Mathletics

for the New Zealand Curriculum

6

Mathematics



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A 3P Learning Product

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Term 3

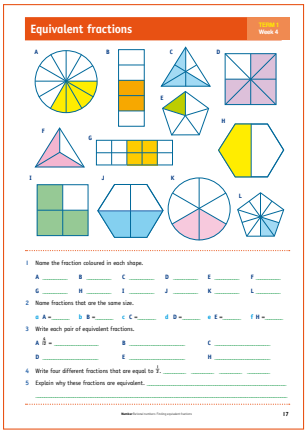
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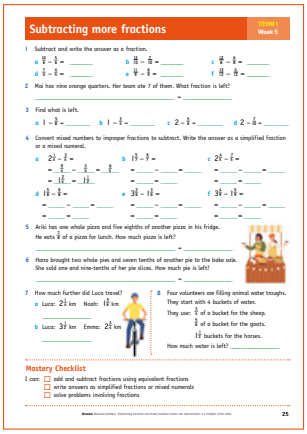
Term 4

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Mathletics Student Book





New Zealand Curriculum Alignment

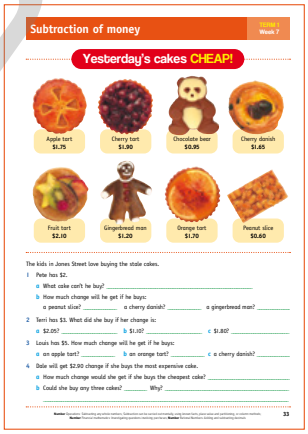
This edition fully aligns each student page with the refreshed **New Zealand Curriculum: Mathematics and Statistics Years 0–8, 2025**. The New Zealand Curriculum teaching sequence statements appear on each student page.

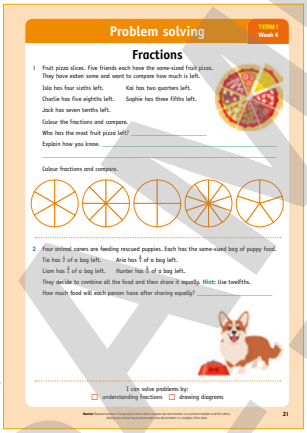


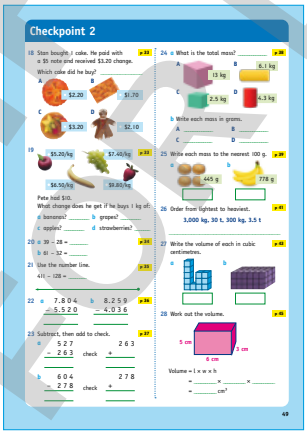
Knowledge and Practices

The **Mathletics Programme** develops the **knowledge** students need to build a deep understanding of mathematics and statistics — including number structures, algebraic thinking, measurement, geometry, statistics and probability.

Students build their **practices** by focusing on key facts, concepts and procedures, such as patterns, place value and the structure of the base-10 system. They develop the **skills, strategies and processes** required to reason, model and solve problems. Through these practices, students apply what they know to connect ideas, identify patterns and relationships, and explain their reasoning with confidence.







Integrated Problem-Solving

Builds students' reasoning and problem-solving capabilities through purposeful, meaningful problems.

Regular Checkpoints

Checkpoints appear both at mid-term and end of each term to review and assess key concepts.



Hands-on Activities

Various hands-on activities are included in each term, asking students to measure and make, count and compare, using objects from around the classroom or home.



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Year 6 Knowledge and Practices

The New Zealand Curriculum Mathematics and Statistics 2025

Knowledge	Practices	Pages
Number — Number structures		
The base 10 number system extends infinitely in two directions.	Reading, writing, comparing, and ordering any whole number and representing them using base 10 structure	2, 3, 4, 5
	Finding factor pairs for numbers that result from multiplying any two whole numbers between 1 and 12	50, 51, 52, 53, 54, 55
Rounding can support predicting or estimating the result of a calculation. Rounding is based on identifying the nearest place value or unit (ten, hundred, thousand) for a given number; a number line supports this.	Rounding whole numbers to the nearest million, hundred thousand, ten thousand, thousand, hundred, or ten	7, 130, 131
	Rounding hundredths to the nearest whole number or tenth	3, 7
Square numbers are produced by multiplying a number by itself.	Recognising square and cube numbers and the notation for squared (^{2}) and cubed (^{3})	56, 57, 58
Cube numbers are produced by multiplying a number by itself twice (e.g. 4 × 4 × 4).	Memorising the square numbers to 144 and cube numbers to 125	56, 57, 58
Negative numbers are to the left of 0 on a horizontal number line and below 0 on a vertical number line. Negative numbers are represented symbolically with a negative sign (−) and named 'negative' along with the numeral (e.g. −4 is named negative four). Zero is neither positive nor negative. Negative numbers arise in a range of situations (e.g. debt, temperature).	Counting forwards and backwards with positive whole numbers, including working with negative numbers (e.g. starting at −6 and counting backwards in 2s)	146, 147, 148, 149
Number — Operations		
In expressions that have more than one operation, the order of operations is important; operations are done as follows: 1. operations grouped inside brackets 2. exponents such as squaring 3. multiplication and division, from left to right 4. addition and subtraction, from left to right.	Calculating expressions using the order of operations	124, 125, 126, 127, 128, 129, 130
Addition and subtraction can be carried out mentally, using known facts, place value and partitioning, or column methods. Standard written algorithms (e.g. column addition, column subtraction) rely on place value, regrouping, and renaming.	Adding and subtracting any whole numbers	28, 29, 30, 31, 32, 33, 34, 35, 36, 37
	Multiplying any whole number by a two-digit number (e.g. 542 × 12)	51, 52, 60, 61, 62, 63, 64
Remainders from division can be represented as whole numbers, fractions, or decimals, depending on the context.	Dividing up to five-digit whole numbers by a one-digit divisor, with a remainder (e.g. 1,283 ÷ 5 = 256, remainder 3)	53, 76, 77, 78, 79, 80, 118, 119, 120, 121
	Connecting finding unit fractions of whole numbers to division (with remainders) (e.g. 1—6 of 31 is equivalent to 31 ÷ 6 = 5 1—6)	104
	Representing remainders from division as whole numbers, fractions, or rounded decimals, as appropriate to the context	76, 77, 78, 79, 118, 119, 120, 121
Number — Rational numbers		
Thousandths can be created by dividing whole numbers by 1,000 and can be expressed as fractions or decimals.	Reading, writing, and representing tenths, hundredths, and thousandths as fractions and decimals	2, 3, 4, 5, 6, 98
	Comparing and ordering numbers with up to three decimal places	5, 19, 20
	Multiplying and dividing numbers by 10, 100, or 1,000 to make decimals and whole numbers (e.g. 1.3 × 10 = 13) and to identify tenths, hundredths, and thousandths places	8, 9, 10, 11
Percentages can be used to compare quantities to a value or whole.	Memorising decimal and percentage equivalents of common fractions (½, ¼, ¾, ⅕, ⅖, ⅗, ⅘) including fractions with denominators that are 10 or 100	99, 100, 106
	Converting decimal tenths and hundredths to fractions and percentages (e.g. 0.31 = 31⁄100 = 31%)	4, 6, 98, 99, 103, 106
Equivalent fractions can be generated and simplified using common factors.	Finding equivalent fractions	17, 18, 106
	Comparing and ordering fractions where at least one denominator is a common multiple of all the others	21
	Converting between mixed numbers and improper fractions	20, 22, 24
Fractions should have the same denominator before using them in addition or subtraction.	Adding and subtracting fractions and mixed numbers when one denominator is a multiple of the other	19, 21, 22, 23, 24, 25
Multiplication, division, fractions, decimals, and percentages can be used to solve problems involving relative quantities and measures.	Adding and subtracting decimals to three decimal places	29, 31, 33, 36
	Finding a non-unit fraction of a whole number, using multiplication and division facts and where the answer is a whole number (e.g. ⅔ of 240)	104, 105
	Finding a whole set or amount when given a non-unit fraction, using multiplication and division facts (e.g. ¾ of the set is 90, what is the whole set?)	105
	Finding common percentages (1%, 10%, 20%, 25%, 50%, 75%) of whole numbers	100, 101, 106
	Finding the whole (100%) when given a percentage (e.g. 75% is 24)	106, 107
	Reasoning proportionally with fractions, decimals, and percentages to compare two quantities and determine missing values	102, 107, 131, 132, 133
Number — Financial mathematics		
Money uses our decimal place-value system to two decimal places.	Calculating 10%, 25%, and 50% of whole dollar amounts (e.g. 50% of $280)	101, 103, 106
	Investigating questions involving purchases (e.g. ensuring there's enough money)	29, 33, 64, 131, 133
Algebra — Equations and relationships		
The relative size of expressions involving numbers can be communicated using "greater than" (>), "less than" (<), and equals (=).	Checking the truth of and completing open number sentences that involve all four operations and that include the use of inequalities, respecting the order of operations (e.g. 8 × 7 ≤ 8 × 5 + 42, true or false?)	68, 69, 127, 129, 130
Tables provide a way of organising the positions and elements of a pattern to reveal relationships or rules.	Developing a rule for a growing pattern in words and making conjectures about further elements in the pattern	59, 65, 66, 67
A coordinate plane is formed when two perpendicular number lines intersect at (0, 0); usually the coordinate plane consists of a horizontal x-axis and a vertical y-axis.	Locating coordinate points on a coordinate plane, including points found on the *x*- or *y*-axis	151, 152, 153, 154
Coordinates are represented as (x,y), where the x-value represents horizontal movement and the y-value represents vertical movement. Plotting points on a coordinate plane can help to visualise numeric patterns.	Generating a table of values from a rule for a growing pattern and plotting these points on a coordinate plane	70, 71, 72, 73, 155

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Year 6 Knowledge and Practices

The New Zealand Curriculum Mathematics and Statistics 2025

Knowledge	Practices	Pages
Measurement — Measuring		
Measurements can be approximated by referencing previously measured benchmark lengths, volumes, or areas.	Accurately measuring length with a ruler, mass (weight) with scales, capacity with measuring jugs, temperature with a thermometer, and duration with a timer, using appropriate metric or time-based units or a combination of units (e.g. 2 hours and 30 minutes)	42, 93, 94, 95, 109, 111, 112, 150, 182, 183, 184, 185
	Estimating (using benchmarks) length, mass (weight), capacity, temperature, and duration, using appropriate metric or time-based units or a combination of units	40, 42, 94, 110, 111, 150, 184
Prefixes are added to base metric units to signify larger or smaller quantities. The prefix: 'milli–' (m) signifies a unit one thousand times smaller than the base unit; 'centi–' (c) signifies a unit one hundred times smaller than the base unit; 'kilo–' (k) signifies a unit one thousand times larger than the base unit. Converting between metric units can involve multiplying and dividing by 10, 100, or 1,000.	Converting metric units of length (m and cm), mass (g and kg), and capacity (L and mL), including combining mixed units to produce units with up to 2 decimal places (e.g. 10 kg and 500 g = 10.5 kg)	38, 39, 40, 41, 108, 109, 110, 183
The area of a right-angled triangle is equal to half the area of a rectangle with the same base and height.	Calculating, estimating, and comparing the volumes of cubes and rectangular prisms using standard units, including cubic centimetres (cm^3) and cubic metres (m^3)	43, 44, 45, 46, 182
The volumes of rectangular prisms can be calculated by multiplication of side lengths.	Visualising, estimating, and calculating (using multiplication) the areas of rectangles and right-angled triangles (in cm^2 and m^2) and the volumes of rectangular prisms (in cm^3)	45, 47, 113, 114, 115, 116, 117
Angles at a point sum to 360°.	Classifying, measuring, and constructing angles up to 360°, using a protractor	172, 173, 174
Angles on a straight line sum to 180°.	Identifying and describing angles at a point, angles on a straight line, and vertically opposite angles, using angle notation	174
Vertically opposite angles are equal.	Reasoning about and finding unknown angles in situations involving angles at a point, angles on a straight line, and vertically opposite angles	175, 176
Time and duration arise in a range of situations including solar calendars (e.g. Roman, Gregorian) and lunar calendars (e.g. maramataka Māori, Chinese).	Converting between units of time (h, min, s)	86
	Measuring duration in both 12- and 24-hour time systems	87, 88, 89, 90, 91, 92
	Finding elapsed time in minutes across an hour (e.g. the difference between 2:53 pm and 3:28 pm)	89, 91, 92
Timetables can be used to record the time and duration of events.	Using and interpreting timetables to calculate the duration of events (e.g. bus and train schedules)	87, 88, 89, 90, 91
Geometry — Shapes		
Quadrilaterals can be categorised into one or more of the following categories: a trapezium, which has one pair of parallel sides; a parallelogram, which has two pairs of parallel sides; a kite, which has two pairs of equal-length adjacent sides; a rectangle, which has four right angles; a rhombus, which has four equal-length sides; a square, which has four right-angles and four equal-length sides.	Identifying, classifying, and explaining similarities and differences between 2D shapes (including different types of triangles and quadrilaterals) and between prisms and pyramids	134, 135, 136, 137, 138, 179, 180, 181
	Identifying and describing the interior angles of triangles and quadrilaterals	177, 178
The order of rotational symmetry for a given shape is the number of times it appears in an identical orientation when completing a full turn (360°).	Identifying shapes with rotational symmetry and determining their order of rotational symmetry	12, 13, 14
The order of rotational symmetry for a circle is infinite.		
Geometry — Spatial reasoning		
A tessellation is a pattern made from a repeated shape or combination of shapes that can be rotated or reflected to fit together with no gaps or overlaps.	Visualising, creating, and describing 2D geometric patterns and tessellations using rotation, reflection, and translation, and identifying the properties of the shapes that do not change	15, 16
A reflection is when a shape is flipped over a line, creating a mirror image. A translation is when a shape is slid from one place to another without being turned. A rotation is when a shape is turned around a fixed point.	Predicting the results of two-step transformations (reflections, translations, rotations) on 2D shapes	15
Geometry — Pathways		
An alphanumeric grid reference is a system that divides a map into labelled rows (letters) and columns (numbers), so that each square can be identified by combining a letter and a number (e.g. A1, B2).	Interpreting and creating grid references and simple scales on maps, using directional language including the four main compass points, turn (in degrees), and distance (in m, km) to locate and describe positions and pathways	81, 82, 83, 84, 85, 117
Statistics — Developing knowledge from data		
Bivariate data includes time-series data with two numerical values, one time-based.	Collecting time-series data (e.g. how the mass of a kilogram of carrots varies over 5 days)	165
The answers to a statistical investigative question will vary for different subjects.		165
The mean (average) measures the centre of numerical data. The mean is the sum of all the values divided by the total number of values.	Calculating the mean for numerical data	163, 165
The range measures the spread of numerical data. The range is the difference between the highest and lowest values.	Calculating the range for numerical data	159, 163, 165
Statistics— Visualisation of data		
Time-series data can be visualised with a time-series or line graph formed on a coordinate plane, with the x-axis representing time and the y-axis the second variable.	Creating time-series graphs	158, 163, 165
	Choosing and creating an appropriate data visualisation for a given set of data	156, 157, 158, 159, 160, 167
Statistics — Interpretation of data		
Interpreting a data visualisation includes describing its variables and their units, the context for the data, and the visualisation's key features: its shape (e.g. the number of peaks), its middle group(s) (where the middle of the data lies), its spread (how spread the data is from the minimum (lowest) value to the maximum (highest) value).	Identifying whether a time-series graph shows a trend	161, 162, 163, 165
	Calculating an average and a range for continuous numerical data	159, 162
	Interpreting data visualisations, including those from contemporary media	156, 157, 159, 160, 161, 162, 164, 166, 167, 168, 169
Probability — Experimental probability		
Situations that involve chance, uncertainty, and randomness are called chance-based situations. Probability can be used to describe such situations. A trial is a single run of a chance-based situation that results in one of a set of possible outcomes. The possible outcomes for a chance-based situation can be arranged into events. The probability of an outcome is the chance of it occurring. Probabilities are associated with values between 0 and 1, where: 0 is impossible, between 0 and 0.5 or ½ ranges from very unlikely to unlikely, 0.5 or ½ is equally likely, between 0.5 or ½ and 1 range from likely to very likely, 1 is certain. Likelihood can be visualised using a number line from 0 to 1. The sample space is the set of all possible outcomes of an experiment. The probability of an event, if events are believed to be equally likely, is the number of ways the event can happen divided by the total number of possible outcomes. The sum of the probabilities of all outcomes is equal to 1.	Listing the sample space of an event (e.g. the sample space for rolling a die is 1, 2, 3, 4, 5, 6)	139, 140, 141, 142, 143
	Calculating the probabilities of individual outcomes	139, 140, 141, 142, 143
	Calculating probabilities using a spinner, where each event is a fraction or combination of fractions on the spinner	140, 142, 143
	Answering questions about the probability of combinations of outcomes, including checking that the sum of all the probabilities is 1	139, 140, 141, 142, 143

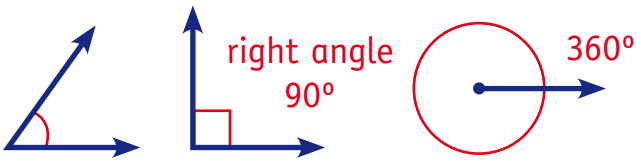
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Dictionary

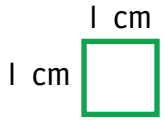
angle

The amount of turning between two lines that meet at a point

Measured in degrees



area



The size of a surface

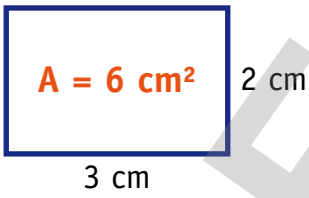
Measured in squares

1 square centimetre = 1 cm²

A = 1 cm²

Rectangular area = length × width

A = L × W



ascending order

In order from smallest to largest

67, 804, 1,007, 5,475, 7,862

capacity

The amount a container can hold

Measured in cups, litres (L) and millilitres (mL)

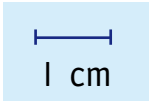


centimetre (cm)

A unit of length

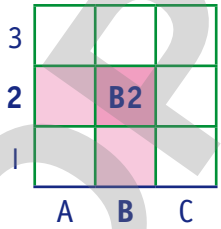
10 mm = 1 cm

100 cm = 1 m



coordinates

Position on a grid using letters and numbers for the rows and columns



data

A collection of information

Can be recorded in tally marks

Favourite sports		
Sport	**Tallies**	**Total**
Soccer	𝍸 𝍸 ||	12
Netball	𝍸 |	6
Rugby	𝍸 |||	8
Chess	𝍸 𝍸 |	11

decimal number

A number that has a decimal point

e.g. 0·3, 75·1

descending order

In order from largest to smallest

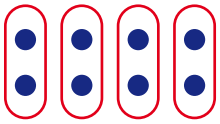
3,927, 1,423, 875, 610, 40

digit

The numerals that are used to write numbers: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9

division (÷)

Sharing into equal groups

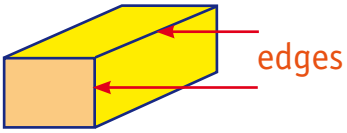


4 groups of 2

8 ÷ 2 = 4

edge

Where two surfaces meet



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Dictionary

equation

Number sentence

3 + 2 = 5

equivalent

Of equal value

$\frac{1}{2} = \frac{2}{4}$ 1 + 4 = 2 + 3

estimate

Make a good guess

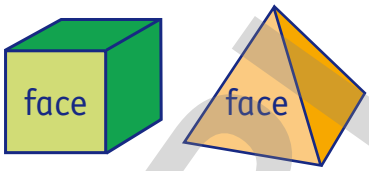


Around 20

21 + 38 = about 20 + 40 = around 60

face

A flat surface of a solid shape



factor

A number that divides into another number exactly

A number to be multiplied

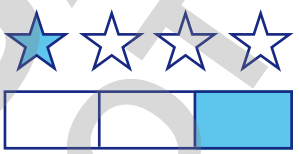
factor × factor = product

3 × 4 = 12 12 ÷ 4 = 3

3 and 4 are factors of 12

fraction

A part of a whole or a group



$\frac{1}{4}$ coloured

$\frac{1}{3}$ coloured

$\frac{1}{2}$ ← numerator

← denominator

grams (g)

A unit of mass (weight)

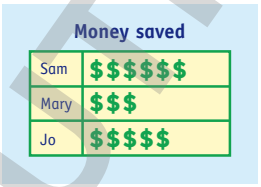
1,000 g = 1 kg

graph

A diagram that shows a collection of data



bar graph



picture graph



dot plot

improper fraction

A fraction greater than 1

The numerator is larger than the denominator → $\frac{7}{4}$

kilogram (kg)

A unit of mass for weighing things

1 kilogram = 1,000 grams

1,000 kilograms = 1 tonne

litre (L)

A unit of capacity

1 L = 1,000 millilitres (mL)

mass (weight)

The amount of material that makes up an object. Measured in grams, kilograms and tonnes

metre (m)

A unit of length

1 m = 100 cm 1,000 m = 1 km

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Dictionary

millilitre (mL)

A unit of capacity

1,000 mL = 1 L

millimetre (mm)

A unit of length

10 mm = 1 cm

mixed numbers

A whole number with a fraction $1\frac{1}{4}$

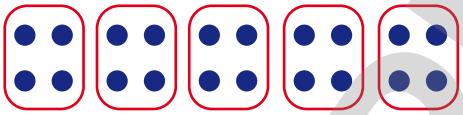
multiple

The product (answer) when you multiply a given number by another

Multiples of 3 are 6, 9, 12, 15, 18, 21…

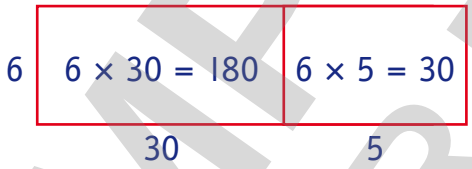
multiplication (×)

Find the total of a number of equal groups or equal rows



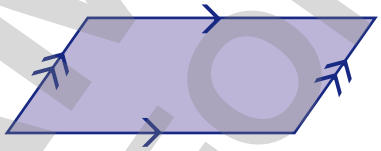
5 × 4 = 20

6 × 35 =



parallelogram

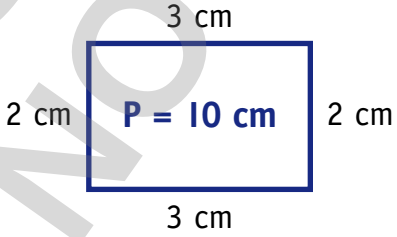
A quadrilateral with opposite sides parallel



perimeter

Distance around the outside

Add side lengths: 3 + 3 + 2 + 2 = 10 cm



place value

The value of a numeral depending on its position in a number

396 = 300 + 90 + 6

754 = 7 hundreds + 5 tens + 4 ones

8·57 = 8 ones + 5 tenths + 7 hundredths

polygon

A closed shape with 3 or more straight sides

e.g.



polygons – regular

2D shapes with all sides the same length and all angles the same size



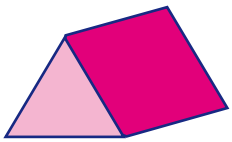
polygons – irregular

2D shapes with sides and angles of different sizes are **irregular** polygons



prism

A 3D shape with identical ends. All other faces are rectangles. The ends give a prism its name.



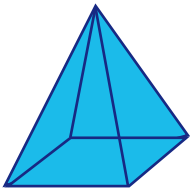
triangular prism

product

When numbers are multiplied, the answer is called the product.

pyramid

A 3D object with one flat base. All other faces are triangles coming to a point at the apex. The base shape gives a pyramid its name.



