

Mathematics Level 3

Chapter 4 — Measurement

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Choosing metric units and making estimates

Code: VC2M3M01 (.E01, .E02, .E03, .E04)

You measure things every day. You might say how long a pencil is, how heavy your bag is, or how much water a bottle holds. In this section you will learn the names for these three ideas — **length**, **mass** and **capacity** — and the **metric units** we use for each. Then you will use things you already know, like a 1 kg bag of sugar, as a **benchmark** to make a good **estimate**. An estimate is an answer that is close, worked out without measuring exactly.

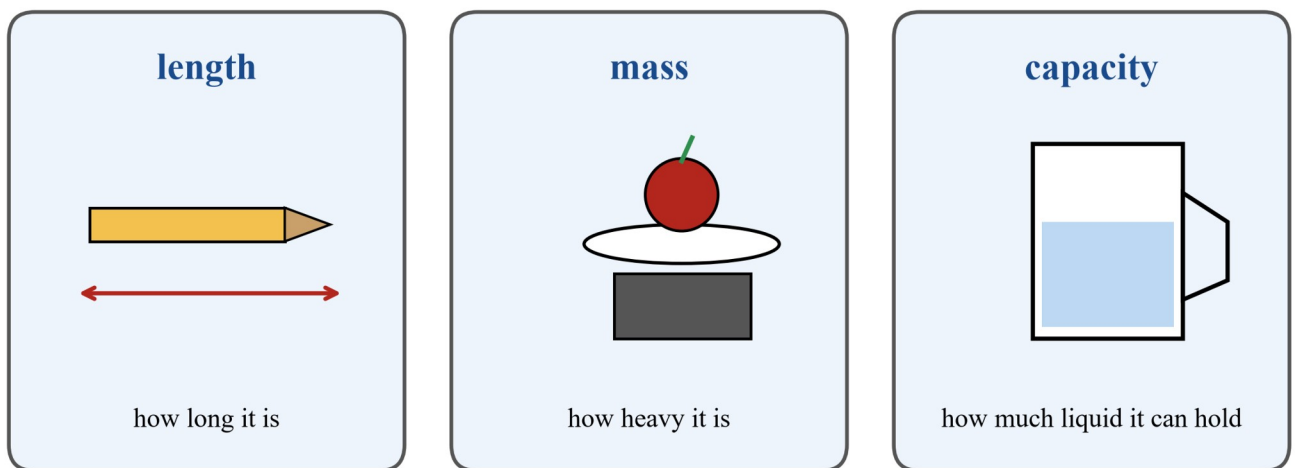
You will need: a metre ruler or tape, an empty 1 L milk carton, kitchen scales, and your own big steps.

Learn about choosing units and estimating

1. Three things we measure

Everything you can measure has attributes like length, mass and capacity.

- **Length** is how long something is, or how tall it is.
- **Mass** is how heavy something is.
- **Capacity** is how much liquid something can hold.



Three pictures side by side. The first shows a pencil with a double arrow and the word length over the words 'how long it is'. The second shows an apple on scales and the word mass over the words 'how heavy it is'. The third shows a jug and the word capacity over the words 'how much liquid it can hold'.

A ruler measures length. Scales measure mass. A jug or a cup measures capacity.

2. The metric units we use

We measure length in **centimetres (cm)**, **metres (m)** and **kilometres (km)**. We measure mass in **grams (g)** and **kilograms (kg)**. We measure capacity in **millilitres (mL)** and **litres (L)**.

The metric units we use

length	centimetre (cm) an eraser	metre (m) a door	kilometre (km) a long drive
mass	gram (g) a strawberry	kilogram (kg) a bag of sugar	
capacity	millilitre (mL) a small bottle	litre (L) a milk carton	

The units and a familiar item for each. Length: centimetre (cm), an eraser; metre (m), a door; kilometre (km), a long drive. Mass: gram (g), a strawberry; kilogram (kg), a bag of sugar. Capacity: millilitre (mL), a small bottle; litre (L), a milk carton.

3. Match the unit to the thing

Short things are measured in centimetres. An eraser is about 4 cm long. Your finger is about 5 cm long.

Tall things like doors and trees are measured in metres. A door is about 2 m tall.

Very long distances are measured in kilometres. The drive from Melbourne to Geelong is about 75 km.

Source: Wikipedia, *Geelong*, retrieved 2026-08-20.

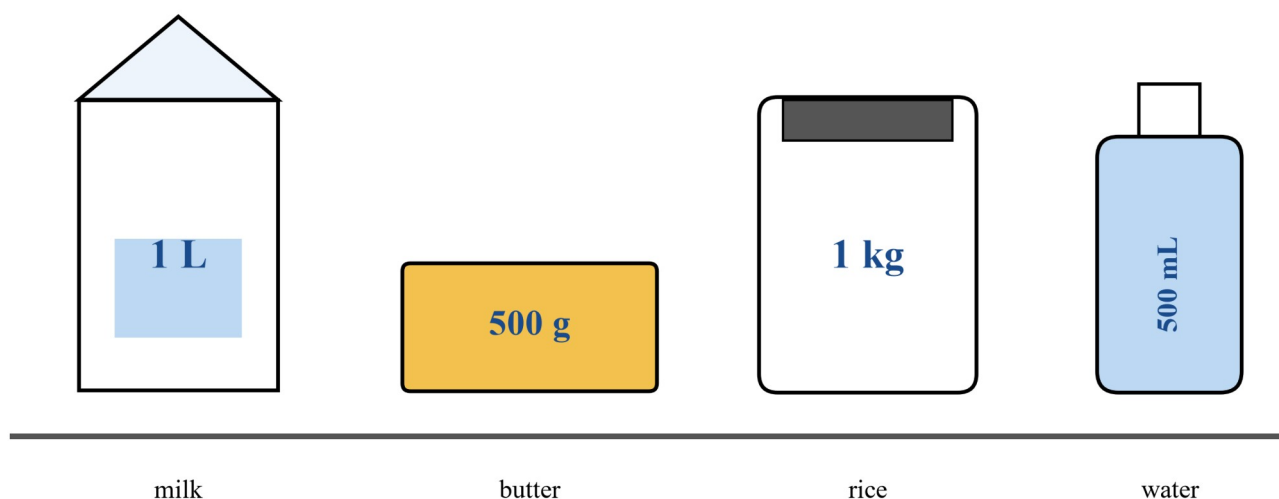
Light things like strawberries are measured in grams. A strawberry has a mass of about 20 g. Heavier things like people and shopping are measured in kilograms. A bag of sugar has a mass of 1 kg.

Capacity is measured in millilitres and litres. A small water bottle holds 500 mL. A milk carton holds 1 L.

4. Read the labels on packaging

At the supermarket, the packaging tells you the mass or the capacity of what is inside.

What do the labels say?



A shelf with four packs on it: a milk carton labelled 1 L, a block of butter labelled 500 g, a bag of rice labelled 1 kg, and a water bottle labelled 500 mL. Under the shelf are the names milk, butter, rice and water. The words at the top ask, 'What do the labels say?'

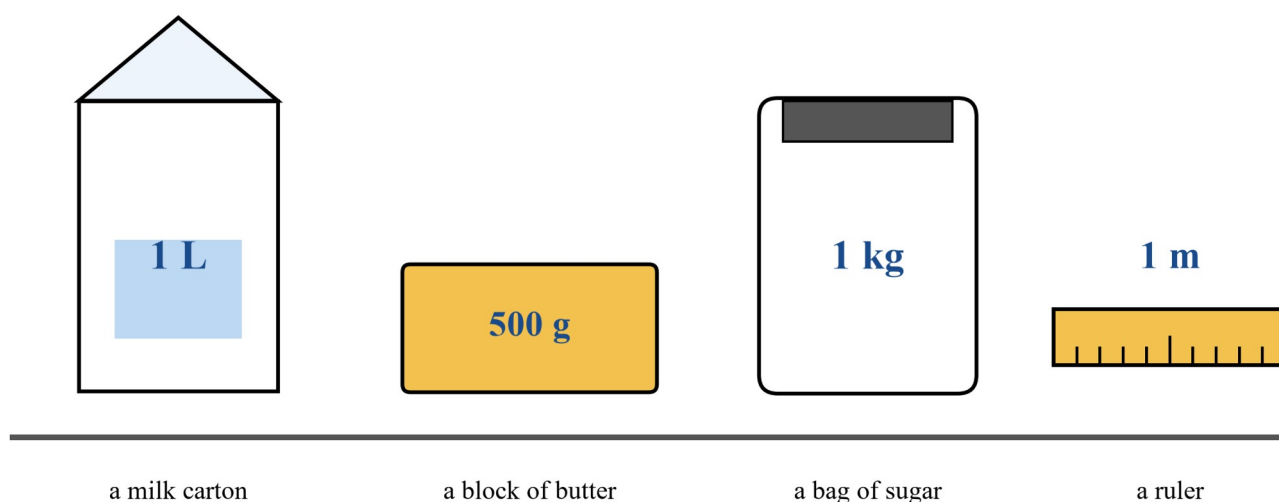
The milk carton and the water bottle tell you capacity: 1 L and 500 mL. The butter and the rice tell you mass: 500 g and 1 kg.

Source: Coles, *Devondale Full Cream Long Life Milk 1L*, retrieved 2026-08-20.

5. Know your benchmarks

Keep these in your head. They are your benchmarks.

Know these!



Four things to know. A milk carton labelled 1 L, a block of butter labelled 500 g, a bag of sugar labelled 1 kg, and a ruler labelled 1 m. The words at the top say, 'Know these!'

- A milk carton holds 1 L.
- A small water bottle holds 500 mL.
- A block of butter has a mass of 500 g.
- A bag of sugar has a mass of 1 kg.

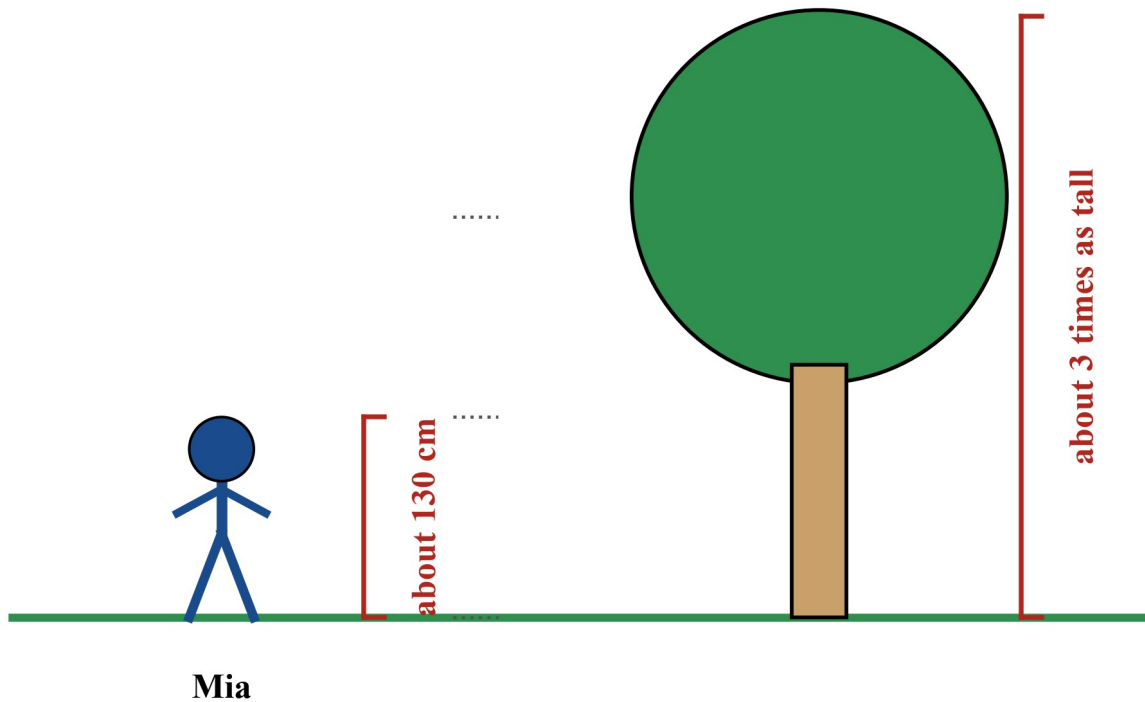
- A big ruler is 1 m long.

When you know these, you can estimate other things.

6. Use a benchmark to estimate

Mia is about 130 cm tall. The tree is about 3 times as tall as Mia.

the tree is about 3 times as tall as Mia



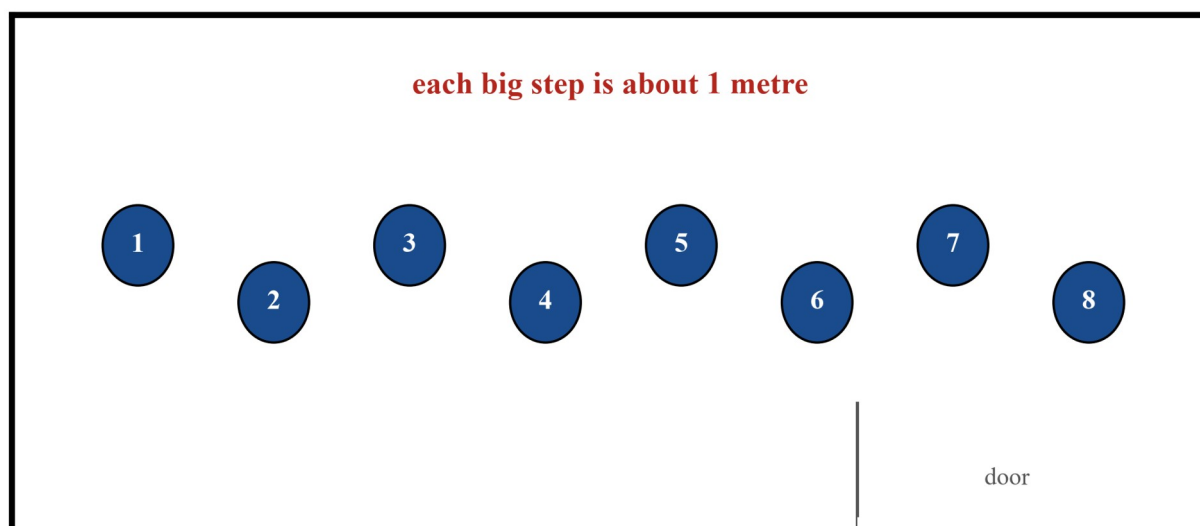
Mia, who is about 130 cm tall, stands next to a tree. The tree is about 3 times as tall as Mia. The words at the top say, 'the tree is about 3 times as tall as Mia'.

$$130 + 130 + 130 = 390$$

The tree is about **390 cm** tall. We used something we know (Mia's height) to estimate something we do not know (the tree's height).

7. Estimate lengths with your steps

One big step is about 1 m. Walk from the door in big steps and count them.



8 steps along the classroom is about 8 metres

A top view of a classroom with 8 numbered footprints from the door to the far wall. The words say, 'each big step is about 1 metre' and '8 steps along the classroom is about 8 metres'.

8 steps means the classroom is about **8 m** long. You used your own step as a benchmark.

Worked examples

Example 1 — with help

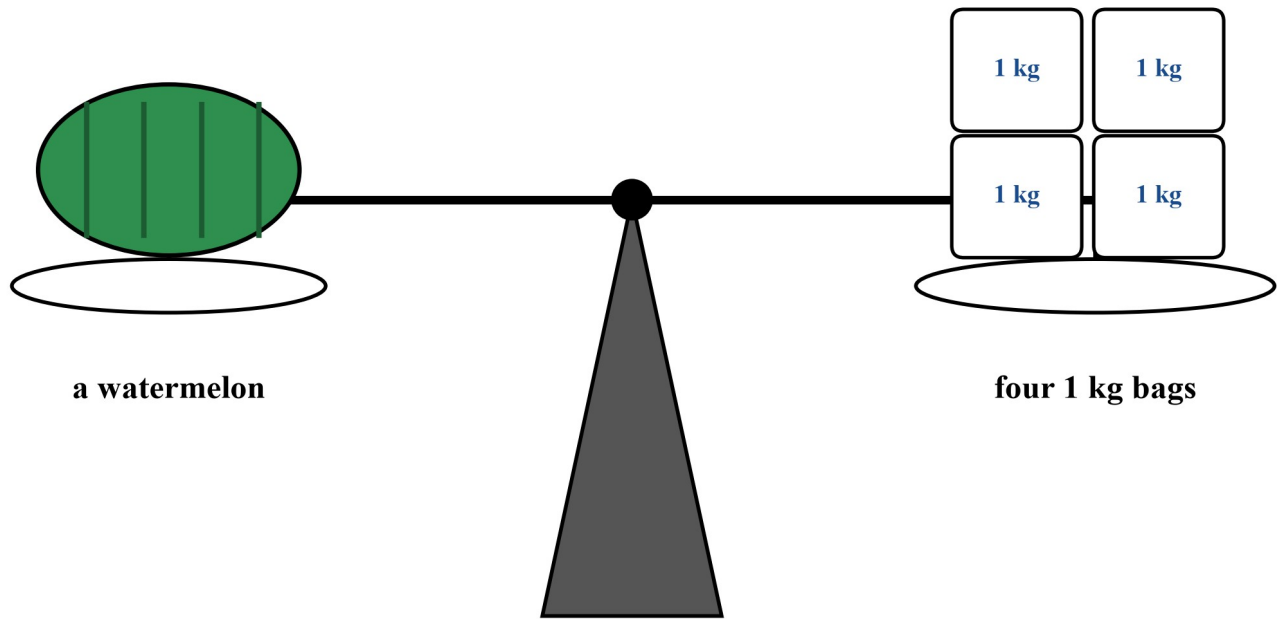
Choose the unit you would use. (a) the length of a pencil (b) the capacity of a bathtub (c) the mass of a strawberry

Working	What we did
(a) A pencil is short, like an eraser, so we use centimetres (cm).	Matched the length to a familiar item.
(b) A bathtub holds many cartons of water, so we use litres (L).	Matched the capacity to a familiar item.
(c) A strawberry is light, like the berry on the scales, so we use grams (g).	Matched the mass to a familiar item.

Example 2 — with help

A watermelon sits on one side of a balance. Four 1 kg bags of sugar balance it. Estimate the mass of the watermelon.

the two sides are the same



a watermelon

four 1 kg bags

A balance with a watermelon on one side and four bags labelled 1 kg on the other side. The two sides are level, and the words say, 'the two sides are the same'.

Working

The watermelon balances 4 bags.

Each bag has a mass of 1 kg.

$$1 + 1 + 1 + 1 = 4$$

The watermelon has a mass of about **4 kg**.

What we did

Read the balance.

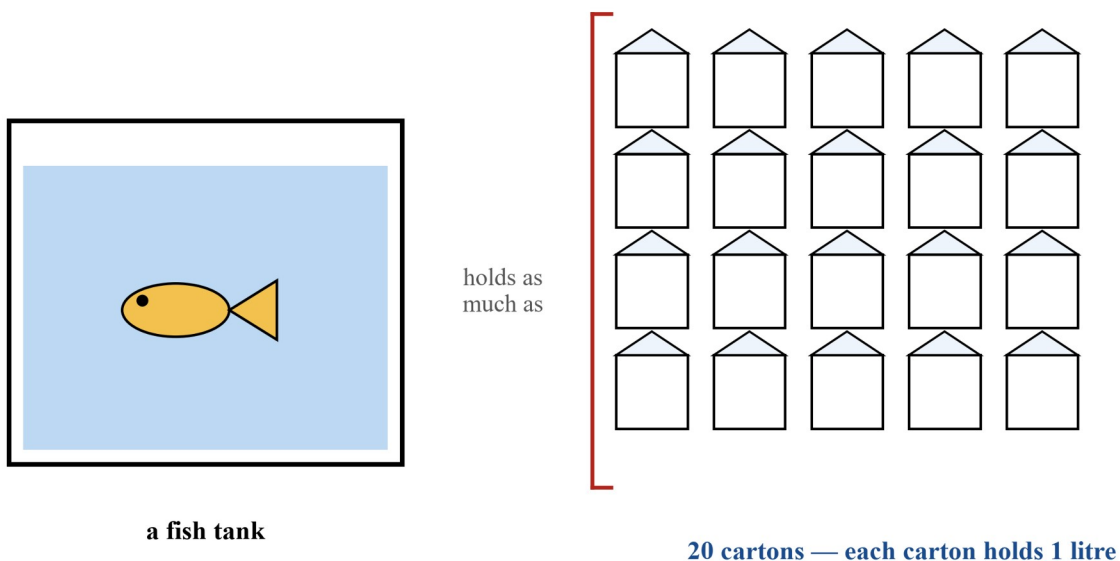
Used the benchmark.

