.

(a) At 6:00 pm the hour hand points to 6 and the minute hand points to 12. Name the angle between the hands.
(b) The minute hand turns all the way around and back to 12. Name the turn.

(c) At 5:00 pm the hour hand points to 5 and the minute hand points to 12. Is the angle between the hands less than or more than a right angle? Less than or more than a straight angle? Name it.

Answers

Q1. acute. **Q2.** half turn → straight angle; full turn → revolution; less than a quarter turn → acute. **Q3.** a right angle. **Q4.** true — two quarter turns make a half turn. **Q5.** D. **Q6.** reflex. **Q7.** obtuse. **Q8.** four. **Q9.** (a) acute; (b) straight angle; (c) obtuse; (d) revolution. **Q10.** A obtuse; B acute; C reflex; D right. **Q11.** B, D, A, C. **Q12.** a, b, c, d right; e acute; f acute; g right; h acute; i acute; j reflex; k acute. **Q13.** A acute; B obtuse; C right; D acute. **Q14.** a straight angle. **Q15.** true — a reflex angle is more than a straight angle and less than a full turn. **Q16.** true — two right angles make a straight angle. **Q17.** two. **Q18.** a straight angle. **Q19.** Answers may vary; see worked solution. **Q20.** (a) a spirit level; (b) a set square. **Q21.** (a) a straight angle; (b) a revolution; (c) more than a right angle and less than a straight angle — obtuse.

Worked solutions

Q1. An angle less than a right angle is an **acute** angle.

Q2. A half of a full turn is a **straight angle**. A full turn is a **revolution**. Less than a quarter of a full turn is less than a right angle, so it is **acute**.

Q3. From 12 to 3 is one quarter of the way round the face. One quarter of a full turn is a right angle, so the angle is a **right angle**.

Q4. True. A right angle is a quarter turn. Two quarter turns make a half turn, and a half turn is a straight angle.

Q5. A right angle is a quarter turn. Turn **D** is exactly a quarter turn, so D shows a right angle.

Q6. More than a straight angle and less than a full turn is **reflex**.

Q7. Angle C goes past the corner of the template, so it is more than a right angle. More than a right angle and less than a straight angle is **obtuse**.

Q8. Four quarter turns make a full turn, so **four** right angles make a revolution.

Q9. (a) Less than a right angle is **acute**. (b) A half of a full turn is a **straight angle**. (c) More than a right angle and less than a straight angle is **obtuse**. (d) A full turn is a **revolution**.

Q10. A is more than a right angle and less than a straight angle — **obtuse**. B is less than a right angle — **acute**. C is more than a straight angle and less than a full turn — **reflex**. D is exactly a quarter turn — **right**.

Q11. From the least turn to the most turn: B (acute), D (right), A (obtuse), C (reflex) — **B, D, A, C**.

Q12. The square: a, b, c and d are all **right** angles. The triangle: g is a **right** angle, and e and f are **acute**. The arrow shape: h, i and k are **acute**, and j is the folded-in corner whose marked turn goes past a straight angle — **reflex**.

Q13. A: the open laptop is less than a right angle — **acute**. B: the open gate is more than a right angle and less than a straight angle — **obtuse**. C: the wall meets the floor at a **right** angle. D: the ramp is less than a right angle — **acute**. Checking with the template: the laptop and the ramp fit inside the corner, the wall corner matches the corner, and the gate goes past the corner.

Q14. From 12 to 6 is one half of the way round the face. A half turn is a **straight angle**.

Q15. True. By its name, a reflex angle is more than a straight angle and less than a full turn, so every reflex angle is more than a straight angle.

Q16. True. Two right angles make a straight angle, so one right angle is half of a straight angle.

Q17. Two quarter turns make a half turn, so **two** right angles make a straight angle.

Q18. When the two arms make a straight line, the turn is a half turn — a **straight angle**.

Q19. Answers may vary. Your acute angle should fit inside the corner of the template, and your obtuse angle should go past the corner of the template. If one does not, draw it again and test it again.