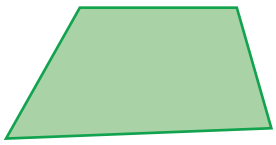
square pyramid

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Dictionary

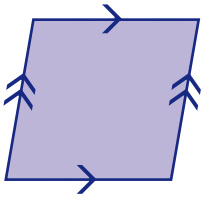
quadrilateral

A 2D shape with 4 straight sides



rhombus

A quadrilateral with all sides equal and opposite sides parallel. It is a special parallelogram.



rounding (to nearest 10)

Round down ← 1 2 3 4

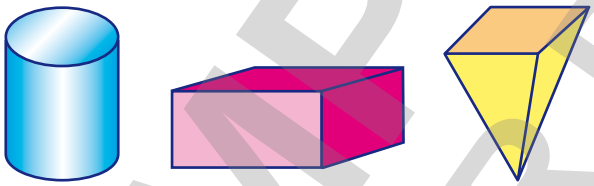
Round up → 5 6 7 8 9

e.g. 675 → 700
(rounded to the nearest 100)

4,492 → 4,000
(rounded to the nearest 1,000)

three-dimensional objects (3D)

Solid shapes that have length, width and height



time



analogue



digital

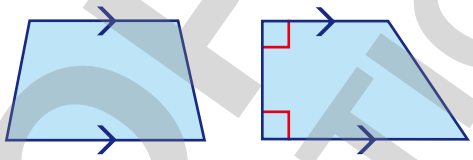
1 hour = 60 minutes

1 minute = 60 seconds

trapezium

A quadrilateral that has one pair of parallel sides

Some have 2 right angles



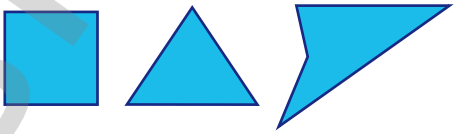
triangle

A 2D shape with 3 straight sides



two-dimensional shapes (2D)

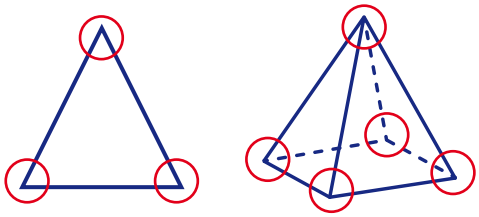
Shapes that only have length and width



vertex

2D: where 2 straight lines meet

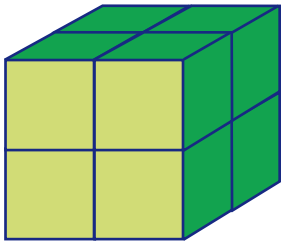
3D: where 3 or more edges meet



1 vertex, 3 vertices

volume

The amount of space a solid object takes up



8 cm^3

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Place value



1 Name the place of the digit 8 in each number.

a 6,384.2 tens	**b** 7,418.364 _____	**c** 824.632 _____
d 1.038 _____	**e** 564.380 _____	**f** 8,002.4 _____
g 248.241 _____	**h** 4,201.873 _____	**i** 6,423.368 _____
j 389.2 _____	**k** 659.008 _____	**l** 392.860 _____

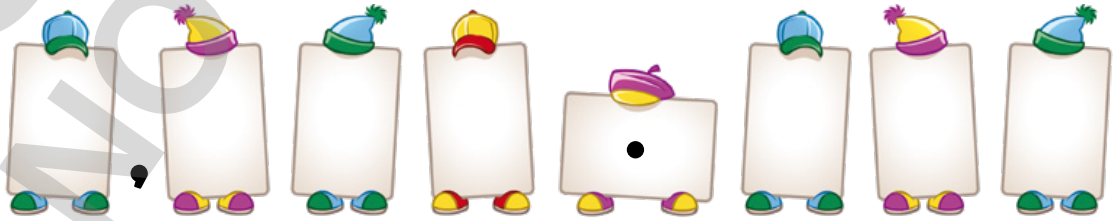
2 Write a number that matches the place value description.

a 7 in the tens place _____	**b** 4 in the ones place _____
c 2 in the thousands place _____	**d** 1 in the hundreds place _____
e 8 in the ones place _____	**f** 9 in the tenths place _____
g 3 in the thousandths place _____	**h** 5 in the hundredths place _____

3 Ray has these cards and instructions for how to arrange them.
Write the digits in the correct places.



Instructions:
9 in the ones place
6 in the hundreds place
0 in the tenths place
3 in the thousandths place
8 in the tens place
7 in the thousands place
5 in the hundredths place



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Number structures: Reading and writing any whole number and representing them using base 10 structure;
Number Rational numbers: Reading, writing, and representing tenths, hundredths, and thousandths as decimals

More place value

1 Write the numbers in the place value chart.

a 64,329.68 **b** 906.784 **c** 528,045.6 **d** 80.961 **e** 439,200.707

f 6,030.59 **g** 700,358.2 **h** 49,306.295 **i** 1.906 **j** 5,945.250

	Hundred thousands	Ten thousands	Thousands	Hundreds	Tens	Ones	.	Tenths	Hundredths	Thousandths
a										
b										
c										
d										
e										
f										
g										
h										
i										
j										

2 Write the value of each red numeral.

a 7,651.245 50 **b** 8,139.68 _____

c 15,384.10 _____ **d** 62.459 _____

e 934,058.7 _____ **f** 526.327 _____

g 26,290.68 _____ **h** 249,807.324 _____

i 64,843.023 _____ **j** 5,496.249 _____

3 Round each number in question 2 to the nearest whole number.

a 7,651 **b** _____

c _____ **d** _____

e _____ **f** _____

g _____ **h** _____

i _____ **j** _____



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Expanded notation

This is expanded notation for **2,564,283.179**:

$2{,}000{,}000 + 500{,}000 + 60{,}000 + 4{,}000 + 200 + 80 + 3 + \frac{1}{10} + \frac{7}{100} + \frac{9}{1{,}000}$

1 Write the numbers in expanded notation.

a 642,859.371 _____

b 29,603.295 _____

c 1,893.064 _____

d 43.230 _____

e 1.005 _____

f 4,759,605.07 _____

g 200.358 _____

h 503.090 _____

i 1,044,000.588 _____

2 Complete the operation and write the answer in expanded notation.

a 3,253.163 (Add $\frac{1}{100}$) _____

b 64,950.62 (Subtract 0.02) _____

c 59.653 (Add $\frac{1}{1000}$) _____

d 128.005 (Subtract 0.4) _____

e 3.089 (Add 0.001) _____

f 5,980.324 (Add $\frac{5}{100}$) _____

g 0.584 (Add 0.02) _____

h 74.735 (Subtract 4) _____

i 68,904.237 (Subtract 0.03) _____

j 596.280 (Add 10) _____



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Number Number structures: Reading and writing any whole number and representing them using base 10 structure;
Number Rational numbers: Reading, writing, and representing tenths, hundredths, and thousandths as fractions and decimals; Converting decimal tenths and hundredths to fractions

Working with large numbers

TERM 1
Week 1

1 Use red to box the whole number part and blue to circle the decimal part.

a 7,342,683.594 **b** 895.23 **c** 7,435.682

d 7.003 **e** 436.829 **f** 14,596.25

g 897.329 **h** 6.49 **i** 1.2

j 124,987.2 **k** 38.481 **l** 9.123

2 Answer yes or no.

a 8.093 has 9 hundredths. _____

b 643,284.210 has 1 thousandth. _____

c 29.3 has 3 tenths. _____

d 749.083 has 4 tens. _____

e 1,529.210 has 2 tenths. _____

f 5,068,491.35 has 5 millions. _____

g 265,429.384 has 6 ten thousands. _____

h 17.563 has 6 tens. _____

i 8,495.030 has 4 hundreds. _____



3 Write these decimals in ascending order.

a 542.649 245.496 452.946 425.609 524.708

_____ _____ _____ _____ _____

b 1,794.632 1,974.635 1,947.356 1,479.653 1,749.365

_____ _____ _____ _____ _____

c 89,243.17 89,432.70 82,439.07 84,932.72 82,934.27

_____ _____ _____ _____ _____

4 Write these decimals in descending order.

a 638.429 683.942 638.249 643.829 643.982

_____ _____ _____ _____ _____

b 9,386.280 9,863.820 9,683.082 9,368.280 9,836.208

_____ _____ _____ _____ _____

c 38,420.983 38,024.389 38,240.398 38,283.409 38,823.904

_____ _____ _____ _____ _____

Mastery Checklist

I can:

- ☐ use place value from millions to thousandths
- ☐ expand numbers
- ☐ round to the nearest whole number
- ☐ order decimals

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Decimals

1 Mason and Treany have been asked to expand 0.621.

Mason writes:

0.621 expanded is 0.6 + 0.2 + 0.1

Treany writes:

0.621 expanded is 0.6 + 0.02 + 0.001

a Who is correct? _____

Why? _____

b Write 0.621 in expanded form using fractions. _____

2 Joash is thinking of a number.

It has:

Ones	.	Tenths	Hundredths	Thousandths
0	.	𝍸	||	?

Write 5 different numbers that could be Joash's number.

_____ _____ _____ _____ _____

3 Killara converted the decimal 5.29 to a fraction.

$5.29 = \frac{529}{100}$

Is Killara correct? _____

Explain your answer.

_____

_____

_____

_____

_____

_____



I can solve problems by:

☐ understanding decimal place value ☐ checking answers

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Rounding

1 Complete the labels.

millions
hundred thousands
ten thousands
2,653,124.897
ones
tenths

2 **a** What is the whole number part of this number? _____

b What is the decimal part of this number? _____

3 Round this number to the nearest:

a tenth _____ **b** hundredth _____

c whole _____ **d** thousand _____

e ten thousand _____ **f** ten _____

g hundred _____ **h** hundred thousand _____

i million _____

4 Round these numbers to the nearest tenth.

a 0.123 _____ **b** 0.387 _____ **c** 0.529 _____ **d** 0.764 _____

e 1.012 _____ **f** 1.967 _____ **g** 1.403 _____ **h** 9.855 _____

i 0.638 _____ **j** 7.208 _____ **k** 4.437 _____ **l** 1.009 _____

5 Round these measurements to the nearest whole unit.






a 4.5 kg = _____ **b** 2.72 kg = _____ **c** 0.9 kg = _____ **d** 1.375 kg = _____







e 4.8 L = _____ **f** 0.75 L = _____ **g** 1.415 L = _____ **h** 132.3 L = _____

6 Round these distances to the nearest thousand kilometres.

a Auckland to Sydney 2,155 km _____

b around the earth 40,075 km _____

c Wellington to London 18,776 km _____

d Earth to the moon 384,425 km _____



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Multiply and divide by 10 and 100

TERM 1
Week 2

1 Multiply by 10.

a $4.35 _____ b $5.65 _____ c $2.70 _____

d $1.65 _____ e $0.85 _____ f $54.25 _____

g $0.58 _____ h $13.30 _____

2 Increase these amounts by 10.

a $22.50 _____ b $10.10 _____ c $24.75 _____

d $15.25 _____ e $0.45 _____ f $543.20 _____

3 Multiply these numbers by 100.

a 7.894 _____ b 13.605 _____ c 3.0 _____ d 72.94 _____

e 14.003 _____ f 135.32 _____ g 78.5 _____ h 1.6 _____

Multiply by 10 and 100

Multiplying increases the value of each digit.

×10 makes each digit 10 times greater

×100 makes each digit 100 times greater

e.g. 7.31 × 10 = 73.1
8.52 × 100 = 852

4 To assist families with storm-damaged homes, the government promised to give the Relief Fund one hundred times as much as was donated. What did the government give if the donation was:

a $425.00? _____ b $945.00? _____

c $2,260.00? _____ d $53.80? _____

e $3,580.00? _____ f $214.45? _____



5 Solve each division.

a $10 \overline{)70}$ b $10 \overline{)90}$ c $10 \overline{)30}$ d $10 \overline{)47}$

e $10 \overline{)150}$ f $10 \overline{)392}$ g $10 \overline{)4895}$

h $100 \overline{)270}$ i $100 \overline{)764}$ j $100 \overline{)5163}$

k $100 \overline{)950}$ l $100 \overline{)860}$ m $100 \overline{)4081}$

Divide by 10 and 100

Dividing by 10 or 100 decreases the value of each digit.

÷10 makes each digit 10 times smaller

÷100 makes each digit 100 times smaller

e.g. 12.34 ÷ 10 = 1.234
12.34 ÷ 100 = 0.1234

6 How much each if 10 cost:

a $50? _____ b $79? _____ c $36? _____ d $1.50? _____

e $2.80? _____ f $9.40? _____ g $11.20? _____ h $33.50? _____

i $59.10? _____ j $72.30? _____ k $123.60? _____ l $297.90? _____

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Place value patterns

1 Complete the tables.

a Multiply by 100.

Number	× 100
3.6	
8.25	
0.47	
12.09	

b Divide by 10.

Number	÷ 10
480	
37.5	
9.08	
612	

2 What changes? What stays the same? Complete the table.

Calculation	Digits change?	Value of each digit changes?	Position changes?
5.3 × 10	Yes / No	Yes / No	Yes / No
42 ÷ 100	Yes / No	Yes / No	Yes / No
7.85 × 100	Yes / No	Yes / No	Yes / No

3 Find the missing number.

a _____ × 10 = 56.3

b _____ × 100 = 472

c _____ ÷ 10 = 3.4

d _____ ÷ 100 = 0.87

e 6.3 × _____ = 630

f 84 ÷ _____ = 0.84

g 0.728 × _____ = 72.8

h _____ ÷ 1,000 = 0.506

i 4.26 × _____ = 4,260

j _____ × 1,000 = 6.42

4 Circle the larger number.

a 3.45 × 10 or 3.45 × 100

b 67.2 ÷ 10 or 67.2 ÷ 100

c 0.89 × 100 or 89 ÷ 100

d 5.08 × 100 or 50.8

5 Continue the pattern. Write the rule.

a 0.245, 2.45, 24.5, _____, _____, _____ Rule: _____

b 0.358, 3.58, 35.8, _____, _____, _____ Rule: _____

c 0.065, 0.65, _____, _____ Rule: _____

d 1,674, 167.4, 16.74, _____, _____, _____ Rule: _____

e 283,710, 28,371, _____, _____ Rule: _____

6 Explain the mistake.

a Olivia says 4.27 × 100 = 4.2700
Why is Olivia incorrect?

_____

_____

b Jacob says 650 ÷ 10 = 6,500
Explain his mistake.

_____

_____

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Multiply by 10, 100, 1,000

1 Multiply by 10.

a 10 × 2 = _____
b 10 × 61 = _____
c 4 × 10 = _____
d 8 × 10 = _____
e 10 × 10 = _____
f 13 × 10 = _____
g 10 × 64 = _____
h 59 × 10 = _____
i 10 × 773 = _____
j 10 × 189 = _____
k 293 × 10 = _____
l 420 × 10 = _____

Multiply by 10

When multiplying by 10, each digit becomes 10 times greater in value.

Each digit becomes one place value larger.

e.g. 6 × 10 = 60

2 Multiply by 100.

a 7 × 100 = _____
b 100 × 56 = _____
c 863 × 100 = _____
d 24 × 100 = _____
e 100 × 34 = _____
f 97 × 100 = _____
g 100 × 33 = _____
h 100 × 20 = _____
i 4 × 100 = _____
j 349 × 100 = _____
k 100 × 62 = _____
l 81 × 100 = _____

Multiply by 100

When multiplying by 100, each digit becomes 100 times greater in value.

Each digit becomes two place values larger.

e.g. 6 × 100 = 600

3 Multiply by 1,000.

a 1,000 × 3 = _____
b 808 × 1,000 = _____
c 1,000 × 37 = _____
d 1,000 × 80 = _____
e 382 × 1,000 = _____
f 101 × 1,000 = _____
g 1,000 × 64 = _____
h 123 × 1,000 = _____
i 1,000 × 1,000 = _____
j 1,000 × 433 = _____
k 139 × 1,000 = _____
l 1,000 × 506 = _____

Multiply by 1,000

When multiplying by 1,000, each digit becomes 1,000 times greater in value.

Each digit becomes three place values larger.

e.g. 6 × 1,000 = 6,000

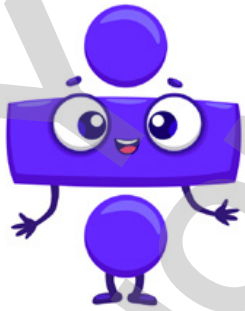
1,000 × 8.45 = 8,450

4
a 10 × 1.6 = _____
b 100 × 2.8 = _____
c 1,000 × 3.1 = _____
d 100 × 4.25 = _____
e 1,000 × 5.37 = _____
f 10 × 6.43 = _____
g 10 × 7.591 = _____
h 100 × 8.629 = _____
i 1,000 × 9.783 = _____
j 100 × 41.8 = _____
k 10 × 73.9 = _____
l 1,000 × 65.2 = _____
m 10 × 57.4 = _____
n 100 × 89.637 = _____
o 1,000 × 92.81 = _____
p 100 × 14.102 = _____



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Divide by 10, 100, 1,000



1 a 80 ÷ 10 = _____ b 300 ÷ 10 = _____

c 4,200 ÷ 10 = _____ d 5,670 ÷ 10 = _____

e 900 ÷ 100 = _____ f 1,000 ÷ 100 = _____

g 7,500 ÷ 100 = _____ h 24,600 ÷ 100 = _____

i 3,000 ÷ 1,000 = _____ j 69,000 ÷ 1,000 = _____

2 Divide by 10.

a 8.27 ÷ 10 = _____ b 47.1 ÷ 10 = _____

c 4.09 ÷ 10 = _____ d 334.63 ÷ 10 = _____

e 26.83 ÷ 10 = _____ f 201.2 ÷ 10 = _____

g 616.2 ÷ 10 = _____ h 9 ÷ 10 = _____

i 24.65 ÷ 10 = _____ j 534 ÷ 10 = _____

k 325.14 ÷ 10 = _____ l 0.03 ÷ 10 = _____

Divide by 10

When dividing by 10, each digit becomes 10 times smaller in value.

Each digit becomes one place value smaller.

e.g. 60 ÷ 10 = 6

32 ÷ 10 = 3.2

3 Divide by 100.

a 72 ÷ 100 = _____ b 36.4 ÷ 100 = _____

c 41.3 ÷ 100 = _____ d 0.8 ÷ 100 = _____

e 9 ÷ 100 = _____ f 97.43 ÷ 100 = _____

g 23.6 ÷ 100 = _____ h 8.24 ÷ 100 = _____

i 1.47 ÷ 100 = _____ j 43.6 ÷ 100 = _____

k 0.5 ÷ 100 = _____ l 3 ÷ 100 = _____

Divide by 100

When dividing by 100, each digit becomes 100 times smaller in value.

Each digit becomes two place values smaller.

e.g. 600 ÷ 100 = 6

32 ÷ 100 = 0.32

4 Divide by 1,000.

a 7.9 ÷ 1,000 = _____ b 0.92 ÷ 1,000 = _____

c 4.3 ÷ 1,000 = _____ d 440 ÷ 1,000 = _____

e 77 ÷ 1,000 = _____ f 2.36 ÷ 1,000 = _____

g 630 ÷ 1,000 = _____ h 0.7 ÷ 1,000 = _____

i 0.59 ÷ 1,000 = _____ j 380 ÷ 1,000 = _____

k 970 ÷ 1,000 = _____ l 0.401 ÷ 1,000 = _____

Divide by 1,000

When dividing by 1,000, each digit becomes 1,000 times smaller in value.

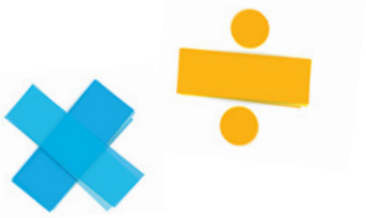
Each digit becomes three place values smaller.

e.g. 6,000 ÷ 1,000 = 6

32 ÷ 1,000 = 0.032

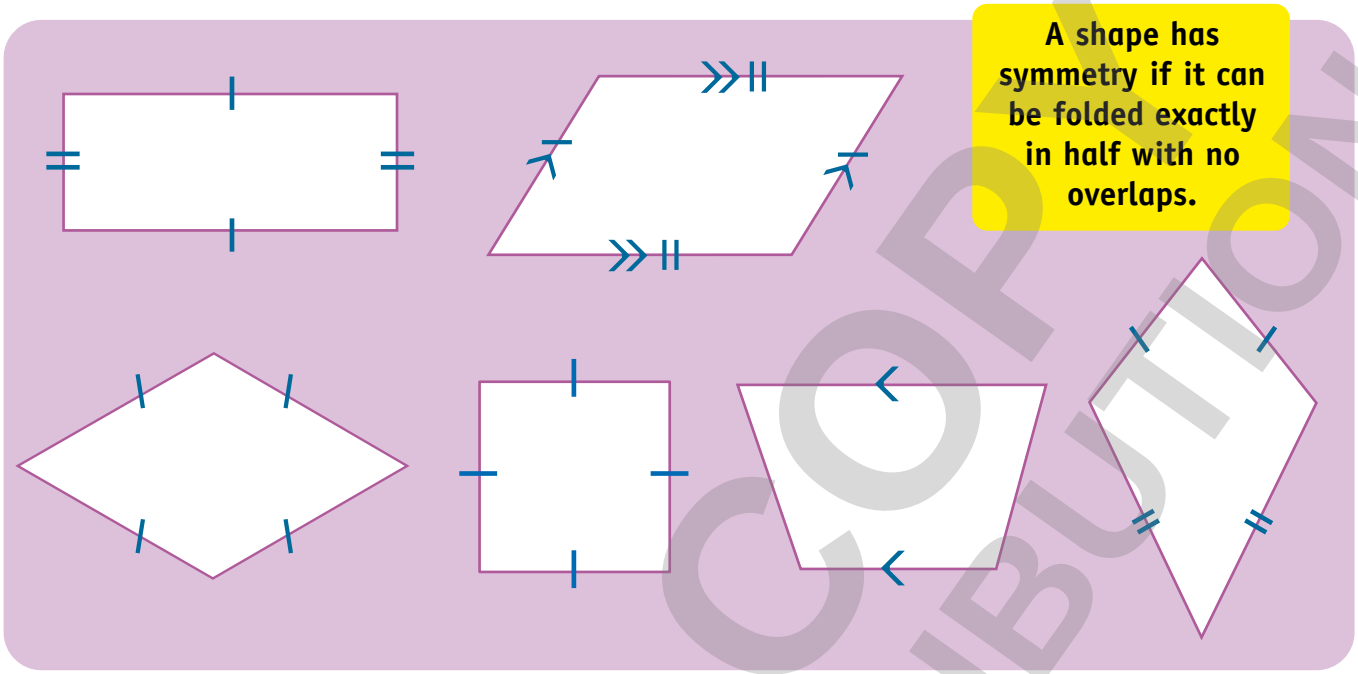
Mastery Checklist

I can:
- ☐ round numbers up to 7 digits to the nearest given place value
- ☐ round decimals to the nearest whole number or tenth
- ☐ multiply whole numbers and decimals by 10, 100 and 1,000
- ☐ divide whole numbers and decimals by 10, 100 and 1,000



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Symmetry of shapes



A shape has symmetry if it can be folded exactly in half with no overlaps.

1 a Draw the axes of symmetry on these shapes.

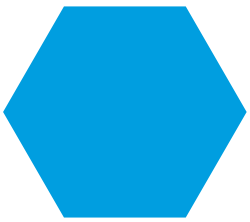
b Name the shape with no axis of symmetry. _____

c True or false? The axes of symmetry are also diagonals on all quadrilaterals. _____

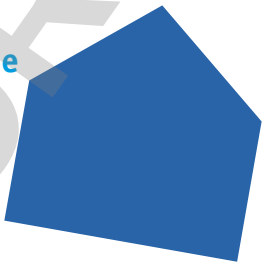
2 For each shape, draw as many lines of symmetry as you can.
How many does each shape have?

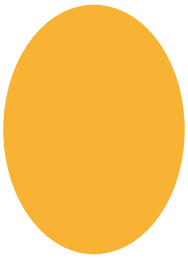
a  ☐

b  ☐

c  ☐

d  ☐

e  ☐

f  ☐

3 Complete each shape to make it symmetrical.

a 

b 

c 

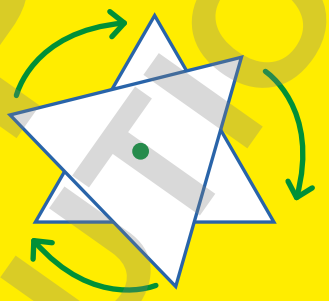
Challenge! Tick the shapes on this page that have rotational symmetry.

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Rotational symmetry

Rotational symmetry

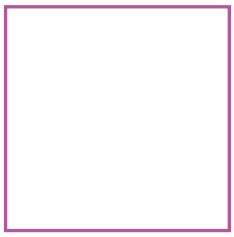
A shape has rotational symmetry if the shape matches the original before it's made one full turn.



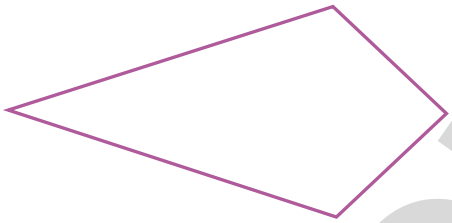
This equilateral triangle will match each time a corner sits on the top, so it has rotational symmetry.

1 Tick the quadrilaterals that have rotational symmetry.

a



b



c

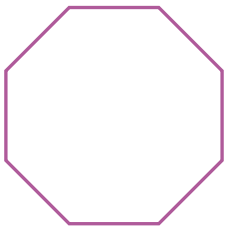


d

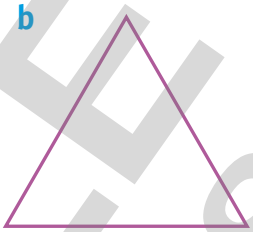


2 Circle the shapes that have rotational symmetry.

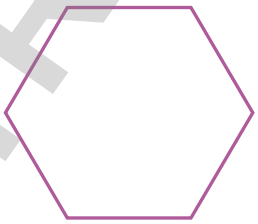
a



b



c



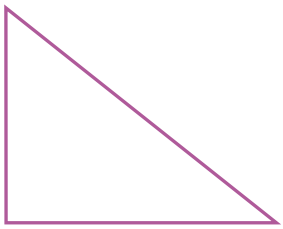
d



e



f



3 Write all the letters of the alphabet as capital letters.

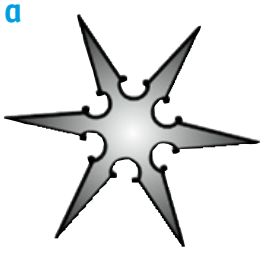
4 Draw all the possible lines of symmetry on each capital letter.