Added the kilograms.

Gave the estimate.

Example 3 — on your own

A fish tank holds as much water as 20 milk cartons. Each carton holds 1 L. Estimate the capacity of the fish tank.



a fish tank

20 cartons — each carton holds 1 litre

A fish tank on the left and 20 milk cartons in 4 rows of 5 on the right. The words between them say, 'holds as much as', and the words under the cartons say, '20 cartons — each carton holds 1 litre'.

Each carton holds 1 L, and there are 20 cartons: $20 \times 1 = 20$.

The fish tank holds about **20 L**. ✓

Practice questions

With help

Q1. Put each card in the right box: length, mass or capacity.

how tall a tree is	how heavy a rock is	how much juice a cup holds
how long a pencil is	how heavy your bag is	how much milk a bottle holds

Put each card in the right box.

length	mass	capacity
---------------	-------------	-----------------

Six cards with the words 'how tall a tree is', 'how heavy a rock is', 'how much juice a cup holds', 'how long a pencil is', 'how heavy your bag is' and 'how much milk a bottle holds', and three boxes labelled length, mass and capacity. The words say, 'Put each card in the right box.'

Q2. Name the unit you would use. (a) the length of your finger (b) the length of a football field (c) the drive from Melbourne to Geelong

Q3. Look at the labels on the shelf in the picture above. (a) Which packs tell you capacity? (b) Which packs tell you mass? (c) What is the mass of the rice? (d) What is the capacity of the milk carton?

Q4. Circle the closer estimate. (a) the mass of a full school bag: 3 g or 3 kg (b) the capacity of a cup: 250 mL or 250 L (c) the length of a car: 4 m or 4 km

Q5. The backpack that Zac carries balances with 3 bags of sugar. Each bag has a mass of 1 kg. Estimate the mass of the backpack.

Q6. A bucket holds as much water as 8 milk cartons. Each carton holds 1 L. Estimate the capacity of the bucket.

Q7. Walk your classroom in big steps. Each big step is about 1 m. You take 9 steps. About how long is your classroom?

Q8. Choose the unit (cm, m, km, g, kg, mL or L). (a) the height of a door (b) the mass of a cat (c) the capacity of a jug (d) the length of an ant (e) the mass of an elephant (f) the capacity of a swimming pool

On your own

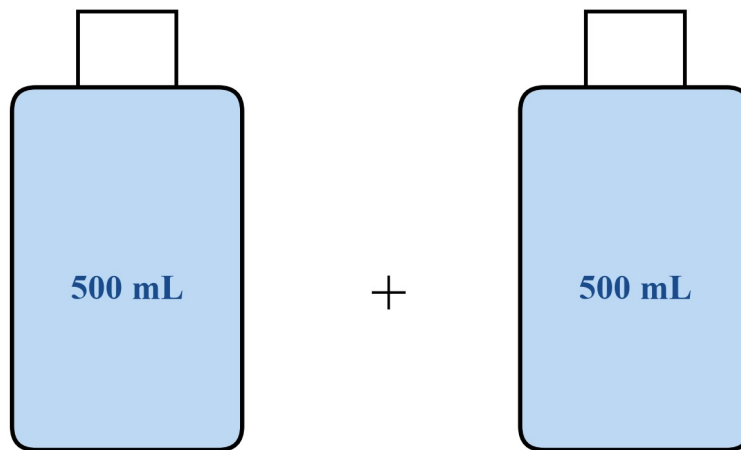
Q9. Name the unit you would use. (a) the length of an eraser (b) the height of a tree (c) the mass of a watermelon (d) the capacity of a small juice bottle (e) the length of a hallway (f) the mass of a feather

Q10. Circle the closer estimate. (a) the mass of an apple: 150 g or 150 kg (b) the capacity of a jug: 2 L or 2 mL (c) the height of a door: 2 m or 2 cm

Q11. Match each label to the thing it goes with: 500 g, 1 L, 2 kg, 500 mL — a block of butter, a milk carton, a bag of potatoes, a small water bottle.

Q12. A pumpkin balances with 2 bags of sugar. Each bag has a mass of 1 kg. Estimate the mass of the pumpkin.

Q13. Mia drinks 2 bottles of water. Each bottle holds 500 mL. How much water does Mia drink in all?



Mia drinks 2 bottles

Two water bottles, each labelled 500 mL, with a plus sign between them. The words under the bottles say, 'Mia drinks 2 bottles'.

Q14. A jug fills 4 milk cartons. Each carton holds 1 L. Estimate the capacity of the jug.

Q15. A bookshelf is about as tall as 2 Mias standing one on top of the other. Mia is about 130 cm tall. Estimate the height of the bookshelf.

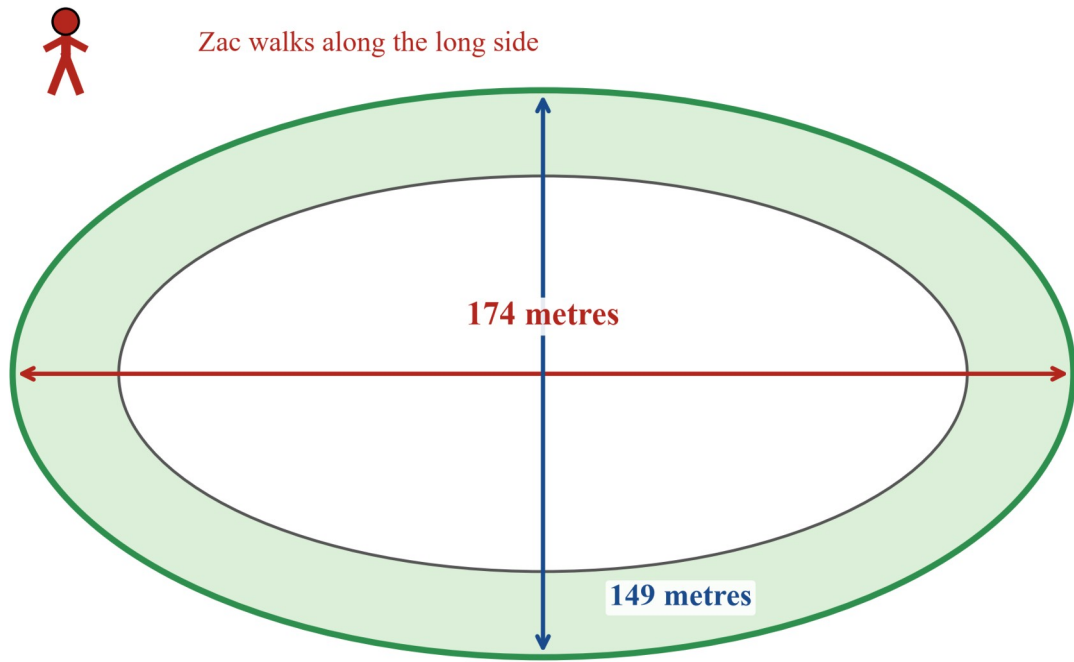
Q16. Zac says his pencil is 20 m long. Does that make sense? Explain your answer.

Q17. Ava says her cat has the same mass as a car. Does that make sense? Explain your answer.

Q18. The hallway to the office takes 12 big steps. Each big step is about 1 m. Estimate the length of the hallway.

Q19. The Melbourne Cricket Ground (MCG) has an oval field. The field is 174 metres long and 149 metres wide.

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



An oval field. A red double arrow across the long way is labelled 174 metres, and a blue double arrow across the short way is labelled 149 metres. The red stick figure is Zac, and he walks along the long side.

- (a) Which metric unit is used to measure the field?
 - (b) If Zac walks along the long side and back, how far does he walk in all?
 - (c) A sign says the field is about 1 kilometre wide. Does that make sense? Explain your answer.
-

Answers

Q1. Length: how tall a tree is; how long a pencil is. Mass: how heavy a rock is; how heavy your bag is. Capacity: how much juice a cup holds; how much milk a bottle holds. **Q2.** (a) centimetres (cm) (b) metres (m) (c) kilometres (km). **Q3.** (a) the milk carton and the water bottle (b) the butter and the rice (c) 1 kg (d) 1 L. **Q4.** (a) 3 kg (b) 250 mL (c) 4 m. **Q5.** About 3 kg. **Q6.** About 8 L. **Q7.** About 9 m. **Q8.** (a) m (b) kg (c) L (d) cm (e) kg (f) L. **Q9.** (a) cm (b) m (c) kg (d) mL (e) m (f) g. **Q10.** (a) 150 g (b) 2 L (c) 2 m. **Q11.** 500 g — a block of butter; 1 L — a milk carton; 2 kg — a bag of potatoes; 500 mL — a small water bottle. **Q12.** About 2 kg. **Q13.** 1 000 mL. **Q14.** About 4 L. **Q15.** About 260 cm. **Q16.** No — a pencil is about 20 cm; 20 m is as long as a classroom. **Q17.** No — a cat has a mass of a few kilograms; a car has a mass of more than 1 000 kg. **Q18.** About 12 m. **Q19.** (a) metres (b) $174 + 174 = 348$, so about 348 m (c) no — kilometres are for much longer distances, like the drive between towns; the width of the field is 149 m, so metres make sense.

Worked answers

Q1. How tall a tree is and how long a pencil is are both about length. How heavy a rock is and how heavy your bag is are both about mass. How much juice a cup holds and how much milk a bottle holds are both about capacity.

how tall a tree is	how heavy a rock is	how much juice a cup holds
how long a pencil is	how heavy your bag is	how much milk a bottle holds

Put each card in the right box.

length	mass	capacity
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Six cards with the words 'how tall a tree is', 'how heavy a rock is', 'how much juice a cup holds', 'how long a pencil is', 'how heavy your bag is' and 'how much milk a bottle holds', and three boxes labelled length, mass and capacity. The words say, 'Put each card in the right box.'

Q2. (a) A finger is short, like an eraser, so use centimetres. (b) A football field is long, like a big room, so use metres. (c) A drive between towns is very long, so use kilometres.

Q3. (a) The milk carton (1 L) and the water bottle (500 mL) tell you capacity. (b) The butter (500 g) and the rice (1 kg) tell you mass. (c) The rice has a mass of 1 kg. (d) The milk carton has a capacity of 1 L.

Q4. (a) A full school bag is heavy, like 3 bags of sugar, so 3 kg is closer. (b) A cup holds about as much as a small bottle, so 250 mL is closer. (c) A car is about as long as a big room, so 4 m is closer.

Q5. Each bag has a mass of 1 kg, and there are 3 bags: $1 + 1 + 1 = 3$. The backpack has a mass of about 3 kg.

Q6. Each carton holds 1 L, and there are 8 cartons: $8 \times 1 = 8$. The bucket holds about 8 L.

Q7. Each big step is about 1 m, and you take 9 steps, so your classroom is about 9 m long.

Q8. (a) A door is tall, so use m. (b) A cat is heavier than a strawberry but not as heavy as a car, so use kg. (c) A jug holds a few cartons of water, so use L. (d) An ant is very short, so use cm. (e) An elephant is very heavy, so use kg. (f) A swimming pool holds many cartons of water, so use L.

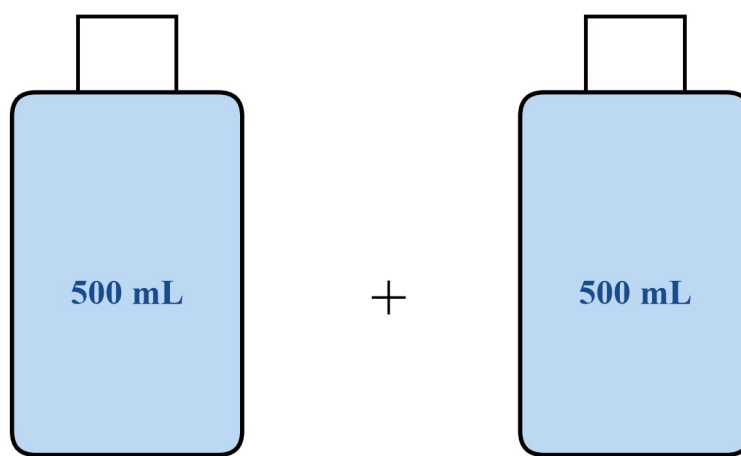
Q9. (a) cm (b) m (c) kg (d) mL (e) m (f) g.

Q10. (a) 150 kg is as heavy as two tall people, so 150 g is closer. (b) 2 mL is only a few drops, so 2 L is closer. (c) 2 cm is as short as an eraser, so 2 m is closer.

Q11. A block of butter has a mass of 500 g. A milk carton has a capacity of 1 L. A bag of potatoes has a mass of 2 kg. A small water bottle has a capacity of 500 mL.

Q12. Each bag has a mass of 1 kg, and there are 2 bags: $1 + 1 = 2$. The pumpkin has a mass of about 2 kg.

Q13. Each bottle holds 500 mL, and Mia drinks 2 bottles: $500 + 500 = 1\ 000$. Mia drinks 1 000 mL in all.



Mia drinks 2 bottles

Two water bottles, each labelled 500 mL, with a plus sign between them. The words under the bottles say, 'Mia drinks 2 bottles'.

Q14. Each carton holds 1 L, and the jug fills 4 cartons: $4 \times 1 = 4$. The jug has a capacity of about 4 L.

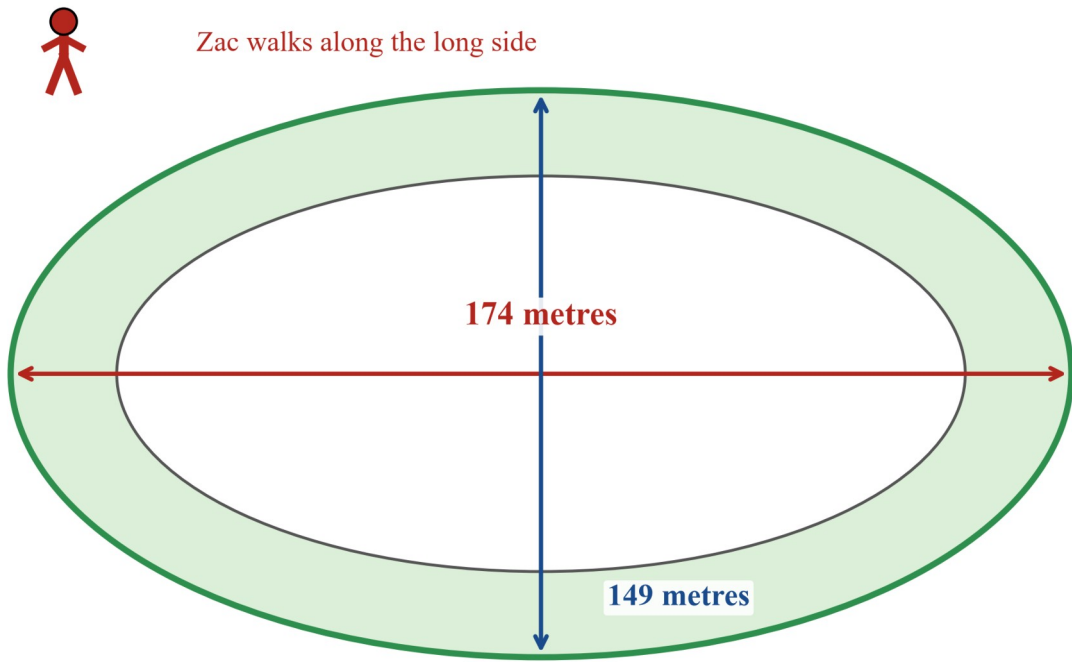
Q15. Mia is about 130 cm tall, and the bookshelf is as tall as 2 Mias: $130 + 130 = 260$. The bookshelf is about 260 cm tall.

Q16. No. A pencil is about 20 cm long. 20 m is as long as a classroom, so 20 m does not make sense for a pencil. Centimetres are the right unit.

Q17. No. A cat has a mass of a few kilograms. A car has a mass of more than 1 000 kg, so a cat and a car do not have the same mass.

Q18. Each big step is about 1 m, and the hallway takes 12 steps, so the hallway is about 12 m long.

Q19. (a) The field is measured in metres. (b) The long side is 174 m, and Zac walks it twice: $174 + 174 = 348$, so Zac walks about 348 m in all. (c) No. Kilometres are for much longer distances, like the drive from Melbourne to Geelong. The width of the field is 149 m, so metres make sense, not kilometres.



An oval field. A red double arrow across the long way is labelled 174 metres, and a blue double arrow across the short way is labelled 149 metres. The red stick figure is Zac, and he walks along the long side.

Measuring and comparing length, mass and capacity

Code: VC2M3M02 (.E01, .E02, .E03, .E04, .E05)

measure and compare objects using familiar metric units of length, mass and capacity, and instruments with labelled markings — VC2M3M02

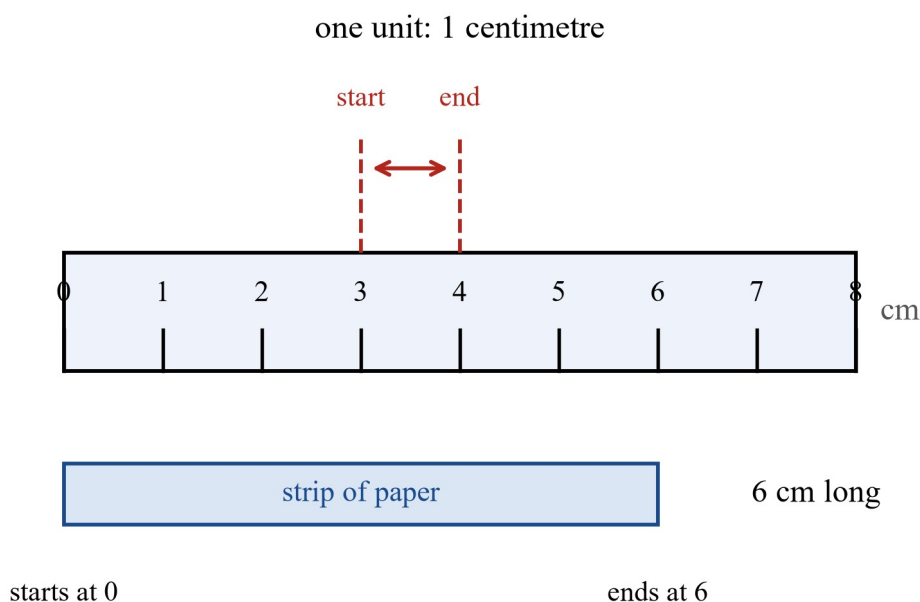
In Year 2 you measured things with units you made yourself, like paper clips and cups. Now you will use the metric units everyone in Australia uses: centimetres (cm) and metres (m) for length, grams (g) and kilograms (kg) for mass, and millilitres (mL) and litres (L) for capacity. You will learn to read rulers, jugs, scales and beakers, and to compare what they show.

You will need: a centimetre ruler, a strip of centimetre grid paper, and a pencil.

