Tenths, hundredths and decimal place value

Number · VC2M4N01

A digit's place tells its value. One whole = 10 tenths = 100 hundredths.

Ones		Tenths		Hundredths
3	.	4		7

$$3.47 = 3 + 0.4 + 0.07$$

☆ Read and rename decimals

First after the point: tenths. Second: hundredths.

3.47 = 3 ones + 4 tenths + 7 hundredths.

0.36 = 36/100: thirty-six hundredths.

☆ Compare matching places

Compare ones, then tenths, then hundredths.

2.70 > 2.65; 2.7 = 2.70.

0.05 has no tenths; 0.5 = 0.50 > 0.05.

☆ Regroup and take small steps

3 wholes + 7 tenths + 16 hundredths = 3.86.

One tenth more: 1.97 + 0.1 = 2.07.

One hundredth less: 2.00 − 0.01 = 1.99.

☆ Model and locate decimals

Shade 36 of 100 equal parts: 0.36 = 36/100.

From 0.10 to 0.20, ten equal steps are 0.01 each.

0.12 is two hundredth-steps after 0.10.

Remember...

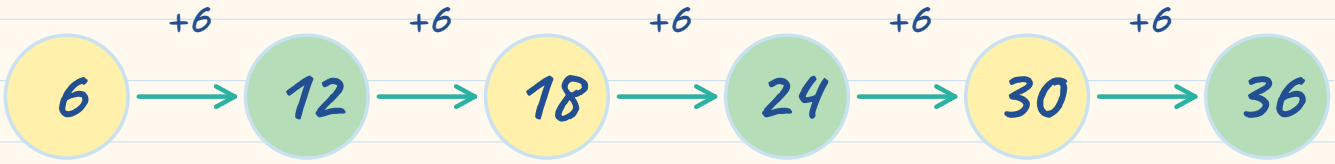
Read 3.47 as 'three point four seven': say each decimal digit.

Ten hundredths make one tenth; ten tenths make one whole.

Multiples and number sequences

Number · VC2M4N02

Multiples are numbers made by multiplying a number by whole numbers.



6 × 1, 6 × 2, 6 × 3 ...

☆ Find the repeated step

Multiples of 6 include 6, 12, 18, 24 and 30.

6 × 4 = 24, so 24 is a multiple of 6.

Count forwards by adding 6; backwards by subtracting 6.

☆ Practise these multiples

3s: 3, 6, 9, 12 4s: 4, 8, 12, 16

6s: 6, 12, 18, 24 7s: 7, 14, 21, 28

8s: 8, 16, 24, 32 9s: 9, 18, 27, 36

☆ Missing terms and starting numbers

14, 21, __, 35: add 7. The missing term is 28.

After three +7 steps, we reach 35.

Work backwards: 35 − 7 − 7 − 7 = 14, the start.

☆ Positions and shared multiples

Term 1 is 12. Add 6 each time.

Term 5 needs four steps: 12 + 4 × 6 = 36.

24 is a multiple of both 6 and 8: 6 × 4 = 8 × 3.

Remember...

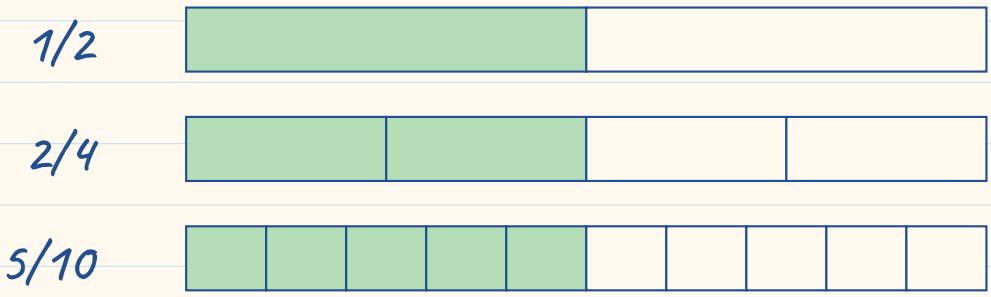
Extend each sequence and explain its rule; it can keep going.

Double multiples of 3 to make multiples of 6.

Equivalent fractions and decimals

Number · VC2M4N03

Equivalent fractions name the same amount of the same whole.



Same whole. Same amount. 1/2 = 0.5

☆ Parts of the same whole

Denominator: how many equal parts make one whole.

Numerator: how many of those equal parts we have.

4/4 = 1 and 8/4 = 2: fractions can name whole numbers.

☆ Make equivalent fractions

Multiply both by the same non-zero number: 1/2 = 2/4.

Divide both by a common factor: 6/8 = 3/4.

3/4 = □/20: multiply both by 5, so □ = 15.

☆ Connect fractions and decimals

1/10 = 0.1; 1/100 = 0.01; 2 3/4 = 2.75.

1/4 m = 0.25 m = 25 cm; 3/4 = 0.75.

0.6 = 6/10 = 3/5: simplify by dividing both by 2.

☆ Compare using equal-sized parts

Compare 1/2 and 3/4: change 1/2 to 2/4.

2/4 < 3/4, so 1/2 < 3/4.

1/4 of 12 = 12 ÷ 4 = 3: share 12 into 4 equal groups.

Remember...