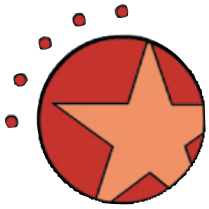
5 Which capital letters have rotational symmetry? _____

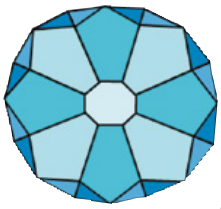
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Order of rotational symmetry

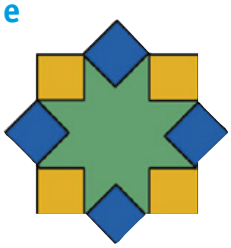
1 Which shapes have rotational symmetry?
Trace and test if necessary.

a 

b 

c 

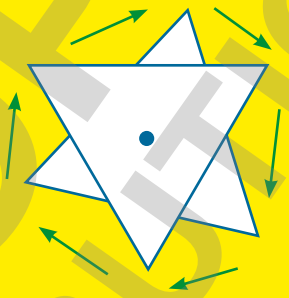
d 

e 

f 

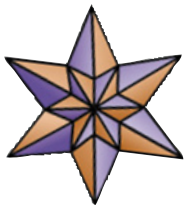
Order of rotational symmetry

An equilateral triangle has rotational symmetry to the order of 3 as it matches three times when turned on the central point.



Trace the triangle. Pin the tracing on the original at the central point. Turn.

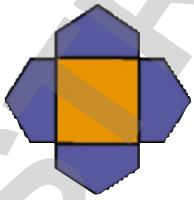
2 How many times do these shapes match as they make one complete turn?



a _____



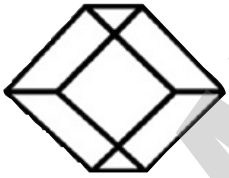
b _____



c _____



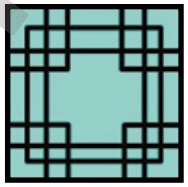
d _____



e _____



f _____



g _____



h _____



i _____



j _____

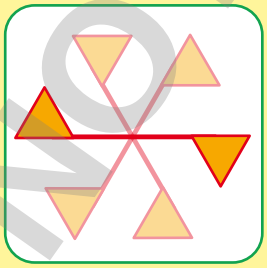


k _____



l _____

Challenge! Add to these shapes so that they have rotational symmetry.

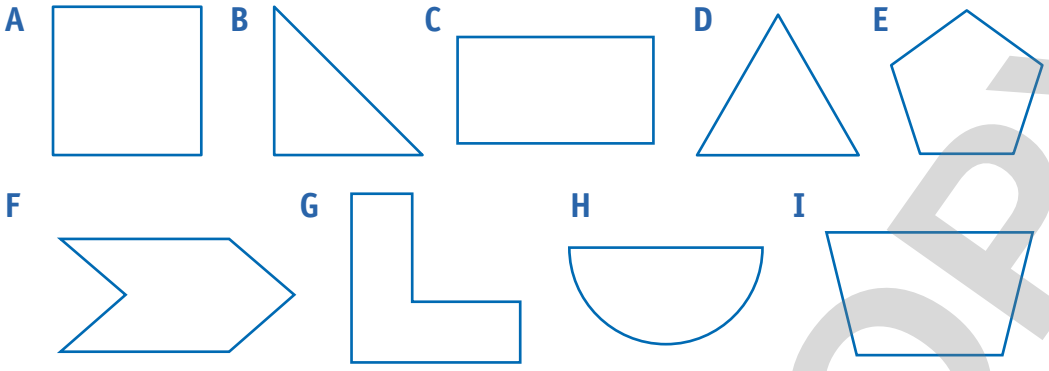
eg 

a 

b 

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Shape patterns



Reflection = flip

Rotation = turn
Half turn (180°)
Quarter turn (90°)
Clockwise
Anticlockwise

Translation = slide

1 a Tick ✓ shapes that change after a quarter turn.

b Put a cross ✗ on the shapes that change after a half turn.

c Put a heart ♥ on the shapes that change after a reflection.

d Will any shape change after a translation? _____

2 Imagine each shape going through the transformations and draw what it looks like in the end.

a  Half turn, translate

b  Reflect up, rotate 90° clockwise

c  Flip left, turn 180°

d  Slide, turn 90° anticlockwise

3 Name the transformations. Draw the missing term to continue each pattern.

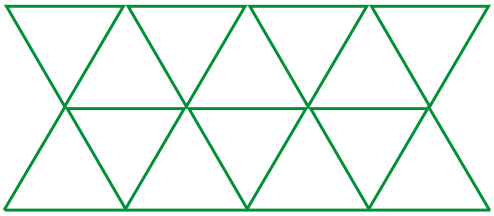
a 	 Side flip	 180° turn	 Side flip	180° turn
b 	 _____	 _____	 _____	_____
c 	 _____	 _____	 _____	_____

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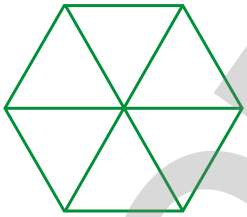
Tessellation



This equilateral triangle was reflected (flipped) to make this tessellation.



This triangle was rotated (turned) to make this tessellating pattern.



An equilateral triangle has sides of equal lengths and angles of equal sizes.

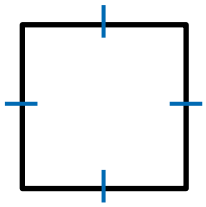
A tessellation is a pattern of repeated shapes that fit together without gaps and without overlapping.

1 Do all regular shapes tessellate? _____

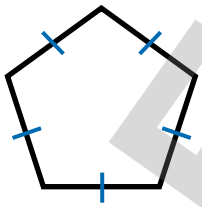
Draw a tessellation for each regular shape if you can.

Use shape blocks or trace and cut out the shapes from blank paper to investigate.

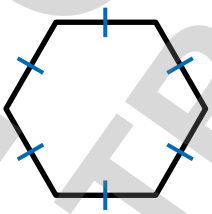
a Regular square



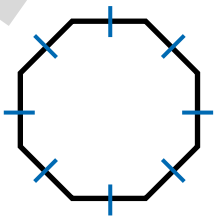
b Regular pentagon



c Regular hexagon



d Regular octagon



2 For each shape that tessellates, did you use rotation, reflection or translation?

a _____ b _____

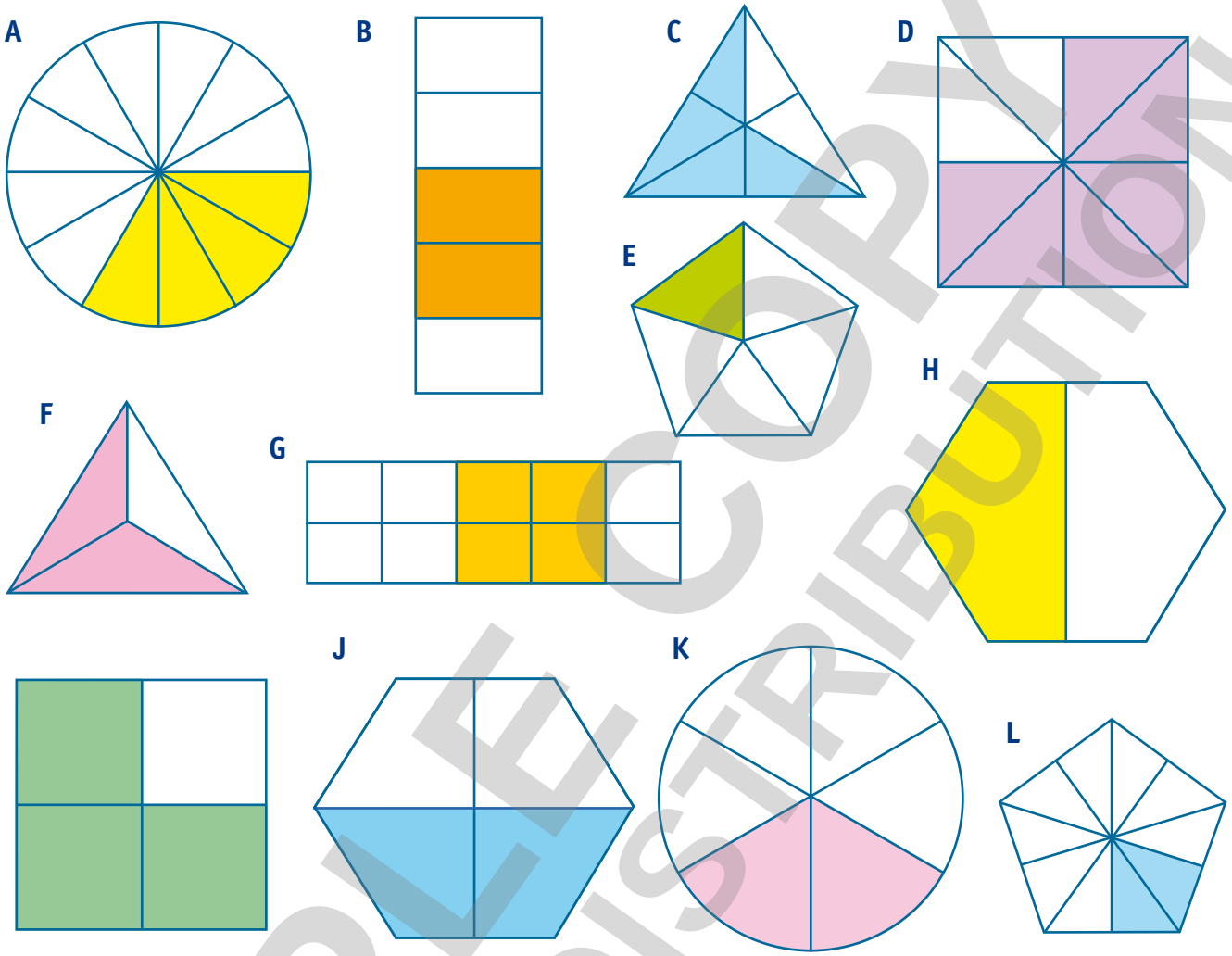
c _____ d _____

Mastery Checklist I can:

- ☐ identify shapes with symmetry and rotational symmetry
- ☐ work out the order of rotational symmetry for a design
- ☐ use 2D shape transformations to make patterns
- ☐ tessellate regular shapes

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Equivalent fractions



1 Name the fraction coloured in each shape.

A _____ B _____ C _____ D _____ E _____ F _____

G _____ H _____ I _____ J _____ K _____ L _____

2 Name fractions that are the same size.

a A = _____ b B = _____ c C = _____ d D = _____ e E = _____ f H = _____

3 Write each pair of equivalent fractions.

A $\frac{4}{12}$ = _____ B _____ C _____

D _____ E _____ H _____

4 Write four different fractions that are equal to $\frac{1}{2}$. _____ _____ _____ _____

5 Explain why these fractions are equivalent. _____

_____

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Making equivalent fractions

1 Make equivalent fractions for each diagram on page 17 by multiplying the numerator and the denominator by 3.

a $\frac{4}{12} = \frac{4 \times 3}{12 \times 3} = \frac{12}{36}$	**b** $\frac{2}{5} = \frac{2 \times 3}{5 \times 3} =$	
c	**d**	
e	**f**	
g	**h**	**i**
j	**k**	**l**

Remember $\frac{2}{5}$ ← numerator ← denominator

To make equivalent fractions

- **multiply the numerator and the denominator by the same number.**
  e.g. $\frac{1}{3} = \frac{1 \times 5}{3 \times 5} = \frac{5}{15}$

OR

- **divide the numerator and the denominator by the same number.**
  e.g. $\frac{8}{12} = \frac{8 \div 4}{12 \div 4} = \frac{2}{3}$

2 Divide to make the smallest equivalent fraction.

a $\frac{5}{20} = \frac{5 \div 5}{20 \div 5}$	**b** $\frac{6}{30} =$	**c** $\frac{9}{12} =$
d $\frac{15}{40} =$	**e** $\frac{8}{28} =$	**f** $\frac{20}{90} =$

3 Circle the equivalent fractions.

a $\frac{2}{3}$, $\frac{3}{6}$, $\frac{4}{6}$ **b** $\frac{6}{12}$, $\frac{5}{8}$, $\frac{1}{2}$ **c** $\frac{2}{5}$, $\frac{6}{15}$, $\frac{4}{12}$ **d** $\frac{1}{4}$, $\frac{1}{8}$, $\frac{2}{16}$

e $\frac{3}{9}$, $\frac{1}{3}$, $\frac{6}{12}$ **f** $\frac{7}{8}$, $\frac{10}{12}$, $\frac{5}{6}$ **g** $\frac{10}{20}$, $\frac{6}{10}$, $\frac{3}{5}$ **h** $\frac{2}{4}$, $\frac{3}{6}$, $\frac{4}{8}$

4 Write the equivalent fraction.

a $\frac{15}{20} = \frac{3}{\square}$ **b** $\frac{24}{32} = \frac{\square}{4}$ **c** $\frac{27}{30} = \frac{\square}{10}$ **d** $\frac{28}{36} = \frac{7}{\square}$

e $\frac{21}{56} = \frac{3}{\square}$ **f** $\frac{90}{100} = \frac{\square}{10}$ **g** $\frac{16}{18} = \frac{8}{\square}$ **h** $\frac{20}{50} = \frac{10}{\square} = \frac{\square}{5}$

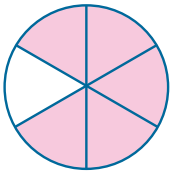
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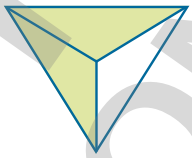
Number Rational numbers: Finding equivalent fractions; Equivalent fractions can be generated and simplified using common factors

Fractions to 1

A fraction is equal to 1 whole when the numerator and denominator are the same.
Examples: $\frac{1}{1}$ $\frac{2}{2}$ $\frac{3}{3}$ $\frac{4}{4}$ $\frac{8}{8}$

1 Complete the wholes. Colour the missing part of each shape.



a $\frac{3}{4} + \frac{\square}{\square} = \frac{\square}{\square}$ b $\frac{5}{6} + \frac{\square}{\square} = \frac{\square}{\square}$ c $\frac{7}{8} + \frac{\square}{\square} = \frac{\square}{\square}$ d $\frac{2}{3} + \frac{\square}{\square} = \frac{\square}{\square}$

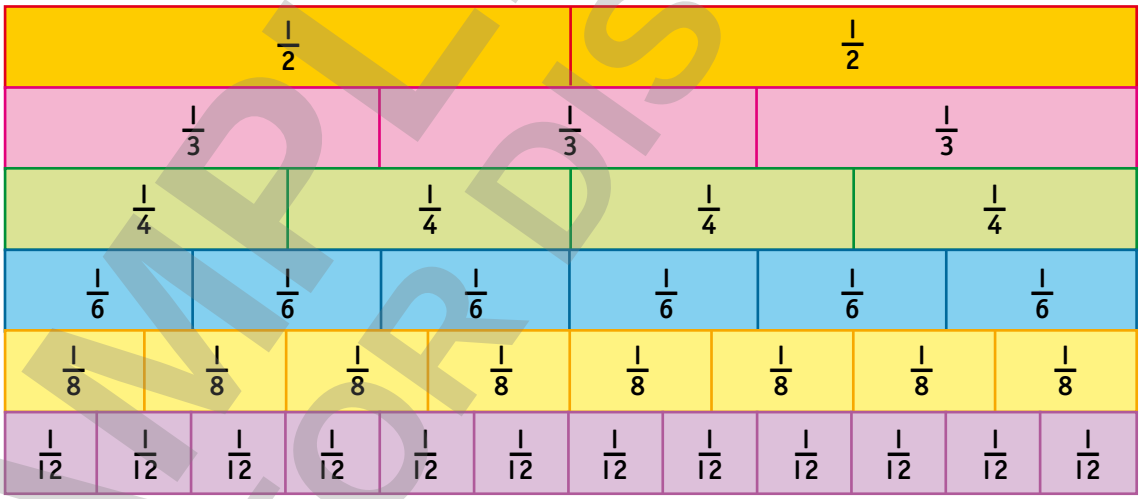
2 Complete each fraction.

a $1 = \frac{\square}{10}$ b $1 = \frac{7}{\square}$ c $\frac{\square}{} = \frac{9}{9}$ d $1 = \frac{\square}{56}$ e $1 = \frac{100}{\square}$

f Complete: If a fraction is equal to 1, the numerator and the denominator _____.

3 How much more to make one whole?

a $\frac{3}{8} + \frac{\square}{\square} = 1$ b $\frac{5}{6} + \frac{\square}{\square} = 1$ c $\frac{7}{12} + \frac{\square}{\square} = 1$ d $\frac{1}{4} + \frac{\square}{\square} = 1$ e $\frac{3}{5} + \frac{\square}{\square} = 1$



4 Use the fraction wall.

a $\frac{4}{8} + ____ = 1$ b $\frac{7}{12} + ____ = 1$ c $\frac{5}{6} + ____ = 1$ d $\frac{1}{3} + ____ = 1$ e $\frac{3}{4} + ____ = 1$

f $1 - \frac{4}{8} = ____$ g $1 - \frac{3}{8} = ____$ h $1 - \frac{2}{4} = ____$ i $1 - \frac{6}{12} = ____$ j $1 - \frac{2}{6} = ____$

5 Use the fraction wall to compare using =, < or >.

a $\frac{1}{2} ____ \frac{5}{12}$ b $\frac{1}{4} ____ \frac{3}{12}$ c $\frac{5}{12} ____ \frac{1}{3}$ d $\frac{11}{12} ____ \frac{7}{8}$ e $\frac{1}{8} ____ \frac{1}{6}$

f $\frac{3}{4} ____ \frac{7}{12}$ g $\frac{4}{6} ____ \frac{5}{8}$ h $\frac{4}{8} ____ \frac{1}{2}$ i $\frac{2}{3} ____ \frac{7}{12}$ j $\frac{3}{8} ____ \frac{1}{2}$

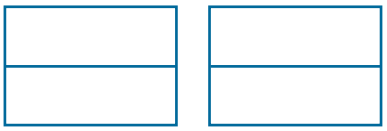
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Fractions over 1

TERM 1
Week 4

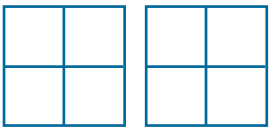
1 Colour.

a



$1\frac{1}{2}$

b



$1\frac{3}{4}$

c



$1\frac{2}{3}$

d



$2\frac{1}{5}$

e



$2\frac{5}{8}$

2 Place these fractions on the number line.

a $1\frac{1}{4}, \frac{1}{4}, 1\frac{3}{4}$



b $1\frac{1}{2}, \frac{2}{3}, 2\frac{1}{4}$



3 Rewrite the mixed numbers from Question 1 as improper fractions.

a $\frac{\square}{\square}$ **b** $\frac{\square}{\square}$ **c** $\frac{\square}{\square}$ **d** $\frac{\square}{\square}$ **e** $\frac{\square}{\square}$

4 Convert to improper fractions with the same denominator. Then compare using <, > or =.

a $1\frac{1}{5}$ ___ $\frac{12}{10}$ _____

b $\frac{15}{6}$ ___ $1\frac{3}{6}$ _____

c $2\frac{5}{8}$ ___ $\frac{5}{2}$ _____

d $1\frac{3}{4}$ ___ $\frac{13}{8}$ _____

e $\frac{8}{3}$ ___ $2\frac{3}{6}$ _____

f $1\frac{2}{12}$ ___ $\frac{4}{3}$ _____

g $\frac{16}{6}$ ___ $2\frac{2}{3}$ _____

h $\frac{30}{12}$ ___ $2\frac{1}{2}$ _____

Challenge! Order from smallest to largest: $\frac{3}{4}, 1\frac{1}{2}, \frac{1}{5}, \frac{7}{10}, \frac{5}{6}, 1\frac{1}{3}, \frac{2}{3}, 1\frac{3}{4}, \frac{1}{12}$

Mastery Checklist I can:

- ☐ identify fractions, equivalent fractions and fractions equivalent to 1
- ☐ represent and order mixed numbers
- ☐ convert mixed numbers to improper fractions and compare them

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Fractions

1 Fruit pizza slices. Five friends each have the same-sized fruit pizza. They have eaten some and want to compare how much is left.



Isla has four sixths left.

Kai has two quarters left.

Charlie has five eighths left.

Sophie has three fifths left.

Jack has seven tenths left.

Colour the fractions and compare.

Who has the most fruit pizza left? _____

Explain how you know. _____

_____

Colour fractions and compare.



2 Four animal carers are feeding rescued puppies. Each has the same-sized bag of puppy food.

Tia has $\frac{1}{2}$ of a bag left.

Aria has $\frac{2}{3}$ of a bag left.

Liam has $\frac{3}{4}$ of a bag left.

Hunter has $\frac{5}{12}$ of a bag left.

They decide to combine all the food and then share it equally. **Hint:** Use twelfths.

How much food will each person have after sharing equally? _____



I can solve problems by:

☐ understanding fractions ☐ drawing diagrams

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Add and subtract fractions

TERM 1
Week 5

1 **a** $\frac{3}{4} - \frac{1}{4} =$ _____ **b** $\frac{3}{4} + \frac{1}{4} =$ _____ **c** $\frac{5}{6} - \frac{3}{6} =$ _____

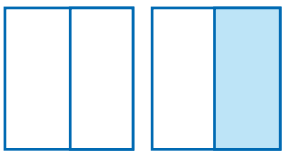
d $\frac{2}{3} + \frac{1}{3} =$ _____ **e** $\frac{7}{8} - \frac{3}{8} =$ _____ **f** $\frac{7}{8} - \frac{1}{8} =$ _____

g $\frac{9}{10} - \frac{5}{10} =$ _____ **h** $\frac{7}{12} + \frac{4}{12} =$ _____ **i** $\frac{13}{20} + \frac{5}{20} =$ _____

j $1\frac{5}{9} + \frac{2}{9} =$ _____ **k** $2\frac{3}{4} - \frac{2}{4} =$ _____ **l** $1\frac{3}{10} + \frac{5}{10} =$ _____

2 Draw diagrams to show the subtraction, then write the answer.

a $2 - \frac{1}{2} =$ _____



b $3 - \frac{1}{4} =$ _____



c $2 - \frac{1}{3} =$ _____



d $1 - \frac{2}{5} =$ _____



e $2 - \frac{1}{8} =$ _____

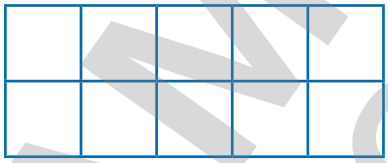


f $2 - \frac{1}{6} =$ _____

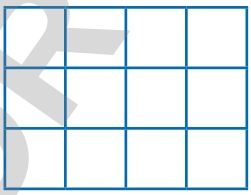


3 Use the diagrams to fill in the missing fraction.

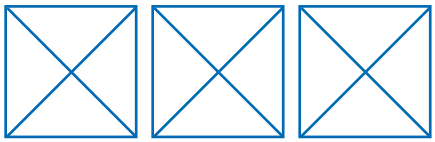
a $\frac{4}{10} + \frac{\square}{10} = 1$



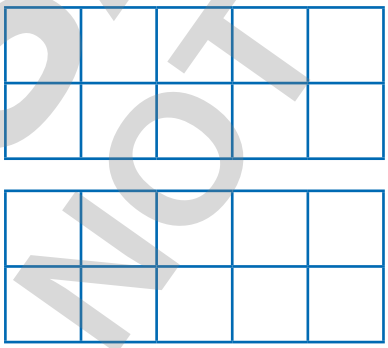
b $\frac{7}{12} + \frac{\square}{12} = 1$



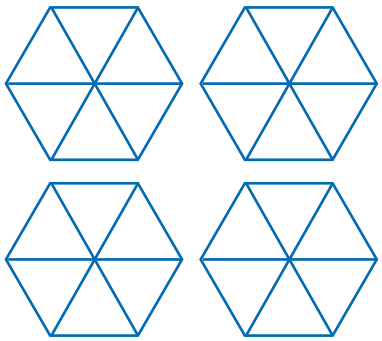
c $\frac{7}{4} +$ _____ $= 3$



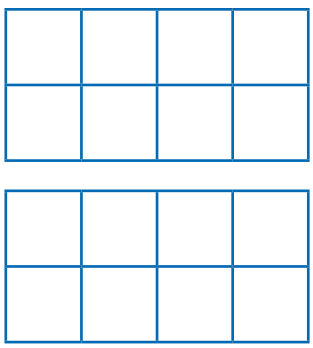
d $1\frac{3}{10} +$ _____ $= 2$



e $2\frac{3}{6} +$ _____ $= 4$



f $\frac{9}{8} + \frac{\square}{\square} = 2$



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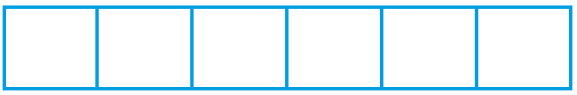
Add and subtract fractions

1 Colour each fraction a different colour, then add.

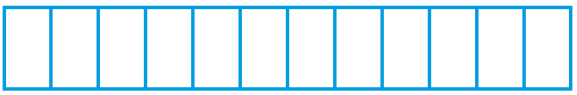
To + or −, make the denominators the same.