Q20. (a) A **spirit level**: when the bubble sits in the middle, the shelf is straight. (b) A **set square**: its right-angle corner fits exactly into a right-angle corner.

Q21. (a) From 12 to 6 is a half turn, so the hands make a **straight angle**. (b) All the way around and back to 12 is a full turn — a **revolution**. (c) From 12 to 5 is more than the quarter turn from 12 to 3, and less than the half turn from 12 to 6. So the angle is more than a right angle and less than a straight angle — **obtuse**.

Test

Chapter test T4 — Measurement

Codes: VC2M4M01, VC2M4M02, VC2M4M03, VC2M4M04 · **Total: 20 marks**

This is a classroom check, not an exam. It is **untimed**. The guidance duration is **25 minutes**.

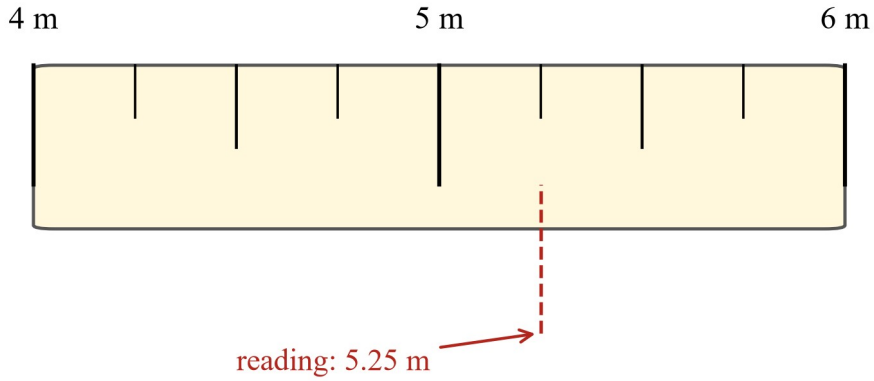
You will need: paper and a pencil. All the instruments you must read are printed on this paper. Measuring with real instruments is checked in the class practical tasks K1 and K2.

Calculators: you do not need a calculator for any question in this test.

Show your working where a question asks for it.

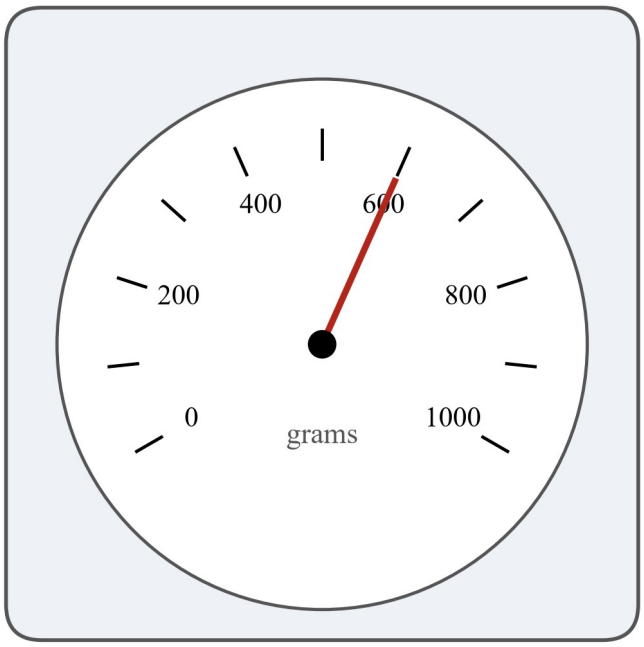
Section A — Measuring with scaled instruments (VC2M4M01) — 6 marks

Q1. (1 mark) Look at the tape measure below. What length does it show?