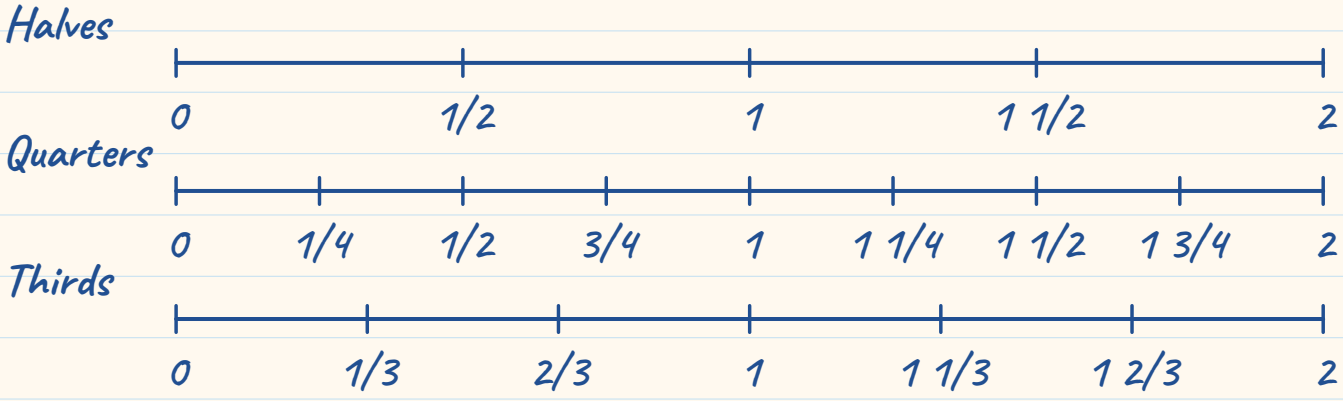
Use wholes of the same size when comparing fraction pictures.

Use × or ÷ on both parts to make an equivalent fraction.

Counting in fractions

Number · VC2M4N04

Fractions are numbers. Keep taking equal-sized steps, even past one whole.



☆ Count in halves

0, 1/2, 1, 1 1/2, 2, 2 1/2

Two halves make one whole: 2/2 = 1.

Three halves make one and a half: 3/2 = 1 1/2.

☆ Move forwards and backwards

Quarters: 0, 1/4, 2/4, 3/4, 4/4, 5/4.

From 5/4: forward 2 quarters, then back 3 quarters.

5/4 + 2/4 − 3/4 = 4/4 = 1.

☆ Count thirds and rename

0, 1/3, 2/3, 3/3, 4/3, 5/3, 6/3

3/3 = 1, 4/3 = 1 1/3 and 6/3 = 2.

2 1/3 = (2 × 3 + 1)/3 = 7/3.

☆ Use a number line

Mark each whole-number interval the same length.

Split each whole into 2, 4 or 3 equal spaces.

Count the spaces between marks, not the marks themselves.

Remember...

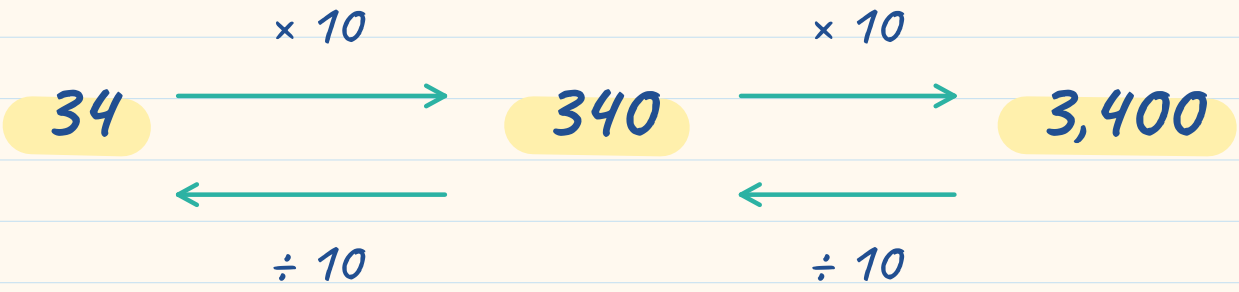
A mixed numeral has a whole number and a fraction.

Tenths across 1: 8/10, 9/10, 1, 1 1/10, 1 2/10.

Multiplying and dividing with tens

Number · VC2M4N05

Each place to the left has ten times the value of the place beside it.



☆ Multiply by 10, 100 or 1,000

Move digits left 1, 2 or 3 places in the place-value chart.

34 × 10 = 340; 34 × 100 = 3,400.

34 × 1,000 = 34,000.

☆ Divide by 10, 100 or 1,000

Move digits right 1, 2 or 3 places in the place-value chart.

360 ÷ 10 = 36; 3,600 ÷ 100 = 36.

36,000 ÷ 1,000 = 36.

☆ Use known multiplication facts

12 × 30 = 12 × 3 × 10 = 360.

6 × 4,000 = 24 × 1,000 = 24,000.

30 × 400 = 3 × 4 × 10 × 100 = 12,000.

☆ Divide by a multiple of 10

480 ÷ 20 = 480 ÷ 10 ÷ 2 = 24.

Divide both numbers by 10: 4,800 ÷ 60 = 480 ÷ 6 = 80.

Check with multiplication: 80 × 60 = 4,800.

Remember...

Use place value; simply 'adding a zero' is not a general rule.

Explore ×10 with a calculator; then solve without one.

Strategies for the four operations

Number · VC2M4N06

Choose mental, written or digital methods to suit the numbers; check the result.

Addition: carry

```
  1  1  1  1
  2  3  8  4  6
+    7  9  7  8
-----------------
  3  1  8  2  4
```

Subtraction: trade

```
  2  9  9  9  12
  3  0  0  0  2
-    7  5  8  9
-----------------
  2  2  4  1  3
```

☆ **Add and regroup**

Line up same places. Regroup 10 ones as 1 ten.

23,846 + 7,978 = 31,824.

268 + 157 = 268 + 100 + 50 + 7 = 425.

☆ **Subtract: trade or compensate**

30,002 − 7,589 = 22,413.

Trade across zeroes: 1 thousand can make 10 hundreds.

503 − 278 = 503 − 300 + 22 = 225.

☆ **Multiply every part**

24 × 6 = (20 × 6) + (4 × 6) = 144.

23 × 14 = (20 × 10) + (20 × 4) + (3 × 10) + (3 × 4)

= 200 + 80 + 30 + 12 = 322.

☆ **Divide and handle brackets**

1,248 ÷ 4 = (1,200 ÷ 4) + (48 ÷ 4)

= 300 + 12 = 312.

Brackets first: (18 + 6) ÷ 3 = 24 ÷ 3 = 8.

Remember...