$\frac{1}{4} + \frac{1}{8} = \frac{2}{8} + \frac{1}{8} = \frac{3}{8}$

a $\frac{1}{3} + \frac{1}{6} =$ _____



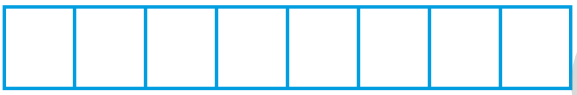
b $\frac{1}{6} + \frac{5}{12} =$ _____



c $\frac{1}{4} + \frac{1}{12} =$ _____



d $\frac{3}{8} + \frac{1}{2} =$ _____



e $\frac{1}{4} + \frac{1}{8} =$ _____

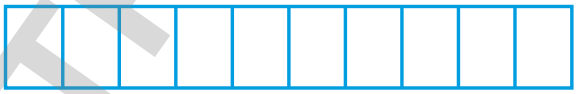


2 Colour the first fraction. Cross out the second fraction to take away.

a $\frac{1}{2} - \frac{5}{12} =$ _____



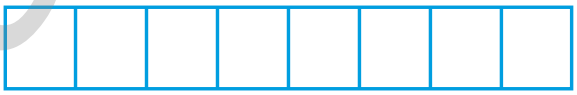
b $\frac{3}{5} - \frac{4}{10} =$ _____



c $\frac{2}{3} - \frac{3}{9} =$ _____



d $\frac{7}{8} - \frac{1}{2} =$ _____



3 Add or subtract the fractions.
Show the equivalent fractions you used.

a $\frac{1}{2} + \frac{1}{3} =$ _____ = _____

b $\frac{1}{6} + \frac{1}{3} =$ _____ = _____

c $\frac{3}{4} + \frac{2}{8} =$ _____ = _____

d $\frac{2}{5} + \frac{5}{10} =$ _____ = _____

e $\frac{1}{2} + \frac{1}{5} =$ _____ = _____

f $\frac{1}{2} - \frac{1}{5} =$ _____ = _____

g $\frac{1}{4} - \frac{1}{12} =$ _____ = _____

h $\frac{7}{8} - \frac{3}{4} =$ _____ = _____

i $\frac{7}{10} - \frac{1}{5} =$ _____ = _____

j $\frac{2}{3} - \frac{2}{9} =$ _____ = _____

Remember $\frac{2}{5}$ ← numerator, ← denominator

To make equivalent fractions

- **multiply the numerator and the denominator by the same number.**
  e.g. $\frac{1}{3} = \frac{1 \times 5}{3 \times 5} = \frac{5}{15}$

OR

- **divide the numerator and the denominator by the same number.**
  e.g. $\frac{8}{12} = \frac{8 \div 4}{12 \div 4} = \frac{2}{3}$

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Adding more fractions

Mixed numerals
A mixed numeral has a whole number and a fraction.
$1\frac{1}{2}$ = one and one half
$3\frac{1}{4}$ = three and one quarter

1 Add and write the answer as a mixed numeral.

a $\frac{3}{10} + \frac{9}{10}$ _____ **b** $\frac{3}{4} + \frac{3}{4}$ _____

c $\frac{3}{8} + \frac{7}{8}$ _____ **d** $\frac{7}{12} + \frac{11}{12}$ _____

2 Estimate before calculating.
Will the answer be: less than, equal to or greater than one?
Use < 1, = 1, > 1. Then find the exact answer.

Question	Estimate	Exact answer
a $\frac{2}{5} + \frac{3}{5}$		
b $\frac{4}{6} + \frac{5}{6}$		
c $\frac{1}{2} + \frac{3}{4}$		
d $\frac{2}{3} + \frac{5}{6}$		

3 Use equivalent fractions. Add, and answer as mixed numerals.

a $\frac{3}{8} + \frac{3}{4}$
$= \frac{3}{8} + \frac{6}{8}$
$= \frac{9}{8} = 1\frac{1}{8}$

b $\frac{3}{4} + \frac{7}{8}$ **c** $\frac{2}{3} + \frac{5}{6}$

d $\frac{7}{10} + \frac{1}{2}$ **e** $\frac{1}{4} + \frac{7}{8}$ **f** $\frac{7}{12} + \frac{1}{2}$

4 Complete the missing fraction.

a $\frac{5}{8} + \frac{\square}{\square} = 1\frac{1}{8}$ **b** $\frac{3}{4} + \frac{\square}{\square} = 1\frac{1}{2}$ **c** $\frac{7}{10} + \frac{\square}{\square} = 1\frac{2}{5}$ **d** $\frac{2}{3} + \frac{\square}{\square} = 2$

5 Explain the mistake. Ben says $\frac{3}{4} + \frac{1}{2} = \frac{4}{6}$

Explain Ben's mistake. _____

6 Three friends walked on a bush track. Ella walked $\frac{3}{4}$ km. Finn walked $\frac{5}{6}$ km. Grace walked $\frac{1}{2}$ km.

How far did they walk altogether? _____

7 Doing a building job for his friends, Toby worked for $\frac{1}{2}$ a day on Monday, $\frac{3}{4}$ of a day on Tuesday and finished the job with $\frac{5}{8}$ of a day on Wednesday. How many days' work did Toby do?

_____ Answer _____

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Subtracting more fractions

TERM 1
Week 5

1 Subtract and write the answer as a fraction.

a $\frac{10}{6} - \frac{5}{6} =$ _____ **b** $\frac{13}{10} - \frac{7}{10} =$ _____ **c** $\frac{12}{8} - \frac{6}{8} =$ _____

d $\frac{7}{5} - \frac{4}{5} =$ _____ **e** $\frac{11}{9} - \frac{6}{9} =$ _____ **f** $\frac{13}{12} - \frac{4}{12} =$ _____

2 Mai has nine orange quarters. Her team ate 7 of them. What fraction is left?

_____ = _____

3 Find what is left.

a $1 - \frac{5}{8} =$ _____ **b** $1 - \frac{3}{4} =$ _____ **c** $2 - \frac{5}{6} =$ _____ **d** $2 - \frac{7}{10} =$ _____

4 Convert mixed numbers to improper fractions to subtract. Write the answer as a simplified fraction or a mixed numeral.

a $2\frac{1}{4} - \frac{3}{4} =$

$= \frac{9}{4} - \frac{3}{4} = \frac{6}{4}$

$= 1\frac{2}{4} = 1\frac{1}{2}$

b $1\frac{5}{7} - \frac{6}{7} =$

= _____ − _____ = _____

= _____ = _____

c $2\frac{4}{5} - \frac{7}{5} =$

= _____ − _____ = _____

= _____ = _____

d $1\frac{5}{8} - \frac{9}{8} =$

= _____ − _____ = _____

= _____ = _____

e $3\frac{2}{6} - 1\frac{3}{6} =$

= _____ − _____ = _____

= _____ = _____

f $3\frac{4}{9} - 1\frac{5}{9} =$

= _____ − _____ = _____

= _____ = _____

5 Ariki has one whole pizza and five eighths of another pizza in his fridge. He eats $\frac{7}{8}$ of a pizza for lunch. How much pizza is left?

_____ = _____



6 Hana brought two whole pies and seven tenths of another pie to the bake sale. She sold one and nine-tenths of her pie slices. How much pie is left?

_____ = _____

7 How much further did Luca travel?

a Luca: $2\frac{1}{4}$ km Noah: $1\frac{5}{6}$ km

_____

b Luca: $3\frac{1}{2}$ km Emma: $2\frac{3}{4}$ km

_____



8 Four volunteers are filling animal water troughs. They start with 4 buckets of water.

They use: $\frac{3}{4}$ of a bucket for the sheep.

$\frac{5}{6}$ of a bucket for the goats.

$1\frac{1}{2}$ buckets for the horses.

How much water is left? _____

Mastery Checklist

I can:
- ☐ add and subtract fractions using equivalent fractions
- ☐ write answers as simplified fractions or mixed numerals
- ☐ solve problems involving fractions

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Checkpoint 1

1 How many thousandths in this number?

Shade one bubble.

523.619

5 ○ 9 ○ 3 ○ 1 ○

2

71,603.58

Round this number to the nearest whole number.

71,600 ○ 71,604 ○ 71,603 ○ 70,000 ○

3 Write 4.859 in expanded notation.

Write your answer in the box.

4.859 =

4

$$10 \overline{)\ 2\ 3\ 7}$$

5 Which is the same as:

Shade one bubble.

$9.43 × 100 = ?

$90.43 ○ $943.00 ○ $94.30 ○ $900.43 ○

6

$$\frac{1}{2} + \frac{7}{12} = ?$$

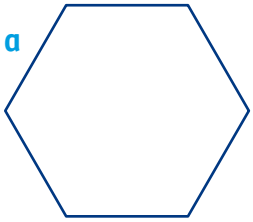
$\frac{10}{12}$ ○ $\frac{11}{12}$ ○ $\frac{12}{12}$ ○ $\frac{13}{12}$ ○

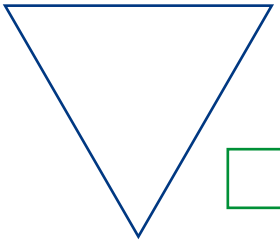
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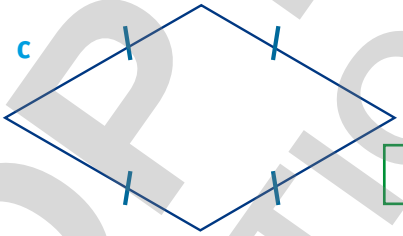
Checkpoint 1

Write your answer in the boxes.

7 For each shape draw as many lines of symmetry as you can.
How many does each shape have?

a  ☐

b  ☐

c  ☐

8 Write equivalent fractions.

a $\frac{1}{3}$, ☐/6, ☐/12, ☐/15, ☐/24

b $\frac{1}{4}$, ☐/8, ☐/12, ☐/16, ☐/24, ☐/100

c $\frac{3}{4}$, ☐/8, ☐/12, ☐/16, ☐/100

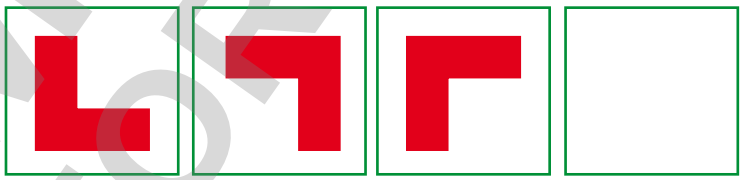
d $\frac{1}{5}$, ☐/10, ☐/15, ☐/20, ☐/100

9 a $\frac{1}{4} + \frac{5}{16} + \frac{2}{8} =$ ☐

b $\frac{8}{10} + \frac{2}{5} =$ ☐

10 $\frac{3}{10}$ of the day was spent walking and $\frac{4}{10}$ was spent resting.
What fraction of the day was left? ☐

11 a Draw the next shape after another 90° clockwise rotation.



b Which transformations have been used?

☐ rotation ☐ reflection ☐ translation

$\frac{3}{4}$ ★ $\frac{3}{5}$

Shade one bubble.

12 Which sign can replace the star to make the sentence true?

< ○ > ○ = ○ + ○

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Mental strategies

Near doubles
15 + 16 = 15 + 15 + 1
27 + 25 = 27 + 27 − 2

Quick practice.

1 Use doubles and near doubles.

a 9 + 8 = _____ b 11 + 12 = _____ c 15 + 16 = _____ d 25 + 24 = _____

e 17 + 18 = _____ f 35 + 34 = _____ g 43 + 44 = _____ h 56 + 57 = _____

i 16 + 11 + 16 = _____ j 23 + 17 + 17 = _____ k 92 + 92 + 83 = _____

2 Use the split strategy.

Split strategy
67 + 32 = 60 + 30 +7 + 2 = 99
54 + 87 = 50 + 80 + 4 + 7 = 141

a 43 + 34 = _____ b 65 + 24 = _____

c 81 + 17 = _____ d 38 + 27 = _____

e 55 + 38 = _____ f 68 + 49 = _____

g 85 + 27 = _____ h 39 + 49 = _____ i 76 + 67 = _____ j 46 + 79 = _____

3 Use the compensation strategy.

Compensation strategy
38 + 42 = 38 + 40 + 2
= 78 + 2
= 80
53 + 39 = 53 + 40 − 1
= 93 − 1
= 92

a 27 + 41 = _____ b 45 + 29 = _____

c 83 + 38 = _____ d 57 + 42 = _____

e 56 + 39 = _____ f 74 + 81 = _____

g 98 + 73 = _____ h 66 + 52 = _____



4 Use the jump strategy.

Jump strategy
53 + 38
53 + 30 = 83
83 + 8 = 91

a 46 + 38 = _____ b 72 + 27 = _____

c 39 + 55 = _____ d 23 + 69 = _____

e 68 + 64 = _____ f 19 + 77 = _____

g 57 + 83 = _____ h 84 + 97 = _____ i 28 + 69 = _____

5

a 38 sheep. 43 cows. 27 horses. How many animals altogether?



b I spent 17c on an apple, 46c on a peach, 85c on a mango. How much did I spend?



c 49 red pens. 38 blue pens. 64 black pens. How many pens altogether?



Challenge! Work these out mentally. Name the strategies you used.

	Strategies
a 68 + 47 + 48 =	
b 93 + 17 + 76 =	
c 46 + 59 + 37 =	

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Number Operations: Adding any whole numbers; Addition can be carried out mentally, using known facts, place value and partitioning, or column methods

Addition algorithms

1 **a**
$$\begin{array}{r} 37 \\ 64 \\ 28 \\ +\ 43 \\ \hline \\ \hline \end{array}$$

b
$$\begin{array}{r} 58 \\ 19 \\ 20 \\ +\ 64 \\ \hline \\ \hline \end{array}$$

c
$$\begin{array}{r} 72 \\ 16 \\ 85 \\ +\ 57 \\ \hline \\ \hline \end{array}$$

d
$$\begin{array}{r} 55 \\ 94 \\ 78 \\ +\ 46 \\ \hline \\ \hline \end{array}$$

e
$$\begin{array}{r} 80 \\ 39 \\ 69 \\ +\ 63 \\ \hline \\ \hline \end{array}$$

2 **a**
$$\begin{array}{r} 342 \\ +\ 113 \\ \hline \\ \hline \end{array}$$

b
$$\begin{array}{r} 216 \\ +\ 453 \\ \hline \\ \hline \end{array}$$

c
$$\begin{array}{r} 206 \\ +\ 345 \\ \hline \\ \hline \end{array}$$

d
$$\begin{array}{r} 374 \\ +\ 518 \\ \hline \\ \hline \end{array}$$

e
$$\begin{array}{r} 158 \\ +\ 629 \\ \hline \\ \hline \end{array}$$

f
$$\begin{array}{r} 407 \\ +\ 287 \\ \hline \\ \hline \end{array}$$

g
$$\begin{array}{r} 634 \\ +\ 279 \\ \hline \\ \hline \end{array}$$

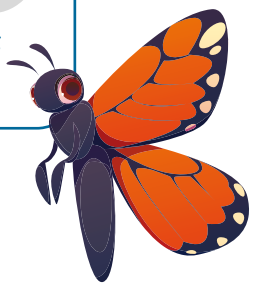
h
$$\begin{array}{r} 255 \\ +\ 463 \\ \hline \\ \hline \end{array}$$

i
$$\begin{array}{r} 193 \\ +\ 754 \\ \hline \\ \hline \end{array}$$

j
$$\begin{array}{r} 264 \\ +\ 584 \\ \hline \\ \hline \end{array}$$

k
$$\begin{array}{r} 323 \\ +\ 597 \\ \hline \\ \hline \end{array}$$

Don't forget to add the extra tens and hundreds.





$3.50



$2.50



$4.85



$1.65



$4.50

3 Calculate mentally the price of:

a a sandwich and a drink. _____

b a hamburger and a fruit salad. _____

c a pie and a drink. _____

d a sandwich and a pie. _____

e a hamburger and a sandwich. _____

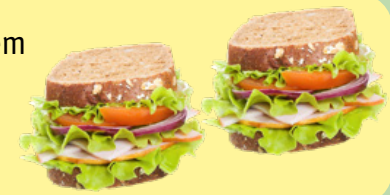
f a drink and a fruit salad. _____

4 Write algorithms for the cost of:

a a pie, a sandwich and a fruit salad.

b 3 hamburgers.

Challenge! What is the total cost of buying 2 of each item for a family picnic?



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Number lines

1 Round to the hundreds place to estimate answers.

a 723 + 254 = _____

b 618 + 176 = _____

c 375 + 481 = _____

d 546 + 363 = _____

e 472 + 337 = _____

f 891 + 126 = _____

2 Use the number lines.

a 723 + 254 = _____



b 618 + 176 = _____



c 375 + 481 = _____



d 546 + 363 = _____



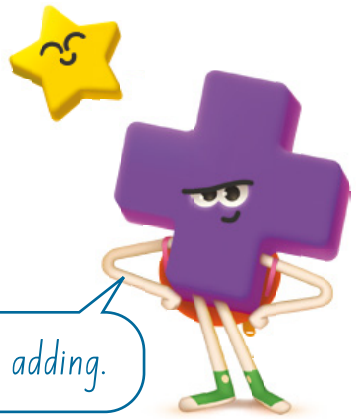
3 Estimate first.

a
```
  68
  49
  81
+ 26
```
Est. _____

b
```
  75
  18
  54
+ 37
```
Est. _____

c
```
 265
+578
```
Est. _____

d
```
 408
+395
```
Est. _____



4 Work the above examples using number lines.

a



= _____

b



= _____

c



= _____

d



= _____

5 What strategies could you use for question **2c** and **2d**?

_____ _____

6 **a** Which method was easiest? _____

b Why? _____

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Number Operations: Adding any whole numbers; Standard written algorithms (e.g. column addition) rely on place value, regrouping and renaming;
Number Number structures: Rounding can support predicting or estimating the result of a calculation;

Adding more digits

1 **a**
$$\begin{array}{r} 1694 \\ +\ 5282 \\ \hline \\ \hline \end{array}$$

b
$$\begin{array}{r} 4715 \\ +\ 4563 \\ \hline \\ \hline \end{array}$$

c
$$\begin{array}{r} 2068 \\ +\ 7912 \\ \hline \\ \hline \end{array}$$

d
$$\begin{array}{r} 3706 \\ +\ 5265 \\ \hline \\ \hline \end{array}$$

e
$$\begin{array}{r} 3907 \\ +\ 3764 \\ \hline \\ \hline \end{array}$$

f
$$\begin{array}{r} 6270 \\ +\ 1895 \\ \hline \\ \hline \end{array}$$

g
$$\begin{array}{r} 7695 \\ +\ 2178 \\ \hline \\ \hline \end{array}$$

h
$$\begin{array}{r} 9238 \\ +\ 4758 \\ \hline \\ \hline \end{array}$$

2 **a**
$$\begin{array}{r} 3750 \\ 216 \\ 1907 \\ \hline \\ \hline \end{array}$$

b
$$\begin{array}{r} 85 \\ 347 \\ 5291 \\ \hline \\ \hline \end{array}$$

c
$$\begin{array}{r} 512 \\ 7090 \\ 68 \\ \hline \\ \hline \end{array}$$

d
$$\begin{array}{r} 8759 \\ 7 \\ 618 \\ \hline \\ \hline \end{array}$$

e
$$\begin{array}{r} 28 \\ 63 \\ 4045 \\ \hline \\ \hline \end{array}$$

f
$$\begin{array}{r} 8290 \\ 6548 \\ 7 \\ \hline \\ \hline \end{array}$$



3 First estimate in whole numbers and then work out the answers.

a
$$\begin{array}{r} 7.6 \\ 3.8 \\ +\ 1.4 \\ \hline \\ \hline \end{array}$$
Est. _____

b
$$\begin{array}{r} 9.4 \\ 4.8 \\ +\ 0.6 \\ \hline \\ \hline \end{array}$$
Est. _____

c
$$\begin{array}{r} 11.2 \\ 0.8 \\ +\ 24.5 \\ \hline \\ \hline \end{array}$$
Est. _____

d
$$\begin{array}{r} 3.85 \\ 2.07 \\ +\ 1.92 \\ \hline \\ \hline \end{array}$$
Est. _____

e
$$\begin{array}{r} 5.632 \\ 8.715 \\ +\ 4.589 \\ \hline \\ \hline \end{array}$$
Est. _____

f
$$\begin{array}{r} 7.095 \\ 0.381 \\ +\ 9.172 \\ \hline \\ \hline \end{array}$$
Est. _____

+, − decimals

- **Keep decimal points under each other.**
- **Put a decimal point in the answer.**

$$\begin{array}{r} 7.34 \\ +\ 1.69 \\ \hline 9.03 \end{array}$$

4 Write algorithms to add these numbers. Make sure to line up the places correctly.

a 4,780.542 + 4,157.83

b 57,319.045 + 12,430.578

Mastery Checklist I can:

- ☐ use a variety of mental strategies to add
- ☐ use number lines and algorithms to add
- ☐ add numbers up to 5 places and decimals to 3 places

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Digit shuffling

1 Use the digits 1, 2, 4, 6, 7 and 9 once each to form two three-digit numbers that:

a give the largest sum possible.

Largest sum = _____

b give the smallest sum possible.

Smallest sum = _____

2 Rearrange the same digits to make different numbers that add to the same totals.

a _____

b _____

3 Using the digits 0, 2, 3, 5, 6, 7, 8, 9, form two 4-digit numbers to:

a give the largest sum possible.

Largest sum = _____

b give the smallest sum possible.

Smallest sum = _____

4 Rearrange the same digits to make different numbers that add to the same totals.

a _____

b _____

5 What strategies helped to solve these problems? Explain your thinking.

a _____

b _____

1 2 4 6 7 9 1 2 4 6 7 9 1 2 4 6 7 9

I can solve problems by:

☐ adding numbers ☐ thinking about place value ☐ using different strategies

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Subtraction of money

Yesterday's cakes CHEAP!



Apple tart
$1.75



Cherry tart
$1.90



Chocolate bear
$0.95



Cherry danish
$1.65



Fruit tart
$2.10



Gingerbread man
$1.20



Orange tart
$1.70



Peanut slice
$0.60

The kids in Jones Street love buying the stale cakes.

1 Pete has $2.

a What cake can't he buy? _____

b How much change will he get if he buys:

a peanut slice? _____ a cherry danish? _____ a gingerbread man? _____

2 Terri has $3. What did she buy if her change is:

a $2.05? _____ b $1.10? _____ c $1.80? _____

3 Louis has $5. How much change will he get if he buys:

a an apple tart? _____ b an orange tart? _____ c a cherry danish? _____

4 Dale will get $2.90 change if she buys the most expensive cake.

a How much change would she get if she buys the cheapest cake? _____

b Could she buy any three cakes? _____ Why? _____

_____

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Subtraction strategies

Jump strategy

54 – 37: 54 – 30 = 24
24 – 7 = 17

Compensation strategy

65 – 28: 65 – 30 = 35
35 + 2 = 37

60 – 41: 60 – 40 = 20
20 – 1 = 19

1 Use the jump strategy.

a 29 – 18 = _____ **b** 36 – 17 = _____ **c** 54 – 25 = _____

d 71 – 46 = _____ **e** 66 – 39 = _____ **f** 87 – 55 = _____

g 90 – 34 = _____ **h** 45 – 23 = _____ **i** 91 – 68 = _____

2 Use the compensation strategy.

a 43 – 19 = _____ **b** 85 – 31 = _____ **c** 54 – 22 = _____

d 79 – 18 = _____ **e** 72 – 28 = _____ **f** 37 – 19 = _____

3 Choose a strategy.

a 65 – 37 = _____

b What strategy did you use? _____

c Why? _____

4 **a** 53 – 29 = _____

b What strategy did you use? _____

c Why? _____

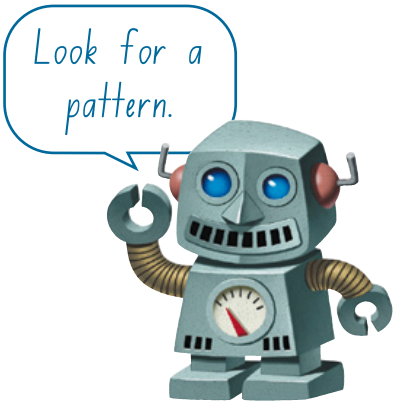
5 Complete.

a

–	31	84	68	42	96	75	53	27
19								

b

–	41	79	50	37	74	90	63	82
29								



6 Estimate the answers.

a 124 – 73 _____ **b** 201 – 97 _____ **c** 81 – 42 _____ **d** 311 – 38 _____

e 117 – 61 _____ **f** 229 – 54 _____ **g** 309 – 102 _____ **h** 156 – 27 _____

7 Now work the answers for question 6.

a _____ **b** _____ **c** _____ **d** _____

e _____ **f** _____ **g** _____ **h** _____

8 How do you rate your estimating skills?

Poor — Fair — Good — Excellent

Challenge!

a Estimate. 603 – 174 – 156 – 98

b Calculate the exact answer.

c Was your estimate a good one?