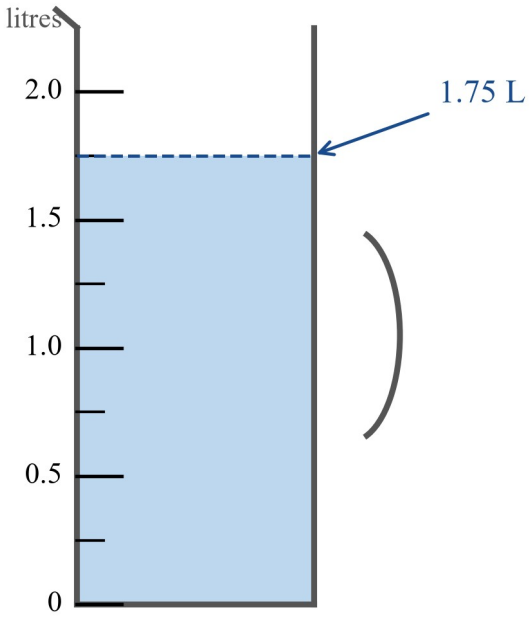
A tape measure marked in metres, with smaller marks for half metres and quarter metres between each metre.

Q2. (1 mark) Look at the analog kitchen scale below. What mass does it show?



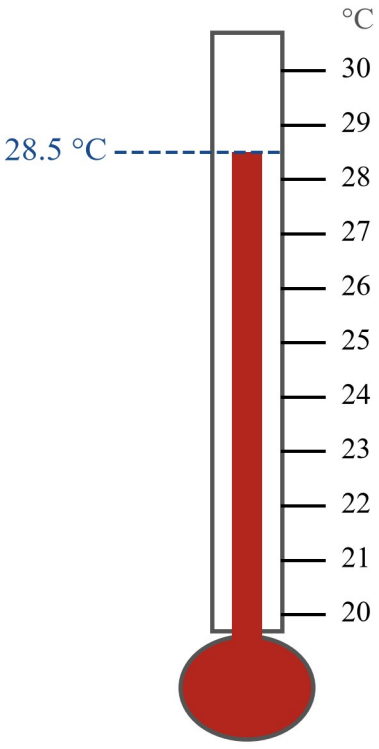
An analog kitchen scale with a needle on a dial marked in grams.

Q3. (1 mark) Look at the measuring jug below. What is the capacity of the water in the jug?



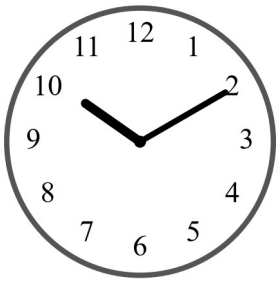
A measuring jug marked in litres, with water inside.

Q4. (1 mark) Look at the thermometer below. The red liquid has stopped at a value with no mark of its own. What is the temperature?

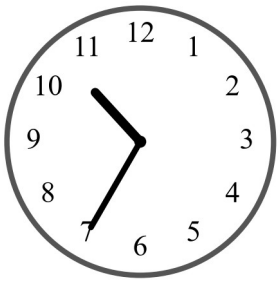


A thermometer marked in degrees Celsius from 20 to 30, with red liquid inside.

Q5. (2 marks) Noah's swimming training starts when the pool clock shows the first time below, and finishes when it shows the second time. The clocks have no minute marks.



start



finish

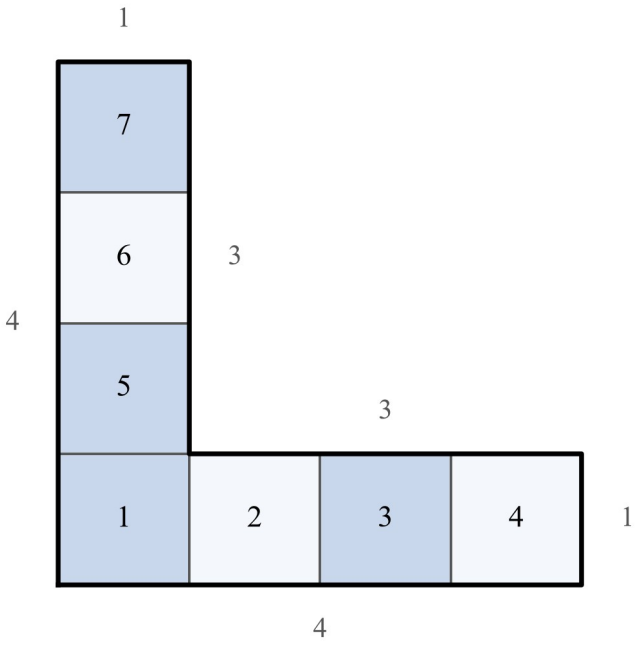
Two clocks with no minute marks, only the numbers 1 to 12. The first is labelled start and the second is labelled finish.