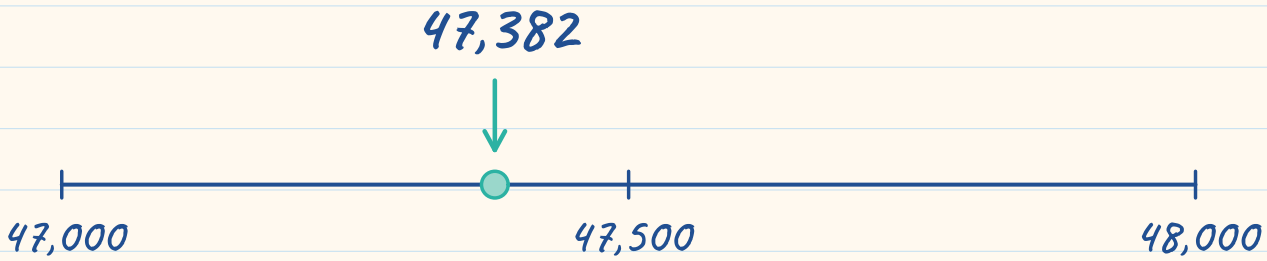
Calculator: 1,248 ÷ 4 = 312; check 312 × 4 = 1,248.

For long lists, use a digital tool; estimate and check entries.

Rounding and sensible estimates

Number · VC2M4N07

Choose nearby friendly numbers to estimate; rounding depends on the place asked for.



Below halfway: nearest 1,000 is 47,000.

☆ Choose the rounding place

Look at the digit just to the right: 0–4 down; 5–9 up.

For whole-number rounding, zero the smaller places.

47,382 → 47,380 (nearest 10); 47,400 (nearest 100).

☆ Decimals, whole numbers and money

Nearest tenth: 12.27 → 12.3; carry: 9.96 → 10.0.

Nearest whole number: 12.76 → 13.

Nearest $10: $28.04 → $30.00.

☆ Estimate with friendly numbers

198 + 307 is about 200 + 300 = 500.

602 − 198 is about 400; 39 × 21 is about 40 × 20 = 800.

574 ÷ 5 is about 575 ÷ 5 = 115: a friendly multiple.

☆ Use bounds to check a budget

6 items at $4.70 cost between 6 × $4 and 6 × $5.

$24 < $28.20 < $30: the exact cost is sensible.

Budget $30: rounding prices up helps allow enough money.

Remember...

For positive sums/products, rounding both up gives a high estimate.

A close estimate helps check an answer; it does not prove it.

Prices, payments and change

Number · VC2M4N08

$1 = 100 cents. Find exact totals; round to the unit asked for.

Add prices

$2.42 + $3.81

Total = $6.23

→

Cash: $6.25

Card: $6.23

Round the total.

Pay $10 cash: change = $10.00 − $6.25 = $3.75

☆ Cash: nearest 5c

Last cent digit: 0 or 5 stay; 1 or 2 → 0; 3 or 4 → 5.

6 or 7 → 5; 8 or 9 → next 10c. $6.98 → $7.00.

Round the final total only. Cards keep exact cents.

☆ Estimate: nearest 10c

Look at the last cent digit: 0–4 down; 5–9 up.

$6.23 → $6.20; $6.27 → $6.30.

Halfway: $6.25 → $6.30. Carry: $6.95 → $7.00.

☆ Estimate: nearest $1

00–49c: lower dollar. 50–99c: next dollar.

$6.23 → $6.00; $6.75 → $7.00.

Halfway: $6.50 → $7.00. Whole dollars stay.

☆ Calculate by hand and with a tool

Change = paid − payable total. Count up on paper:

$6.25 → $7 (+75c) → $10 (+$3): $3.75 change.

Calculator: 2.42 + 3.81 = 6.23; then 10 − 6.25 = 3.75.

Remember...

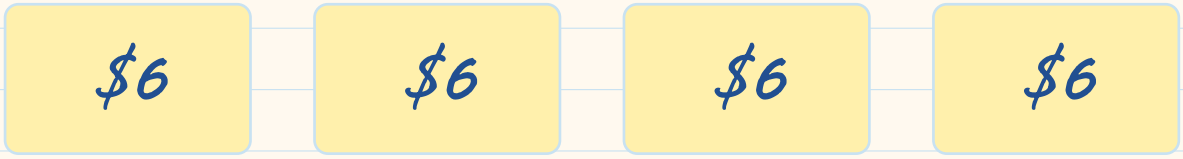
Round from the original amount; estimates are not payments.

Write $2.50 or 250c, not $2.50c. Line up decimal points.

Choosing a mathematical model

Number · VC2M4N09

Turn a real problem into maths, solve it, then explain what your answer means.



4 packs × $6 per pack = $24

☆ Choose an operation

Combine: +. Find a difference or change: −.
Equal groups → multiply. Sharing or grouping → divide.
24 pencils shared by 6 children: 24 ÷ 6 = 4 each.

☆ Model a multi-step problem

Four packs at $6 each; pay $30. Find the change.
Double $6 twice: $12, $24. Change: $30 − $24 = $6.
You receive $6 change; check $24 + $6 = $30.

☆ Check information and try a model

Know the packs but not pencils per pack? Find that fact.
Need 19 pencils, with 1 loose and 6 in each bag.
Try 3 bags: 3 × 6 + 1 = 19, so 3 bags work.

☆ Work backwards

Paid = payable cost + change: $2.95 + $2 = $4.95.
Missing price: $4.34 − $2.00 − $1.14 = $1.20.
Try a calculator: 18.50 + 6.20 + 3.80 = 28.50.

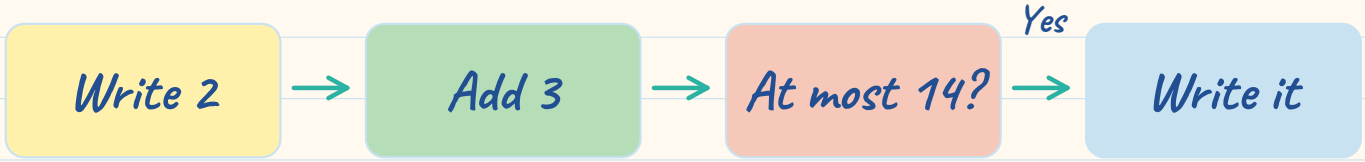
Remember...

Choose +, −, × or ÷ from the situation, not one keyword.
For long price lists, use a calculator; estimate and check entries.