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Number Operations: Subtracting any whole numbers; Subtraction can be carried out mentally, using known facts, place value and partitioning, or column methods

Subtraction methods

Number lines

You choose whether to take big jumps or small jumps. Both are correct.

1 Use the number lines.

a 156 – 72 = _____

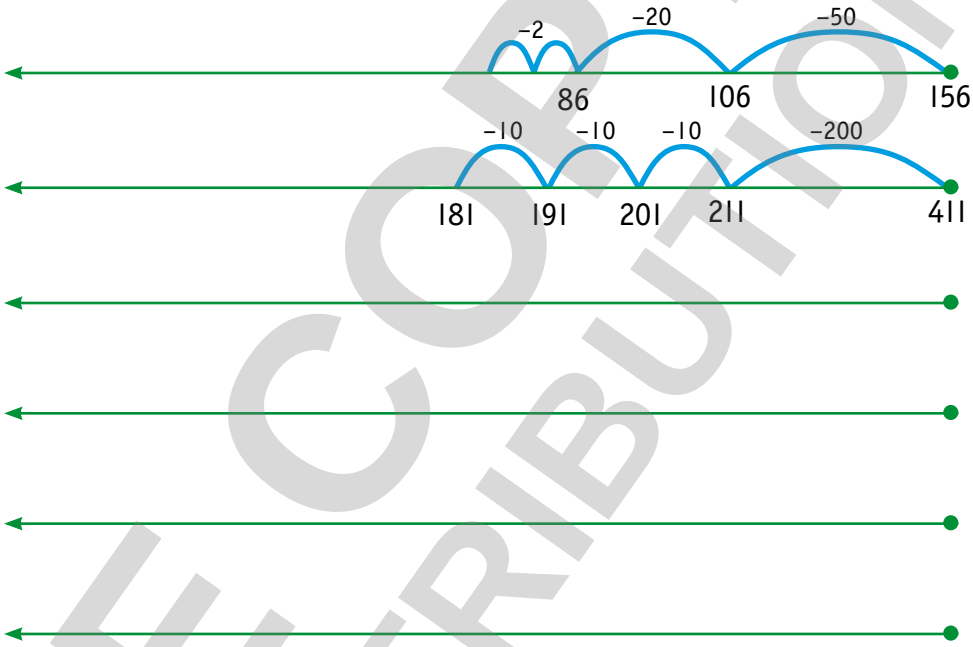
b 411 – 238 = _____

c 235 – 116 = _____

d 369 – 247 = _____

e 753 – 488 = _____

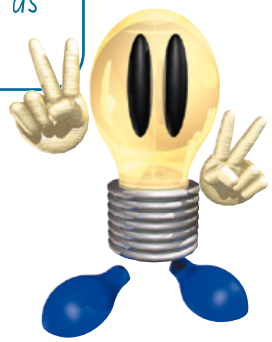
f 614 – 375 = _____



2 Trade in the tens.

a 471 − 237	**b** 583 − 165	**c** 637 − 418
d 990 − 726	**e** 556 − 339	**f** 782 − 537
g 894 − 547		

Remember!
71 is the same as
60 + 11.



3 Trade in the hundreds.

a 736 − 264	**b** 885 − 691	**c** 614 − 330	**d** 577 − 185	**e** 949 − 492
f 428 − 156	**g** 653 − 470	**h** 862 − 581	**i** 716 − 455	**j** 537 − 391
k 725 − 247	**l** 348 − 186	**m** 693 − 389	**n** 857 − 278	**o** 906 − 618

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Subtraction algorithms

1 a
$$\begin{array}{r} 7543 \\ -\ 4721 \\ \hline \\ \hline \end{array}$$

b
$$\begin{array}{r} 9258 \\ -\ 5219 \\ \hline \\ \hline \end{array}$$

c
$$\begin{array}{r} 8652 \\ -\ 7329 \\ \hline \\ \hline \end{array}$$

d
$$\begin{array}{r} 6712 \\ -\ 2784 \\ \hline \\ \hline \end{array}$$

e
$$\begin{array}{r} 8954 \\ -\ 4021 \\ \hline \\ \hline \end{array}$$

f
$$\begin{array}{r} 5350 \\ -\ 4731 \\ \hline \\ \hline \end{array}$$

g
$$\begin{array}{r} 4251 \\ -\ 2360 \\ \hline \\ \hline \end{array}$$

h
$$\begin{array}{r} 7902 \\ -\ 2412 \\ \hline \\ \hline \end{array}$$

2 Write algorithms to subtract these numbers. Make sure to line up the places correctly.

a 6,780 – 4,157

b 57,319 – 12,430

c 904,278 – 682,302

3 a
$$\begin{array}{r} 3.9 \\ -\ 1.7 \\ \hline \\ \hline \end{array}$$
Est. _____

b
$$\begin{array}{r} 8.6 \\ -\ 5.1 \\ \hline \\ \hline \end{array}$$
Est. _____

c
$$\begin{array}{r} 4.93 \\ -\ 1.61 \\ \hline \\ \hline \end{array}$$
Est. _____

d
$$\begin{array}{r} 7.75 \\ -\ 3.44 \\ \hline \\ \hline \end{array}$$
Est. _____

e
$$\begin{array}{r} 8.715 \\ -\ 4.589 \\ \hline \\ \hline \end{array}$$
Est. _____

f
$$\begin{array}{r} 7.095 \\ -\ 0.381 \\ \hline \\ \hline \end{array}$$
Est. _____

g
$$\begin{array}{r} 91.172 \\ -\ 63.074 \\ \hline \\ \hline \end{array}$$
Est. _____

h
$$\begin{array}{r} 64.735 \\ -\ 42.081 \\ \hline \\ \hline \end{array}$$
Est. _____

HINT
Put the decimal point in the answer first.
$$\begin{array}{r} 5.45 \\ -\ 3.43 \\ \hline 2.02 \end{array}$$

4 Write algorithms to subtract these numbers. Make sure to line up the places correctly.

a 0.542 – 0.28

b 1.045 – 0.508

c 2.009 – 0.116

Challenge! Roll 5 dice and make a five-digit number. Take it away from 100,000. What is left? _____



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Number Operations: Subtracting any whole numbers **Number** Rational numbers: Subtracting decimals to three decimal places

Checking answers

1 Work the algorithms, then add to check your answers.

a 627 − 263 = _____

b 835 − 548 = _____

c 410 − 168 = _____

d 727 − 590 = _____

Check.

a 263 + _____ = _____

b 548 + _____ = _____

c _____ + _____ = _____

d _____ + _____ = _____

Checking
Use + to check subtraction.

815
− 278
537

Check
537
+ 278
815

2 The trucks are all carrying cartons to Sam's Super Seconds shop. What are the differences in the numbers of cartons they are carrying? Write the subtractions using the letters.



a A − B = _____ **b** A − C = _____ **c** A − D = _____ **d** E − A = _____

e B − C = _____ **f** B − D = _____ **g** E − B = _____ **h** D − C = _____

i E − C = _____ **j** E − D = _____

k Why can you not work **A** − **E** or **C** − **D**?

_____

3 Complete the path, then work backwards to check.

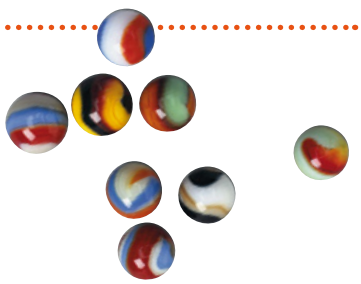


Work backwards

Lui was a marble champion. In June he won 614, July 293, August 504 and September 110. He then had 1,917 marbles altogether. How many did he begin with?

Mastery Checklist

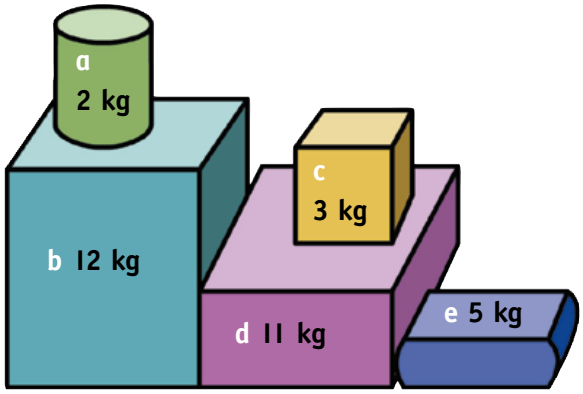
I can:
- ☐ use a variety of mental strategies to subtract
- ☐ use number lines and algorithms to subtract
- ☐ subtract numbers up to 6 places and decimals to 3 places
- ☐ check answers using inverse operations



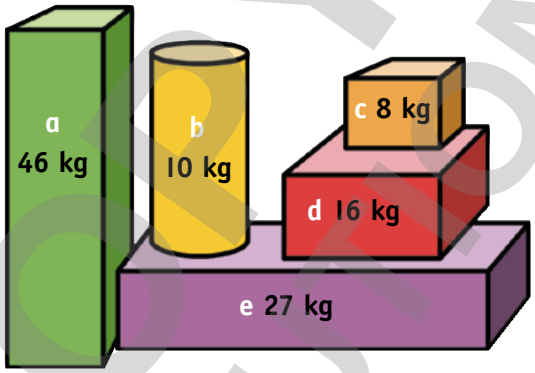
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Mass

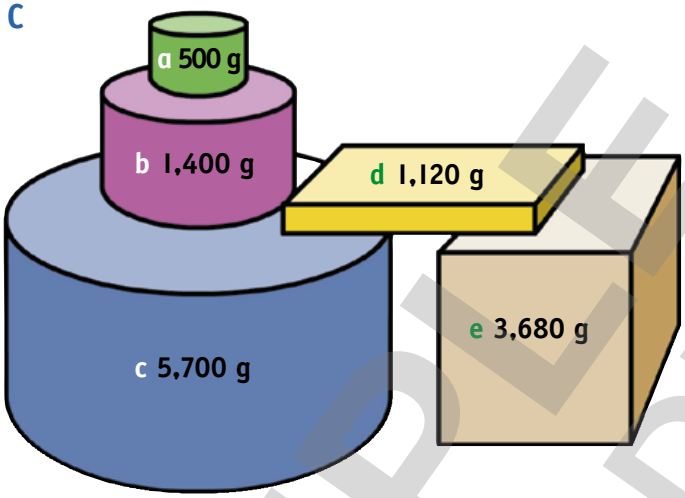
A



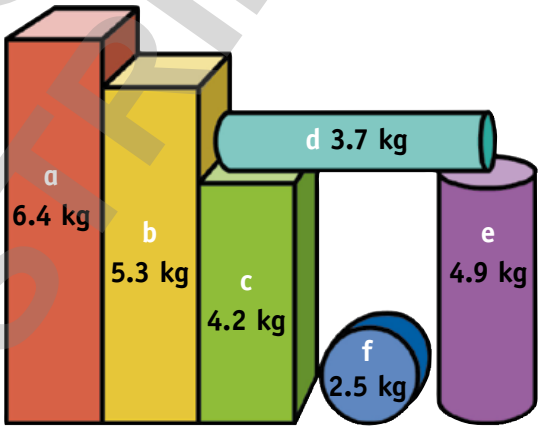
B



C



D



1 What is the total mass of each group of parcels?

A _____ B _____ C _____ D _____

2 For group **A**, write each weight in grams.

a _____ b _____ c _____ d _____ e _____

3 For group **C**, write each weight as a decimal.

a _____ kg b _____ kg c _____ kg d _____ kg e _____ kg

4 For group **D**, change each weight to grams.

a _____ b _____ c _____ d _____ e _____ f _____

5 a Which is the lightest group of parcels? _____

b Which is the heaviest group of parcels? _____

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Measurement Measuring: Converting metric units of mass (g and kg), including combining mixed units to produce units with up to 2 decimal places

Grams and kilograms

Mass
gram – g
kilogram – kg
1,000 g = 1 kg

Use the pictures on page 38.

1 Write the masses from lightest to heaviest.

A _____

C _____

2 Write the masses from heaviest to lightest.

B _____

D _____

3 Change to grams.

a 2 kg _____ b 9 kg _____ c 24 kg _____

d 17 kg _____ e 1 kg 250 g _____ f 3 kg 500 g _____

g 9 kg 750 g _____ h 31 kg 600 g _____ i 15 kg _____

4 Change to kilograms and write the answers as decimals.

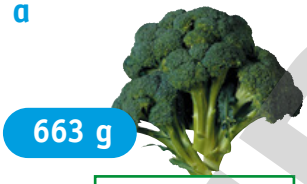
a 13,000 g _____ b 64,000 g _____ c 19,000 g _____

d 38,000 g _____ e 8,500 g _____ f 21,500 g _____

g 2,250 g _____ h 10,750 g _____ i 9,240 g _____

5 Write the mass to the nearest 100 g.

a



663 g

b



815 g

c



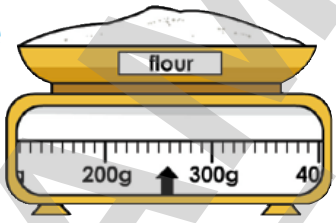
472 g

d

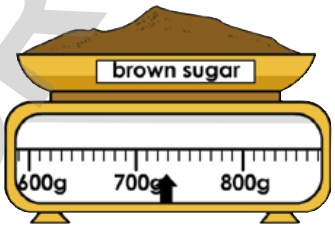


948 g

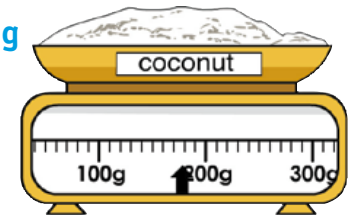
e



f



g



Challenge!

Search at home for packed foods which show their mass.
Write the name and mass of 5 items which weigh less than 1 kg and 5 items which weigh more than 1 kg.



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Estimating mass

measure and compare masses

TERM 1
Week 8

1 Would you use grams or kilograms to find the mass?

a 

b 

c 

d 

e 

f 

g 

h 

i 

j 

2 Work with a partner.

a Find 6 objects in the room that have different masses and list them.

Item	Estimated mass	Actual mass



b Lift some standard masses: 1 kg, 500 g, 100 g, 50 g.

c Lift your objects. Write your estimate of their mass on the table.

d Weigh your objects. Write their actual mass on the table.

e Write your objects from lightest to heaviest. _____

_____

f Find the total mass of your objects. _____

3 List three things that each have a mass of:

a less than 100 g. _____

b about $\frac{1}{2}$ kg. _____

c about 1 kg. _____

d more than 10 kg. _____

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Measurement Measuring: Converting metric units of mass (g and kg), including combining mixed units to produce units with up to 2 decimal places; Estimating (using benchmarks) mass (weight), using appropriate metric units

Tonnes

1 Write in kilograms.

a 3 tonnes _____

b 1 tonne _____

c 10 tonnes _____

d 6 tonnes _____

e 8 tonnes _____

f 14 tonnes _____

2 Write in tonnes.

a 9,000 kg _____

b 1,000 kg _____

c 10,000 kg _____

d 4,000 kg _____

e 15,000 kg _____

f 20,000 kg _____

Large loads are measured in tonnes.
1,000 kg = 1 tonne (t)



3 Arrange the following in order, lightest to heaviest.

a 5,000 kg, 50 t, 50 kg, 5,500 kg _____

b 3 t, 300 kg, 30 t, 3,000 kg _____

c 800 kg, 8,000 g, 80,000 kg, 8 t _____

d 1,000 t, 10,000 kg, 1,000 g, 100 kg _____

e 20,000 kg, 200 t, 2,000 kg, 200 kg _____

4 Which unit of measure is used to record the correct mass?



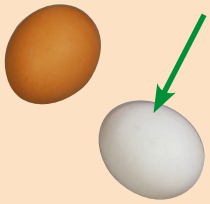
a 4.5 ☐



b 6 ☐



c 1.2 ☐



d 60 ☐



e 80 ☐



f 1.5 ☐



g 150 ☐



h 0.6 ☐

Mastery Checklist

I can:
- ☐ convert between tonnes, kilograms and grams
- ☐ estimate and measure masses
- ☐ choose the best unit to measure mass
- ☐ compare and order masses

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Working with mass

1 Work in a group of 4. What do you think is the average mass of your school bags?

a Estimate the mass of the bag that you think is the closest to the average of your group.

Record it here.

Estimated mass of _____'s bag: ☐



b Estimate the masses of the other bags in the group.

Estimated masses: ☐ ☐ ☐

2 a Weigh those bags on a scale.

Masses: ☐ ☐ ☐ ☐

b Find the average of the masses.

Total mass +
Add the 4 masses.

Average mass ÷
Divide the total mass by 4 to find the average.

c Whose bag was closest to the average? _____



3 Zara's backpack has a mass of 13 kg. She takes out three objects with masses of 1,262 g, 2,098 g and 1,140 g.

What is the mass of her backpack now? ☐

Challenge!

Find out what the following terms mean in the trucking world.

Tare: ☐

Aggregate: ☐

I can solve problems by:

☐ understanding mass and using division ☐ writing algorithms

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Measurement Measuring: Accurately measuring mass (weight) with scales, using appropriate metric units or a combination of units; Estimating (using benchmarks) mass (weight) using appropriate metric units or a combination of units

Volume

Volume
the amount of space something occupies.

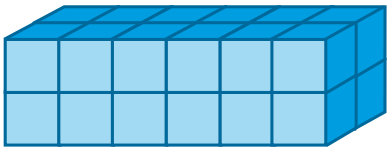


Dimensions = 1 × 2 × 3
Volume = 6 cubic units

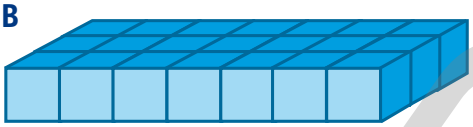


1 Build each model using cubic centimetre blocks.

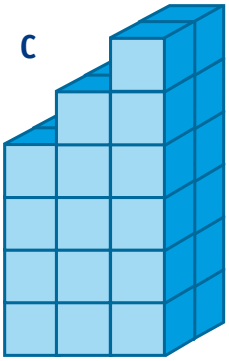
A



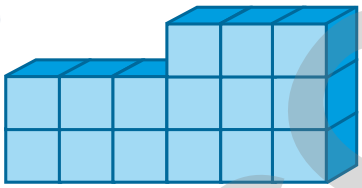
B



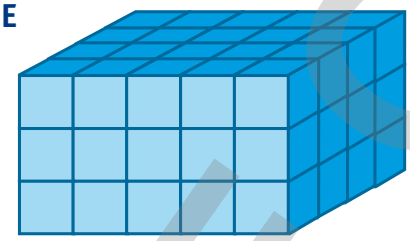
C



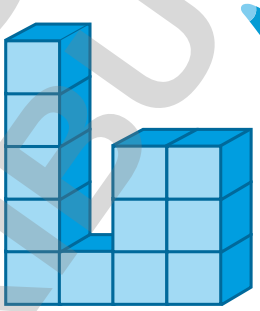
D



E



F



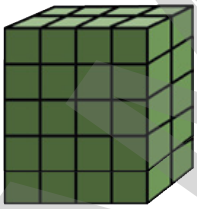
2 How many blocks did you use?

A _____ **B** _____ **C** _____ **D** _____ **E** _____ **F** _____

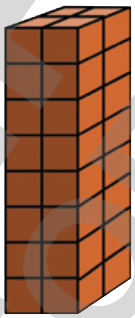
3 What is the volume of each model in cubic centimetres?

A _____ cm^3 **B** _____ **C** _____ **D** _____ **E** _____ **F** _____

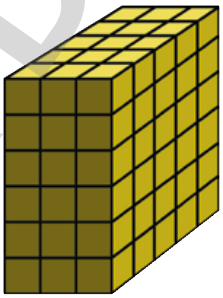
A



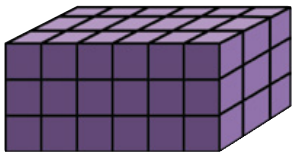
B



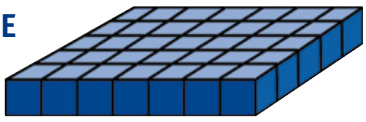
C



D



E



4 **a** What is the volume?

A _____ **B** _____ **C** _____ **D** _____ **E** _____

b List the volumes in descending order.

_____ _____ _____ _____ _____

5 What is the difference in volume between:

a Objects **C** and **E**? _____ **b** Objects **A** and **B**? _____

c Objects **D** and **E**? _____ **d** Objects **C** and **D**? _____

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Cubic centimetres

A cubic centimetre is 1 cm long, 1 cm high and 1 cm wide.



1 cm × 1 cm × 1 cm = 1 cm³

Activity • Work with a friend

1 You need a small empty rectangular box and cubic centimetre blocks.

a Estimate how many cubic centimetre blocks would fit inside the box. _____ cm³

b Use the blocks to measure the length, width and height of the box.

Length _____ blocks Width _____ blocks Height _____ blocks

c How many blocks would fit in one layer? _____ blocks

d Find the total volume by multiplying.

Length × Width × Height

= _____ × _____ × _____

= _____ cm³



2 Which objects could you measure in cubic centimetres? Draw four small objects whose volume could be measured in cubic centimetres.

3 Estimate the volume of each object. Write your estimate in cubic centimetres.

a _____ cm³ b _____ cm³ c _____ cm³ d _____ cm³

4 Order the objects from smallest volume to greatest volume.

_____

_____

5 Choose one of the objects. Build a model with cubic centimetre blocks that has about the same volume. Record the volume. _____ cm³

6 Name an object that is likely to have a volume of:

a about 10 cm³ _____

b about 50 cm³ _____

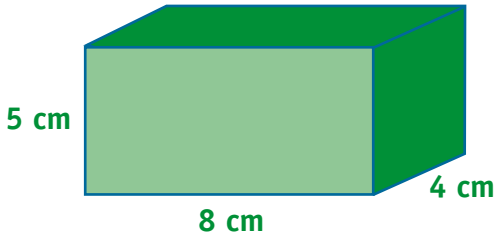
c about 100 cm³ _____

d more than 200 cm³ _____

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Volume of a rectangular prism

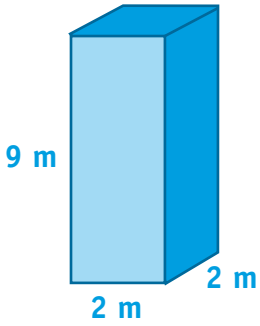
To find the volume of a rectangular prism, multiply the length by the width by the height.
The answer will be in cubic units.



Volume = length (l) × width (w) × height (h)
= 8 cm × 5 cm × 4 cm
= 160 cm^3

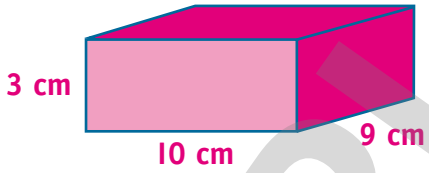
1 Work out the volume.

a



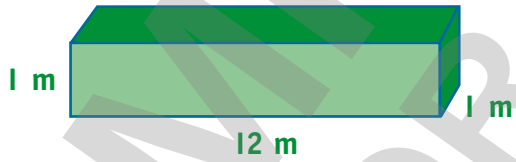
Volume = length (l) × width (w) × height (h)
= _____ × _____ × _____
= _____ m^3

b



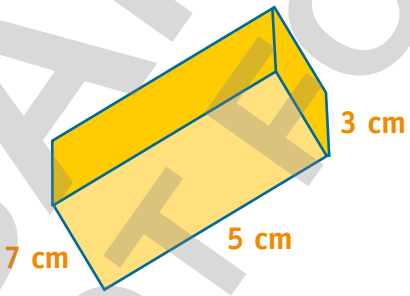
Volume = l × w × h
= _____ × _____ × _____
= _____ cm^3

c



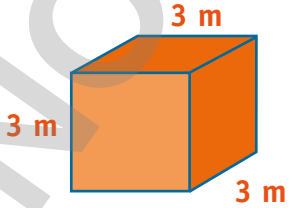
Volume = l × w × h
= _____ × _____ × _____
= _____ m^3

d



Volume = l × w × h
= _____ × _____ × _____
= _____ cm^3

e



Volume = l × w × h
= _____ × _____ × _____
= _____ m^3

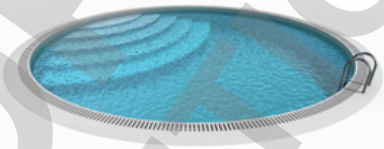
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Cubic metres

A cubic metre
The volume of large objects can be measured in cubic metres (m^3).
1 m × 1 m × 1 m = 1 m^3

1 A cubic metre is a cube that is 1 metre long, 1 metre wide and 1 metre high. Circle the objects that would most likely have their volume measured in cubic metres.