Learn about length, mass and capacity

1. The lines on a ruler show where each unit starts and ends

The lines on a ruler are the start and the end of each unit. On a centimetre ruler, each unit is 1 centimetre. When you measure, line the object up with 0 and read the line at the end of the object.



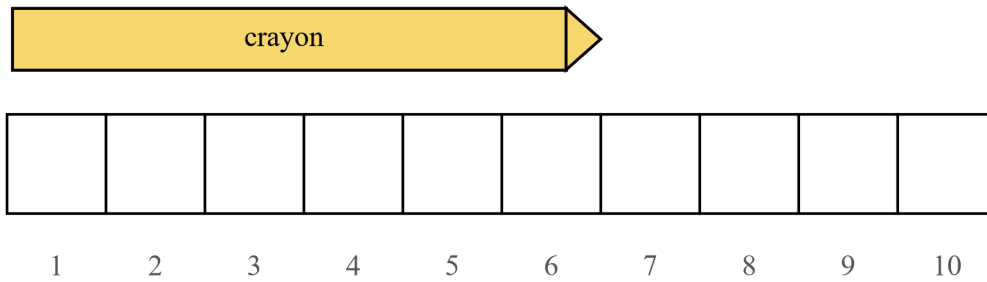
A ruler from 0 to 8 centimetres with a strip of paper below it. The strip starts at 0 and ends at 6, so it is 6 cm long. The unit between 3 and 4 is picked out: one unit is 1 centimetre.

The strip of paper starts at 0 and ends at the line for 6, so it is 6 cm long. Count the units to check: 6 units of 1 centimetre.

2. A strip of grid paper measures things too

Each square on centimetre grid paper is 1 centimetre wide. Put the object along the strip and count the squares it covers.

each square is 1 centimetre



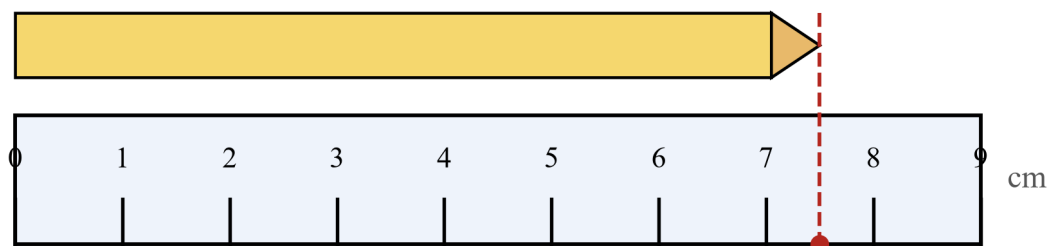
the crayon covers 6 squares, so it is 6 cm long

A strip of ten 1-centimetre squares with a crayon above it. The crayon covers 6 squares, so it is 6 cm long.

The crayon covers 6 squares, so it is 6 cm long.

Sometimes the end of an object falls between two lines. Then say how far past the line it comes. If it ends halfway between two lines, add a half.

the tip is halfway between 7 and 8: $7\frac{1}{2}$ cm



the pencil is seven and a half centimetres long

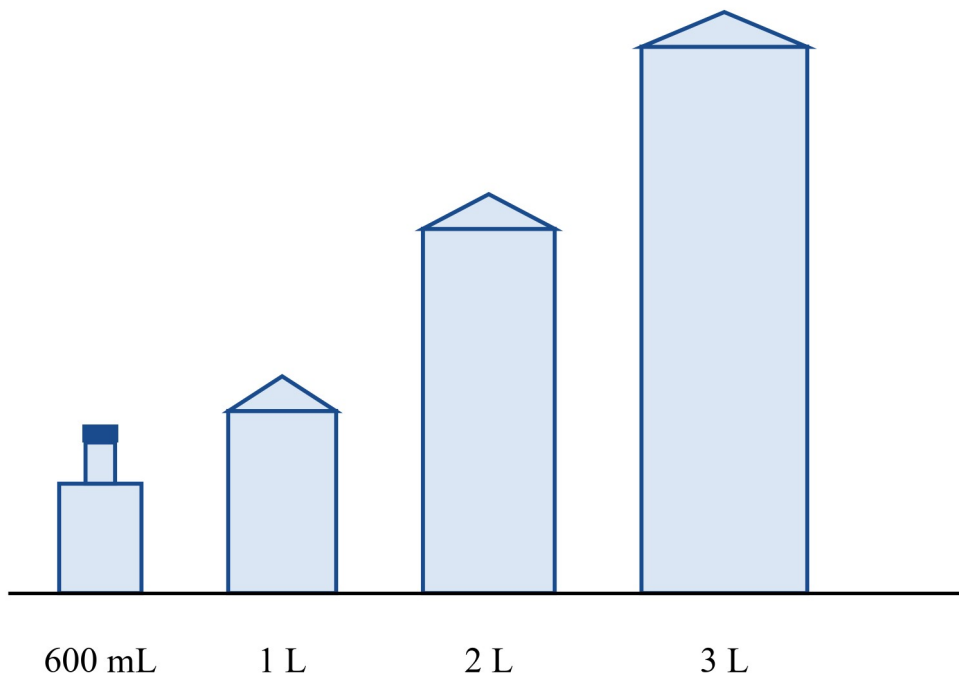
A ruler from 0 to 9 centimetres with a pencil above it. The tip of the pencil ends halfway between 7 and 8, so the pencil is seven and a half centimetres long.

The tip of the pencil is halfway between 7 and 8. The pencil is $7\frac{1}{2}$ cm long: seven and a half centimetres.

3. Capacity is what a container holds

The **capacity** of a container is the amount of liquid it can hold. We use millilitres (mL) for small amounts and litres (L) for big amounts.

the same drink, in four sizes of container

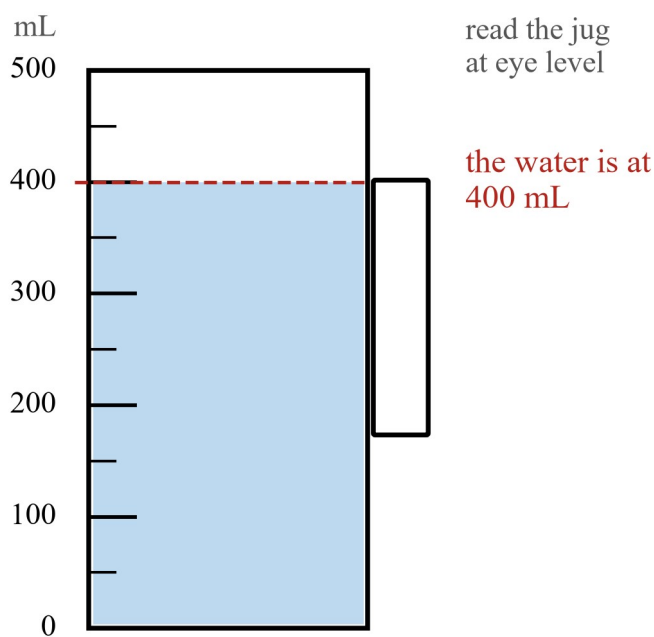


The same milk in four containers: a 600 mL bottle, then a 1 L carton, a 2 L carton and a 3 L carton.

The same drink comes in four kinds of container. The smallest holds 600 mL, and the 3 L carton holds the most.

4. Read a jug by its markings

A jug has labelled markings. On this jug the labels count by 100 mL, and a small line sits halfway between each pair of labels. Each small line stands for 50 mL. Put the jug on the bench and read it at eye level.



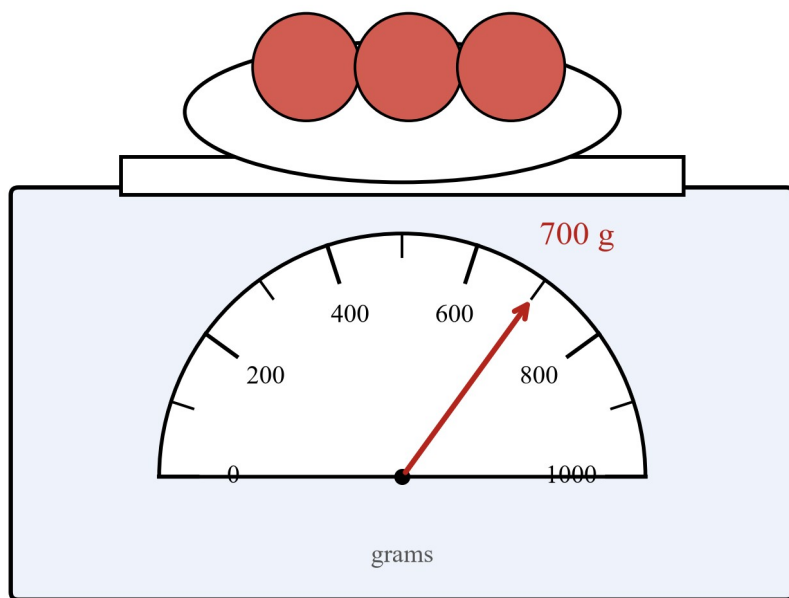
A jug with labels counting by 100 millilitres and a small line every 50 millilitres. The water is at 400 mL.

The water is at 400 mL.

5. Read kitchen scales in grams

Kitchen scales show mass in grams (g). On this dial the big labels count by 200 g, and the small lines between them stand for 100 g. The needle shows the mass.

the apples have a mass of 700 g



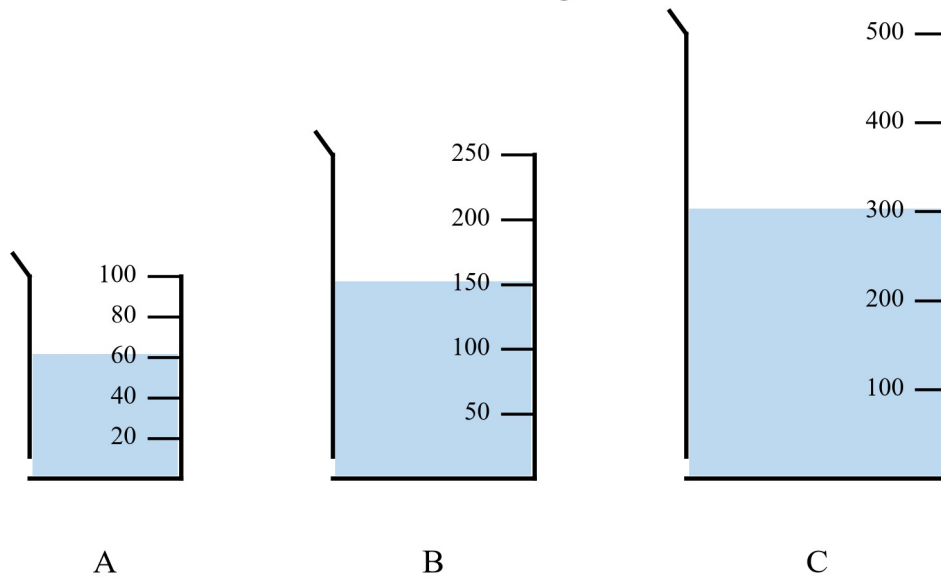
Kitchen scales with a dial from 0 to 1000 grams and three apples on top. The needle is at 700 g.

The apples have a mass of 700 g. For heavier things, like a full school bag, we use kilograms (kg).

6. Beakers have numbered graduations

In science you read beakers. The numbered graduations on the side are millilitres.

three beakers, like the ones in science
the numbers on the graduations are millilitres



Three beakers labelled A, B and C, with numbered graduations in millilitres and water in each.

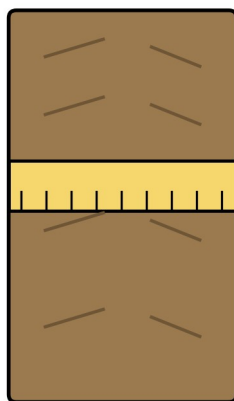
Look at B. The water is halfway between 100 and 200, at 150 mL.

Worked examples

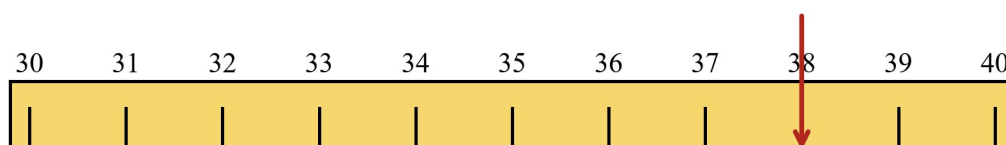
Example 1 — with help

A class wraps a paper tape once around a tree trunk to measure the distance around it (the **girth**). Then they lay the tape flat and read it.

the tape goes once around the trunk



the tape ends at 38



the reading is 38 cm

A paper tape wrapped once around a tree trunk, laid flat below from 30 to 40 centimetres. The tape ends at 38, so the reading is 38 cm.

Working

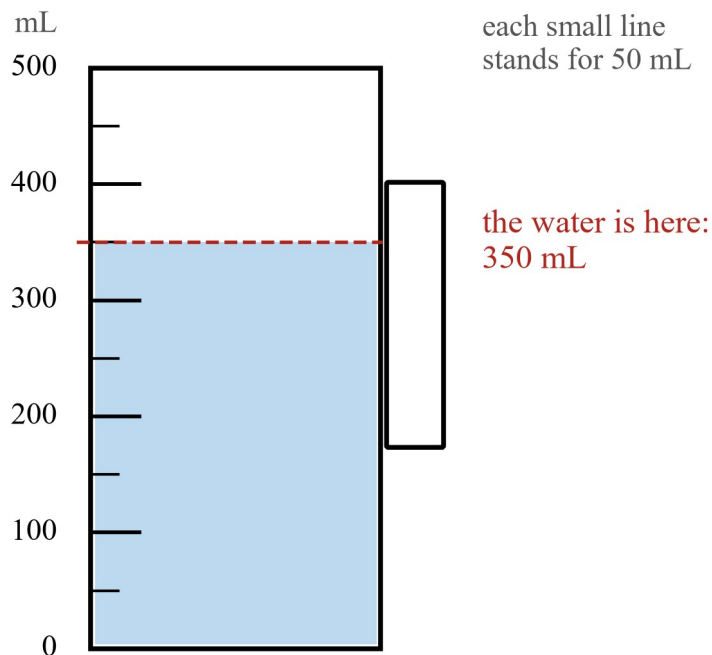
The tape starts at 0 and goes once around the trunk.
The tape ends at 38.
The girth of the trunk is 38 cm.

What we did

Measured the girth with a tape (. E01).
Read the number where the tape ends.
Gave the length in centimetres.

Example 2 — with help

What does this jug show?



A jug with labels every 100 millilitres and a small line every 50 millilitres. The water is at the small line halfway between 300 and 400.

Working

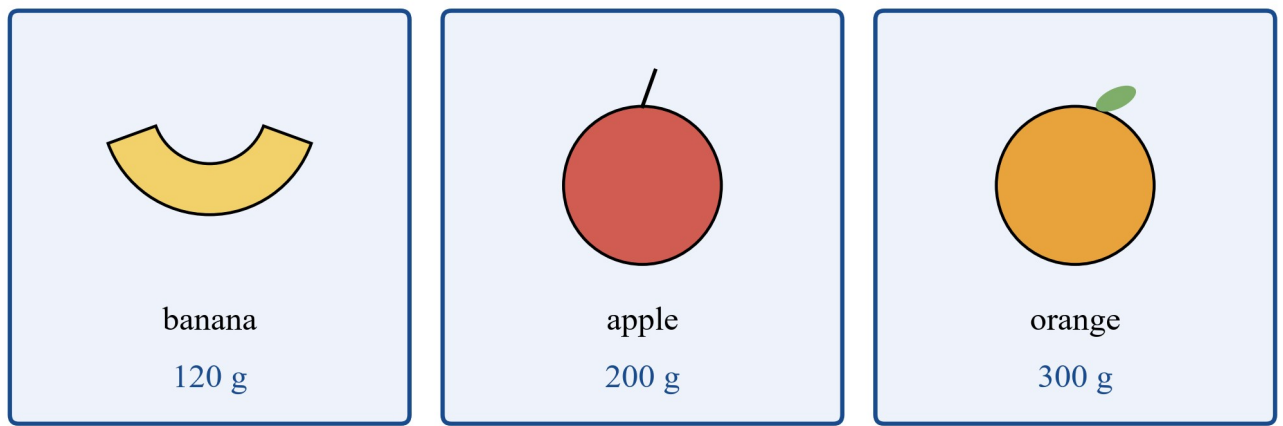
The water is above 300 and below 400.
The water is at the small line halfway between them.
 $300 + 50 = 350$
The jug shows 350 mL. ✓

What we did

Found the labels the water sits between.
Used the small line: it stands for 50 mL.
Counted on 50 from 300.
Gave the capacity in millilitres.

Example 3 — on your own

The cards show the mass of three fruits. Put them in order from lightest to heaviest. How much heavier is the heaviest fruit than the lightest fruit?

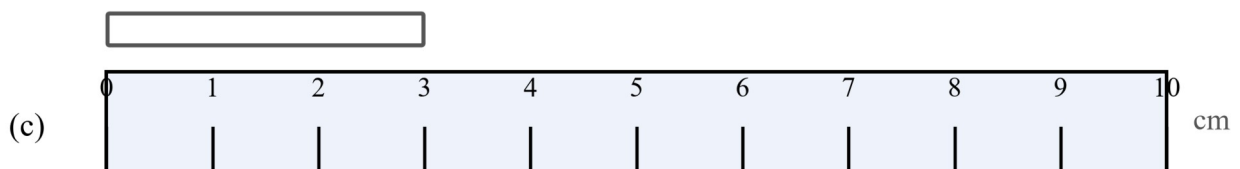
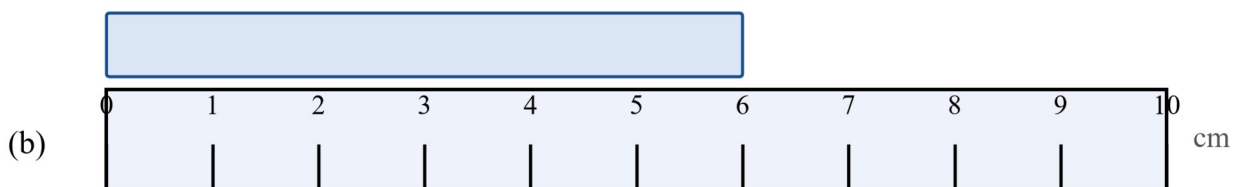
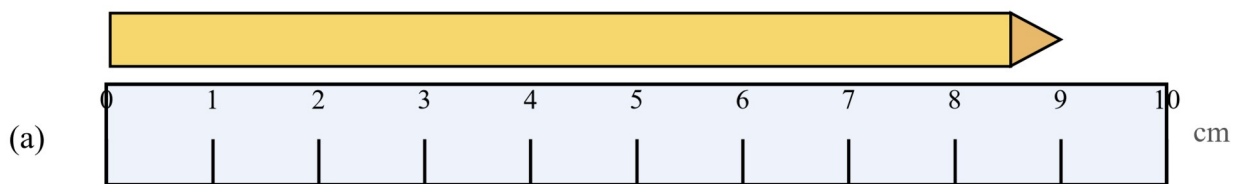


Three cards: a banana with a mass of 120 g, an apple with a mass of 200 g and an orange with a mass of 300 g.
 (Check: the order is banana, apple, orange, and $300 - 120 = 180$ g.)