Number patterns and algorithms

Number · VC2M4N10

An algorithm is an ordered set of steps. It can include a yes/no decision.



Yes: write & add 3 again. No: stop.

Output: 2, 5, 8, 11, 14

☆ Follow an addition algorithm

Start at 2. Record it. Add 3 to get the next number.

If the next number is at most 14, record it and repeat.

Output: 2, 5, 8, 11, 14. Stop before 17.

☆ Rules with two operations

Input 3. × 2 then + 5: (3 × 2) + 5 = 11.

Repeat × 2 then + 5: 3, 11, 27, 59.

Follow the order; five recorded terms need four steps.

☆ Compare pattern rules

Doubling: 2, 4, 8, 16, 32 (× 2 each time).

Growing steps: 9, 16, 30, 51, 79.

With jumps +7, +14, +21, +28, the next jump is +35.

☆ Create a rule and test it

Choose a start, a + or × rule, and a stopping test.

Example: start 3, add 4; record numbers at most 19.

3, 7, 11, 15, 19. Now change the rule and describe it.

Remember...

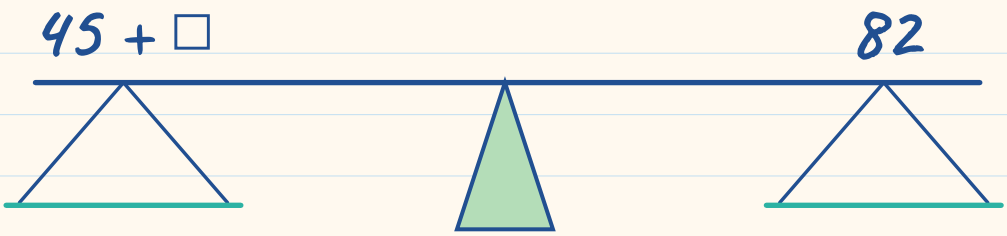
Spreadsheet: put 2 in A1 and =A1*2 in A2.

Fill A2 down to A5: 2, 4, 8, 16, 32. Explain the rule.

Find the missing number

Algebra · VC2M4A01

The equals sign means both sides have the same value. A box stands for an unknown.



Both sides balance: □ = 82 − 45 = 37

☆ Equality and addition properties

Both sides of = have the same value: 8 + 5 = 10 + 3.

Swap: 8 + 5 = 5 + 8. Regroup: (8 + 2) + 5 = 8 + (2 + 5).

Adding zero changes nothing: 23 + 0 = 23.

☆ Find a missing addend

45 + □ = 82

Use subtraction: 82 − 45 = 37.

Check: 45 + 37 = 82, so □ = 37.

☆ Find an unknown in subtraction

□ − 28 = 46, so □ = 46 + 28 = 74.

90 − □ = 54, so □ = 90 − 54 = 36.

The position of the box tells you what needs undoing.

☆ Calculations on both sides

74 + 36 = 8 + □. 110 = 8 + □, so □ = 102.

138 − 47 = 103 − □. 91 = 103 − □, so □ = 12.

14 + 32 = 61 − □. 46 = 61 − □, so □ = 15.

Remember...

Addition and subtraction undo each other.

Put your answer back into the original box to check it.

Multiplication and division connections

Algebra · VC2M4A02

Rows skip count. Swap factors: same product. No calculator.

×	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20
3	3	6	9	12	15	18	21	24	27	30
4	4	8	12	16	20	24	28	32	36	40
5	5	10	15	20	25	30	35	40	45	50
6	6	12	18	24	30	36	42	48	54	60
7	7	14	21	28	35	42	49	56	63	70
8	8	16	24	32	40	48	56	64	72	80
9	9	18	27	36	45	54	63	72	81	90
10	10	20	30	40	50	60	70	80	90	100

☆ Read a fact family

Swap factors: 6 × 8 = 8 × 6 = 48.

48 ÷ 6 = 8; 48 ÷ 8 = 6: division undoes ×.

☆ Build and extend facts

9 × 6 = (10 × 6) − 6 = 54.

6 × 80 = 480; the related fact is 480 ÷ 6 = 80.

☆ Partition larger numbers

23 × 4 = (20 × 4) + (3 × 4) = 80 + 12 = 92.

3 × 75 = (3 × 70) + (3 × 5) = 225.

☆ Find missing factors and numbers

3 × □ = 21: □ = 7. 54 ÷ □ = 9: □ = 6.

□ ÷ 6 = 8: □ = 8 × 6 = 48.

Remember...

Practise all table facts and inverse divisions in mixed order.

× 0 gives zero; × 1 and ÷ 1 keep the number.

Read and compare measurements

Measurement · VC2M4M01

Choose a tool and unit, then read the scale carefully.

Read the unnumbered marks (mL)



5 equal spaces: 100 ÷ 5 = 20 mL per space

Arrow: 3 × 20 = 60 mL

☆ Choose tools and units

Length: ruler/tape (mm, cm, m). Mass: scales (g, kg).
Capacity: jug (mL, L). Temperature: thermometer (°C).
Duration: clock or timer (seconds, minutes, hours).

☆ Read every scale carefully

One interval = (higher label − lower label) ÷ spaces.
0 to 100 in 5 equal spaces: 100 ÷ 5 = 20 mL per space.
Halfway between 40 mL and 60 mL is 50 mL.

☆ Compare in the same unit

1 cm = 10 mm; 1 m = 100 cm; 1 km = 1,000 m.
1 kg = 1,000 g; 1 L = 1,000 mL; 1 min = 60 s.
Digital scales: 1.25 kg = 1,250 g, more than 950 g.

☆ Measure, record and compare

Measure 2 objects or events with suitable scaled and digital tools.
Compare: 750 mL < 1 L; 90 s > 1 min; 25 °C > 20 °C.
Record units and part units; explain your tool and unit choices.

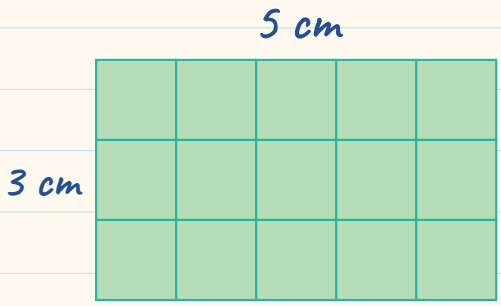
Remember...