(a) What time does the finish clock show? (1 mark)

(b) What is the duration from the start time to the finish time? (1 mark)

Section B — Perimeter and area (VC2M4M02) — 5 marks

Q6. (1 mark) Look at the L-shape on grid paper below. Each square is 1 square unit. What is the area of the shape?



An L-shape on grid paper.

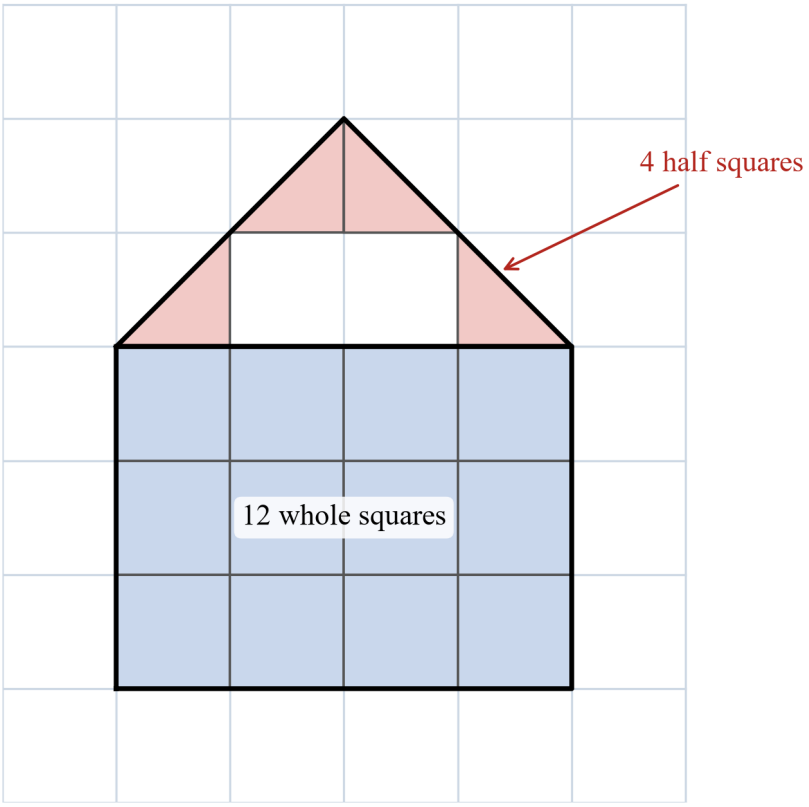
Q7. (2 marks) A basketball court is a rectangle. It is 28 m long and 15 m wide.

Source: Wikipedia, *Basketball court*, retrieved 2026-08-23.

(a) Write the lengths of the four sides of the court. (1 mark)

(b) Find the perimeter of the court. Show your working. (1 mark)

Q8. (2 marks) Look at the house shape on grid paper below. Each square is 1 square unit. Find the area of the house shape. Show how you counted.



A house shape drawn on grid paper.

Section C — Time (VC2M4M03) — 5 marks

Q9. (2 marks) The Year 4 school assembly starts at 11:50 am and finishes at 12:30 pm. How long is the assembly? Show your working.

Q10. (2 marks) Convert the units. Remember: 1 hour holds 60 minutes, and 1 minute holds 60 seconds.

(a) 2 hours = _____ minutes (1 mark)

(b) 180 seconds = _____ minutes (1 mark)

Q11. (1 mark) Ruby wakes up at 7 o'clock in the morning. She eats her dinner at 6 o'clock in the evening. Which of these writes the two times correctly?