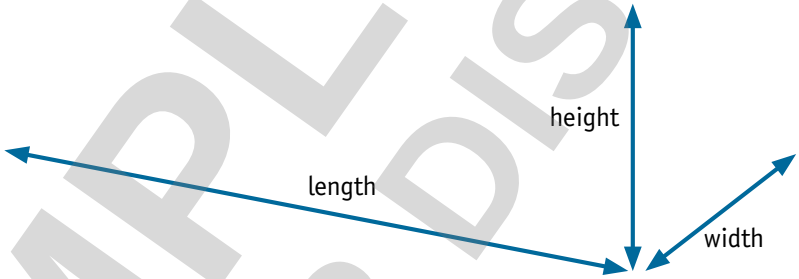






2 A container is being packed with 1 m^3 cubes. The container holds: 3 cubes long, 2 cubes wide and 3 cubes high. Draw the container below and label its dimensions.

What is its volume? _____



3 **a** Make a list of 3 objects which have a volume of:

- about 1 m^3. _____
- about 2 m^3. _____
- about $\frac{1}{2}$ m^3. _____

b Estimate the volume of your classroom in cubic metres. _____

c How could you measure it? _____

Challenge! A space 6 metres long and 6 metres wide is covered in cubic metre blocks. A crane builds a pyramid 1 metre shorter and 1 metre narrower in each layer.

How many cubic metre blocks are needed to complete the pyramid? _____

How many blocks will be on the top layer? _____ **Hint:** Build a model with blocks.

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Measurement Measuring: Calculating, estimating, and comparing the volumes of cubes and rectangular prisms using standard units, including cubic metres (m^3)

Rectangular prism volume

TERM 1
Week 9

1 Use centimetre cubes to build three different rectangular prisms with a volume of 36 cm³.

2 Draw these models below. Label them **A**, **B**, **C**.



3 Fill in the table using your models.

Volume	Length	Width	Height
A 36 cm³			
B 36 cm³			
C 36 cm³			

4 Write the calculation for each model to find the volume.

A _____

B _____

C _____

Mastery Checklist I can:

- ☐ build models and count blocks to work out volumes
- ☐ use cubic centimetres and cubic metres to measure volume
- ☐ use a formula to work out the volume of a rectangular prism

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Checkpoint 2

1 Write the values of the 4. p 2

a 738.45 _____

b 342.79 _____

c 281.904 _____

2 Round to the nearest whole number. p 3

a 56,900.809 _____

b 13,886.46 _____

3 Expand this number. p 4

a 45,900.8 _____

_____

4 Write in ascending order. p 5

725.81 725.015 725.89 715.059

_____ _____

_____ _____

5 Round 1,729,835 to the nearest: p 7

a ten thousand _____

b hundred thousand _____

c million _____

6 Round 4.625 to the nearest: p 7

a tenth _____

b hundredth _____

c whole _____

7 What is the next term? p 9

a 200,000, 20,000, 2,000, _____

b 0.135, 13.5, 13,500, _____

8 a 1.895 × 10 = _____ p 10

b 1.895 × 100 = _____

c 1.895 × 1,000 = _____

9 a 1.895 ÷ 10 = _____ p 11

b 1.895 ÷ 100 = _____

c 1.895 ÷ 1,000 = _____

10 a Reflect this shape. p 15



b Turn 90° anticlockwise.



11 Write the missing fraction. p 19

a $\frac{4}{8} + \frac{\square}{\square} = 1$ b $\frac{7}{12} + \frac{\square}{\square} = 1$

12 Compare using <, > or =. p 20

$1\frac{3}{4}$ _____ $\frac{13}{8}$

13 Complete the missing fraction. p 24

a $\frac{5}{8} + \frac{\square}{\square} = 1\frac{1}{8}$ b $\frac{6}{10} + \frac{\square}{\square} = 1\frac{2}{5}$

14 a 73 + 19 = _____ p 28

b 37 + 55 = _____

p 29

15 a

$$\begin{array}{r} 403 \\ +\ 294 \\ \hline \\ \hline \end{array}$$

b

$$\begin{array}{r} 574 \\ +\ 228 \\ \hline \\ \hline \end{array}$$

c

$$\begin{array}{r} 358 \\ +\ 429 \\ \hline \\ \hline \end{array}$$

16 Use the number line. p 30

689 + 246 = _____



17 a

$$\begin{array}{r} 21.05 \\ 5.73 \\ +\ 0.10 \\ \hline \\ \hline \end{array}$$

b

$$\begin{array}{r} 8.20 \\ 94.75 \\ +\ 13.06 \\ \hline \\ \hline \end{array}$$

p 31

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Checkpoint 2

18 Stan bought 1 cake. He paid with a $5 note and received $3.20 change. p 33

Which cake did he buy? _____

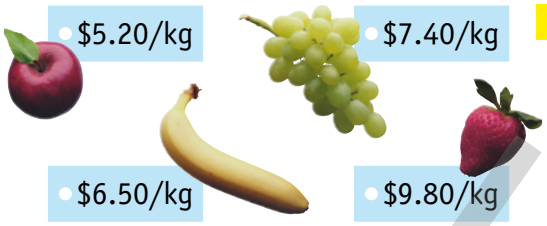
A  $2.20

B  $1.70

C  $3.20

D  $2.10

19 p 33



Pete had $10.
What change does he get if he buys 1 kg of:

a bananas? _____ b grapes? _____

c apples? _____ d strawberries? _____

20 p 34

a 39 − 28 = _____

b 61 − 32 = _____

21 Use the number line. p 35

411 − 128 = _____



22 p 36

a
$$\begin{array}{r} 7\,8\,0\,4 \\ -\ 5\,5\,2\,0 \\ \hline \\ \hline \end{array}$$

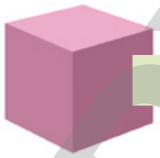
b
$$\begin{array}{r} 8\,2\,5\,9 \\ -\ 4\,0\,3\,6 \\ \hline \\ \hline \end{array}$$

23 Subtract, then add to check. p 37

a
$$\begin{array}{r} 5\,2\,7 \\ -\ 2\,6\,3 \\ \hline \\ \hline \end{array}$$
check
$$\begin{array}{r} 2\,6\,3 \\ +\ \\ \hline \\ \hline \end{array}$$

b
$$\begin{array}{r} 6\,0\,4 \\ -\ 2\,7\,8 \\ \hline \\ \hline \end{array}$$
check
$$\begin{array}{r} 2\,7\,8 \\ +\ \\ \hline \\ \hline \end{array}$$

24 a What is the total mass? _____ p 38

A  13 kg

B  6.1 kg

C  2.5 kg

D  4.3 kg

b Write each mass in grams.

A _____ B _____

C _____ D _____

25 Write each mass to the nearest 100 g. p 39

a  445 g

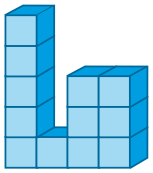
b  778 g

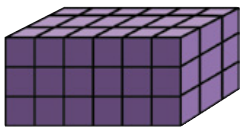
26 Order from lightest to heaviest. p 41

3,000 kg, 30 t, 300 kg, 3.5 t

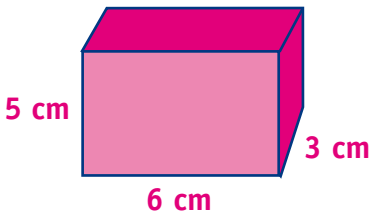
_____

27 Write the volume of each in cubic centimetres. p 43

a 

b 

28 Work out the volume. p 45



Volume = l × w × h

= _____ × _____ × _____

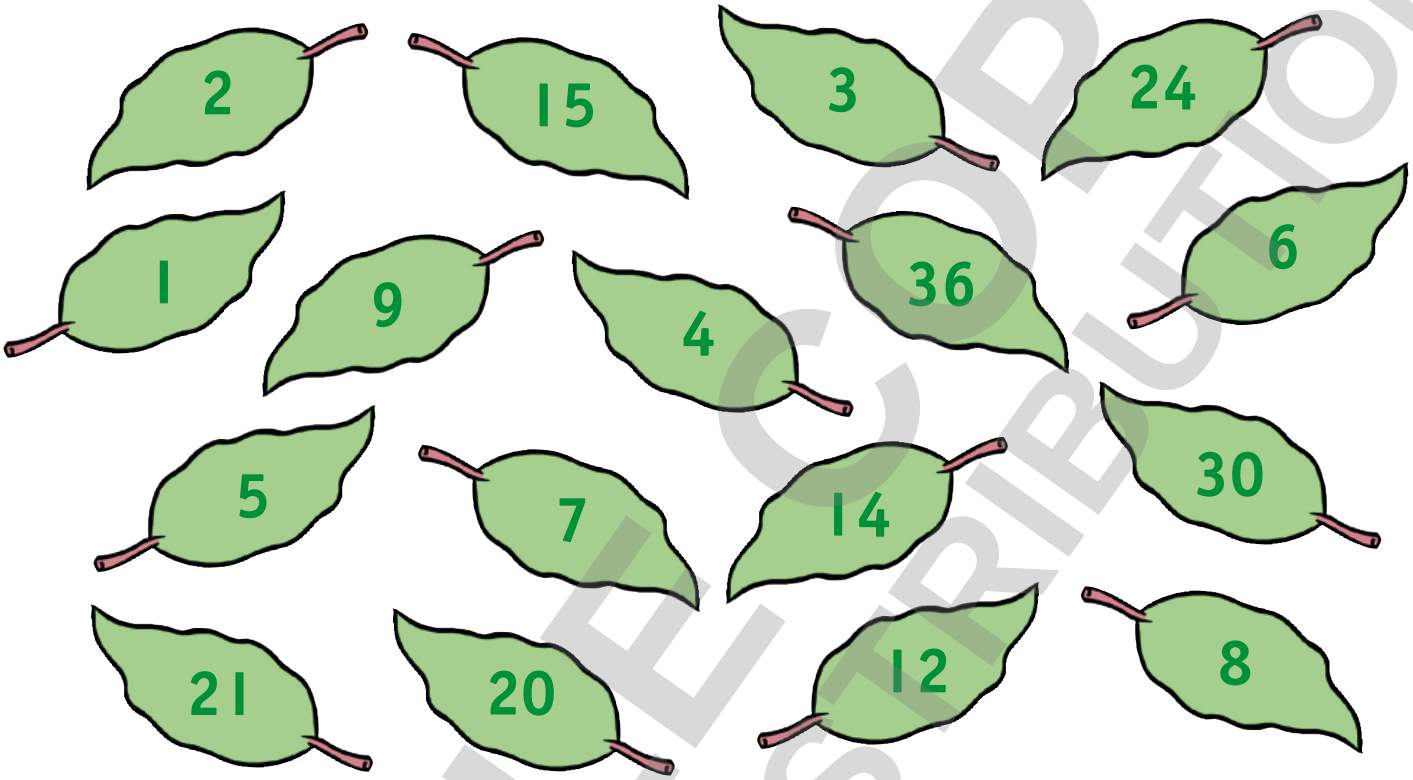
= _____ cm^3

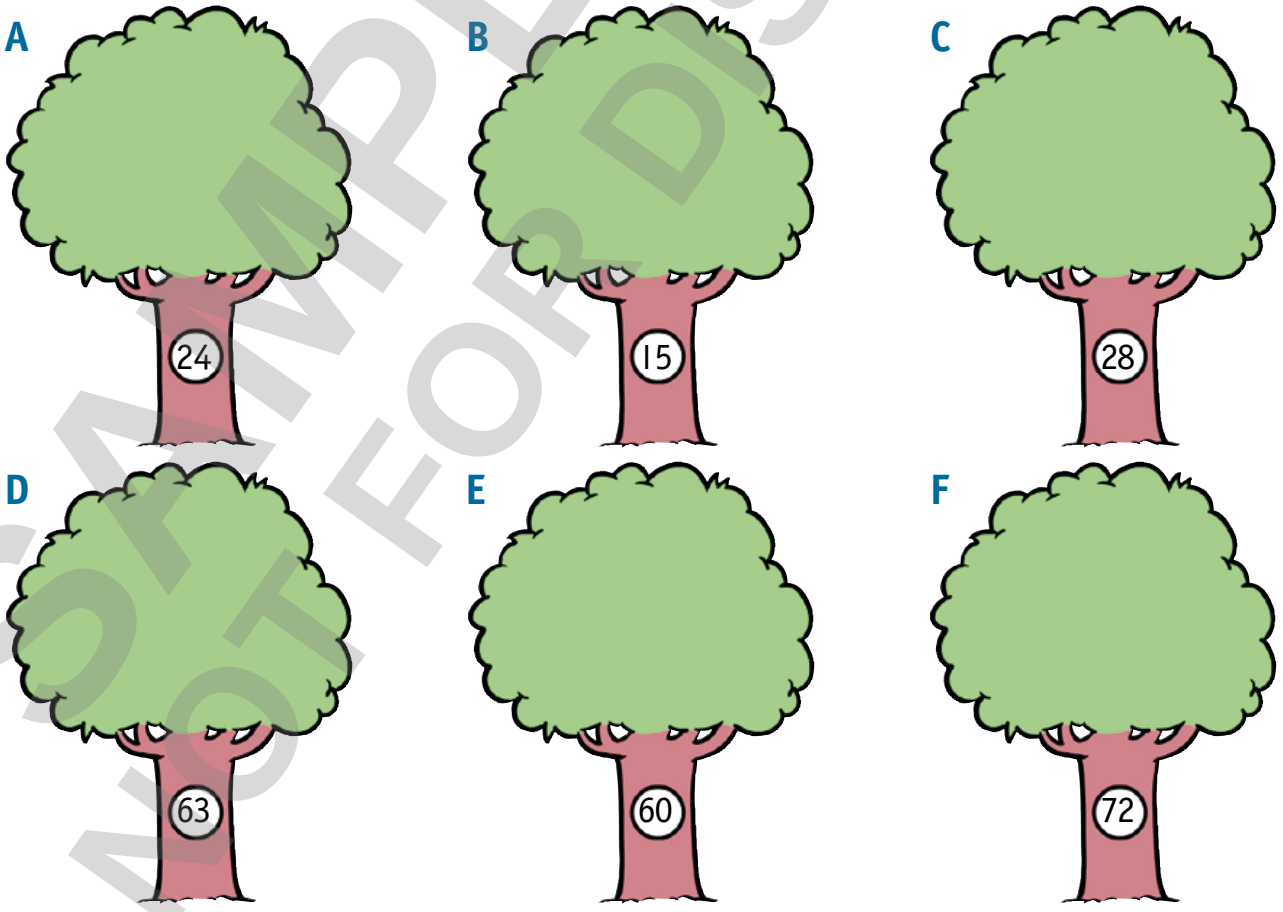
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Factors

The leaves are factors. Write the leaf numbers on the tree they belong to.

Some leaves will go on more than one tree. Circle the common factors of 60 and 72.





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Multiples

Product is the answer when numbers are multiplied.
e.g. 7 × 3 = 21
21 is the product.

Multiple is the product of two factors.
e.g. 3 × 4 = 12
12 is a multiple of 3.
12 is a multiple of 4.

1 Write the first 5 multiples of:

a 4. _____ _____ _____ _____ _____

b 7. _____ _____ _____ _____ _____

c 9. _____ _____ _____ _____ _____

d 11. _____ _____ _____ _____ _____

e 20. _____ _____ _____ _____ _____

2 Complete.

Factor	7	6		5		10		7
Factor	7		8		10	16	4	
Product		54	24	35	60		80	56

3 Put these multiples in their correct boxes. Some will go in more than one box.

20 63 36 54 35 14 16 44 81 15 28 21 25 60 27 49 45

a	b	c	d
4	5	9	7

4 Multiply by 2 (double).

a 14 _____ **b** 19 _____ **c** 23 _____ **d** 35 _____ **e** 67 _____

5 Multiply by 4 (double, double).

a 8 _____ **b** 12 _____ **c** 24 _____ **d** 42 _____ **e** 71 _____

6 Multiply by 8 (double, double, double).

a 6 _____ **b** 12 _____ **c** 15 _____ **d** 27 _____ **e** 63 _____

Challenge! Use doubles to multiply these numbers by 32.

a 3 ☐ **b** 5 ☐ **c** 9 ☐ **d** 20 ☐

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Multiplication

1 Work each one mentally. Then write how you did it.

a 16 × 8 = _____

b 82 × 5 = _____

c 62 × 20 = _____

d 106 × 4 = _____

e 78 × 20 = _____

Some tricks

× 10	add a zero 16 × 10 = 160
× 2	double
× 4	double, double
× 8	double, double, double
× 5	×10 then halve 16 × 5 = 160 ÷ 2

2 Which mental strategy would you use? Write the best strategy, then solve.

	Question	Strategy	Answer
a	48 × 5		
b	36 × 20		
c	125 × 4		
d	48 × 8		
e	72 × 5		
f	250 × 4		

3 Find the mistake and write the correct answer.

a 26 × 5 = 260 _____

b 48 × 4 = 96 _____

c 75 × 20 = 750 _____

Challenge!

Use these digit cards to write four different multiplications for the red cards.



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Number Number structures: Finding factor pairs for numbers that result from multiplying any two whole numbers between 1 and 12;
Number Operations: Multiplying any whole number by a two-digit number

Using factors

1 Mentally calculate the following using factors.

a 13 × 6 = _____
b 19 × 6 = _____
c 29 × 4 = _____
d 23 × 9 = _____
e 32 × 9 = _____
f 12 × 15 = _____
g 32 × 12 = _____
h 17 × 12 = _____
i 22 × 15 = _____
j 56 × 16 = _____

17 × 6 Factors of 6 are 2 and 3. To multiply by 6, multiply by 2 and then by 3.

17 × 2 = 34

34 × 3 = 90 + 12 = 102

2 Mentally calculate the following using factors.

a 72 ÷ 18 = _____
b 84 ÷ 14 = _____
c 120 ÷ 8 = _____
d 96 ÷ 16 = _____
e 144 ÷ 6 = _____
f 276 ÷ 12 = _____

96 ÷ 12 Factors of 12 are 3 and 4. To divide by 12, divide by 3 and then by 4.

96 ÷ 3 = 32

32 ÷ 4 = 8

3

a Teams of 16 children are needed to run a relay. How many teams will 128 children make?

_____

b Each bag of seeds contains 75 seeds. How many seeds will there be in 8 bags?

_____

c How many fortnights are there in 126 days?

_____

d How many hours are there in 17 days?

_____

Challenge! There will be 64 children at the family picnic. Grandad says he can arrange them in five different ways for games, e.g. 2 teams of 32 for a tug-o'-war. Is he right?



What are the ways?

_____

_____

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Products of factors

1 Write each number as a product of all their factor pairs.
e.g. 18 is 1 × 18, 2 × 9, 3 × 6.

There is no need to write the reverse facts,
e.g. 18 × 1, 9 × 2, 6 × 3.

Hint: Start with 1 × _____ and progress in order.

Prime numbers have only two factors – themselves and 1.



a 28 _____

b 40 _____

c 84 _____

d 45 _____

e 72 _____

2 Write all the factor pairs of these larger numbers.

a 108 _____

b 200 _____

c 350 _____

d 620 _____

3 Express these numbers as a product of all their prime factors.

60 = 2 × 30
30 = 2 × 15
15 = 3 × 5
So, 60 = 2 × 2 × 3 × 5 – which are all prime factors.



a 30 = _____ × _____
15 = _____ × _____
So 30 = _____

b 42 = _____ × _____
21 = _____ × _____
So 42 = _____

c 28 = _____ × _____
14 = _____ × _____
So 28 = _____

d 50 = _____ × _____
25 = _____ × _____
So 50 = _____

e 60 = _____ × _____
30 = _____ × _____
So 60 = _____

f 75 = _____ × _____
75 = _____ × _____
So 75 = _____

4 Write the product for each set of prime factors.

a 2 × 2 × 2 × 3 = _____

b 5 × 2 × 3 = _____

c 5 × 7 × 2 = _____

d 3 × 3 × 2 × 2 = _____

e 3 × 3 × 3 × 2 = _____

f 11 × 2 × 5 = _____

Mastery Checklist I can:

- ☐ recognise factors
- ☐ write numbers as products of prime factors
- ☐ recognise multiples
- ☐ use doubles to multiply
- ☐ use factors to multiple and divide



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Prime numbers

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100



ERATOSTHENES

Eratosthenes was a Greek mathematician who lived from 275 BC to 195 BC. He discovered a method for finding prime numbers.

1 a Cross off 1.
b Circle 2, then cross off all multiples of 2.
c Circle 3, then cross off all multiples of 3.
d Circle 5, then cross off all multiples of 5.
e Circle 7, then cross off all multiples of 7.
f Highlight the circled numbers and all remaining numbers. They are the prime numbers less than 100.
Write them here: _____

_____

_____

2 Prime numbers are multiples of 1 and themselves only. They have no other f_____.

3 Which numbers are prime? Circle them.

87	2	129	104	71	217

4 True or false?
a All prime numbers are odd. _____ Why? _____
b Every odd number is prime. _____ Why? _____

5 What are the composite numbers between 50 and 80?

_____

_____

_____

Composite numbers have more than two factors.
e.g. 4 is composite. Its factors are 1, 2, 4.

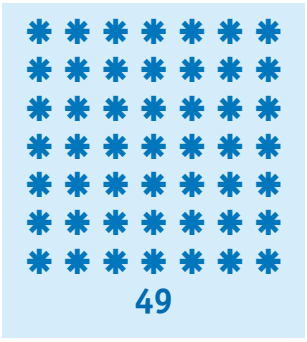
6 What is the smallest composite number larger than zero? _____

7 Is the number 1 prime or composite? _____ Explain your answer. _____

_____

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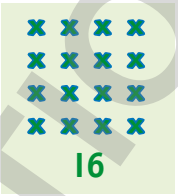
Square numbers



When **a number is multiplied by itself**, the array makes a **square.**
For example, **7 × 7 = 49** and 49 can be arranged in a square: 7 rows of 7.
We use an **exponent** to show that we want to **square** a number.
It is a **small 2** next to the number to be squared.

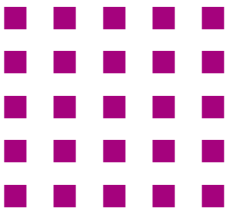
7^2 = 49 49 is a square number.

4^2 = 16 16 is a square number.



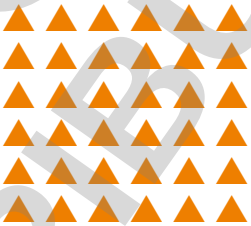
1 What do these arrays represent?

a



_____ × _____ = _____ ² = _____

b



_____ × _____ = _____ ² = _____

2 Draw the array and complete the equation.

a 1^2 = _____ × _____ = _____

b 2^2 = _____ × _____ = _____

c 3^2 = _____ × _____ = _____

d 6^2 = _____ × _____ = _____

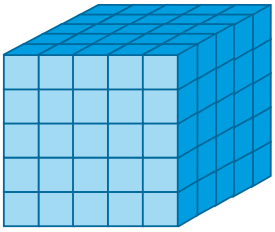
3 Fill in the table of square numbers.

1^2	2^2	3^2		5^2	6^2						
1			16			49					

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Number Number structures: Recognising square numbers and the notation for squared (²); Memorising the square numbers to 144

Cube numbers



When **a number is multiplied by itself twice**, the array makes a **cube.**
For example, **5 × 5 × 5 = 125**, which can make a cube: 5 wide by 5 long by 5 tall.
We use a different **exponent** to show that we want to **cube** a number.
It is a **small 3** next to the number.

5^3 = 125 125 is a cube number.

1 Draw the cube and complete the equation.

a 1^3 = _____ × _____ × _____
= _____

b 2^3 = _____ × _____ × _____
= _____

c 3^3 = _____ × _____ × _____
= _____

d 4^3 = _____ × _____ × _____
= _____

2 Fill in the table of cube numbers to 125.

1^3	2^3		4^3	
1		27		125

Challenge!

How many more cube numbers can you find?

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Number investigations

TERM 2
Week 2

1 Sort the numbers. Put each number into the correct group.

1, 2, 8, 9, 16, 17, 25, 27, 29, 36, 49, 53, 64, 81, 100, 125

Prime	Composite	Square	Cube

Some numbers belong in more than one group.