Practice questions

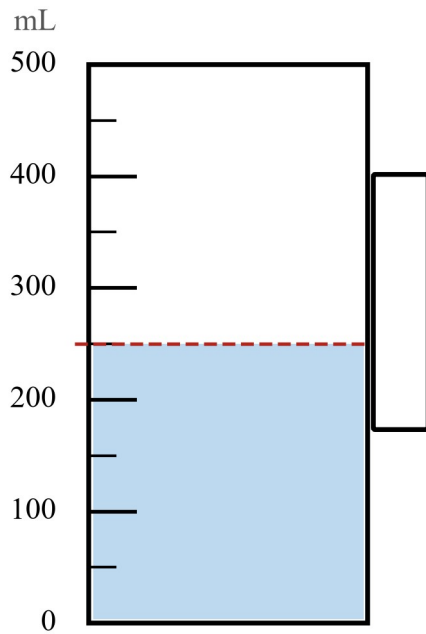
With help

Q1. How long is each object? (a) the pencil (b) the glue stick (c) the paper clip



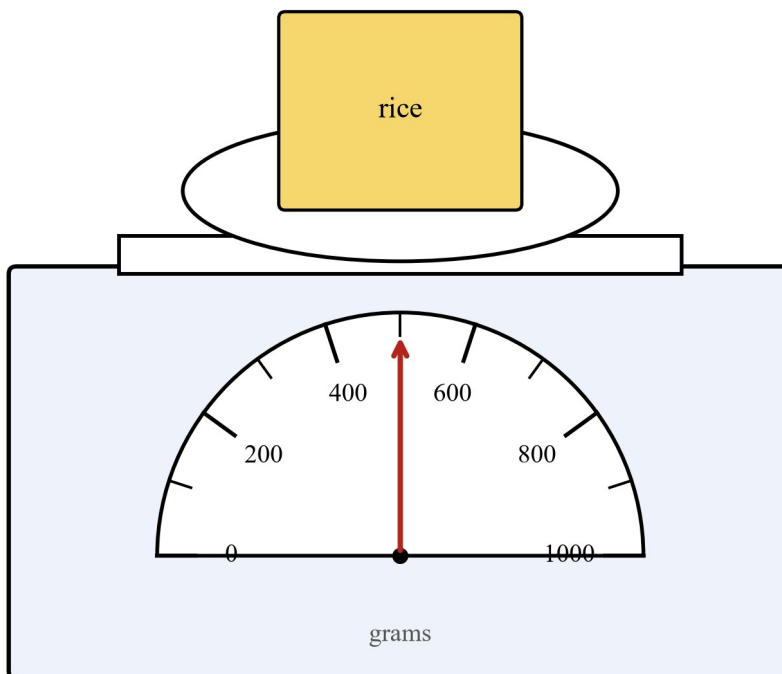
Three rulers from 0 to 10 centimetres, each with an object above it to measure: (a) a pencil, (b) a glue stick and (c) a paper clip.

Q2. What does the jug show?



A jug with labels counting by 100 millilitres and a small line every 50 millilitres, with water in it. Read the level of the water.

Q3. What is the mass of the bag of rice on the scales?



Kitchen scales with a dial from 0 to 1000 grams and a bag of rice on top. Read the needle.

Q4. Fill each gap with $<$ or $>$.

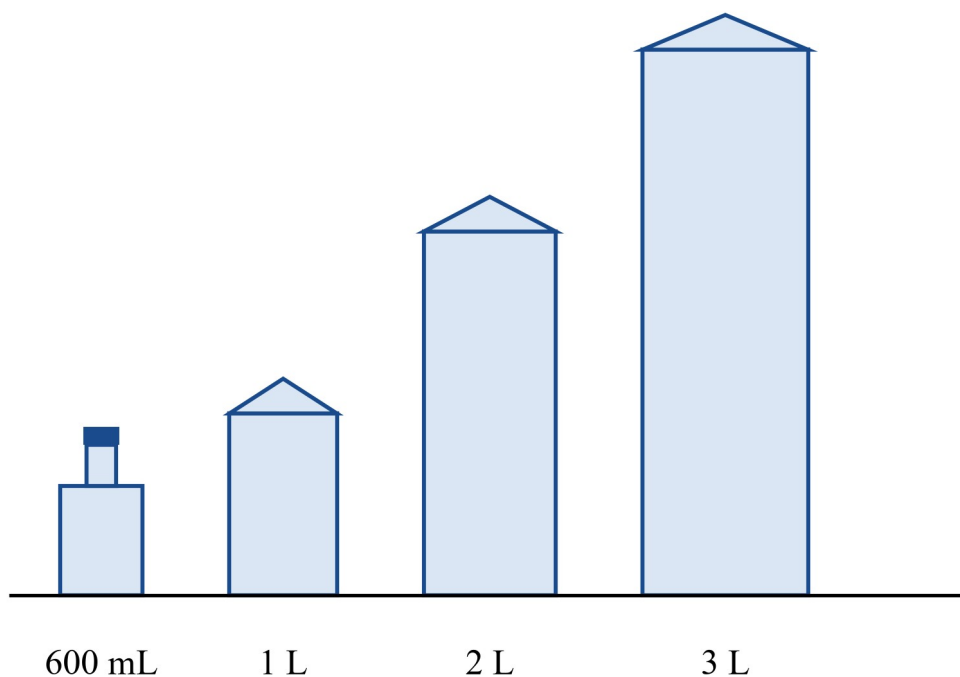
- (a) 450 mL $\underline{\hspace{1cm}}$ 540 mL (b) 2 kg $\underline{\hspace{1cm}}$ 3 kg (c) 38 cm $\underline{\hspace{1cm}}$ 83 cm (d) 9 m $\underline{\hspace{1cm}}$ 6 m

Q5. Put these in order from lightest to heaviest: 250 g, 900 g, 500 g, 750 g.

Q6. A pencil ends halfway between 7 and 8 on a centimetre ruler. How long is the pencil?

Q7. Put the milk containers in order, from the one that holds the least to the one that holds the most.

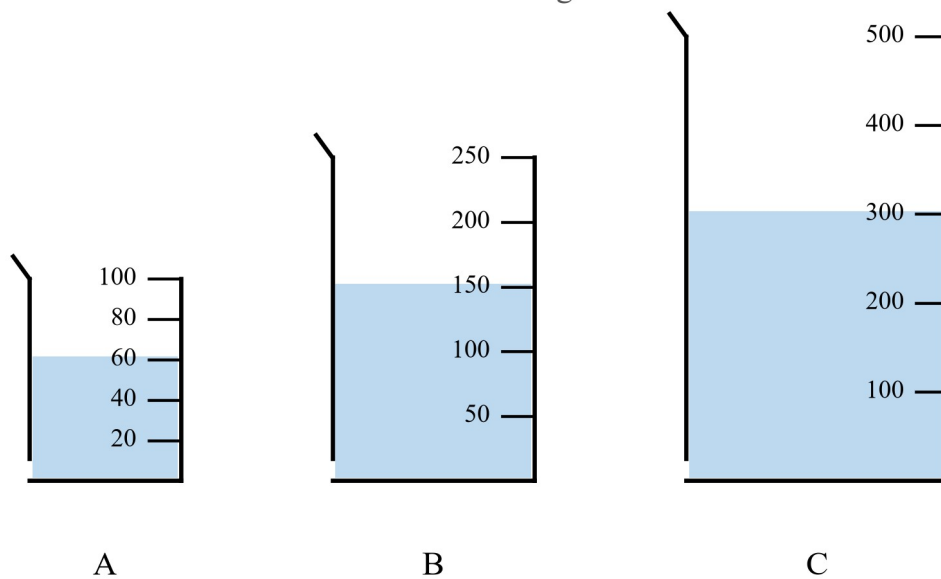
the same drink, in four sizes of container



The same milk in four containers: a 600 mL bottle, then a 1 L carton, a 2 L carton and a 3 L carton.

Q8. How many millilitres do beakers A and C each show?

three beakers, like the ones in science
the numbers on the graduations are millilitres



Three beakers labelled A, B and C, with numbered graduations in millilitres and water in each.

On your own

- Q9.** One ribbon is 12 cm long. Another ribbon is 9 cm long. How much longer is the first ribbon?
- Q10.** A jug shows 400 mL. I pour in more water, and the water ends up 3 small lines above where it was. Each small line stands for 50 mL. What does the jug show now?
- Q11.** A bowl of flour on kitchen scales shows 800 g. I take 300 g of flour out. What do the scales show now?
- Q12.** Three water containers hold 2 L, 3 L and 1 L. (a) Put them in order, from the one that holds the least to the one that holds the most. (b) How many litres do they hold altogether?
- Q13.** On a kitchen scales dial, the big labels count by 100 g, and three small lines sit between each pair of labels, so each small line stands for 25 g. The needle is at the third small line past 200. What mass does the dial show?
- Q14.** Does each make sense? Say yes or no, and give a reason.
- (a) A new pencil is about 15 cm long.
 - (b) A full school bag has a mass of 3 g.
 - (c) A metre stick is longer than 90 cm.
- Q15.** A tape around one tree trunk reads 42 cm. A tape around another tree trunk reads 35 cm. (a) Which trunk is thicker? (b) How much more is the distance around the thicker trunk?
- Q16.** A jug holds 500 mL of water. I pour some water out. Now the jug shows 300 mL. How much water did I pour out?
- Q17.** A straw ends halfway between 10 and 11 on a centimetre ruler. How long is the straw?
- Q18.** Pick the unit you would use. (a) the length of a pencil (cm or m) (b) the mass of a watermelon (g or kg) (c) the capacity of a bath (mL or L) (d) the capacity of a teaspoon (mL or L)
- Q19.** The cards show the lengths of four Victorian rivers.

Murray River	Goulburn River	Yarra River	Barwon River
2508 km	654 km	242 km	160 km
long	long	long	long

Four cards naming four Victorian rivers, each with its length in kilometres: the Murray River, the Goulburn River, the Yarra River and the Barwon River.

Source: Wikipedia, *Murray River, Goulburn River, Yarra River, Barwon River (Victoria)*, retrieved 2026-08-20.

- (a) Which river is the longest?
 - (b) Put the rivers in order from shortest to longest.
 - (c) How much longer is the Yarra River than the Barwon River?
-

Answers

Q1. (a) 9 cm (b) 6 cm (c) 3 cm. **Q2.** 250 mL. **Q3.** 500 g. **Q4.** (a) < (b) < (c) < (d) >. **Q5.** 250 g, 500 g, 750 g, 900 g.
Q6. $7\frac{1}{2}$ cm. **Q7.** 600 mL, 1 L, 2 L, 3 L. **Q8.** A: 60 mL; C: 300 mL. **Q9.** 3 cm. **Q10.** 550 mL. **Q11.** 500 g. **Q12.** (a) 1 L, 2 L, 3 L (b) 6 L. **Q13.** 275 g. **Q14.** (a) yes (b) no (c) yes. **Q15.** (a) the trunk that reads 42 cm (b) 7 cm. **Q16.** 200 mL. **Q17.** $10\frac{1}{2}$ cm. **Q18.** (a) cm (b) kg (c) L (d) mL. **Q19.** (a) the Murray River (b) Barwon, Yarra, Goulburn, Murray (c) 82 km.

Worked answers

Q1. Each object starts at 0, so read the line at its end. (a) The pencil ends at 9: it is 9 cm long. (b) The glue stick ends at 6: it is 6 cm long. (c) The paper clip ends at 3: it is 3 cm long.

Q2. The water is above 200 and below 300, at the small line halfway between them. $200 + 50 = 250$, so the jug shows 250 mL.

Q3. The needle is between 400 and 600, at the small line halfway between them. Each small line stands for 100 g, so the needle is at 500 g. The bag of rice has a mass of 500 g.

Q4. (a) $450\text{ mL} < 540\text{ mL}$. (b) $2\text{ kg} < 3\text{ kg}$. (c) $38\text{ cm} < 83\text{ cm}$. (d) $9\text{ m} > 6\text{ m}$.

Q5. $250\text{ g} < 500\text{ g} < 750\text{ g} < 900\text{ g}$, so the order is 250 g, 500 g, 750 g, 900 g.

Q6. Halfway between 7 and 8 is seven and a half: the pencil is $7\frac{1}{2}$ cm long.

Q7. The bottle holds the least (600 mL), then the 1 L carton, the 2 L carton and the 3 L carton.

Q8. In A, the graduations count by 20: the water is at 60 mL. In C, the graduations count by 100: the water is at 300 mL.

Q9. $12 - 9 = 3$. The first ribbon is 3 cm longer.

Q10. Three small lines is $50 + 50 + 50 = 150$ mL more. $400 + 150 = 550$, so the jug shows 550 mL.

Q11. $800 - 300 = 500$. The scales show 500 g.

Q12. (a) 1 L, 2 L, 3 L. (b) $1 + 2 + 3 = 6$, so they hold 6 L altogether.

Q13. Count on by 25s from 200: 225, 250, 275. The dial shows 275 g.

Q14. (a) Yes. Pencils are about 15 cm long. (b) No. 3 g is about the mass of a paper clip, not a school bag. A full school bag has a mass of about 3 kg. (c) Yes. Line a metre stick up against a centimetre ruler: it reaches the 100 mark, and 100 cm is more than 90 cm.

Q15. (a) The trunk that reads 42 cm is thicker, because the distance around it is more. (b) $42 - 35 = 7$. The distance around the thicker trunk is 7 cm more.

Q16. $500 - 300 = 200$. I poured out 200 mL of water.

Q17. Halfway between 10 and 11 is ten and a half: the straw is $10\frac{1}{2}$ cm long.

Q18. (a) cm — a pencil is short. (b) kg — a watermelon is heavy. (c) L — a bath holds a lot of water. (d) mL — a teaspoon holds a little water.

Q19. (a) The Murray River, at 2508 km. (b) Barwon (160 km), Yarra (242 km), Goulburn (654 km), Murray (2508 km). (c) $242 - 160 = 82$. The Yarra River is 82 km longer than the Barwon River.

Units of time and the duration of events

Code: VC2M3M03 (.E01, .E02, .E03, .E04)

Some events are quick and some are long. In this topic you will get to know the four units of time — **seconds, minutes, hours and days** — how they fit together, and how to **estimate** and **compare** how long events take.

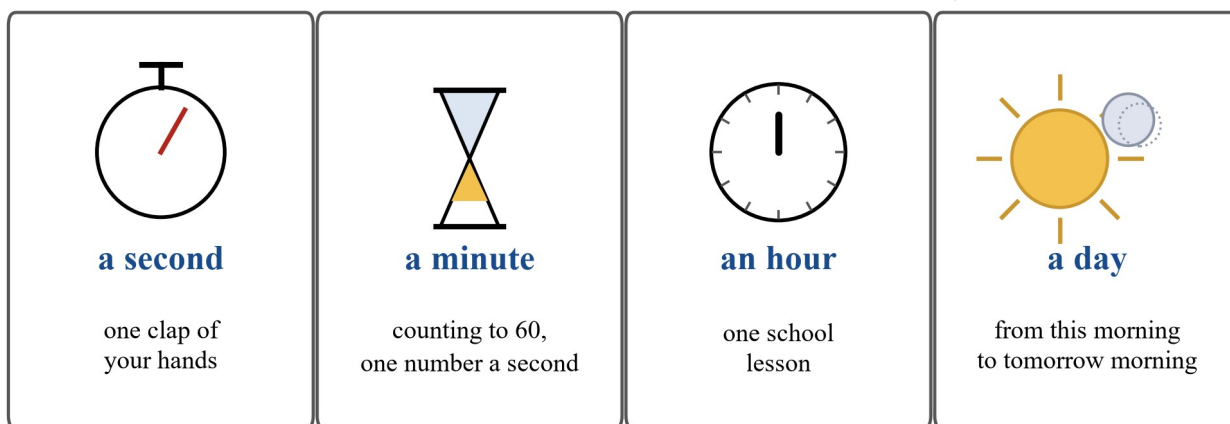
You will need: a digital timer or a sand timer, and a clock with a second hand.

Learn about units of time

1. Four units of time

We measure time in seconds, minutes, hours and days. Here is one event that takes about each unit.

We measure time in seconds, minutes, hours and days

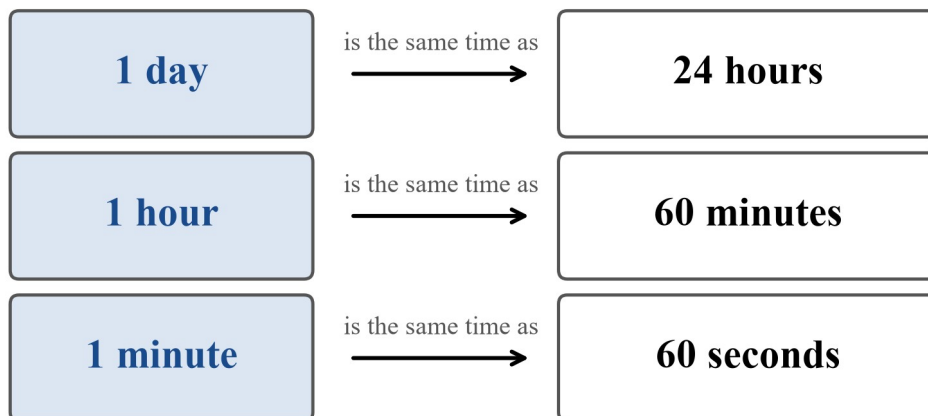


Four cards, one for each unit. A second is one clap of your hands. A minute is counting to 60, one number a second. An hour is one school lesson. A day is from this morning to tomorrow morning.

A clap takes about a second. Counting to 60, one number a second, takes about a minute. One school lesson takes about an hour. From this morning to tomorrow morning is one day.

2. How the units fit together

These three facts join the units up. Learn them, and practise saying them until they come quickly.



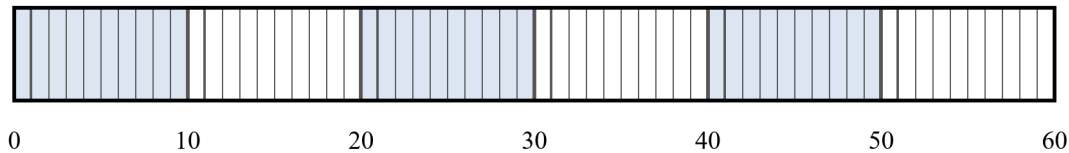
Three rows joined by arrows. 1 day is the same time as 24 hours. 1 hour is the same time as 60 minutes. 1 minute is the same time as 60 seconds.

- 1 minute = 60 seconds
- 1 hour = 60 minutes
- 1 day = 24 hours

3. One minute is 60 seconds

Each small square is one second. The whole bar is one minute.

1 minute = 60 seconds



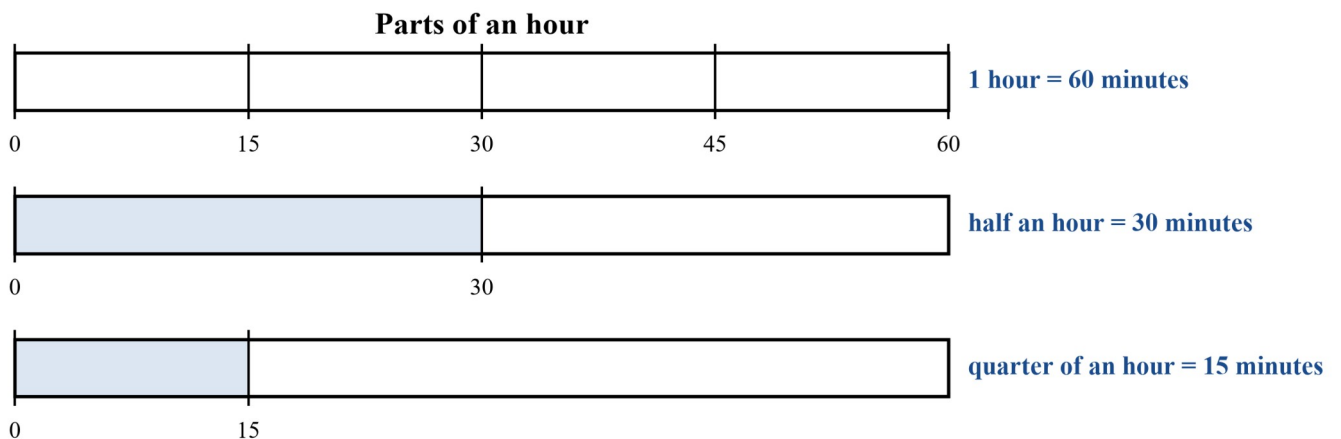
The bar has 60 small squares: one square for each second.