A 7:00 am and 6:00 am

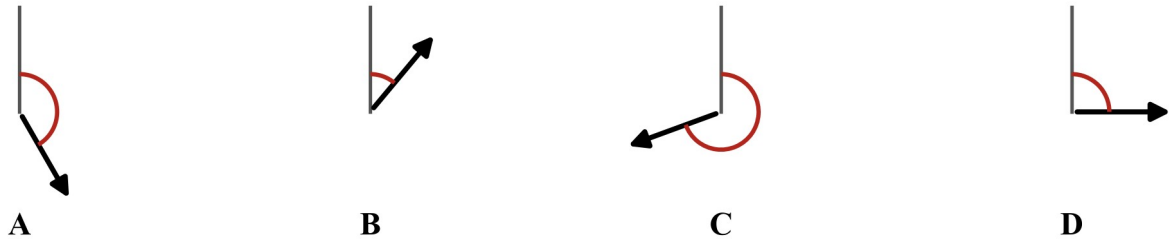
B 7:00 am and 6:00 pm

C 7:00 pm and 6:00 am

D 7:00 pm and 6:00 pm

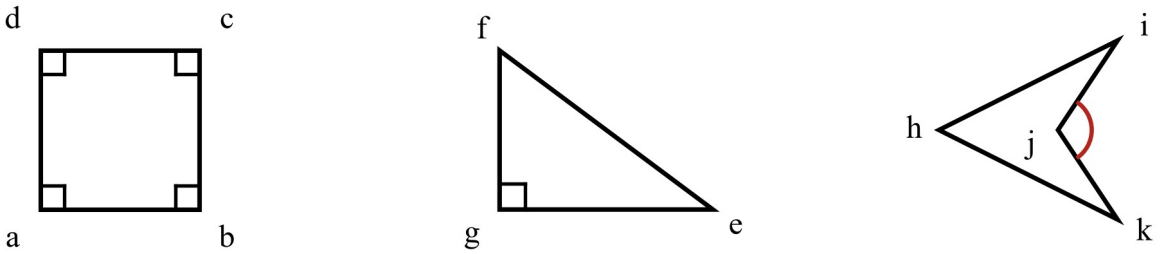
Section D — Angles (VC2M4M04) — 4 marks

Q12. (1 mark) Look at the four turns below. Which letter shows an acute angle?



Four turns, labelled A, B, C and D, each drawn from a grey arm pointing straight up.

Q13. (2 marks) Look at the three shapes below.



square triangle arrowhead shape

Three shapes with lettered corners: a square with corners a, b, c and d, a triangle with corners e, f and g, and an arrow shape with corners h, i, j and k.

(a) Name the angle at corner g of the triangle. (1 mark)

(b) Name the angle at corner j of the arrow shape. (1 mark)

Q14. (1 mark) The minute hand of a clock turns from 12 to 6. Name the angle the minute hand turns through.

Total: 20 marks

End of test.

Solutions

Answer key

Q	Answer	Marks
Q1	5.25 m	1
Q2	600 g	1
Q3	1.75 L	1
Q4	28.5 °C	1
Q5	(a) about 10:35 am; (b) about 25 minutes	2
Q6	7 square units	1
Q7	(a) 28 m, 15 m, 28 m, 15 m; (b) 86 m	2
Q8	14 square units (12 whole squares and 4 half squares)	2
Q9	40 minutes	2
Q10	(a) 120 minutes; (b) 3 minutes	2
Q11	B	1
Q12	B	1
Q13	(a) right angle; (b) reflex	2
Q14	straight angle	1
	Total	**20**

Worked solutions

Q1 (VC2M4M01, 1 mark). The tape measure marks the metres, and between two metres it has smaller marks for half metres and quarter metres. Each of the smallest marks is worth 0.25 m. The reading sits 1 small mark past 5 m: 5 + 0.25 = 5.25. The length shown is **5.25 m**.

Q2 (VC2M4M01, 1 mark). The numbers on the dial go 0, 200, 400, 600, 800, 1000. Between 0 and 200 there are 2 small-mark steps, so each small mark stands for 100 g. The needle points exactly at 600, so the mass shown is **600 g**.