2 Which numbers belong in two groups? Complete the table.

Numbers	Groups

3 Is every square number composite? Give examples.

_____

4 Continue each pattern.

a Prime numbers: 2, 3, 5, 7, 11, _____, _____, _____

b Square numbers: 1, 4, 9, 16, _____, _____, _____

c Cube numbers: 1, 8, 27, _____, _____, _____

d 25, 36, 49, _____, _____, _____

e 100, 81, 64, _____, _____, _____

5 Complete these sums.

a $2^2 - 1^2 =$ _____

b $3^2 - 2^2 =$ _____

c $4^2 - 3^2 =$ _____

d $5^2 - 4^2 =$ _____

e $6^2 - 5^2 =$ _____

f $7^2 - 6^2 =$ _____

g Explain what pattern you can see in the numbers.

_____

_____

6 Which one doesn't belong? **16** **17** **25** **64** Explain.

_____

_____

Mastery Checklist I can:

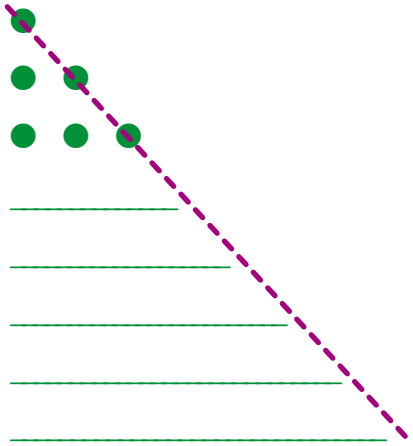
- ☐ identify prime and composite numbers
- ☐ identify square and cube numbers
- ☐ explain relationships between different types of numbers

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Triangular numbers

What are all the triangular numbers to 100?

1 Illustrate the next five triangular number using dots and addition.



1

1 + 2 = 3

1 + 2 + 3 = 6

1 + 2 + 3 + 4 = _____

a _____

b _____

c _____

d _____

e _____

TRIANGULAR NUMBERS

Triangular numbers can be arranged in the shape of a triangle with dots. There is one more in each new row.

1, 3 and 6 are triangular numbers.

2 Explain the rule for this pattern in your own words.

_____

_____

_____

3 List all the triangular numbers from 1 to 100.

_____

4 Which are triangular numbers? Circle them. 3 6 8 10 15 21 24 28 36

5 A triangular number has 10 rows of dots. Without drawing it, work out how many dots there are. Show your thinking.

Challenge! Which numbers less than 100 are:

- square and triangular?
- cube and square?

I can solve problems by:

☐ using addition ☐ recognising patterns

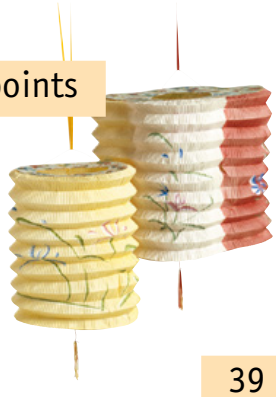
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Multiply by tens

TERM 2
Week 3

The school fair has lots of games where you can earn points.
You can redeem your points for prizes. Each prize requires the number of points shown.


65 points


63 points


17 points


39 points


84 points


45 points


98 points


76 points


32 points


30 points

1 The table shows the number of each prize redeemed by different times during the day.
Work out how many points were used.

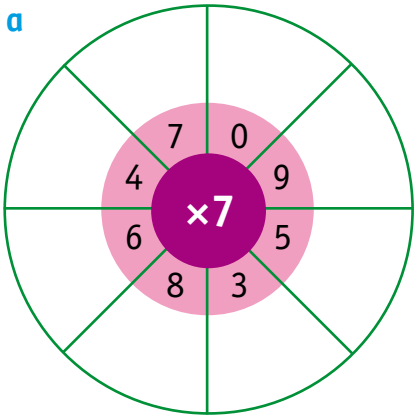
	Prize	Points each	10 am: 10 prizes	12 pm: 20 prizes	2 pm: 30 prizes	5 pm: 50 prizes
a	Iceblock	65				
b	Fortune cookie	17				
c	Piñata	98				
d	Party hat	32				
e	Umbrella	45				
f	Candle	39				
g	Lei	84				
h	Mask	76				
i	Balloons	30				

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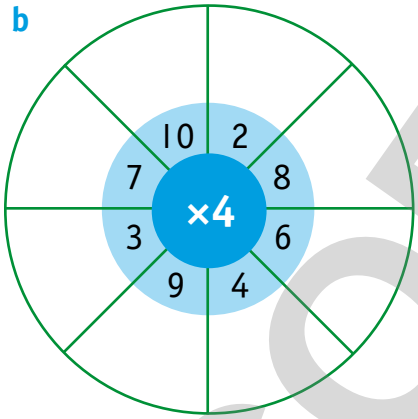
Multiply by a 1-digit number

1 Complete.

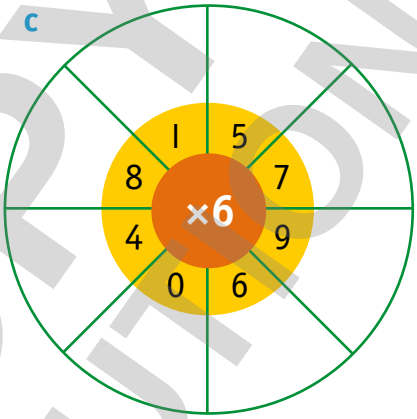
a



b



c



2 Circle the errors. Write the correct numerals in red.

a
$$\begin{array}{r} 67 \\ \times\ 9 \\ \hline 606 \end{array}$$

b
$$\begin{array}{r} 81 \\ \times\ 5 \\ \hline 486 \end{array}$$

c
$$\begin{array}{r} 95 \\ \times\ 5 \\ \hline 425 \end{array}$$

d
$$\begin{array}{r} 46 \\ \times\ 4 \\ \hline 174 \end{array}$$

e
$$\begin{array}{r} 30 \\ \times\ 6 \\ \hline 186 \end{array}$$

3 Multiply. Show your working.

a $\begin{array}{r} 723 \\ \times\ 3 \\ \hline \end{array}$ **b** $\begin{array}{r} 815 \\ \times\ 6 \\ \hline \end{array}$ **c** $\begin{array}{r} 936 \\ \times\ 4 \\ \hline \end{array}$ **d** $\begin{array}{r} 268 \\ \times\ 7 \\ \hline \end{array}$

e $\begin{array}{r} 519 \\ \times\ 8 \\ \hline \end{array}$ **f** $\begin{array}{r} 457 \\ \times\ 5 \\ \hline \end{array}$ **g** $\begin{array}{r} 641 \\ \times\ 9 \\ \hline \end{array}$ **h** $\begin{array}{r} 392 \\ \times\ 2 \\ \hline \end{array}$

Multiplying 3-digit numbers

$$\begin{array}{r} {}^{3}7{}^{1}62 \\ \times\ 5 \\ \hline 3810 \end{array}$$

4 Multiply. Remember that zero is a place holder.

a $\begin{array}{r} 103 \\ \times\ 7 \\ \hline \end{array}$ **b** $\begin{array}{r} 970 \\ \times\ 3 \\ \hline \end{array}$ **c** $\begin{array}{r} 508 \\ \times\ 8 \\ \hline \end{array}$ **d** $\begin{array}{r} 460 \\ \times\ 9 \\ \hline \end{array}$

e $\begin{array}{r} 690 \\ \times\ 6 \\ \hline \end{array}$ **f** $\begin{array}{r} 302 \\ \times\ 0 \\ \hline \end{array}$ **g** $\begin{array}{r} 890 \\ \times\ 5 \\ \hline \end{array}$ **h** $\begin{array}{r} 750 \\ \times\ 4 \\ \hline \end{array}$



Challenge!

a 3,725,061,498 × 7

b 6,029,475,138 × 9

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Multiply by 2-digit numbers

1 Use the expanded algorithm to solve each multiplication.

Estimate first. Round each number before multiplying. If your answer is very different from your estimate, check your working.

Worked example:

	²¹ 3 4 2	Est.
×	6 3	18,000
	1 0 2 6	(3 × 342)
+	2 0 5 2 0	(60 × 342)
	2 1 5 4 6	

a 498 × 25 Est. 12,500 + ____0

b 903 × 50 Est. ____ + ____0

c 373 × 24 Est. ____ + ____0

d 770 × 68 Est. ____ + ____0

e 794 × 97 Est. ____ + ____0

f 524 × 37 Est. ____ + ____0

g 195 × 26 Est. ____ + ____0



Challenge!

1 Fill in the missing digits and the answer.

a 5 0 8 × 3 2; partial products: 1 □ □ 6; 1 5 2 □ □

b 3 0 7 × 4 □; partial products: 2 1 4 9; 1 2 □ □ 0

c 8 0 □ × 6 7; partial products: □ 6 5 6; □ □ □ □ 0

d □ 0 2 × 9 6; partial products: 5 □ □ 2; 8 1 1 □ 0

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More multiplication

TERM 2
Week 3

1 Estimate each product before calculating.

a 315 est. _____
× 40
_____

b 184 est. _____
× 60
_____

c 562 est. _____
× 40
_____

475 × 80
Estimate → 500 × 8 tens
4,000 tens = 40,000
Actual → 475 × 80 = 38,000 Close!

2 Estimate first.

a 2268 est. _____
× 27
_____
_____
_____

b 4714 est. _____
× 35
_____
_____
_____

c 1952 est. _____
× 49
_____
_____
_____

278
× 27
1946 (278 × 7)
5560 (278 × 20)
7506 (total)

Estimate all answers first.

3 **a** 309
× 52
_____
_____
Est. _____

b 508
× 74
_____
_____
Est. _____

c 760
× 83
_____
_____
Est. _____

d 405
× 96
_____
_____
Est. _____

4 **a** The car park contains 209 sections of 27 car spaces each.
Joe: "That's 783 altogether!" Sol: "No, that's 5643 spaces!" Bud: "I get 2,943!"
Who is correct? _____



b Asphalt costs $29 per square metre. How much will it cost to lay 5,136 m²?
Est. _____ Cost _____

c Will printed 575 photos but only 490 were any good. At 58 cents per photo, how much money did he lose? Est. _____ Cost _____



d The post office received 36 sheets of stamps, each sheet containing 108 stamps.
How many stamps is that? Est. _____ Stamps _____

Mastery Checklist

I can:
- ☐ multiply two-digit numbers by tens mentally
- ☐ multiply one to three-digit numbers by single digits mentally and in algorithm layout
- ☐ multiply three and four-digit numbers by two-digit numbers in algorithm layout
- ☐ use rounding to estimate answers

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Multiplication of money



1 Sport Camp Shirts. A school is ordering new sports shirts.
Each sports shirt costs $24. The school needs to buy shirts for 186 students.

a Estimate the total cost.

b Work out the exact cost of the shirts.

c The school has a budget of $5,000. Will the budget be enough? _____
Explain.

2 Sport Camp Lunches. Year 6 are going to a sports camp.
There are 138 students and 9 teachers. Each person receives:



- 1 sandwich costing $5.80
- 1 drink costing $2.40
- 1 piece of fruit costing $1.30

a How many lunches are needed altogether?

b Estimate the total cost.

c Work out the exact cost of providing lunch for everyone.

I can solve problems by:

☐ estimating before calculating ☐ choosing efficient multiplication strategies

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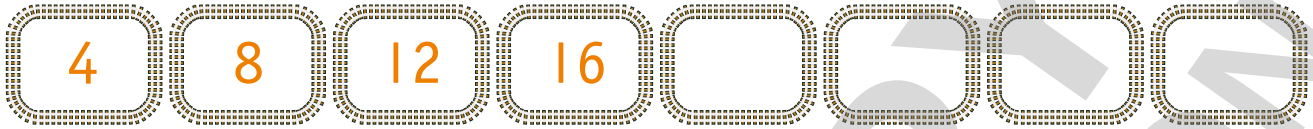
Number Operations: Multiplying any whole number by a two-digit number; **Number** Financial mathematics: Investigating questions involving purchases

Number patterns

TERM 2
Week 4

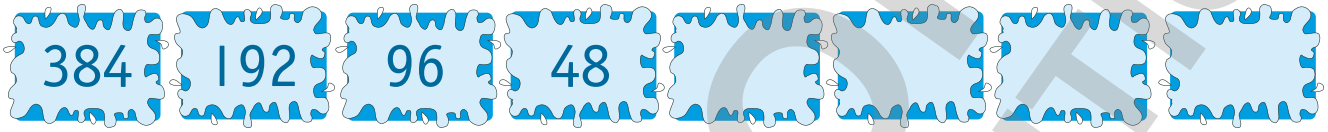
1 Work out the rule and then complete the pattern.

a



Rule _____

b



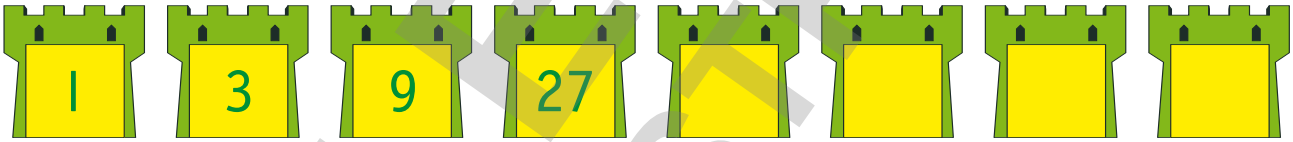
Rule _____

c



Rule _____

d



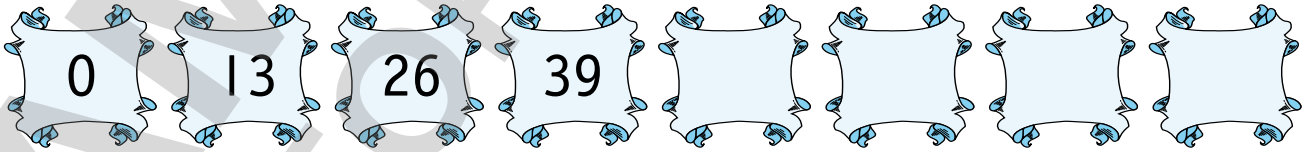
Rule _____

e



Rule _____

f



Rule _____

2 Make up two patterns. Write the first 5 numbers of each, then swap with a partner. Complete each one and write the rules.



a Rule _____



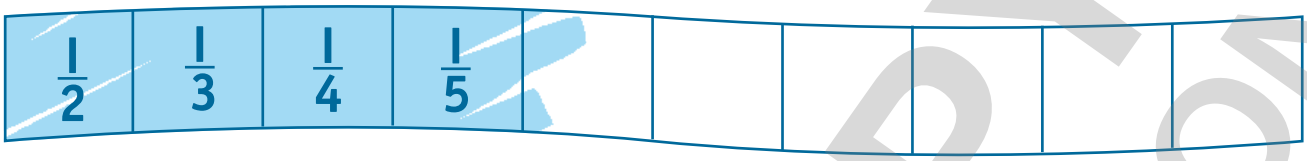
b Rule _____

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Fractions and decimals

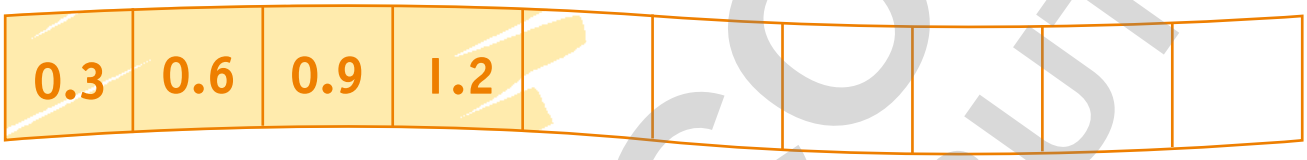
1 Complete each pattern and write the rule.

a



Rule _____

b



Rule _____

c



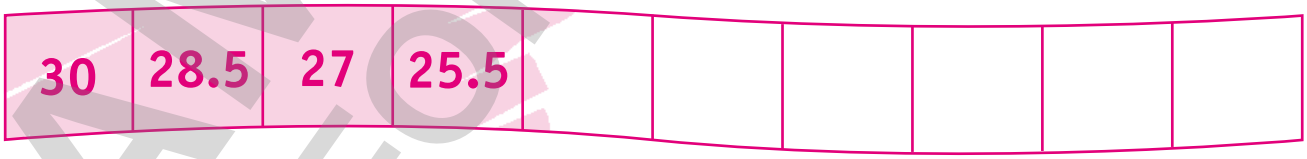
Rule _____

d



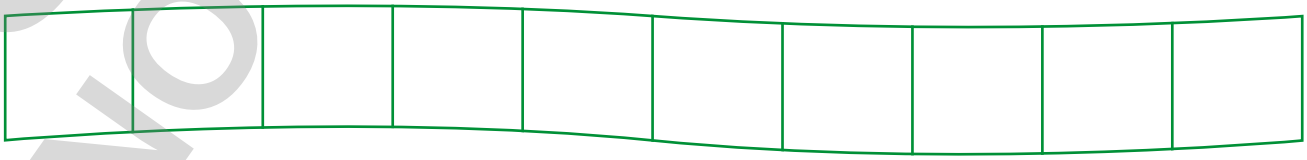
Rule _____

e



Rule _____

2 Write your own pattern.



Rule _____

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Following patterns

Complete each pattern and match with its rule.

1 a 16, 25, 34, ☐, ☐, ☐ — $-\frac{2}{3}$

b 1.6, 1.9, 2.2, ☐, ☐, ☐ — + 9

c $6\frac{1}{3}$, $5\frac{2}{3}$, 5, $4\frac{1}{3}$, ☐, ☐, ☐ — + 0.002

d 0.15, 0.25, 0.35, ☐, ☐, ☐ — + 0.3

e 0.729, 0.731, 0.733, ☐, ☐, ☐ — + 0.08

f 2.4, 2.48, 2.56, ☐, ☐, ☐ — + 0.1

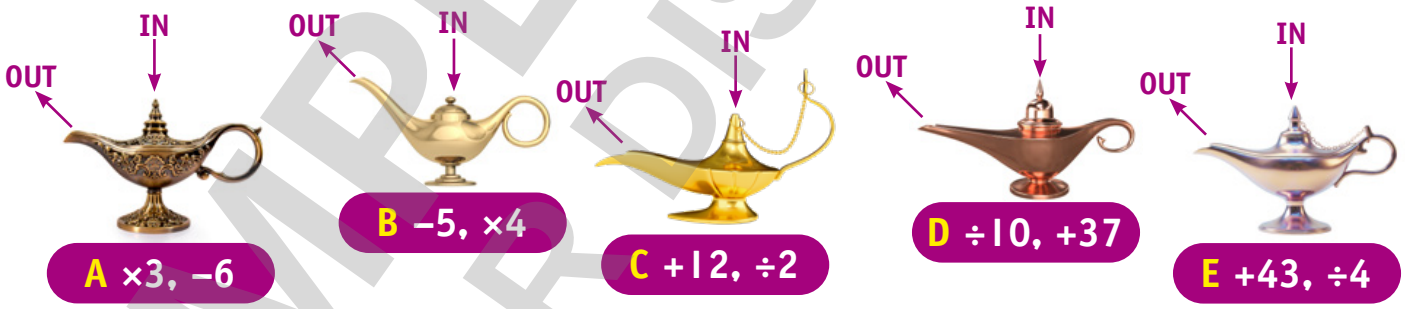
2 Make up three patterns and write their rules.

a ☐ ☐ ☐ ☐ ☐ ☐ → ☐

b ☐ ☐ ☐ ☐ ☐ ☐ → ☐

c ☐ ☐ ☐ ☐ ☐ ☐ → ☐

3



Each lamp changes numbers by performing different operations. What numbers come out if:

a 5 is put in? A _____ B _____ C _____ D _____ E _____

b 20 is put in? A _____ B _____ C _____ D _____ E _____

c 12 is put in? A _____ B _____ C _____ D _____ E _____

d 0 is put in? A _____ B _____ C _____ D _____ E _____

e 43 is put in? A _____ B _____ C _____ D _____ E _____

4 Tick all the rules that could make this pattern.

a 2, 5, 8, 11, 14

- ☐ Add 3
- ☐ Double then subtract 1
- ☐ Add 2 then add 1
- ☐ Multiply by 2

b 9, 19, 39, 79

- ☐ + 10, + 20, + 40
- ☐ Double then add 1
- ☐ Add 20
- ☐ Multiply by 2, then add 1

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Inverse operations

Inverse operations

An inverse operation reverses the effect of another operation.

20 − 17 = 3 and 3 + 17 = 20

4 × 5 = 20 and 20 ÷ 5 = 4

1 Write the inverse operation (number sentence) to solve:

a ? − 7 = 6 _____ **b** 19 + ? = 26 _____

c ? + 15 = 24 _____ **d** 25 + ? = 32 _____

e ? × 9 = 54 _____ **f** ? ÷ 9 = 4 _____

g ? ÷ 6 = 8 _____ **h** ? ÷ 9 = 7 _____

2 Check the answer for each one using inverse operations.

a ☐ + 7 = 11
☐ = _____
Check _____

b 9 × ☐ = 72
☐ = _____
Check _____

c 49 ÷ ☐ = 7
☐ = _____
Check _____

d ☐ − 9 = 8
☐ = _____
Check _____

e 36 − ☐ = 15
☐ = _____
Check _____

f 43 + ☐ = 62
☐ = _____
Check _____

g ☐ ÷ 9 = 11
☐ = _____
Check _____

h 53 × ☐ = 159
☐ = _____
Check _____

i 19 × ☐ = 76
☐ = _____
Check _____

j 164 ÷ ☐ = 41
☐ = _____
Check _____

k ☐ + 62 = 91
☐ = _____
Check _____

l ☐ − 24 = 51
☐ = _____
Check _____

m ☐ × 9 = 108
☐ = _____
Check _____

n 43 + ☐ = 106
☐ = _____
Check _____

o 155 − ☐ = 82
☐ = _____
Check _____

p ☐ ÷ 3 = 62
☐ = _____
Check _____

q 91 ÷ ☐ = 13
☐ = _____
Check _____

r ☐ × 20 = 360
☐ = _____
Check _____

s ☐ − 115 = 171
☐ = _____
Check _____

t 112 ÷ ☐ = 7
☐ = _____
Check _____

3 **a** 16 + 9 − 9 = ____ **b** 24 − 14 + 14 = ____ **c** 63 − 21 + 21 = ____ **d** 55 − 25 + 25 = ____

e 84 − 19 + 19 = ____ **f** 100 + 37 − 37 = ____ **g** 92 − 17 + 17 = ____ **h** 77 + 29 − 29 = ____

i Explain your answers. _____

j Write a rule. _____

4 **a** 3 × 4 ÷ 4 = ____ **b** 10 × 7 ÷ 7 = ____ **c** 9 × 6 ÷ 6 = ____ **d** 8 × 7 ÷ 7 = ____

e 8 ÷ 2 × 2 = ____ **f** 20 ÷ 5 × 5 = ____ **g** 80 ÷ 8 × 8 = ____ **h** 63 ÷ 9 × 9 = ____

i Explain your answers. _____

j Write a rule. _____

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Algebra Equations and relationships: Checking the truth of and completing open number sentences that involve all four operations

Algebra

1 Write a number sentence equivalent to the one given, e.g. 31 + 4 = 27 + 8.

a 17 + 12 = _____ **b** 2 × 16 = _____ **c** 60 ÷ 5 = _____

d 27 − 13 = _____ **e** 6 × 15 = _____ **f** 16 × 4 = _____

2 What is my value?

a ■ + 6 = 18 − 3
■ = _____

b 8 × ■ = 45 + 11
■ = _____

c ★ ÷ 9 = 4 × 2
★ = _____

d 53 + 24 = ▲ × 11
_____ = ▲

e 90 ÷ 9 = 17 − ✸
_____ = ✸

f 36 + 8 = ✦ × 4
_____ = ✦

g ★ + 37 = 100 − 19
★ = _____

h 94 − ✺ = 38 + 17
✺ = _____

i 7 × 3 = 63 ÷ ▲
_____ = ▲

j 86 − 59 = ■ ÷ 2
_____ = ■

k 204 ÷ 4 = ★ + 21
_____ = ★

l 147 ÷ ✺ = 73 − 52
✺ = _____

USE THE CLUES **Turn the words into a number sentence.**
Use a letter or a symbol to represent the unknown number.

I'm thinking of a number which is 100 less than the product of 60 and 3. What is my number? x = (60 x 3) - 100 x = 80

		Equation
3	**W** is 15 more than the product of 7, 3 and 4.	**W** = _____
4	❤ is the sum of 25, 24 and 23 divided by three.	❤ = _____
5	When I take 18 away from the product of 8 and 10, I get **Z**.	**Z** = _____
6	If I obtain the quotient of 72 and 18, then add 14 minus 6, my answer is ▲.	▲ = _____

Challenge!

Find one set of numbers that fit these clues.