A bar made of 60 small squares, counted 0, 10, 20, 30, 40, 50, 60. One small square is one second, so the whole bar is 60 seconds.

Count the squares by 10s: 10, 20, 30, 40, 50, 60. Sixty small squares, so **1 minute = 60 seconds**.

4. One hour is 60 minutes

Each bar below is one hour, cut into 60 minutes.



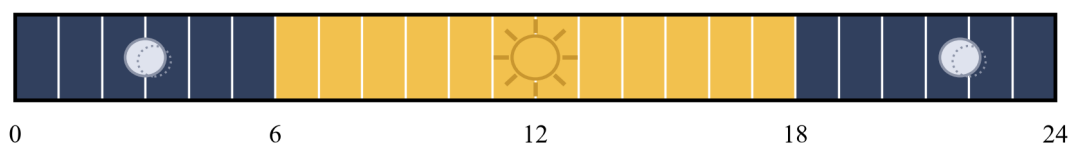
Three bars of 60 minutes. The top bar is one whole hour. The middle bar has 30 minutes shaded, which is half an hour. The bottom bar has 15 minutes shaded, which is a quarter of an hour.

- **1 hour = 60 minutes**
- **Half an hour = 30 minutes**
- **A quarter of an hour = 15 minutes**

5. One day is 24 hours

Each square is one hour. The whole strip is one day.

1 day = 24 hours



The strip has 24 squares: one square for each hour. The yellow squares are day, the dark squares are night.

A strip of 24 squares, one for each hour. The dark squares are the night and the yellow squares are the day, with a sun in the middle of the day and moons in the night.

Count the squares: 24. So **1 day = 24 hours**. Two days would be $24 + 24 = 48$ hours.

6. Estimate, then check with a timer

An **estimate** is a good guess about how long something takes. You make it before you use the timer — then you use the timer and see how close you were.

Estimate first, then measure with a timer

The first row is done for you as an example.

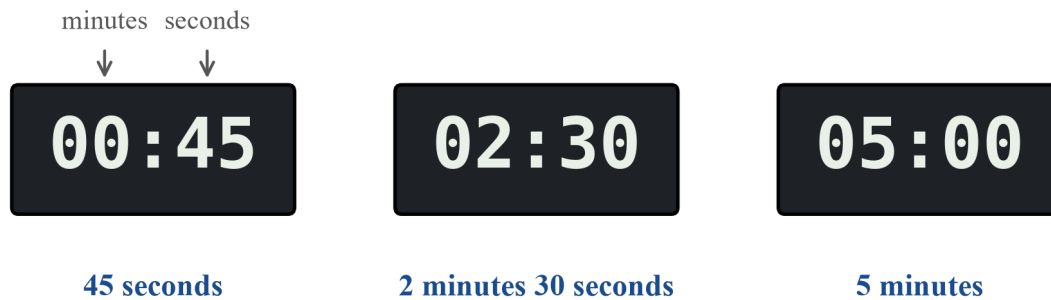
Event	My estimate	Time we measured
read one page out loud	60 seconds	45 seconds
write the letters A to Z		
hop 10 times		

A table with three events: read one page out loud, write the letters A to Z, and hop 10 times. The first row is filled in as an example: the estimate is 60 seconds and the time we measured is 45 seconds. The other two rows have blank boxes for your estimate and the time the timer shows.

Try the table with a partner. Use a sand timer or a digital timer to check your estimates for 1 minute, 3 minutes and 5 minutes, and share what you find out with your class.

7. Reading a digital timer

A digital timer shows two numbers, like **02:30**. The number on the left counts **minutes**. The number on the right counts **seconds**.



The number on the left counts minutes. The number on the right counts seconds.

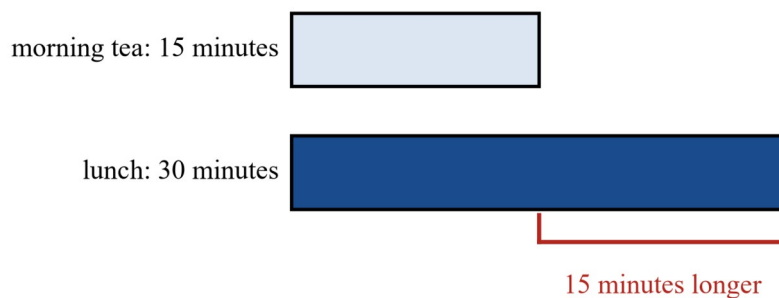
Three digital timers with the minutes and the seconds labelled. 00:45 is 45 seconds. 02:30 is 2 minutes and 30 seconds. 05:00 is 5 minutes.

So 02:30 means 2 minutes and 30 seconds, and 05:00 means 5 minutes.

8. Compare how long things take

To compare two times, put them in the **same unit** first. Then you can see which is longer, and by how much.

Lunch is longer than morning tea.



$30 - 15 = 15$. Lunch is 15 minutes longer.

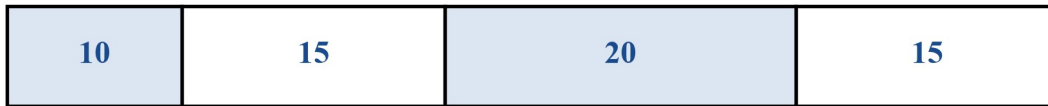
Two bars. Morning tea is 15 minutes and lunch is 30 minutes. A red line marks the part that is 15 minutes longer.

Morning tea is 15 minutes and lunch is 30 minutes. Both are in minutes, so we can compare: $30 - 15 = 15$. Lunch is **15 minutes longer** than morning tea.

9. Plan a sequence of events

You can add times up to plan a sequence of events, like a class party.

The class party plan



musical statues	pass the parcel	party food	dancing
-----------------	-----------------	------------	---------

$$10 + 15 + 20 + 15 = 60 \text{ minutes}$$

60 minutes is 1 hour, so the plan fits the party time.

The class party plan as one bar of 60 minutes: musical statues 10 minutes, pass the parcel 15 minutes, party food 20 minutes, and dancing 15 minutes. $10 + 15 + 20 + 15 = 60$ minutes, which is 1 hour.

Add the parts: $10 + 15 + 20 + 15 = 60$ minutes. And 60 minutes is 1 hour, so the plan fits the party time.

Worked examples

Example 1 — with help

Which is longer: 2 hours, or 90 minutes? How much longer?

Working

$$2 \text{ hours} = 60 + 60 = 120 \text{ minutes}$$

$$120 > 90$$

$$120 - 90 = 30$$

2 hours is longer, by 30 minutes. ✓

What we did

Put both times in the same unit (minutes).

Compared the numbers.

Found how much longer.

Gave the answer.

Example 2 — with help

A countdown timer shows 00:48. How many more seconds until it reaches 1 minute?

Working

00:48 is 48 seconds.

$$1 \text{ minute} = 60 \text{ seconds}$$

$$60 - 48 = 12$$

12 more seconds. ✓

What we did

Read the timer: left is minutes, right is seconds.

Used the units fact.

Took away the seconds that have gone.

Gave the answer.

Example 3 — on your own

Look at the class party plan in point 9. Do the four parts take 1 hour in all? Show your working.

$10 + 15 + 20 + 15 = 60$ minutes, and 60 minutes is 1 hour. Yes — the plan fits the party time. ✓

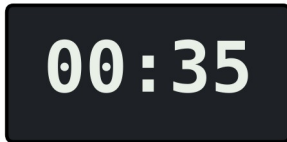
Practice questions

With help

Q1. Fill in the blanks. (a) 1 minute = __ seconds (b) 1 hour = __ minutes (c) 1 day = __ hours

Q2. Write the time each timer shows, in minutes and seconds.

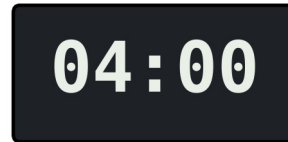
Write the time each timer shows.



(a)



(b)



(c)

Three digital timers labelled (a), (b) and (c), showing 00:35, 01:20 and 04:00.

Q3. Circle the longer time. (a) 1 minute or 50 seconds (b) 1 hour or 70 minutes (c) 1 day or 20 hours

Q4. A sand timer runs for 3 minutes. How many seconds is that? (Count by 60s: 60, 120, ...)

Q5. A timer counts down from 10 minutes. Now it shows 4 minutes to go. How many minutes have gone by?

Q6. Match each event to the best unit.

Match each event to the best unit.

one clap	brushing your teeth		
watching a movie	the school camp		
a second	a minute	an hour	a day

Four event cards: one clap, brushing your teeth, watching a movie, and the school camp. Four unit cards: a second, a minute, an hour, and a day.

Q7. You read for half an hour, then play sport for half an hour. How many minutes is that in all? How many hours?

Q8. A countdown timer counts down by 5 seconds. Fill in the blanks: 20, , 10, , 0.

On your own

Q9. Write $<$, $>$ or $=$ in each circle. (a) 1 hour $\circ$ 50 minutes (b) 90 seconds $\circ$ 1 minute (c) 2 days $\circ$ 50 hours (d) 2 hours $\circ$ 120 minutes

Q10. How many minutes? (a) 2 hours (b) 3 hours (c) half an hour (d) a quarter of an hour

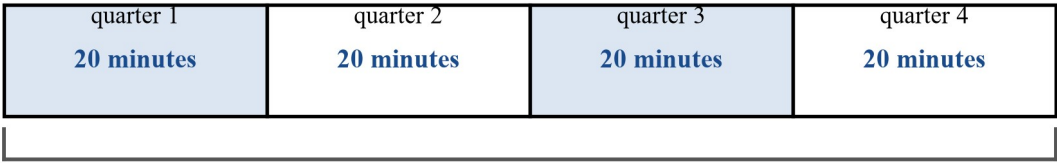
Q11. How many hours? (a) 2 days (b) 3 days

Q12. How many seconds are in 4 minutes?

Q13. A movie runs for 2 hours. You have watched 1 hour of it. How many minutes are left?

- Q14.** Put these in order from the shortest time to the longest: 1 day, 30 minutes, 25 hours, 1 hour.
- Q15.** A 5-minute sand timer has 2 minutes left to run. How many minutes have already run?
- Q16.** The train trip takes 2 hours. The bus trip on the same road takes 90 minutes. Which trip takes longer? How much longer?
- Q17.** Jack says 1 day is 12 hours. Is Jack right? How do you know?
- Q18.** At a school sports day, the races take 20 minutes, the games take 15 minutes, and giving out the medals takes 10 minutes. How many minutes does it all take? Is that more or less than 1 hour? By how much?
- Q19.** AFL (Australian rules football) started in Victoria. In an AFL game, each quarter is 20 minutes of playing time.
- Source: Wikipedia, *Australian rules football*, retrieved 2026-08-20.

An AFL game: 4 quarters of 20 minutes



How many minutes in all?

- A bar showing an AFL game as 4 quarters, each 20 minutes long, with the question: how many minutes in all?*
- (a) How many minutes of playing time are in 2 quarters?
 - (b) How many minutes of playing time are in the whole game (4 quarters)?
 - (c) How many more minutes is that than 1 hour?
-

Answers

Q1. (a) 60 (b) 60 (c) 24. **Q2.** (a) 35 seconds (b) 1 minute 20 seconds (c) 4 minutes. **Q3.** (a) 1 minute (b) 70 minutes (c) 1 day. **Q4.** 180 seconds. **Q5.** 6 minutes. **Q6.** One clap → a second; brushing your teeth → a minute; watching a movie → an hour; the school camp → a day. **Q7.** 60 minutes; 1 hour. **Q8.** 15 and 5. **Q9.** (a) > (b) > (c) < (d) =. **Q10.** (a) 120 (b) 180 (c) 30 (d) 15. **Q11.** (a) 48 (b) 72. **Q12.** 240. **Q13.** 60 minutes. **Q14.** 30 minutes, 1 hour, 1 day, 25 hours. **Q15.** 3 minutes. **Q16.** The train; 30 minutes longer. **Q17.** No; 1 day is 24 hours. **Q18.** 45 minutes; less than 1 hour; 15 minutes less. **Q19.** (a) 40 minutes (b) 80 minutes (c) 20 minutes.

Worked answers

Q1. (a) 1 minute = 60 seconds. (b) 1 hour = 60 minutes. (c) 1 day = 24 hours.

Q2. (a) 00:35 is 35 seconds. (b) 01:20 is 1 minute 20 seconds. (c) 04:00 is 4 minutes.

Q3. (a) 1 minute = 60 seconds, and $60 > 50$, so 1 minute is longer. (b) 1 hour = 60 minutes, and $60 < 70$, so 70 minutes is longer. (c) 1 day = 24 hours, and $24 > 20$, so 1 day is longer.

Q4. 3 minutes is 3 lots of 60 seconds: 60, 120, 180. So 3 minutes = 180 seconds.

Q5. $10 - 4 = 6$. Six minutes have gone by.

Q6. One clap takes about a second. Brushing your teeth takes about a minute. Watching a movie takes about an hour. The school camp takes more than a day, so a day is the best unit.

Q7. Half an hour is 30 minutes. $30 + 30 = 60$ minutes, and 60 minutes is 1 hour.

Q8. Counting down by 5s: 20, 15, 10, 5, 0. The missing numbers are 15 and 5.

Q9. (a) 1 hour = 60 minutes, and $60 > 50$. (b) 1 minute = 60 seconds, and $90 > 60$. (c) 2 days = 48 hours, and $48 < 50$. (d) 2 hours = $60 + 60 = 120$ minutes.

Q10. (a) 2 hours = $60 + 60 = 120$ minutes. (b) 3 hours = $60 + 60 + 60 = 180$ minutes. (c) Half an hour = 30 minutes. (d) A quarter of an hour = 15 minutes.

Q11. (a) 2 days = $24 + 24 = 48$ hours. (b) 3 days = $24 + 24 + 24 = 72$ hours.

Q12. Each minute is 60 seconds: $60 + 60 + 60 + 60 = 240$, so $4 \times 60 = 240$ seconds.

Q13. 2 hours = 120 minutes and 1 hour = 60 minutes. $120 - 60 = 60$ minutes left.

Q14. 30 minutes is the shortest. 1 hour is 60 minutes. 1 day is 24 hours. 25 hours is more than a day. So the order is: 30 minutes, 1 hour, 1 day, 25 hours.

Q15. $5 - 2 = 3$. Three minutes have already run.

Q16. 2 hours = 120 minutes. $120 > 90$, so the train takes longer. $120 - 90 = 30$: the train takes 30 minutes longer.

Q17. No. 1 day is 24 hours, not 12. (12 hours is about half a day.)

Q18. $20 + 15 + 10 = 45$ minutes. 1 hour is 60 minutes, and $45 < 60$, so it is less than 1 hour. $60 - 45 = 15$: it is 15 minutes less than 1 hour.

Q19. (a) $20 + 20 = 40$ minutes. (b) $4 \times 20 = 80$ minutes (or $40 + 40 = 80$). (c) 1 hour = 60 minutes; $80 - 60 = 20$, so the game is 20 minutes longer than 1 hour.

Reading analog and digital clocks to the nearest minute

Code: VC2M3M04 (.E01, .E02, .E03)

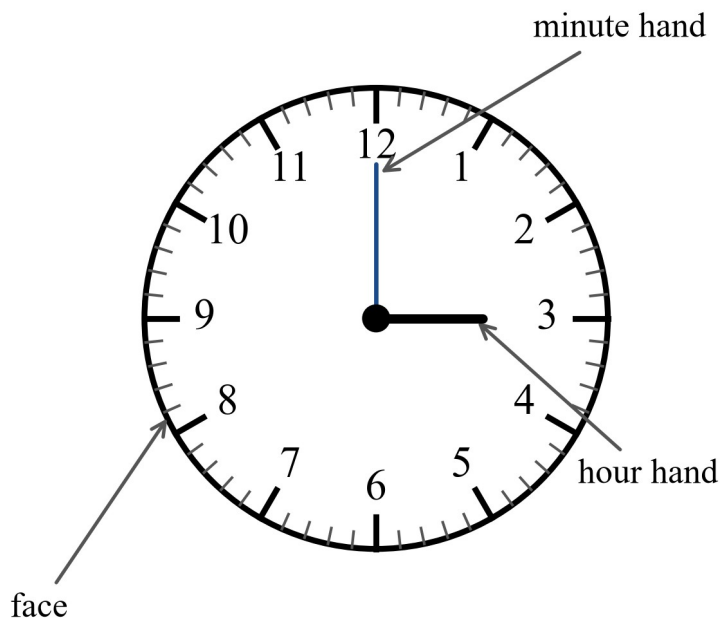
In Year 2 you learned to read a clock at o'clock, half past and quarter past. Now you will learn to read **any** time, to the nearest minute, on an **analog** clock (a clock with hands) and on a **digital** clock (a clock with numbers). You will also learn how the hours and the minutes on a clock work together.

You will need: a clock with moving hands if you have one, the clock faces in this part, and a pencil.

Learn to read the clock

1. Two kinds of clocks

An analog clock has a round face with numbers on it and two hands. A digital clock shows the time with numbers, like 7:15. Both clocks can show the same time.

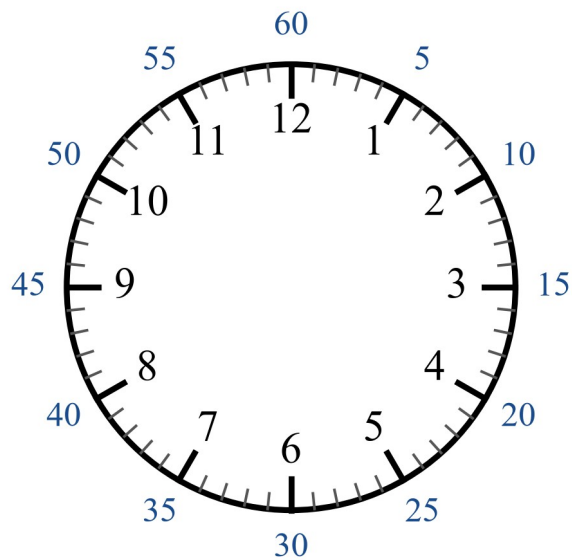


An analog clock at 3 o'clock, with labels. The long blue minute hand points to the 12 and is labelled minute hand. The short black hour hand points to the 3 and is labelled hour hand. The round edge of the clock is labelled face.

The short, thick hand is the **hour hand**. The long, thin hand is the **minute hand**. In this book the hour hand is black and the minute hand is blue, so you can always tell which is which.

2. The face counts minutes

The edge of the face has 12 big marks and 60 small marks. From one small mark to the next small mark is 1 minute.

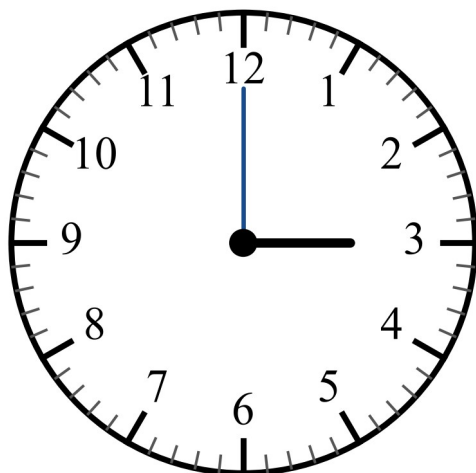


A clock face with no hands. Blue numbers outside the face count by fives at the big marks: 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55 and 60, with 60 at the top by the 12.

The blue numbers show the count by fives at the big marks: 5, 10, 15 and so on, all the way to 60 at the 12. When the minute hand goes right around the face, 60 minutes have gone by.

3. O'clock

When the minute hand points to the 12, no minutes have gone by yet. We say it is ... o'clock.