Q3 (VC2M4M01, 1 mark). The jug is marked in litres, with numbers at 0, 0.5, 1, 1.5 and 2 and a smaller mark at every 0.25 L. The water level is at the third small mark past 1: 1.25, 1.5, 1.75. The capacity shown is **1.75 L**.

Q4 (VC2M4M01, 1 mark). The thermometer has a mark at every degree. The red liquid has stopped halfway between 28 and 29. There is no mark there, so this is an unmarked unit. Halfway between 28 and 29 is 28 and one half, so the temperature is **28.5 °C**.

Q5 (VC2M4M01, 2 marks).

(a) On the finish clock, the hour hand is past 10 and more than halfway to 11, but it has not reached 11, so the hour is still 10. The minute hand points at the 7. Count in fives: 5, 10, 15, 20, 25, 30, 35. The finish clock shows about **10:35 am**.

(b) On the start clock, the hour hand is just past 10 and the minute hand points at the 2, so the start is about 10:10 am. Count on from 10:10 am to 10:35 am: ten to 10:20, ten to 10:30, five to 10:35. 10 + 10 + 5 = 25. The duration is about **25 minutes**.

Marking: 1 mark for each part. Accept “about 10:35” and “25 minutes” — the clocks have no minute marks, so the times are estimates to the nearest 5 minutes.

Q6 (VC2M4M02, 1 mark). Count the squares that make the L-shape: 4 in the long part and 3 in the short part. 4 + 3 = 7. The area is **7 square units**.

Q7 (VC2M4M02, 2 marks).

(a) A rectangle has two long sides that are the same length and two short sides that are the same length. The four sides are **28 m, 15 m, 28 m and 15 m**.

(b) The perimeter is the sum of the side lengths: 28 + 15 + 28 + 15 = 86. The perimeter of the court is **86 m**.

Marking: (a) 1 mark for all four correct side lengths; (b) 1 mark for a correct addition of all four sides with the answer 86 m.

Q8 (VC2M4M02, 2 marks). Count the whole squares inside the shape: the body of the house covers 12 whole squares. Count the part squares at the edge: the roof is made of 4 half squares. Combine the halves: 2 halves make 1 whole, so 4 halves make 2 whole units. 12 + 2 = 14. The area of the house shape is **14 square units**.

Marking: 1 mark for a count that treats the part squares correctly (12 whole squares and 4 half squares combined into 2 whole units); 1 mark for the correct area, 14 square units.

Q9 (VC2M4M03, 2 marks). Count on from the start to the finish, jumping to midday. Jump 11:50 am → 12:00 pm: that is 10 minutes. 12:00 pm is midday. Jump 12:00 pm → 12:30 pm: that is 30 minutes. 10 + 30 = 40. The assembly is **40 minutes** long. The start is am and the finish is pm, and the count goes straight on through midday.

Marking: 1 mark for a correct counting-on method shown as jumps (or any other correct method shown, such as counting on in fives or tens); 1 mark for the correct duration, 40 minutes.

Q10 (VC2M4M03, 2 marks).

(a) Each hour holds 60 minutes, so 2 hours hold 2 lots of 60 minutes: 2 × 60 = 120. 2 hours = **120 minutes**.

(b) 180 seconds holds 3 lots of 60 seconds, because 180 ÷ 60 = 3. 180 seconds = **3 minutes**.

Marking: 1 mark for each correct conversion.

Q11 (VC2M4M03, 1 mark). B. Morning is in the am half of the day, so 7 o'clock in the morning is 7:00 am. Evening is in the pm half of the day, so 6 o'clock in the evening is 6:00 pm.

Q12 (VC2M4M04, 1 mark). B. An acute angle is less than a right angle. Turn B is less than a right angle, so B shows an acute angle. (For the teacher: A is obtuse, C is reflex and D is right.)

Q13 (VC2M4M04, 2 marks).