Start a ruler at zero, not at its edge.
Count the equal spaces between marks, not the marks.

Perimeter and area

Measurement · VC2M4M02

Perimeter goes around the edge. Area covers the inside.



Around: 16 cm

Inside: 15 cm^2

Each small square is 1 cm × 1 cm.

☆ Perimeter: add every outside side

A rectangle is 5 cm long and 3 cm wide.

Perimeter = 5 + 3 + 5 + 3 = 16 cm.

Trace the outside only; do not count internal joining edges.

☆ Area: cover the inside

Rectangle area = length × width: 5 × 3 = 15 cm^2.

This is 3 rows of 5 one-centimetre squares.

Equal square tiles must cover without gaps or overlaps.

☆ Find a side or make a shape

Missing width = area ÷ length: 15 ÷ 5 = 3 cm.

An area of 12 squares can be 3 × 4 or 2 × 6.

The same area can have different perimeters.

☆ Estimate an irregular shape

Follow a curved edge with string, then measure it.

Count full grid squares; combine partly covered squares.

4 full squares + 2 half squares ≈ 5 square units.

Remember...

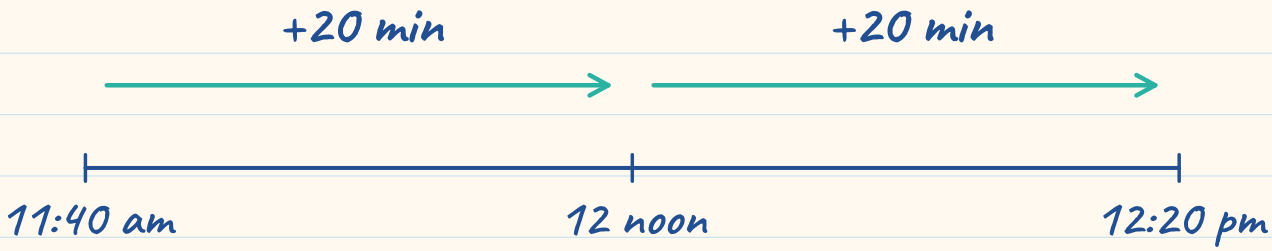
Perimeter uses cm or m; area uses cm^2 or m^2.

Informal units work too: equal steps around or equal tiles inside.

Time and duration

Measurement · VC2M4M03

Duration tells us how long something lasts.



20 + 20 = 40 minutes

☆ Know the time facts

1 minute = 60 seconds. 1 hour = 60 minutes.

1 day = 24 hours. 1 week = 7 days.

Half an hour = 30 min; a quarter = 15; three quarters = 45.

☆ Use am, pm and 24-hour time

am: midnight to before noon. pm: noon to before midnight.

12 am is midnight; 12 pm is noon.

24-hour time: 2:20 pm = 14:20; midnight = 00:00.

☆ Find the start, finish or duration

Bus trip: 11:40 am to 12:20 pm is 20 + 20 = 40 minutes.

End = start + duration: 3:25 pm + 50 min = 4:15 pm.

Start = finish − duration: 3:15 pm − 55 min = 2:20 pm.

☆ Convert and combine durations

2 h 15 min = 135 min; 90 min = 1 h 30 min.

1 h 50 min + 35 min = 2 h 25 min.

3 h 25 min − 20 min = 3 h 5 min = 185 min.

Remember...

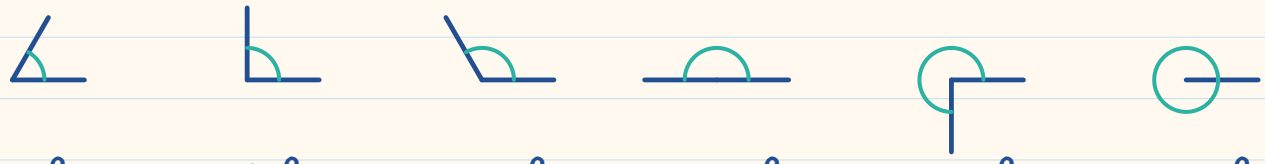
Count in 60s for time, not in 100s.

For a timetable, label each stop and wait on a timeline.

Angles and turns

Measurement · VC2M4M04

An angle measures a turn, not the length of its arms.



60° acute | 90° right | 120° obtuse | 180° straight | 270° reflex | 360° full turn

☆ Start with a right angle

A right angle is a quarter turn: 90°.
Use a square paper corner to compare angles.
Estimate using benchmarks: 45° is half a right angle.

☆ Acute and obtuse

Acute: more than 0° but less than 90°.
Obtuse: more than 90° but less than 180°.
60° is acute. 120° is obtuse.

☆ Straight and reflex

A straight angle is 180°: a half turn.
It equals 2 right angles.
A reflex angle is greater than 180° but less than 360°.

☆ All the way around

A revolution is 360°: one full turn.
It equals 4 right angles.
A three-quarter turn is 270°, a reflex angle.

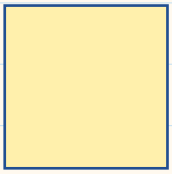
Remember...

Compare angles in a room or polygon with a paper corner.
Check which turn the angle arc is showing.

Shapes and objects

Space · VC2M4SP01

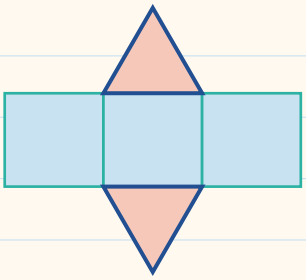
2D shapes are flat; 3D objects have depth.



square



rectangle



Net: 2 triangles + 3 rectangles

☆ Recognise a polygon

A polygon is closed and has only straight sides.

Triangle: 3 sides; quadrilateral: 4; pentagon: 5; hexagon: 6.

☆ Compare quadrilaterals

Square: 4 equal sides, 4 right angles. Rhombus: 4 equal sides.

Rectangle: opposite sides equal and 4 right angles.