An analog clock showing 3 o'clock. The black hour hand points to the 3 and the blue minute hand points to the 12.

This clock shows 3 o'clock. A digital clock shows the same time as 3:00. The 00 means no minutes have gone by.

4. Reading the minutes

To read the minutes on an analog clock:

- Count by fives to the last big mark the minute hand has passed.

- Then count by ones along the small marks.

If the minute hand is 3 small marks past the 4: count by fives to 20 at the 4, then count 21, 22, 23. The minutes are 23.

5. Reading the hour

The hour hand tells the hour, and it moves too. It points to a number, or between two numbers. When it is between two numbers, the hour is the number it has passed. Between 2 and 3, the hour is 2.

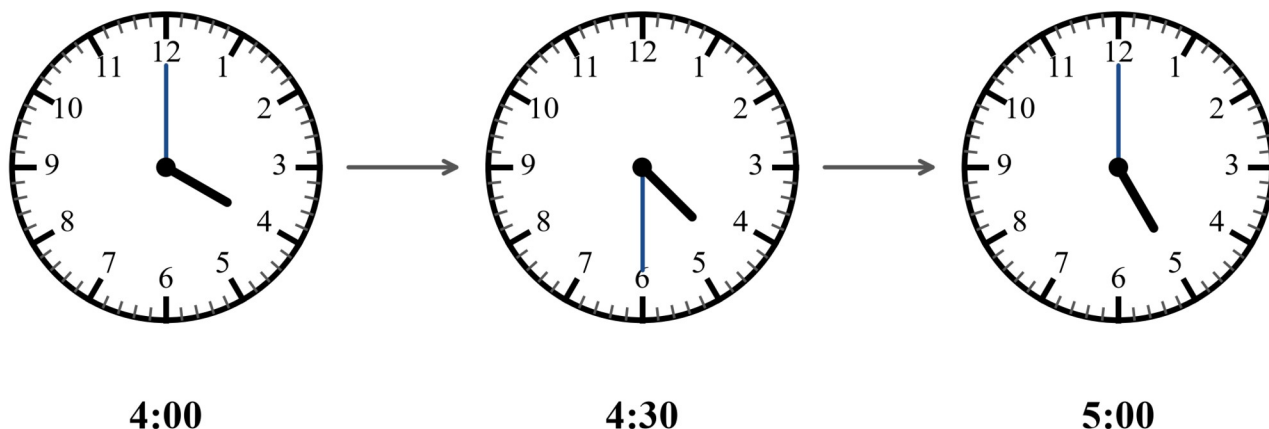
6. Saying the time in words

We can say the same time in more than one way:

- 12:15 is *quarter past 12*, or *15 minutes past 12*.
- 12:45 is *quarter to one*, or *15 minutes before one o'clock*.
- 10:05 is *5 minutes past 10*.
- 9:30 is *half past 9*.

At 12:45 the hour hand is between 12 and 1, close to the 1 — but the hour is still 12, because 1 o'clock has not come yet.

7. The hour hand moves during the hour

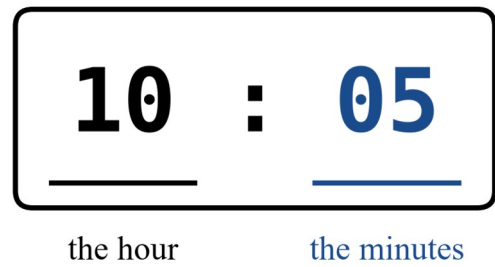
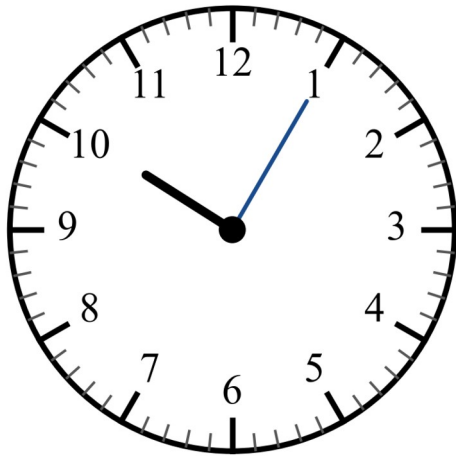


Three clocks in a row with arrows between them. The first shows 4:00, the second shows 4:30 and the third shows 5:00. At 4:30 the hour hand is in the middle between 4 and 5.

Look at the three clocks. At 4:00 the hour hand points to the 4. At 4:30 it is in the middle between 4 and 5. At 5:00 it points to the 5. While the minute hand went all the way around the face, the hour hand moved from one number to the next.

That is the relationship between the hours and the minutes on a clock: **1 hour = 60 minutes**.

8. Digital clocks



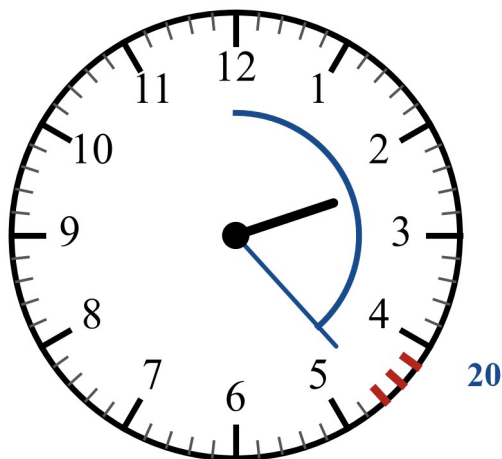
An analog clock showing 10:05 next to a digital clock card showing 10:05. On the card the hour 10 is in black, like the black hour hand, and the minutes 05 are in blue, like the blue minute hand. Under the card, 10 is labelled the hour and 05 is labelled the minutes.

A digital clock shows the hour, then two dots, then the minutes: 10:05. The minutes are always shown with two numbers. At 5 minutes past 10 we write 10:05, not 10:5. The 0 holds the place. The blue minutes match the blue minute hand, and the black hour matches the black hour hand.

Worked examples

Example 1 — with help

Read the analog clock.



An analog clock showing 2:23. The black hour hand is between 2 and 3. The blue minute hand is 3 small marks past the 4. A blue path runs from the 12 around to the minute hand. The big mark at the 4 is labelled 20 in blue, and the marks for 21, 22 and 23 are red.

Working

The minute hand has passed the 4.

Then 3 small marks more: 21, 22, 23.

Minutes = 23

The hour hand is between 2 and 3.

The time is 2:23. ✓

Example 2 — with help

Read the same time two ways.

What we did

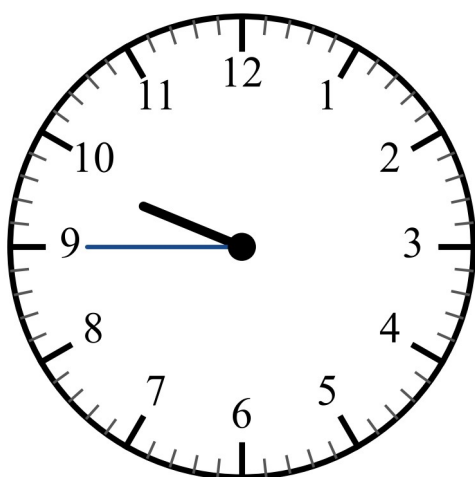
Count by fives to 20 at the 4.

Count by ones to the minute hand.

The blue path shows all 23 minutes.

The hour is 2, the number it has passed.

In words: 23 minutes past 2.



An analog clock showing 9:45 next to a digital clock card showing 9:45. The blue minute hand points to the 9. The black hour hand is between 9 and 10, close to the 10.

Working

The minute hand points to the 9.

The hour hand is between 9 and 10.

The time is 9:45. ✓

What we did

Count by fives: 5, 10, 15, ..., 45. Minutes = 45.

It is near the 10, but it has only passed the 9. The hour is 9.

In words: quarter to ten, or 15 minutes before ten o'clock.

Example 3 — on your own

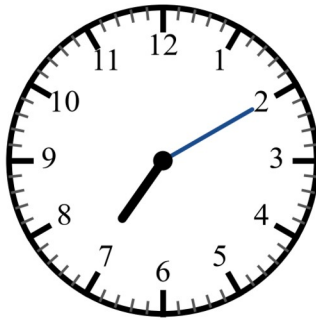
A digital clock shows 10:05. Where are the hands on an analog clock showing the same time?

The minutes are 05, so the minute hand is 5 minutes past the 12: it points to the 1. The hour is 10, and 5 minutes of the hour have gone by, so the hour hand is just past the 10. Check your answer with the picture in part 8 above.

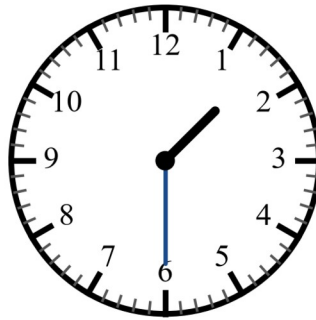
Practice questions

With help

Q1. Match each clock to its digital time.



A



B



C

Three clocks in a row, with the letters A, B and C under them. Clock A shows 7:10. Clock B shows 1:30. Clock C shows 11:55.

Digital times: 11:55, 7:10, 1:30

Q2. Look at the clock in part 3. The minute hand points to the 12 and the hour hand points to the 3. The time is o'clock, or :00.

Q3. Look at the face in part 2. Count by fives. The minute hand points to the 9. The minutes are .

Q4. The minute hand is 2 small marks past the 2. Count by fives to 10, then 11, 12. The minutes are .

Q5. A digital clock shows 6:05. The minutes are . The 0 is there to the place.

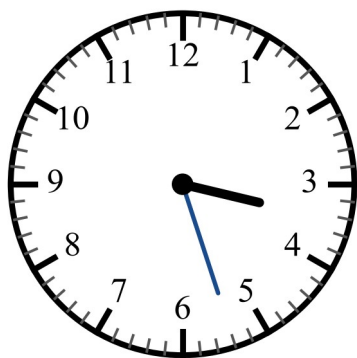
Q6. Look at the clock in part 1. The short, thick hand is the hand. The long, thin hand is the hand.

Q7. Look at the clocks in part 7. From 4:00 to 5:00 the minute hand goes once around the face. That is minutes. So 1 hour = minutes.

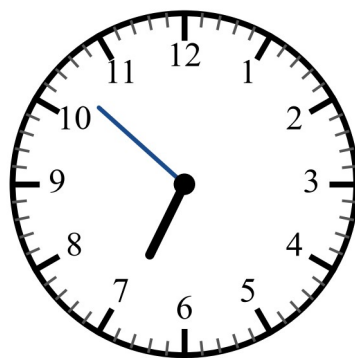
Q8. Write 9:30 in words: half past .

On your own

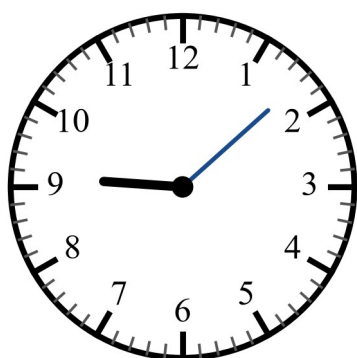
Q9. Write the time on each clock with numbers.



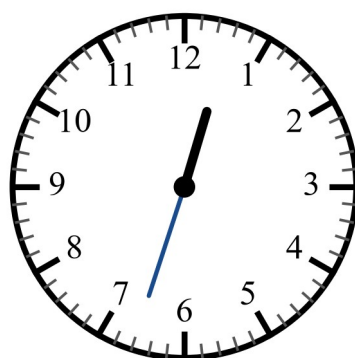
A



B



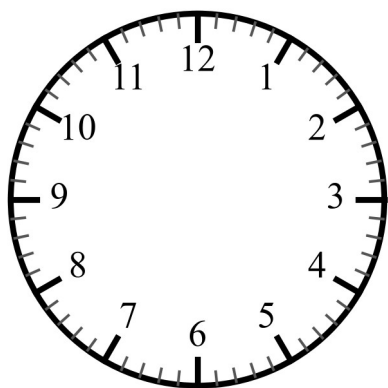
C



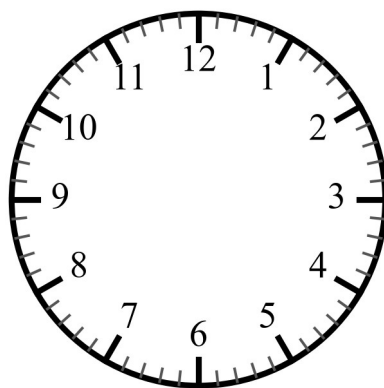
D

Four clocks labelled A, B, C and D. Clock A shows 3:27. Clock B shows 6:52. Clock C shows 9:08. Clock D shows 12:33.

Q10. On the empty faces, draw the hands to show each time.



A



B

Two empty clock faces with numbers but no hands, labelled A and B.

(a) A: 4:20 (b) B: 7:50

Q11. Write each time with numbers.

- (a) 5 minutes past 7
- (b) quarter past 2
- (c) 15 minutes before 11 o'clock
- (d) half past 6

Q12. Write each time in words.

- (a) 1:15
- (b) 8:45
- (c) 10:05

Q13. An analog clock shows 5:50. Which digital time shows the same time: 5:05 or 5:50? How do you know?

Q14. Mia looks at a clock. The minute hand points to the 11 and the hour hand is close to the 5. Mia says the time is 5 o'clock. Is Mia right? What is the real time?

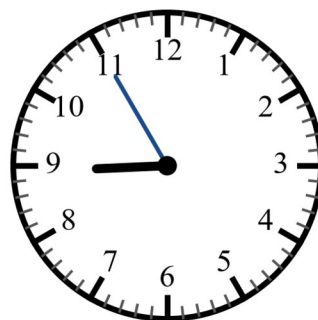
Q15. The minute hand points to the 6. The hour hand is between the 2 and the 3. The time is □.

Q16. At 3:25, which number does the minute hand point to?

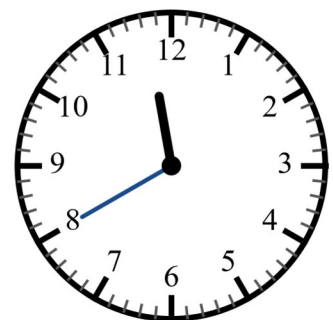
Q17. Zoe looked at the same clock three times in one morning.



A



B



C

Three clocks in a row, with the letters A, B and C under them. Clock A shows 10:10. Clock B shows 8:55. Clock C shows 11:40.

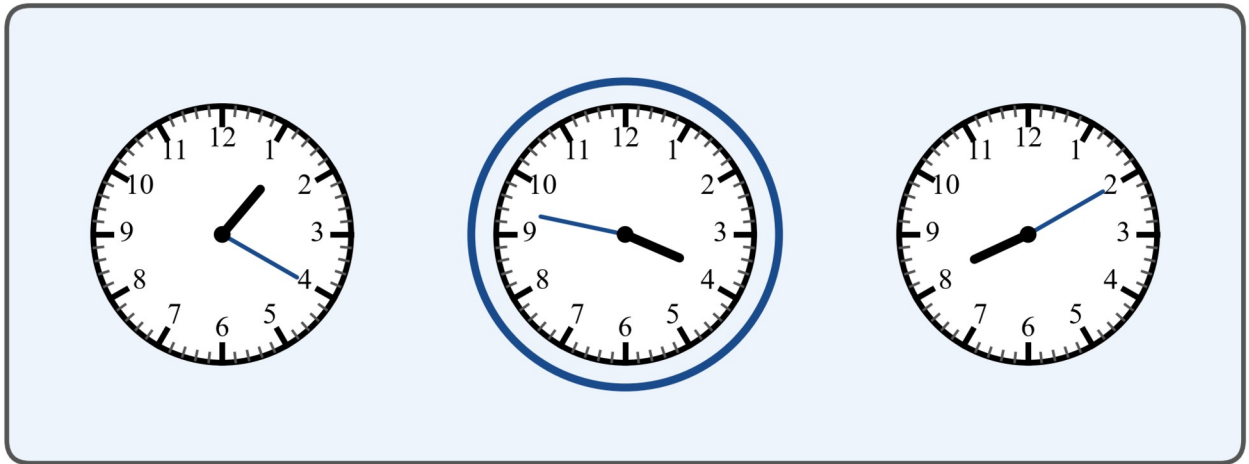
- (a) Write the time on each clock.
- (b) Put the three times in order, from first to last.

Q18. A clock shows 2:00. The minute hand goes once around the face. What time does the clock show now? How many minutes went by?

Q19. Flinders Street station in Melbourne is famous for the row of clocks over its entrance, and Melburnians say “meet me under the clocks”. The clocks show train times.

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

Look at the clock with the blue ring.



A row of three clocks on a station front. The middle clock is ringed in blue and shows 3:47. The left clock shows 1:20 and the right clock shows 8:10.

- (a) Read the time with numbers.
 - (b) Write the time in words, as minutes past 3.
 - (c) The hour hand is between two numbers. Which two? Which one is the hour?
-

Answers

Q1. A = 7:10, B = 1:30, C = 11:55. **Q2.** 3 o'clock; 3:00. **Q3.** 45. **Q4.** 12. **Q5.** 5 minutes; hold. **Q6.** hour; minute. **Q7.** 60; 60. **Q8.** half past 9. **Q9.** A 3:27, B 6:52, C 9:08, D 12:33. **Q10.** (a) The minute hand at the 4, the hour hand just past the 4. (b) The minute hand at the 10, the hour hand near the 8 but not there yet. **Q11.** (a) 7:05, (b) 2:15, (c) 10:45, (d) 6:30. **Q12.** (a) quarter past 1, or 15 minutes past 1; (b) quarter to 9, or 15 minutes before nine o'clock; (c) 5 minutes past 10. **Q13.** 5:50. At 5:50 the minute hand is at the 10; at 5:05 it would be at the 1. **Q14.** No; the real time is 4:55. **Q15.** 2:30. **Q16.** The 5. **Q17.** (a) A 10:10, B 8:55, C 11:40; (b) B, then A, then C. **Q18.** 3:00; 60 minutes. **Q19.** (a) 3:47; (b) 47 minutes past 3; (c) between 3 and 4; the hour is 3.

Worked answers

Q1. Clock A: the minute hand is at the 2 (10 minutes) and the hour hand is just past the 7, so 7:10. Clock B: the minute hand is at the 6 (30 minutes) and the hour hand is in the middle between 1 and 2, so 1:30. Clock C: the minute hand is at the 11 (55 minutes) and the hour hand is nearly at the 12 but has not got there, so 11:55.

Q2. The minute hand at the 12 means no minutes have gone by: 3 o'clock, written 3:00.

Q3. Count by fives to the 9: 5, 10, 15, 20, 25, 30, 35, 40, 45. The minutes are 45.

Q4. The 2 is 10 minutes. Two small marks more: 11, 12. The minutes are 12.

Q5. 05 is 5 minutes. The 0 holds the place, because the minutes are always shown with two numbers.

Q6. Short and thick is the hour hand; long and thin is the minute hand.

Q7. One trip around the face is 60 small marks, so 60 minutes. 1 hour = 60 minutes.

Q8. 30 minutes past 9 is half past 9.

Q9. A: count by fives to 25 at the 5, then 26, 27 → 3:27. B: count by fives to 50 at the 10, then 51, 52 → 6:52. C: the minute hand is 3 small marks past the 1: 5, 6, 7, 8 → 9:08. D: count by fives to 30 at the 6, then 31, 32, 33 → 12:33.

Q10. (a) 20 minutes: the minute hand points to the 4; 20 minutes of the hour have gone by, so the hour hand is just past the 4. (b) 50 minutes: the minute hand points to the 10; the hour hand is near the 8 but has not got there — the hour is still 7.

Q11. (a) 7:05 — the minutes are always two numbers. (b) Quarter past 2 is 15 minutes past 2: 2:15. (c) 15 minutes before 11 o'clock is a quarter to 11: 10:45. (d) Half past 6 is 30 minutes past 6: 6:30.