(a) The corner at g matches the square corner mark of a right angle, so the angle at g is a **right angle**.

(b) At corner j, the marked turn goes past a straight angle and is less than a full turn, so the angle at j is **reflex**.

Marking: 1 mark for each correct name.

Q14 (VC2M4M04, 1 mark). From 12 to 6 is one half of the way round the face. A half turn is a **straight angle** — the two arms of the angle make a straight line.

Marking guide

The guide is written in the language of each CD's achievement-standard extract from the authority file (`maths_4.json`), so a teacher's judgement maps to VCAA wording without translation.

What you can see the student do	Words from the achievement standard	Items	Marks
Reads lengths, masses, capacities and temperatures from printed scales, including partial units (0.25 m, 0.25 L) and a value with no mark of its own (28.5 °C)	"Students use appropriate scaled instruments and appropriate units to measure length, mass, capacity and temperature"	Q1–Q4	4
Reads two clocks with no minute marks and counts on to find a duration	measuring durations — scored against the CD, whose extract omits duration (see note below)	Q5	2
Finds a perimeter by adding all four side lengths, and areas by counting squares and combining part units	"They measure and approximate perimeters and areas for regular and irregular shapes"	Q6–Q8	5
Finds a duration that crosses midday by counting on, and converts between hours, minutes and seconds in both directions	"They convert between units of time when solving problems involving duration"	Q9–Q10	4
Sorts times of day into am and pm	solving problems "including situations involving 'am' and 'pm'"	Q11	1
Names angles by comparing them with a right angle — an acute turn, a right angle in a shape, a reflex angle in a shape, and a straight angle on a clock face	"Students compare angles relative to a right angle using angle names"	Q12–Q14	4

Marking notes:

- **Method marks are shown, not bare answers.** In Q7(b), Q8 and Q9 the working must be shown: the perimeter is scored on the addition of all four sides, the area on the count and the combining of the halves, and the duration on the jumps. A correct final answer with no working scores 0 for the method mark but keeps the answer mark where one is separate.
- **Carried errors.** In Q5(b), score the duration from the student's own readings in Q5(a) and of the start clock: a student whose clock reading is slightly out but whose count-on is correct for their own times still scores the duration mark.
- **MC items.** Q11 and Q12 score 1 for the keyed letter and 0 otherwise; no part marks.
- **Estimates.** Q4 and Q5 accept the nearest-half and nearest-5-minute readings the instruments allow; do not penalise a missing "about".

Marks by content description

CD	Items	Marks
VC2M4M01	Q1 (1), Q2 (1), Q3 (1), Q4 (1), Q5 (2)	6
VC2M4M02	Q6 (1), Q7 (2), Q8 (2)	5
VC2M4M03	Q9 (2), Q10 (2), Q11 (1)	5
VC2M4M04	Q12 (1), Q13 (2), Q14 (1)	4
Total	14 items	**20**

Every CD Chapter 4 owns contributes at least one separately scored item, so a coverage audit can read delivery off the mark scheme (TOC §7). Multiple choice carries 2 of the 20 marks (Q11, Q12), inside the quarter-of-test cap.

Notes for audit:

- **VC2M4M01 and duration.** The achievement-standard extract names only length, mass, capacity and temperature, but the CD requires durations too (TOC §1). Q5 is scored against the CD; the reporting statement uses VCAA's wording as written. Neither is edited to match the other.
- **Written form of the practical CDs.** VC2M4M01 and VC2M4M02 are also assessed by practical tasks K1 and K2 (TOC §7). In T4 they appear in written form as interpreting printed scale readings (Q1–Q5) and recording counts on grid paper (Q6, Q8).
- **Calculator and digital-tool status.** All four CDs are silent on calculators and digital tools (TOC D7). No item needs a calculator or a digital tool; this paper prints no "no calculator" rubric and adds no digital-tool requirement.
- **Level discipline.** No angle is measured in degrees and no protractor appears (4D names and compares against a right angle); no area formula is used (4B tiles, counts and approximates); conversions are between units of time only (4C); all decimals stop at hundredths.