Trapezium (here): exactly 1 pair of opposite sides parallel.

☆ Compare faces, edges and vertices

Cube: 6 square faces, 12 edges (joins), 8 vertices (corners).

Triangular prism: 5 faces, 9 edges, 6 vertices.

Square-based pyramid: 5 faces, 8 edges, 5 vertices.

☆ Flat faces and curved surfaces

Cylinder: 2 flat faces + 1 curved; cone: 1 flat + 1 curved.

Sphere: 1 curved surface; no flat faces, edges or vertices.

☆ Faces and nets: flat plans that fold

Triangular prism: 2 triangles + 3 rectangles; cube: 6 squares.

Square pyramid: 1 square + 4 triangles; fold without face overlaps.

Remember...

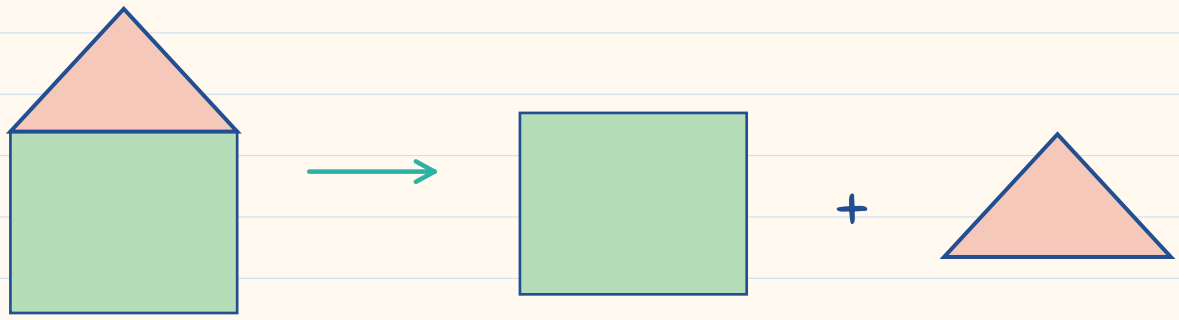
A cube has 1 more face and 2 more vertices than a triangular prism.

A square is a special rectangle and a special rhombus.

Making shapes from parts

Space · VC2M4SP02

A composite shape or object is made from familiar parts.



a house outline rectangle triangle

☆ Look for smaller shapes

Split an L-shaped floor into 2 rectangles.

A simple house outline can be a rectangle + triangle.

Trace the outside boundary; joining lines become internal.

☆ Build a 2D picture

Join 2 matching right triangles to make a rectangle.

Turn or slide the pieces until the edges meet.

Check for gaps and overlaps in a tiled shape.

☆ Build a 3D model

Model a tower with a cylinder and a cone on top.

Model a house with a prism body and a prism roof.

Name each object and explain where it fits.

☆ Approximate real objects

A tree can be modelled by a cylinder and a sphere.

A real tree is not an exact match to these objects.

Choose simple parts that capture its main shape.

Remember...

There may be several correct ways to split a shape.

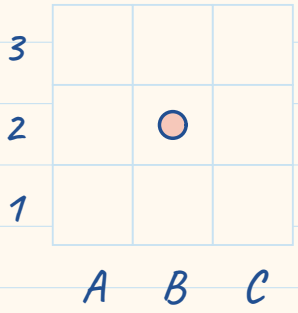
Build with blocks or a drawing app; compare with the real object.

Maps and grid references

Space · VC2M4SP03

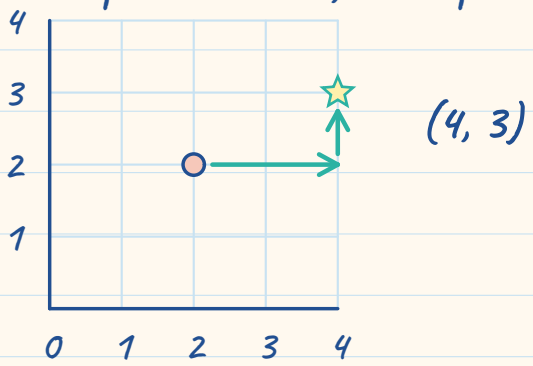
Read the labels: a location can be a grid square or a point.

Grid squares



B2 names a square

Coordinate points: across, then up



(2, 2) → (4, 3): 2 east, 1 north

☆ Letter-grid references name squares

A reference such as B2 names a whole square.

Read the column letter first, then the row number.

To make a map, label rows and columns; add a key and north arrow.

☆ Follow a letter grid

With north at the top, east is right and west is left.

From B2: 1 square east, then 1 north reaches C3.

From C3: 1 square south, then 1 west returns to B2.

☆ Extension: coordinates name points

Coordinates (x, y) name a grid-line intersection.

Start at the origin (0, 0); read across x, then up y.

(3, 2) means 3 across and 2 up.

☆ Move on a coordinate grid

From (2, 2), 2 east and 1 north reaches (4, 3).

East or west changes x; north or south changes y.

Reverse the moves to check the start and finish.

Remember...

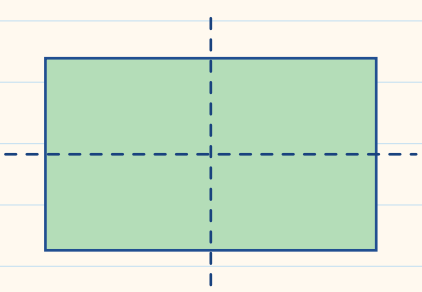
Grid references name squares here; coordinates name points.

Draw a park map; give a friend grid references and a route.

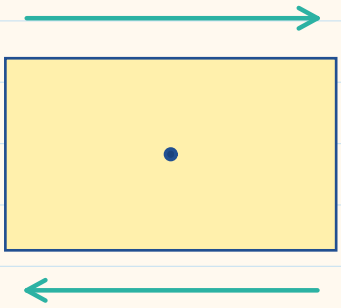
Symmetry

Space · VC2M4SP04

Symmetry means a shape matches itself after a flip or turn.



2 mirror lines



Half turn: matches

☆ Line symmetry: fold and match

A mirror line makes two matching halves.
Fold along the line: the halves fit exactly.
A square has 4 lines of symmetry.