Q12. (a) 1:15 is quarter past 1, or 15 minutes past 1. (b) 8:45 is quarter to 9, or 15 minutes before nine o'clock. (c) 10:05 is 5 minutes past 10.

Q13. 5:50. The minutes are 50, so the minute hand is at the 10. At 5:05 the minute hand would be at the 1. At 5:50 the hour hand is also close to the 6, not just past the 5.

Q14. The minute hand at the 11 is 55 minutes. The hour hand close to the 5 means it has passed the 4 but not the 5, so the hour is 4. The real time is 4:55 — 5 minutes before 5 o'clock, not 5 o'clock.

Q15. The minute hand at the 6 is 30 minutes: half past. The hour hand between 2 and 3 means the hour is 2. The time is 2:30.

Q16. 25 minutes: count by fives 5, 10, 15, 20, 25. The minute hand points to the 5.

Q17. (a) A: 10:10 (minute hand at the 2, hour hand just past the 10). B: 8:55 (minute hand at the 11, hour hand nearly at the 9). C: 11:40 (minute hand at the 8, hour hand between 11 and 12). (b) All three times are in the morning: 8:55 comes first, then 10:10, then 11:40 — so B, then A, then C.

Q18. One trip around the face is 60 minutes, and the hour hand moves one number on: from 2:00 to 3:00. 60 minutes went by.

Q19. (a) The minute hand is 2 small marks past the 9: 45, 46, 47. The hour hand is between 3 and 4. The time is 3:47.
(b) 47 minutes past 3. (c) Between 3 and 4; it has passed the 3, so the hour is 3.

Angles as measures of turn, compared with a right angle

Code: VC2M3M05 (.E01, .E02, .E03)

identify angles as measures of turn and use right angles as a reference to compare angles in everyday situations — VC2M3M05

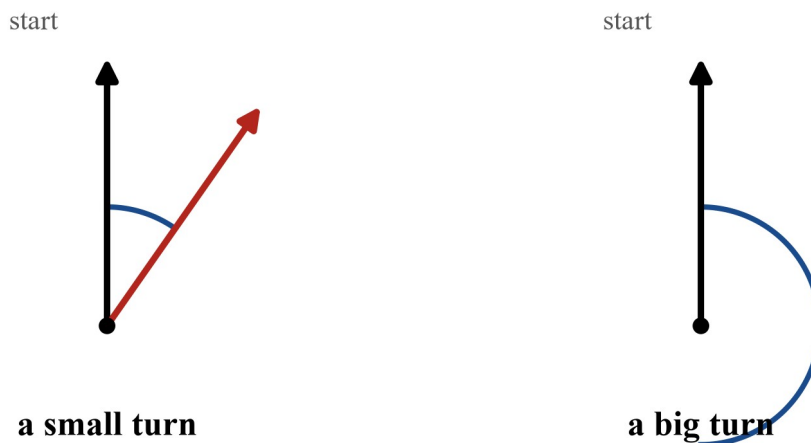
In Year 2 you made quarter turns, half turns, three-quarter turns and full turns. Now you will find out that every turn has a size, and that the size of a turn is called an **angle**. You will meet a special turn called a **right angle**, compare other turns with it, and count how many right angles fit in a turn.

You will need: a sheet of paper, scissors, a book and a pencil.

Learn about angles as measures of turn

1. A turn has a size

When something turns, it turns by some amount. The size of a turn is called an **angle**.



Two arrows that turn from the same start. The left arrow makes a small turn. The right arrow makes a big turn.

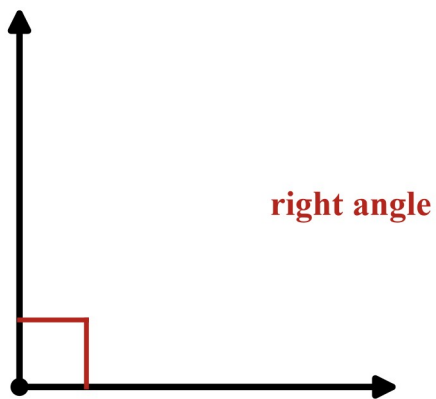
The arrow on the left makes a small turn. The arrow on the right makes a big turn. The angle is the size of the turn.

An **angle** measures the size of a turn.

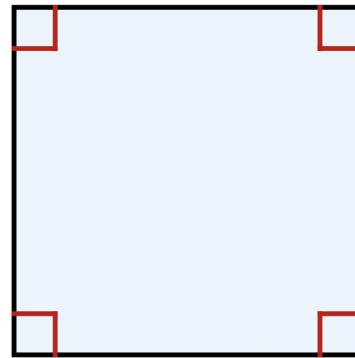
From Year 2 you know the turn names: quarter turn, half turn, three-quarter turn and full turn. Now you can measure all of those turns.

2. The right angle

The turn in a square corner is called a **right angle**. A right angle is the same size as a quarter turn.



the turn in a square corner



a square has 4 right angles

Left: two straight arms meeting at a square corner, with a small red square in the corner and the words right angle.

Right: a square with a red square marker in each of its four corners, and the words a square has 4 right angles.

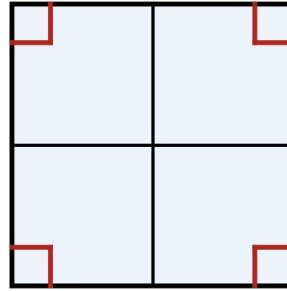
In this topic we mark a right angle with a small square in the corner. A square has 4 right angles, one in each corner.

3. Right angles are all around you

The corners of many everyday objects are right angles.



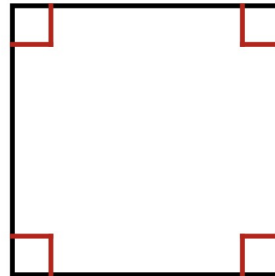
a book



a window



a tabletop



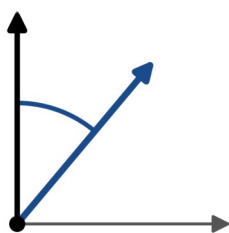
a tile

Four everyday objects with red right angle markers in their corners: a book, a window, a tabletop and a tile.

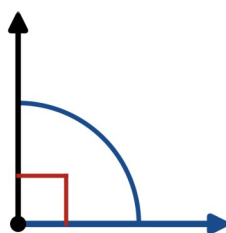
A book cover, a window, a tabletop and a floor tile all have 4 corners that are right angles, just like a square.

4. Compare any turn with a right angle

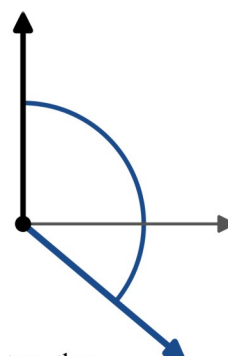
Any turn can be checked against a right angle.



less turn than
a right angle



the same turn as
a right angle



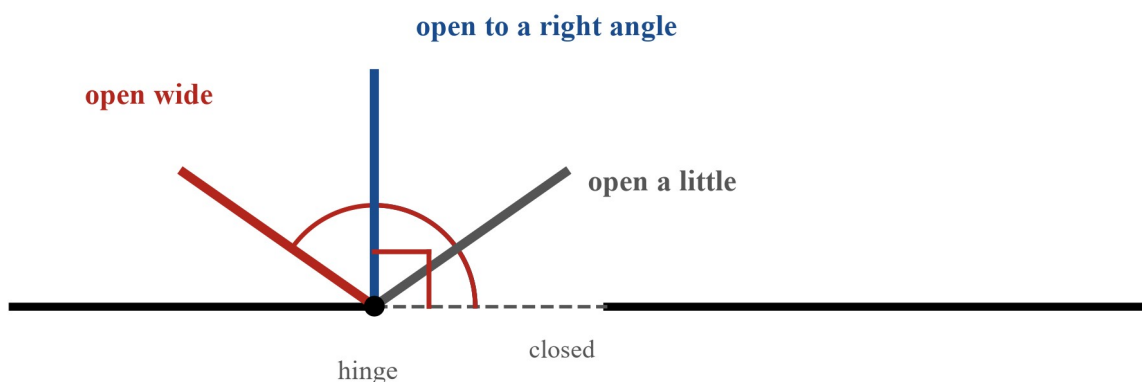
more turn than
a right angle

Three turns checked against a grey right angle. Left: less turn than a right angle. Middle: the same turn as a right angle. Right: more turn than a right angle.

- A turn can be **less than** a right angle.
- A turn can be **the same as** a right angle.
- A turn can be **more than** a right angle.

A door is a good example.

a door seen from above

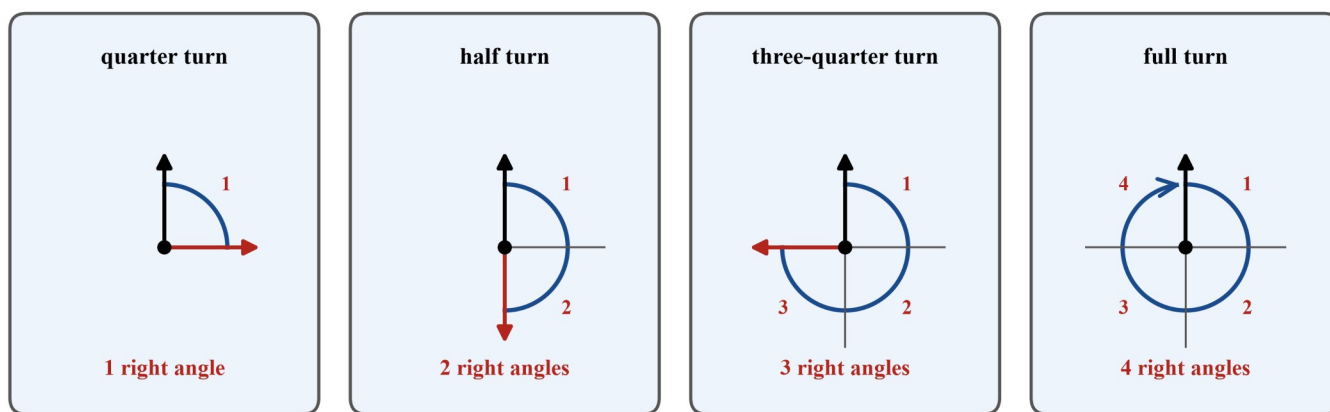


A door seen from above with three ways it can be: open a little, open to a right angle, and open wide. The door that is open a little makes less turn than a right angle. The door that is open to a right angle makes the same turn as a right angle. The door that is open wide makes more turn than a right angle.

Open the door a little and the turn is less than a right angle. Open it until it makes a square corner and the turn is the same as a right angle. Open it wide and the turn is more than a right angle.

5. Count turns in right angles

You can use right angles to measure any turn, by counting how many fit.



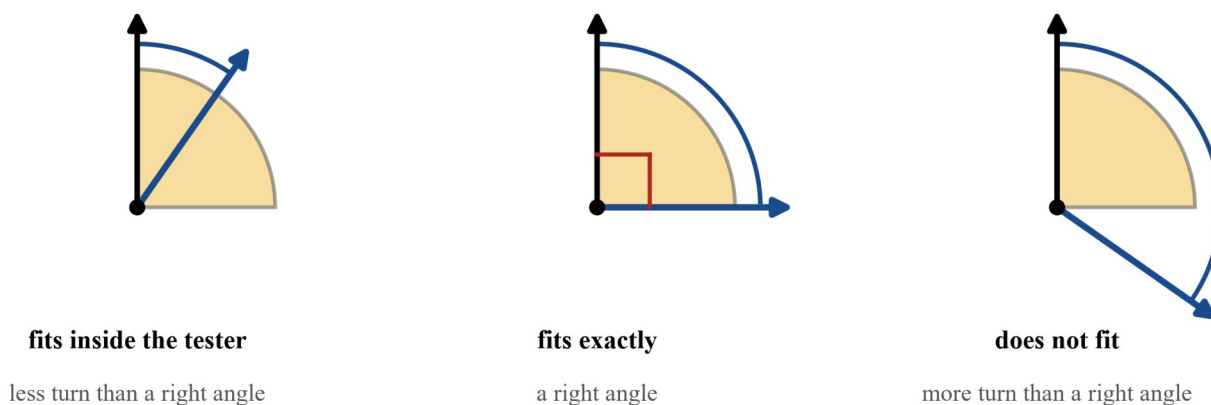
Four cards. A quarter turn is 1 right angle. A half turn is 2 right angles. A three-quarter turn is 3 right angles. A full turn is 4 right angles.

Turn	Right angles
quarter turn	1 right angle
half turn	2 right angles
three-quarter turn	3 right angles
full turn	4 right angles

A half turn is 2 right angles, because a half turn is made of 2 quarter turns. A three-quarter turn is 3 right angles. A full turn is 4 right angles.

6. Test turns with a paper corner

The corner of a sheet of paper is a right angle. Hold the paper corner at the point of any turn to test the turn.



Three turns tested with a yellow paper corner. Left: the turn fits inside the paper corner, so it is less than a right angle. Middle: the turn fits the paper corner exactly, so it is a right angle. Right: the turn does not fit inside the paper corner, so it is more than a right angle.

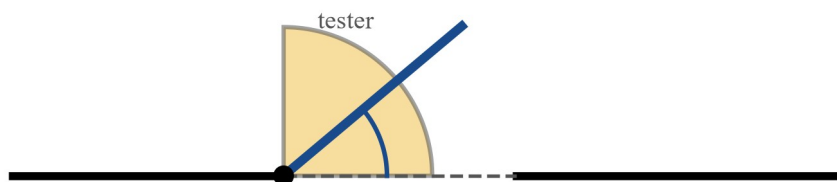
- If the turn **fits inside** the paper corner, it is **less than** a right angle.
- If the turn **fits exactly**, it is a right angle.
- If the turn **does not fit**, it is **more than** a right angle.

Worked examples

Example 1 — with help

A door is open a little, like in the picture. Is the turn less than, the same as, or more than a right angle?

the door is open a little



A door seen from above, open a little, with a yellow paper corner tester held at the hinge. The door fits inside the tester.

Working

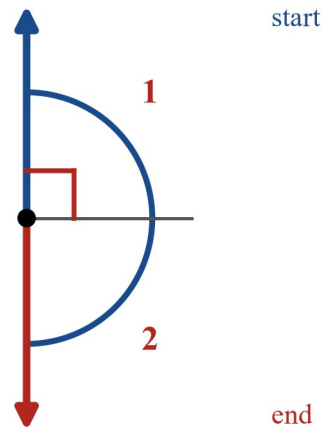
Hold the paper corner at the hinge.
The door fits inside the paper corner.
The turn is less than a right angle. ✓

What we did

Put the corner of the tester at the same point as the turn.
The door stops before the edge of the tester.
Gave the answer.

Example 2 — with help

A spinner arrow makes a half turn. How many right angles does it turn?



a half turn = 2 right angles

A half turn split into two parts, numbered 1 and 2. Each part is a right angle. The words say a half turn = 2 right angles.

Working

What we did

A half turn is 2 quarter turns.

Used the turn names from Year 2.

Each quarter turn is 1 right angle.

A quarter turn is the same as a right angle.

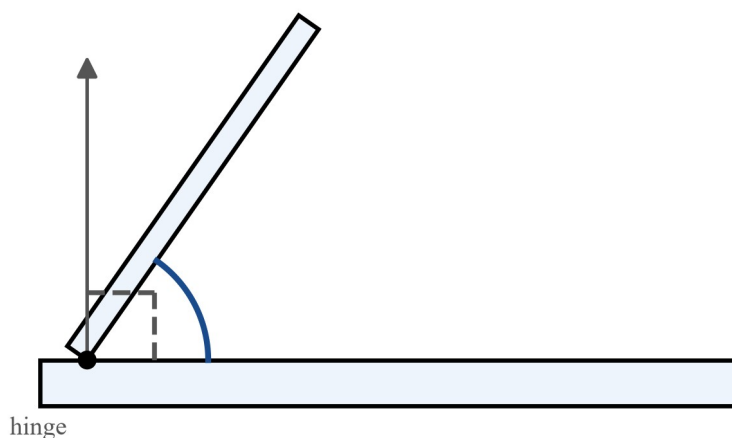
$1 + 1 = 2$ right angles. ✓

Counted the right angles.

Example 3 — on your own

Mia opens her laptop lid a little, like in the picture. She says, “The lid makes more turn than a right angle.” Is Mia right? How can you check?

the lid is open a little



A laptop seen from the side with its lid open a little. A dashed grey right angle at the hinge shows where a right angle would reach. The lid stops before it.

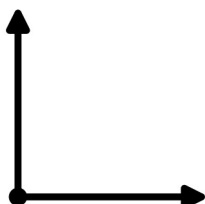
No — the lid is open a little, so its turn is less than a right angle. Check by holding the corner of a book at the hinge: the lid fits inside the book's corner. The dashed right angle in the picture shows where the lid would need to reach.

Practice questions

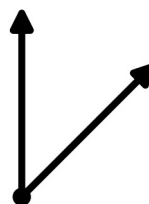
With help

Q1. Look at the four angles. Which ones are right angles?

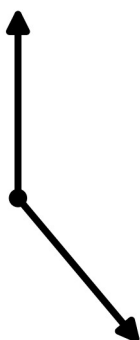
A



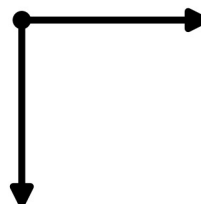
B



C



D



Four angles labelled A, B, C and D. A and D are right angles facing different ways. B is less than a right angle. C is more than a right angle.

Q2. Fill in each gap with 1, 2, 3 or 4. (a) A quarter turn is the same as ___ right angle. (b) A half turn is the same as ___ right angles. (c) A three-quarter turn is the same as ___ right angles. (d) A full turn is the same as ___ right angles.

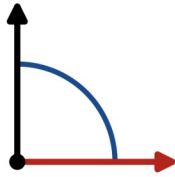
Q3. Count the corners that are right angles. (a) a floor tile (b) a book cover (c) a window

Q4. True or false? (a) A right angle is the same as a quarter turn. (b) A half turn is the same as 1 right angle. (c) A door open wide makes more turn than a right angle.

Q5. Look at the door picture above. (a) Which door is open less than a right angle? (b) Which door is open more than a right angle?

Q6. The minute hand of a clock goes from 12 to 6. (a) What turn is that? (b) How many right angles is that?

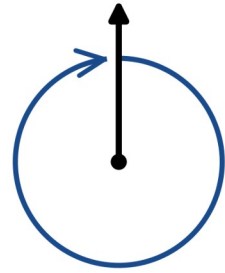
Q7. Count the right angles in each turn.



(a)



(b)



(c)

Three turns labelled (a), (b) and (c). (a) is a quarter turn. (b) is a half turn. (c) is a full turn.

Q8. Use the corner of a sheet of paper or a book. Find 2 things in your room with corners that are right angles, and 1 thing with a corner that is not a right angle.

On your own

Q9. Fill in the turn name. (a) 2 right angles make a ___ turn. (b) 4 right angles make a ___ turn. (c) 3 right angles make a ___ turn. (d) 1 right angle is a ___ turn.

Q10. Draw two turns of your own with arrows: (a) less than a right angle, (b) more than a right angle.

Q11. A windmill makes a full turn. How many right angles is that turn?

Q12. A skateboarder makes a half turn on a ramp. (a) Is that turn less than, the same as, or more than a right angle? (b) How many right angles is it?

Q13. True or false? Explain your answer. A three-quarter turn has more right angles than a full turn.

Q14. Find 3 things in your classroom with corners that are right angles.

Q15. The minute hand of a clock points to 12. It makes a quarter turn. Where does it point now?

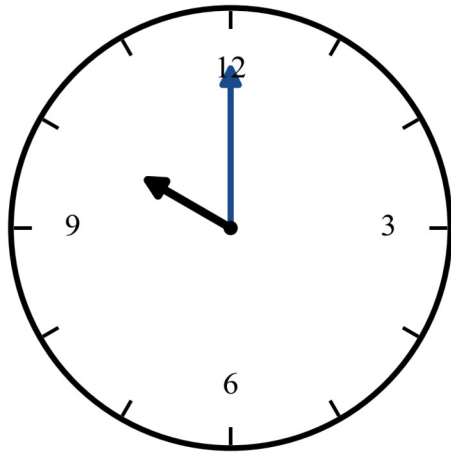
Q16. Draw a turn that is more than 1 right angle and less than 2 right angles.

Q17. Sort these into less than, the same as, or more than a right angle: (a) the corner of a book cover, (b) a door open a little, (c) a door open wide, (d) the corner of a floor tile.

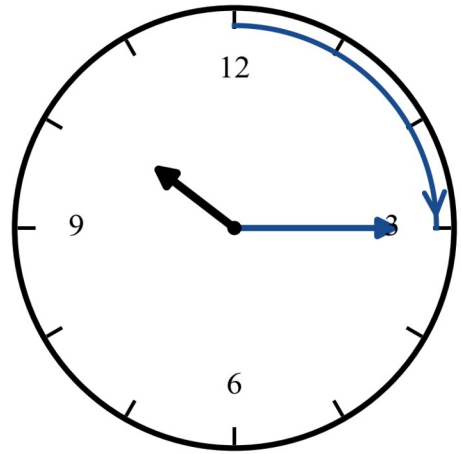
Q18. Leo says a full turn is 3 right angles. Use what you know about turns to show Leo is wrong.

Q19. Flinders Street Station in Melbourne has a row of clocks above the front doors.

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



10:00



10:15

Two clock faces. At 10:00 the minute hand points to 12. At 10:15 the minute hand points to 3, with a blue curved arrow showing the turn from 12 to 3.

- (a) At 10:00 the minute hand points to 12. At 10:15 it points to 3. What turn has the minute hand made?
 - (b) How does that turn compare with a right angle?
 - (c) From 10:00 to 10:30, how many right angles does the minute hand turn through in all?
-

Answers

Q1. A and D. **Q2.** (a) 1 (b) 2 (c) 3 (d) 4. **Q3.** (a) 4 (b) 4 (c) 4. **Q4.** (a) true (b) false — a half turn is 2 right angles (c) true. **Q5.** (a) the door open a little (b) the door open wide. **Q6.** (a) a half turn (b) 2 right angles. **Q7.** (a) 1 (b) 2 (c) 4. **Q8.** Answers will be different. A book and a window have corners that are right angles; the open arms of a pair of scissors make a turn that is not a right angle. **Q9.** (a) half (b) full (c) three-quarter (d) quarter. **Q10.** Answers will be different: a turn that fits inside the paper corner, and a turn that goes past it. **Q11.** 4 right angles. **Q12.** (a) more than a right angle (b) 2 right angles. **Q13.** False — a three-quarter turn has 3 right angles and a full turn has 4, and 3 is less than 4. **Q14.** Answers will be different. **Q15.** 3. **Q16.** Any turn between a right angle and a half turn, checked with a paper corner. **Q17.** (a) the same as (b) less than (c) more than (d) the same as. **Q18.** A full turn is 4 quarter turns, so it is 4 right angles, not 3. **Q19.** (a) a quarter turn (b) the same as a right angle (c) 2 right angles.

Worked answers

Q1. A and D make square corners, so they are right angles. B is less than a right angle and C is more than a right angle.

Q2. (a) 1 (b) 2 (c) 3 (d) 4 — the count from the cards in part 5.

Q3. A floor tile, a book cover and a window each have 4 corners, and each corner is a right angle: 4, 4, 4.

Q4. (a) True — a quarter turn is the same as a right angle. (b) False — a half turn is 2 right angles. (c) True — a door open wide makes more turn than a right angle.

Q5. (a) The door open a little is less than a right angle. (b) The door open wide is more than a right angle.

Q6. (a) From 12 to 6 is a half turn. (b) A half turn is 2 right angles.

Q7. (a) The quarter turn is 1 right angle. (b) The half turn is 2 right angles. (c) The full turn is 4 right angles.

Q8. Answers will be different. Hold the paper corner at the corner of the thing: if it fits exactly, the corner is a right angle.

Q9. (a) half (b) full (c) three-quarter (d) quarter.

Q10. Check your turns with the corner of a book or a sheet of paper.

Q11. A full turn is 4 quarter turns, so it is 4 right angles.

Q12. (a) A half turn is more than a right angle. (b) A half turn is 2 right angles.

Q13. False. A three-quarter turn has 3 right angles. A full turn has 4 right angles. 3 is less than 4, so the full turn has more.

Q14. Answers will be different. Check each corner with the paper corner.

Q15. The minute hand starts at 12 and makes a quarter turn, so it points to 3.

Q16. Check your turn with a paper corner: it should go past the corner but stop before a half turn.

Q17. (a) The corner of a book cover is the same as a right angle. (b) A door open a little is less than a right angle. (c) A door open wide is more than a right angle. (d) The corner of a floor tile is the same as a right angle.

Q18. A full turn is 4 quarter turns. Each quarter turn is 1 right angle, so a full turn is 4 right angles. Leo's 3 right angles is only a three-quarter turn.

Q19. (a) From 12 to 3 is a quarter turn. (b) A quarter turn is the same as a right angle. (c) From 10:00 to 10:30 the minute hand makes a half turn, which is 2 right angles.

Test

Mathematics 3 — Chapter test T4: Measurement

Take your time. Read each question carefully, and show your working.

Marks: 20

Time: There is no timer.

Things you can use: a pencil and paper, a ruler, and the corner of a book or a sheet of paper to check right angles. Your teacher may also give you a clock, a measuring jug and kitchen scales to help you check your answers.

Calculators: you may use a calculator if you want one. No question in this test needs it.

Your teacher may read any question to you.

Q1. Circle the letter of the right answer. [5 marks]

- a. Which unit would you use to measure the drive from Melbourne to Geelong? [1 mark]

A	B	C	D
centimetres (cm)	metres (m)	kilometres (km)	litres (L)

- b. A jug shows 300 mL of water. I pour in more water. The water goes up 2 small lines. Each small line stands for 50 mL. What does the jug show now? [1 mark]

A	B	C	D
350 mL	400 mL	500 mL	600 mL

- c. How many minutes are in 2 hours? [1 mark]

A	B	C	D
60	100	120	240

- d. Which digital time shows quarter past 2? [1 mark]

A	B	C	D
2:15	2:45	12:15	2:50

- e. A right angle is the turn in a square corner. How many right angles are in a full turn? [1 mark]

A	B	C	D
1	2	3	4

Q2. Units and estimates. An **estimate** is an answer that is close, worked out without measuring exactly. [3 marks]

- a. Choose the better unit. [1 mark]

- (i) the height of a tree: centimetres (cm) or metres (m)?
(ii) the capacity (how much liquid it can hold) of a cup: millilitres (mL) or litres (L)?

- b. A watermelon balances with 3 bags of sugar on a balance. Each bag has a mass (how heavy it is) of 1 kg. Estimate the mass of the watermelon. [1 mark]

- c. One big step is about 1 m. Ava takes 7 big steps along the classroom. About how long is the classroom? [1 mark]

Q3. Measuring and comparing. [3 marks]

- a. A jug has labelled markings that count by 100 mL. One small line sits halfway between each pair of labels. The water is 1 small line above the 400 label. What does the jug show? [1 mark]
b. On a kitchen scales dial, the big labels count by 200 g, and one small line sits halfway between each pair of labels. The needle is at the small line between 600 and 800. What mass does the dial show? [1 mark]
c. Three containers hold 500 mL, 1 L and 2 L. Put them in order, from the one that holds the least to the one that holds the most. [1 mark]

Q4. Units of time. [3 marks]

- a. Fill in the blanks. [1 mark]

1 hour = □ minutes

1 day = □ hours

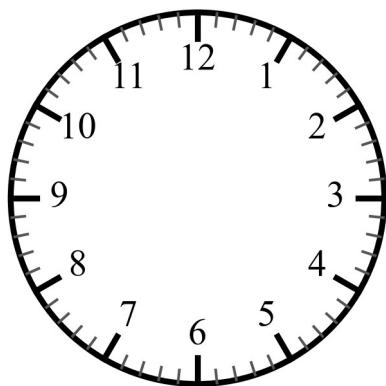
- b. Which is longer: 2 minutes or 100 seconds? How much longer? [1 mark]
- c. Australian rules football started in Victoria. In an AFL game, each quarter is 20 minutes of playing time.

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

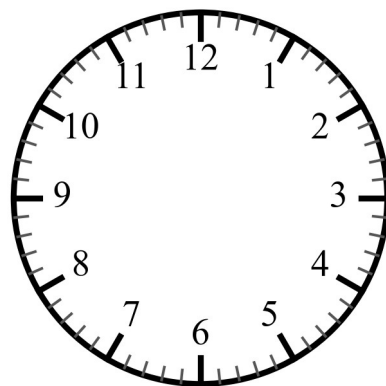
How many minutes of playing time are in 3 quarters? [1 mark]

Q5. Clocks. An analog clock has hands. A digital clock shows the time with numbers. The short, thick hand is the **hour hand. The long, thin hand is the **minute hand**. [3 marks]**

- a. The minute hand points to the 9. The hour hand is between the 4 and the 5, close to the 5. Write the time with numbers. [1 mark]
- b. Write 10:05 in words. [1 mark]
- c. On the blank clock faces, draw the hands to show each time. [1 mark]



A



B

Two empty clock faces with numbers but no hands, labelled A and B.

- (i) A: 5:00
- (ii) B: 2:30

Q6. Angles and turns. The size of a turn is called an **angle. [3 marks]**

- a. A door is open wide. Is the turn less than, the same as, or more than a right angle? [1 mark]
- b. The minute hand of a clock goes from the 12 to the 6. How many right angles does it turn through? [1 mark]
- c. Ava says a three-quarter turn is 4 right angles. Is Ava right? How do you know? [1 mark]

Solutions

Marking guide

Administration (per TOC §7). This is a classroom check, not an exam. It is untimed in principle; the guidance duration for a teacher planning a lesson is 30 minutes. Materials are permitted wherever the CD assumes them (a pencil and paper, a ruler, a clock, a measuring jug and kitchen scales). **Calculator status follows D7:** no Chapter 4 CD says “without a calculator” — the only Level 3 CDs that do are VC2M3N04 (1C) and VC2M3A02 (3A) — so calculators are permitted on this paper, though no question needs one. Any item may be read aloud by the teacher.

Marks by item and CD. Only Chapter 4 CDs are assessed (§4); every Chapter 4 CD contributes at least 3 separately scored marks (§7).

Item	CD code	Subtopic	Type	Marks
Q1a	VC2M3M01	4A	MCQ (A–D)	1
Q1b	VC2M3M02	4B	MCQ (A–D)	1
Q1c	VC2M3M03	4C	MCQ (A–D)	1
Q1d	VC2M3M04	4D	MCQ (A–D)	1
Q1e	VC2M3M05	4E	MCQ (A–D)	1
Q2	VC2M3M01	4A	Short answer / worked response	3
Q3	VC2M3M02	4B	Short answer / worked response	3
Q4	VC2M3M03	4C	Short answer / worked response	3
Q5	VC2M3M04	4D	Short answer / worked response	3
Q6	VC2M3M05	4E	Short answer / worked response	3
Total				20

MCQ total: 5 of 20 marks — no more than one quarter of the marks, per §7. VC2M3M01 and VC2M3M02 are also assessed by practical task K1 (§7); Q2 and Q3 give the written form, so a student absent for the practical is not left with an unassessed CD (§7 coverage note).

Rubrics, by CD. The achievement-standard extract for each CD is quoted verbatim from `maths_3.json`; rubrics score the strategy as well as the answer (§7).

VC2M3M01 (4A) — 4 marks (Q1a 1, Q2 3). “Students use familiar metric units when estimating, comparing and measuring the attributes of objects and events.” Observable actions:

- chooses kilometres for a long distance between towns — C (1 mark);
- matches the unit to the attribute and the size — metres for the height of a tree, millilitres for the capacity of a cup; both needed (1 mark);
- uses the 1 kg benchmark to estimate a mass from a balance — about 3 kg (1 mark);
- uses a 1 m step as a benchmark to estimate a length — about 7 m (1 mark).

VC2M3M02 (4B) — 4 marks (Q1b 1, Q3 3). “Students use familiar metric units when estimating, comparing and measuring the attributes of objects and events.” Observable actions:

- counts on 2 graduations of 50 mL from a jug reading — B, 400 mL (1 mark);

- interprets what a small line on the jug stands for and reads the level — 450 mL (1 mark);
- interprets what a small line on the dial stands for and reads the needle — 700 g (1 mark);
- orders containers by capacity — 500 mL, 1 L, 2 L (1 mark).

VC2M3M03 (4C) — 4 marks (Q1c 1, Q4 3). “Students estimate and compare measures of duration using formal units of time.” Observable actions:

- recalls that 2 hours is 120 minutes — C (1 mark);
- recalls the relationships between the formal units — 60 minutes, 24 hours; both needed (1 mark);
- puts two durations in the same unit, compares them and finds the difference — 2 minutes, by 20 seconds (1 mark);
- uses the 20-minute quarter to find a total duration — 60 minutes (1 mark).

VC2M3M04 (4D) — 4 marks (Q1d 1, Q5 3). “Students estimate and compare measures of duration using formal units of time.” Observable actions:

- connects quarter past 2 with the digital time 2:15 — A (1 mark);
- reads a time from the positions of the hands, keeping the hour the hand has passed — 4:45 (1 mark);
- writes a digital time in words — 5 minutes past 10 (1 mark);
- draws both hands for given times, placing the hour hand correctly — A: minute hand at the 12, hour hand at the 5; B: minute hand at the 6, hour hand between the 2 and the 3; both times needed (1 mark).

VC2M3M05 (4E) — 4 marks (Q1e 1, Q6 3). “They identify angles as measures of turn and compare them to right angles.” Observable actions:

- counts 4 right angles in a full turn — D (1 mark);
- compares the turn of a door open wide with a right angle — more than a right angle (1 mark);
- counts the right angles in the turn of the minute hand — 2 right angles (1 mark);
- judges a claim about turns and right angles and gives a reason — No; a three-quarter turn is 3 right angles (1 mark).

MCQ key. Q1a C · Q1b B · Q1c C · Q1d A · Q1e D. One mark per correct letter; no part marks.

General marking notes.

- A measurement answer earns its mark with the number and the right unit. A number on its own is accepted where the question already gives the unit (for example, Q4a).
- Q3c is ordered by the benchmarks of 4A (a small water bottle is 500 mL, a milk carton is 1 L). No unit conversion is expected or required — converting between units is Level 6 (VC2M6M01) and is out of scope here (D10).
- Q4b must show the comparison in one unit: 2 minutes = 120 seconds, $120 > 100$, and $120 - 100 = 20$ seconds. Both the choice and the difference are needed for the mark.
- Q5a: the hour is the number the hour hand has passed (4), not the number it is close to (5). Accept 4:45 or “quarter to five” written with numbers as 4:45.
- Q5b: accept “5 minutes past 10” or “ten oh five”.
- Q5c: both hands must be drawn for each time. At 2:30 the hour hand is between the 2 and the 3, not on the 2 (4D, point 7).
- Q6c scores the judgement and the reason. Accept any correct reason, for example “each quarter turn is 1 right angle, so three quarter turns is 3 right angles” or “4 right angles is a full turn”.

Answers

Q1. a. C b. B c. C d. A e. D.

Q2. a. (i) metres (m) (ii) millilitres (mL) b. about 3 kg c. about 7 m.

Q3. a. 450 mL b. 700 g c. 500 mL, 1 L, 2 L.

Q4. a. 60; 24 b. 2 minutes, by 20 seconds c. 60 minutes.

Q5. a. 4:45 b. 5 minutes past 10 c. (i) minute hand at the 12, hour hand at the 5 (ii) minute hand at the 6, hour hand between the 2 and the 3.

Q6. a. more than a right angle b. 2 right angles c. No — a three-quarter turn is 3 right angles.

All the working

Q1. a. The drive from Melbourne to Geelong is a long distance between towns. Centimetres and metres are for shorter things, and litres are for capacity. Long distances are measured in kilometres. $\therefore$ C.

b. Each small line stands for 50 mL, and the water goes up 2 small lines: $50 + 50 = 100$ mL more. $300 + 100 = 400$. The jug shows 400 mL. $\therefore$ B.

c. 1 hour = 60 minutes, so 2 hours = $60 + 60 = 120$ minutes. $\therefore$ C.

d. Quarter past 2 is 15 minutes past 2, written 2:15. 2:45 is quarter to three, and 12:15 is quarter past 12. $\therefore$ A.

e. A full turn is 4 quarter turns, and each quarter turn is 1 right angle. So a full turn is 4 right angles. $\therefore$ D.

Q2. a. (i) A tree is tall, like a door, so metres are the better unit. Centimetres are for short things like an eraser. (ii) A cup holds only a little liquid, like a small bottle, so millilitres are the better unit. Litres are for big amounts, like a milk carton.

b. Each bag has a mass of 1 kg, and 3 bags balance the watermelon: $1 + 1 + 1 = 3$. The watermelon has a mass of about 3 kg.

c. Each big step is about 1 m, and Ava takes 7 big steps, so the classroom is about 7 m long.

$\therefore$ a. (i) metres (m) (ii) millilitres (mL) b. about 3 kg c. about 7 m.

Q3. a. The small line sits halfway between 400 and 500, so it stands for 50 mL. $400 + 50 = 450$. The jug shows 450 mL.

b. The small line sits halfway between 600 and 800, so it stands for 100 g. $600 + 100 = 700$. The dial shows 700 g.

c. 500 mL is a small water bottle, 1 L is a milk carton, and 2 L is a big carton. From least to most: 500 mL, 1 L, 2 L.

$\therefore$ a. 450 mL b. 700 g c. 500 mL, 1 L, 2 L.

Q4. a. 1 hour = 60 minutes. 1 day = 24 hours.

b. Put both times in the same unit. 2 minutes = $60 + 60 = 120$ seconds. $120 > 100$, so 2 minutes is longer. $120 - 100 = 20$: it is 20 seconds longer.

c. Each quarter is 20 minutes of playing time, and there are 3 quarters: $20 + 20 + 20 = 60$ (or $3 \times 20 = 60$). That is 60 minutes of playing time.

$\therefore$ a. 60; 24 b. 2 minutes, by 20 seconds c. 60 minutes.

Q5. a. The minute hand points to the 9: count by fives — 5, 10, 15, 20, 25, 30, 35, 40, 45 — so the minutes are 45. The hour hand is between the 4 and the 5: it is close to the 5, but it has only passed the 4, so the hour is 4. The time is 4:45.

b. 10:05 has the hour 10 and 05 minutes: 5 minutes past 10 (also said as ten oh five).

c.

- (i) 5:00 — the minute hand points to the 12, and the hour hand points to the 5. (ii) 2:30 — 30 minutes is half an hour, so the minute hand points to the 6; 30 minutes of the hour have gone by, so the hour hand is in the middle between the 2 and the 3.

∴ a. 4:45 b. 5 minutes past 10 c. (i) minute hand at the 12, hour hand at the 5 (ii) minute hand at the 6, hour hand between the 2 and the 3.

Q6. a. A door open wide goes past a square corner, so its turn is more than a right angle. Check with a paper corner: the door does not fit inside it.

b. From the 12 to the 6 is a half turn. A half turn is 2 quarter turns, and each quarter turn is 1 right angle, so the minute hand turns through 2 right angles.

c. No. Each quarter turn is 1 right angle, so a three-quarter turn is 3 right angles, not 4. 4 right angles is a full turn.

∴ a. more than a right angle b. 2 right angles c. No — a three-quarter turn is 3 right angles.