☆ Rotational symmetry: turn and match

Turn a shape around its centre.
It matches before a full turn if it has rotational symmetry.
A rectangle matches after a half turn.

☆ Count matches and find the turn

Order = number of matches during one full turn.
Smallest turn = 360° ÷ order: a square has 360° ÷ 4 = 90°.
Equilateral triangle: order 3, 120°; regular hexagon: order 6, 60°.

☆ Make a symmetrical pattern

From each point, cross the mirror at 90°; go the same distance.
For a turning pattern, repeat a shape around a centre.
In a geometry app, create a picture by flips or turns; test it.

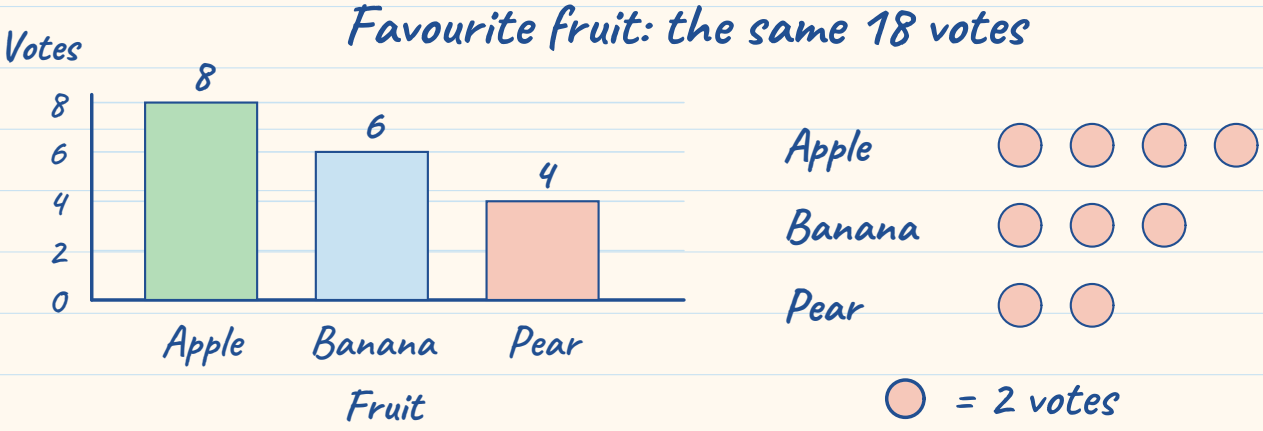
Remember...

A scalene triangle has no match before a full turn.
Include the final full turn; do not count the starting position twice.

Reading and making data displays

Statistics · VC2M4ST01

Data helps us answer questions using evidence.



☆ Collect data to answer a question

Which class fruit snack? Favourite fruit gives categorical data.

How many pets? Whole-number counts give discrete numerical data.

Use a digital form or spreadsheet; record each response.

☆ Read and make a pictograph

A key tells you the value of each picture: 1 picture = 2 votes.

4 pictures × 2 = 8 votes; half a picture means 1 vote.

To draw 8 votes: 8 ÷ 2 = 4 pictures.

☆ Make a column graph

Count frequencies in a table; draw columns for the totals.

Give a title and axis labels; use equal scale steps from 0.

Use equal-width columns with gaps; a dot plot shows each value.

☆ Read counts and frequencies

Frequency means how often a value occurs.

Pets: 0, 1, 1, 2. The value 1 has a frequency of 2.

Fruit: 18 votes; apple 8 – pear 4 = 4 more apple votes.

Remember...

Read the scale and key before counting pictures or columns.

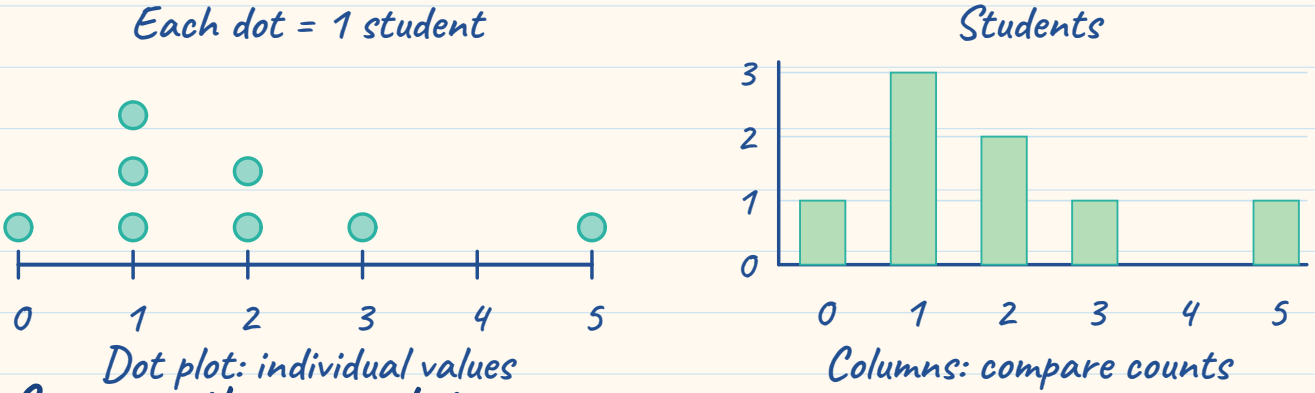
Graph your own data digitally; explain the answer to your question.

Comparing data displays

Statistics · VC2M4ST02

Choose a display that makes patterns and differences clear.

Same data: books read by 8 students



☆ Compare the same data

Both displays show the same 8 students' book counts.

The dot plot shows each student and the cluster at 1–2.

The column graph makes the frequency of each count clear.

☆ Describe the shape of the data

Books read: 0, 1, 1, 1, 2, 2, 3, 5.

Most values cluster from 1 to 2; 1 appears most often.

There is a gap at 4 and one high value at 5.

☆ Compare variation

Group A: 2, 2, 3, 3. Group B: 0, 1, 4, 5.

Range = greatest – least. A: 3 – 2 = 1; B: 5 – 0 = 5.

Group B is more spread out: it has more variation.

☆ Check that a comparison is fair

Read the titles, units, keys and scale steps.

Check how many responses each group has.

Use matching scales when comparing the same kind of data.

Remember...

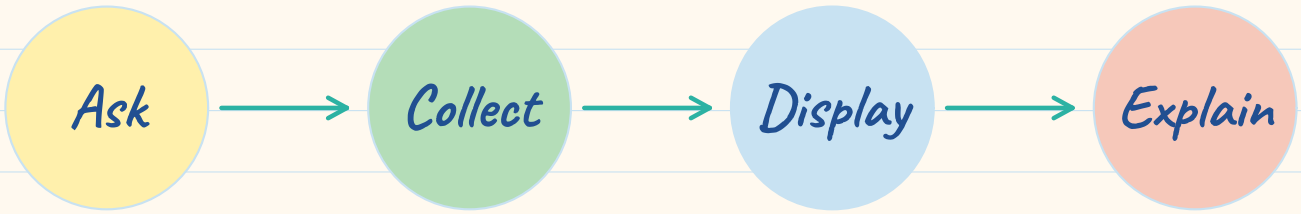
Look for clusters, gaps, peaks and unusual values.

Explain what the display shows well, and what is harder to see.

Planning a data investigation

Statistics · VC2M4ST03

Ask, collect, display, then explain what you found.



A clear question leads to useful evidence.

☆ 1. Ask a clear question

Example: How do students in our class travel to school?
Decide whom to ask and which day to investigate.
Choose clear groups: walk, car, bus, bike or other.

☆ 2. Collect the evidence

Survey each classmate once about that day's main method.
Other methods: observe traffic, count objects or use online data.
Record responses or observations in a spreadsheet.

☆ 3. Organise and display

Count the answers and check the total.
Use a spreadsheet to make a labelled column graph.
Add a clear title, equal scale steps and category names.

☆ 4. Explain your findings

Example results: car 12, walk 8, bus 3, bike 2, other 0.
25 students answered; car was the most common method.
Our results describe this class on this day.

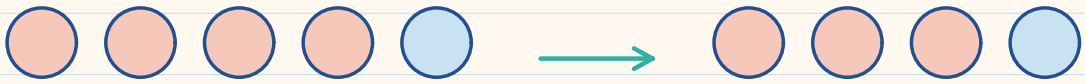
Remember...

Use a fair question that does not suggest the answer.
Carry out these steps; report your findings and any missing answers.

Likelihood and possible outcomes

Probability · VC2M4P01

Chance describes what could happen and how likely it is.



4 red + 1 blue → 3 red + 1 blue

Remove a red counter: the next chance changes.

☆ List the possible outcomes

A fair die: 1, 2, 3, 4, 5 and 6 are equally likely.

Rolling 7 is impossible; rolling less than 7 is certain.

On a fair coin, heads and tails each have an even chance.

☆ Order events by likelihood

Roll: 7 → 6 → even → below 6 → below 7 (a fair die).

Least → most: impossible, unlikely, even chance, likely, certain.

Below 6 has 5 winning outcomes; below 7 has all 6.

☆ Independent or dependent?

Independent: one outcome does not affect another's chance.

Fair coin flips: after 5 heads, the next flip is still an even chance.

Dependent: one outcome changes another's chance.

☆ Other chance situations

Remove a red counter without replacing it: chances change.

A storm makes an outdoor picnic less likely.

Mutually exclusive: one card cannot be both red and a spade.

Remember...

Likely does not mean certain. Unlikely does not mean impossible.

List combinations systematically: 2 tops × 3 shorts = 6 outfits.

Repeating chance experiments

Probability · VC2M4P02

Repeated trials help us observe chance and variation.

Two experiments: 20 coin flips each

Set 1	12 heads	8 tails
Set 2	9 heads	11 tails

Same chances. Different results!

☆ Plan and repeat

Flip a fair coin 20 times; each flip is one trial.
Keep the method the same for every trial.
Predict possible outcomes: heads or tails.

☆ Record every outcome

Use tally marks for heads and tails as you go.
Example: 12 heads + 8 tails = 20 trials.
Check that your counts add to the number of trials.

☆ Compare repeated experiments

Repeat 20 flips; an example result is 9 heads and 11 tails.
These example sets total 40 flips: 21 heads and 19 tails.
Different counts with the same rules show chance variation.

☆ Think about a game

On a fair die, 1, 2, 3 wins for A; 4, 5, 6 wins for B.
Both players have 3 equally likely winning outcomes.
Play 20 rounds, repeat, then compare the numbers of A and B wins.

Remember...

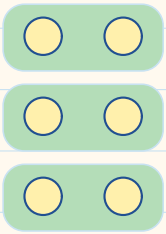
Equal chances do not guarantee equal counts.
More trials usually give a clearer pattern, not certainty.

Odd and even numbers

Number · AC9M4N02

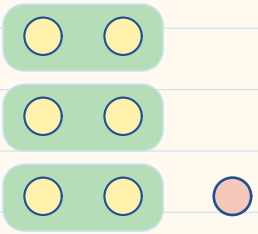
Even numbers make pairs with none left over. Odd numbers leave one unpaired.

6 counters



Even: all paired

7 counters



Odd: one left over

☆ Look at the ones digit

Even numbers end in 0, 2, 4, 6 or 8.

Odd numbers end in 1, 3, 5, 7 or 9.

Zero is even: 0 = 2 × 0. So are 20, 134 and 2,006.

☆ Add or subtract

Even + even = even; odd + odd = even.

Even + odd = odd. For subtraction, compare the types:

Same types → even; different types → odd.

☆ Multiply and explain

Even × any whole number = even; odd × odd = odd.

6 × 7 = 42 (even); 7 × 9 = 63 (odd).

Copies of an even group can all be arranged in pairs.

☆ Use the rules to check

43 + 27 must be even: both numbers are odd.

71 is odd, so it cannot be right. 43 + 27 = 70.

An even answer passes this check, but may still be wrong.

Remember...

Predict first: 8 + 5, 9 − 4 and 7 × 5 are all odd.

Use pairs or calculate to explain an odd/even prediction.