■ = ☐ ▲ = ☐ ● = ☐

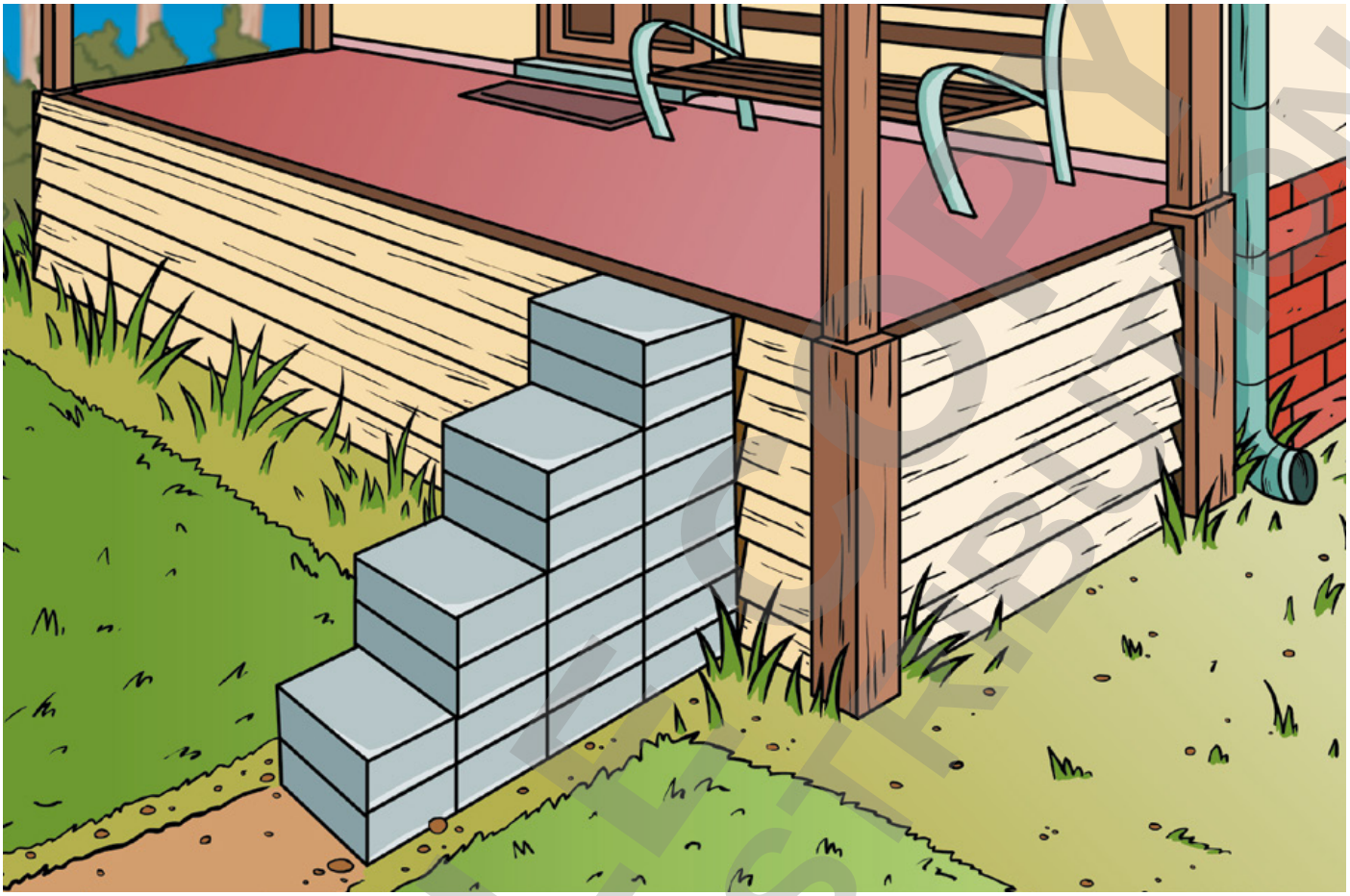
● + ● = ▲
■ − ▲ = ●
▲ + ▲ + ▲ = ■ + ■
● + ● + ● = ■

Mastery Checklist

I can:
- ☐ find the rules for and continue number patterns
- ☐ work with whole numbers, fractions and decimals in patterns
- ☐ use inverse operations to find a missing number
- ☐ use inverse operations to check answers

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Step patterns



Jon built these cement block steps up to his verandah.

1 How many blocks did he use for:

a the 1st step? _____ b the 2nd step? _____ c the 3rd step? _____ d the 4th step? _____

2 Jon has to build a higher set of steps for his brother.
Fill in this table to help him in his planning.

Step	1	2	3	4	5	6	7	8	9	10
Number of blocks										

3 a Describe in words the number pattern made by the blocks. _____

_____

b What kind of number pattern is this? _____

_____

c Write the rule using numerals. _____

4 How many blocks would Jon use to build:

a the 15th step? _____ b the 20th step? _____ c the 100th step? _____

5 How many blocks did he use altogether to build: a 4 steps? _____ b 10 steps? _____

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Using a table

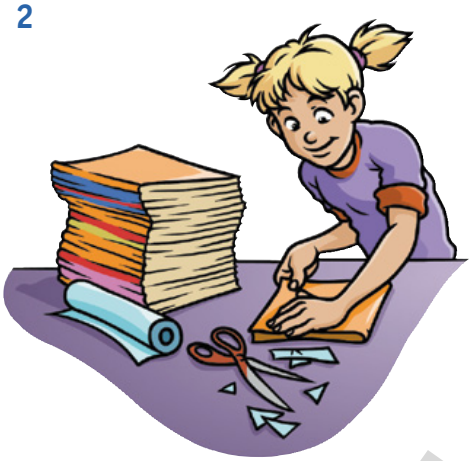
1 Jared has 30 apricots. The first day he eats 2. Each day after that, he eats 2 more than the day before. Complete the table. Keep a running total to find when he will finish eating all 30 apricots.



How many days did it take? _____

Day	1	2	3				
Apricots eaten	2	4	6				
Total eaten so far	2	6					

2



Anita has to cover 60 books. The first day she covered 24. Each day after that, she covered 6 fewer than the day before. Complete the table. Keep a running total to find when she has covered all 60 books.

How many days did it take? _____

Day						
Books covered						
Total books covered						

3 Darak is building towers. The first tower has 5 blocks.
Every tower after that uses 5 more blocks than the tower before it.



Tower						
Number of blocks						

a How many blocks did the 6th tower use? _____

b How many blocks are used altogether to build the 6 towers? _____

4



Class 5M collected money for the local children's charity. The first week they collected $70. Every week after that they collected $9 less than the week before.

Week								
Amount								

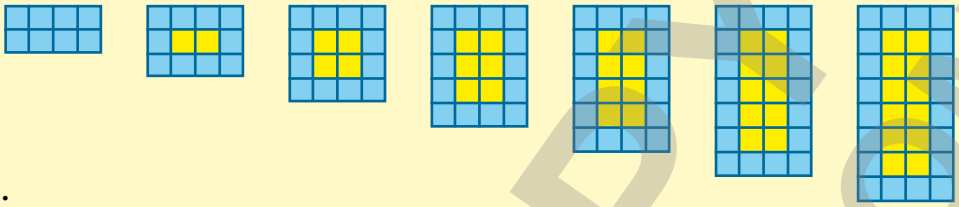
a How much did they collect in the 7th week? _____

b They stopped after week 8.
How much had they collected altogether? _____

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Tables and patterns

A pattern is made using blue and yellow tiles.
Here are some patterns of different sizes.
All patterns are 4 tiles wide.



1 In a pattern that is 5 squares long:

a how many blue tiles are needed? _____ b how many yellow tiles are needed? _____

c how many tiles are needed altogether? _____

2 Complete the table.

Length of pattern in tiles	2	3	4	5	6	7	8	9	10
Number of blue tiles needed	8								
Number of yellow tiles needed	0								

3 In a pattern that is 15 tiles long, how many:

a blue tiles are needed? _____ b yellow tiles are needed? _____

4 How many tiles long is the pattern if there are:

a 40 blue tiles? _____ b 40 yellow tiles? _____

5 a Complete the table to show the perimeters of joined 3 cm squares.



Joined squares	1	2	3	4	5	6
Perimeter	12 cm					

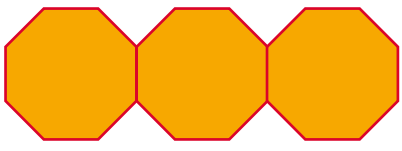
b Write the rule for the perimeters of joined squares.

_____

c What would be the perimeter of twelve joined squares? _____

Draw a diagram

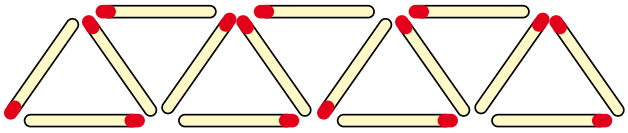
Repeat question 5. Use regular hexagons with 2 cm sides.
Make a table to show the perimeters.



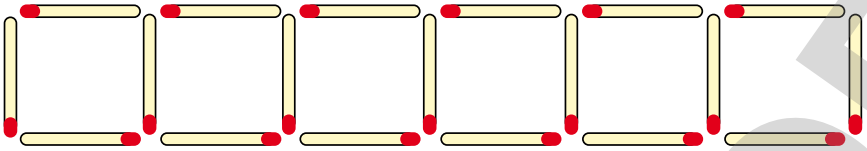
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Stick patterns

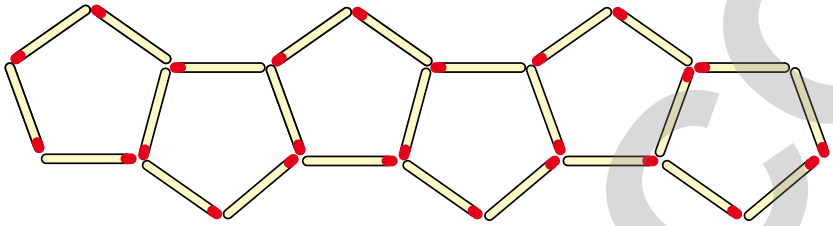
A



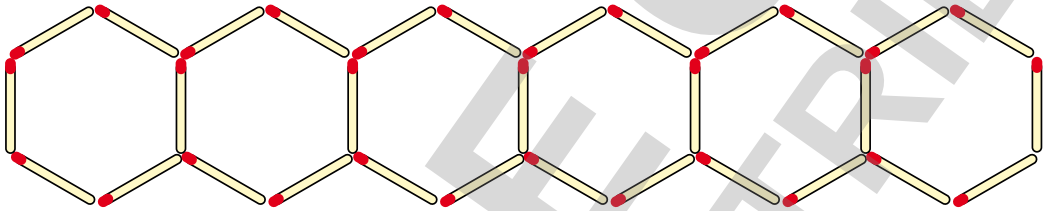
B



C



D



Complete the table for each pattern from 1—10 shapes.

A

Number of shapes	1									
Number of sticks	3									

B

Number of shapes	1									
Number of sticks	4									

C

Number of shapes										
Number of sticks										

D

Number of shapes										
Number of sticks										

Mastery Checklist

I can: ☐ find the rule to continue a growing pattern
☐ complete a table of values for a growing pattern

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Checkpoint 3

1 Find two prime numbers that add to make 30.

Write your answers in the boxes.

$\square + \square = 30$

2 Complete the series.

a prime numbers >10 and <30

11, ☐

b composite numbers >18 and <30

20, ☐

3 Sort the numbers:

25, 28, 45, 49, 81, 55, 66, 121

square numbers:

☐

triangular numbers:

☐

4 The shaded numbers are all:

20	21	22	23	24
25	26	27	28	29
30	31	32	33	34
35	36	37	38	39
40	41	42	43	44

Shade one bubble.

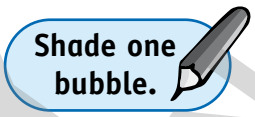
composite ◯ prime ◯ factors of 100 ◯ multiples of 3 ◯

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Checkpoint 3

5 What are the prime factors of 60?

Shade one bubble.



2 × 3 × 5 ○ 2 × 15 × 3 ○ 2 × 2 × 3 × 5 ○ 30 × 2 ○

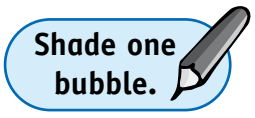
6 **a** 703 × 4 **b** 638 × 25 **c** 743 × 26

Write your answers.

7

$$8\overline{)752} = 94$$

Shade one bubble.



To check this answer, which inverse operation would you use?

8 × 752 ○ 752 ÷ 8 ○ 94 × 8 ○ 752 × 94 ○

8 What is the missing term in this pattern?

30, 29.44, 28.88, _____, 27.76

28.22 ○ 27.23 ○ 28.32 ○ 27.56 ○

9 Jiro bought 5 kg of sausages at $11.98 per kg.

Rounded to the nearest dollar, how much did that cost?

$55 ○ $60 ○ $59.90 ○ $59 ○

SAMPLE COPY NOT FOR DISTRIBUTION

Division facts

YEAR 7
Boys 23
Girls 25

YEAR 1
Boys 19
Girls 17

YEAR 2
Boys 15
Girls 20

YEAR 3
Boys 31
Girls 23

YEAR 4
Boys 29
Girls 35

YEAR 5
Boys 31
Girls 32

YEAR 6
Boys 36
Girls 36

These are the enrolments for Dividy school. Write the total for each year in each panel.

Teachers like to form groups for various activities.



A group of 2.

1 Which years can form exact groups of:

a 2? _____

b 3? _____

c 4? _____

d 5? _____

e 6? _____

f 7? _____

g 8? _____



A group of 8.

2 Which year can make separate boys and girls groups of:

a 5? _____ b 4? _____ c 3? _____

3 What exact groups can you make in your class? _____

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Divide mentally

Work mentally.

1 Divide these by 10.

a 70 _____	**b** 90 _____	**c** 100 _____
d 130 _____	**e** 47 _____	**f** 69 _____
g 84 _____	**h** 91 _____	**i** 52 _____
j 131 _____	**k** 128 _____	**l** 375 _____
m 480 _____	**n** 619 _____	**o** 927 _____

Some tricks

To ÷ by 10
cross off the last number (it is the remainder).
e.g. 73 ÷ 10 = 7 r 3

To ÷ by 5
divide by 10 and double.
e.g. 72 ÷ 5 = 7 r 2
(double 7) = 14 r 2

2 Divide these by 5.

a 80 _____	**b** 90 _____	**c** 110 _____	**d** 240 _____	**e** 160 _____
f 61 _____	**g** 54 _____	**h** 102 _____	**i** 311 _____	**j** 423 _____
k 480 _____	**l** 263 _____	**m** 370 _____	**n** 127 _____	**o** 235 _____

3 Divide these by 2.

a 36 _____	**b** 90 _____	**c** 68 _____
d 76 _____	**e** 144 _____	**f** 268 _____
g 183 _____	**h** 371 _____	**i** 692 _____

More tricks
(with even numbers)

To ÷ by 2
halve the number.
84 ÷ 2 = 42

To ÷ by 4
halve then halve again.
124 ÷ 2 = 62 ÷ 2
= 31

To ÷ by 8
halve, halve and halve.
96 ÷ 2 = 48 ÷ 2
= 24 ÷ 2 = 12

4 Divide these by 4.

a 64 _____	**b** 76 _____	**c** 92 _____
d 108 _____	**e** 216 _____	**f** 252 _____
g 340 _____	**h** 165 _____	**i** 286 _____

5 Divide these by 8.

a 112 _____	**b** 120 _____	**c** 136 _____
d 176 _____	**e** 168 _____	**f** 272 _____
g 360 _____	**h** 409 _____	**i** 724 _____



6 Jo and Terry were sorting the school supplies. They shared:

a 390 exercise books between 10 classes. How many each? _____

b 165 pencils between 4 classes. How many each? _____

How many were left over? _____

c 104 rulers between 8 classes. How many each? _____

d 97 tennis balls between 5 classes. How many each? _____

How many left over? _____

7 Write a division story for your class to solve. _____

_____

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Dividing by 1 digit

Division signs

÷ e.g. 10 ÷ 5 = 2

) e.g. 4) 12 (3

Division algorithm

95 ÷ 4 = 23 r 3

4) 95
15

Steps:

1 9 ÷ 4 = 2 r 1

2 Bring the 1 down

3 15 ÷ 4 = 3 r 3

1 Write the answers.

a

	35	63	7	42	14	56	70	21	49	28
÷ 7										

b

	24	4	36	8	20	28	12	40	16	32
÷ 4										

c

	36	72	45	90	27	81	54	18	63	9
÷ 9										

2

a 4) 76 **b** 5) 95 **c** 7) 94 **d** 6) 87

e 3) 84 **f** 8) 89 **g** 4) 83 **h** 5) 58

3

a 5) 609 **b** 3) 734 **c** 4) 857 **d** 9) 996 **e** 6) 689

f 7) 792 **g** 4) 877 **h** 3) 955 **i** 2) 737 **j** 6) 883

4 Rewrite using the) sign and then work out the answers.

a 74 ÷ 3

3) 7 4

b 59 ÷ 4 **c** 795 ÷ 5 **d** 837 ÷ 6

e 920 ÷ 8 **f** 765 ÷ 9 **g** 624 ÷ 4 **h** 907 ÷ 7

Challenge!

The answers to three division problems are: **172, 309** and **460 r 5.**

What could the division algorithms be?

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Number Operations: Dividing up to five-digit whole numbers by a one-digit divisor, with a remainder; Representing remainders from division as whole numbers

Division algorithms

TERM 2
Week 6

1 Colour the numbers that are exactly:

a divisible by 2.

84 29 76 138 221 610 905

b divisible by 10.

90 110 245 103 680 301 500

c divisible by 5.

95 83 170 502 151 315 132

d divisible by 3.

63 81 35 72 133 213 105

e divisible by 4.

116 220 114 208 318 340 132

Divisibility

A number is divisible by:

2 if it is even.

3 if the sum of its digits is divisible by 3.
e.g. 174 → 1 + 7 + 4 = 12
12 is divisible by 3 so 174 is divisible by 3.

4 if the last 2 digits are divisible by 4.
e.g. 516 → 16 is divisible by 4 so 516 is divisible by 4.

5 if it ends in 0 or 5.

10 if it ends in 0.

2 Before solving, tick the divisions that will have no remainder.

a $4\overline{)693}$

b $5\overline{)560}$

c $6\overline{)678}$

d $7\overline{)896}$

e $2\overline{)748}$

f $4\overline{)564}$

g $5\overline{)705}$

h $6\overline{)696}$

i $4\overline{)836}$

j $5\overline{)549}$

k $3\overline{)692}$

l $7\overline{)914}$

m $6\overline{)582}$

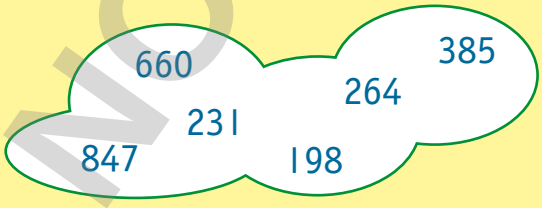
n $8\overline{)965}$

o $9\overline{)658}$

p $5\overline{)706}$

Challenge!

Find the greatest number that will divide into every number in the cloud with no remainder.



Mastery Checklist

I can:
- ☐ make equal groups
- ☐ use different strategies for mental division
- ☐ solve division with remainders
- ☐ complete division algorithms
- ☐ explore divisibility

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Testing divisibility

1 These numbers must cross the river. They can only move down or across onto numbers they divide into exactly. Colour their paths.

4 7 8 9

48	34	49	64	59	54	96
120	217	207	128	182	108	
146	92	182	233	304	351	319
216	274	357	520	345	414	
308	526	406	514	912	726	297
656	654	735	530	736	855	

2 At the school fair, customers can buy lucky tickets for $5.
They can win prizes depending on how many factors their ticket has.

divisible by three factors – $10	divisible by four factors – $50

Which three ticket numbers over one hundred would you want to buy?

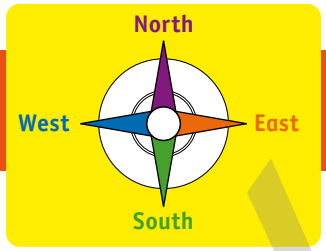
Why?

I can solve problems by:

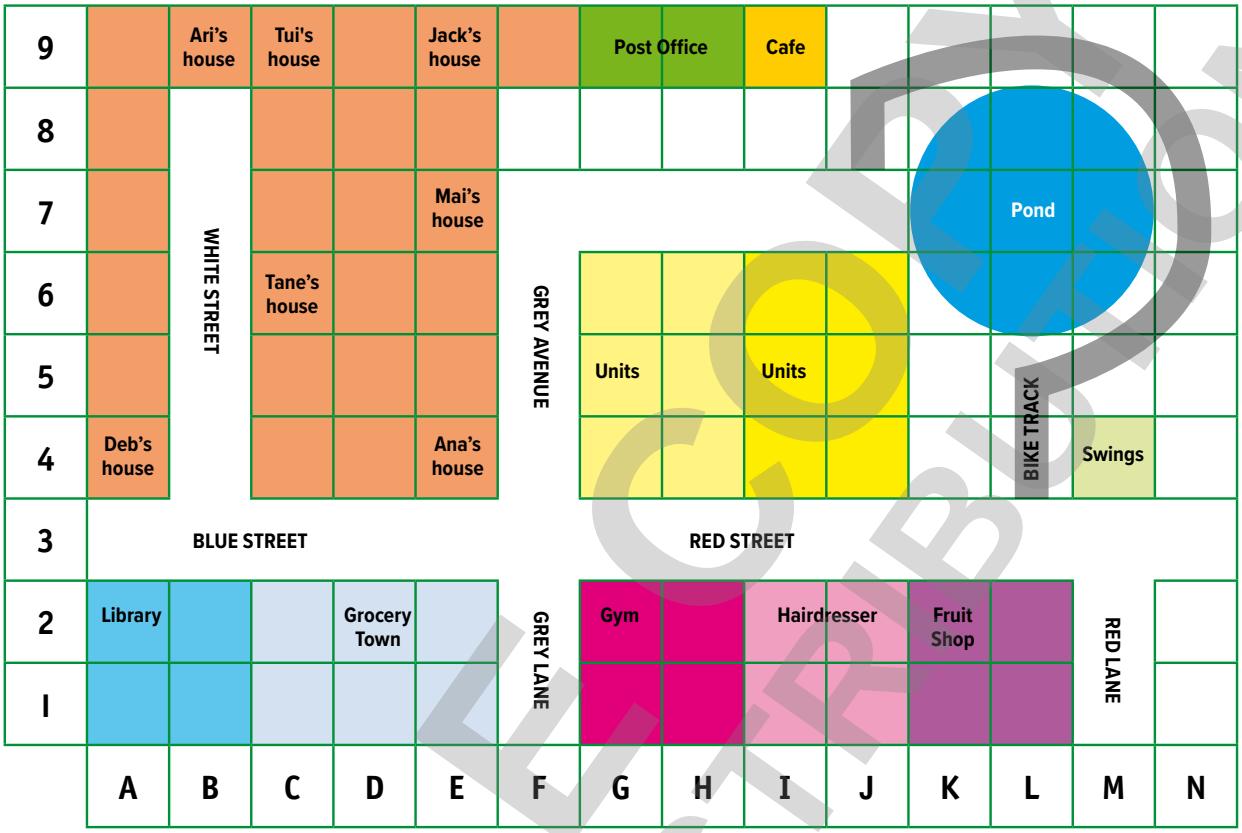
☐ using division ☐ writing algorithms

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Grid references

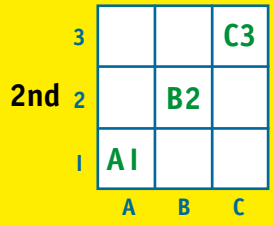


TERM 2
Week 7



Grid references

Read the column (letter) first, then the row (number).



1 Write the grid reference for these places.

a Ari's house _____ b Swings _____

c Cafe _____ d Library _____

e Mai's house _____ f Gym _____

g Deb's house _____ h Tane's house _____

2 What is located at each grid reference?

a E4 _____ b H5 _____

c J2 _____ d L8 _____

e D2 _____ f F2 _____

g B7 _____ h K2 _____

i C3 _____ j G9 _____

3 Write all the grid references for the pond. _____

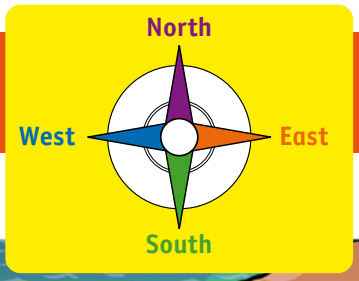
4 Follow the directions. Start at Ari's house. Move 3 squares east, 7 squares south, 2 squares west. Where do you finish? _____

5 Write directions from the Library to the Fruit Shop using north, south, east and west.

_____

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Map reading





This is a map of Bliss Point and Reco Island.

1 What will you find at:

a **B1**? _____ b **H3**? _____ c **I4**? _____

d **D3**? _____ e **J7**? _____ f **E7**? _____

2 Give two different grid references for:

a the shipwreck. _____ b the castle. _____ c the motel. _____

d the bridge. _____ e the kiosk. _____ f the school. _____

3 Give two different grid references for:

a the cliffs. _____ b Beauty Beach. _____ c the lake. _____

4 Name one place or features that is:

a north of the lighthouse. _____ b south of the castle. _____

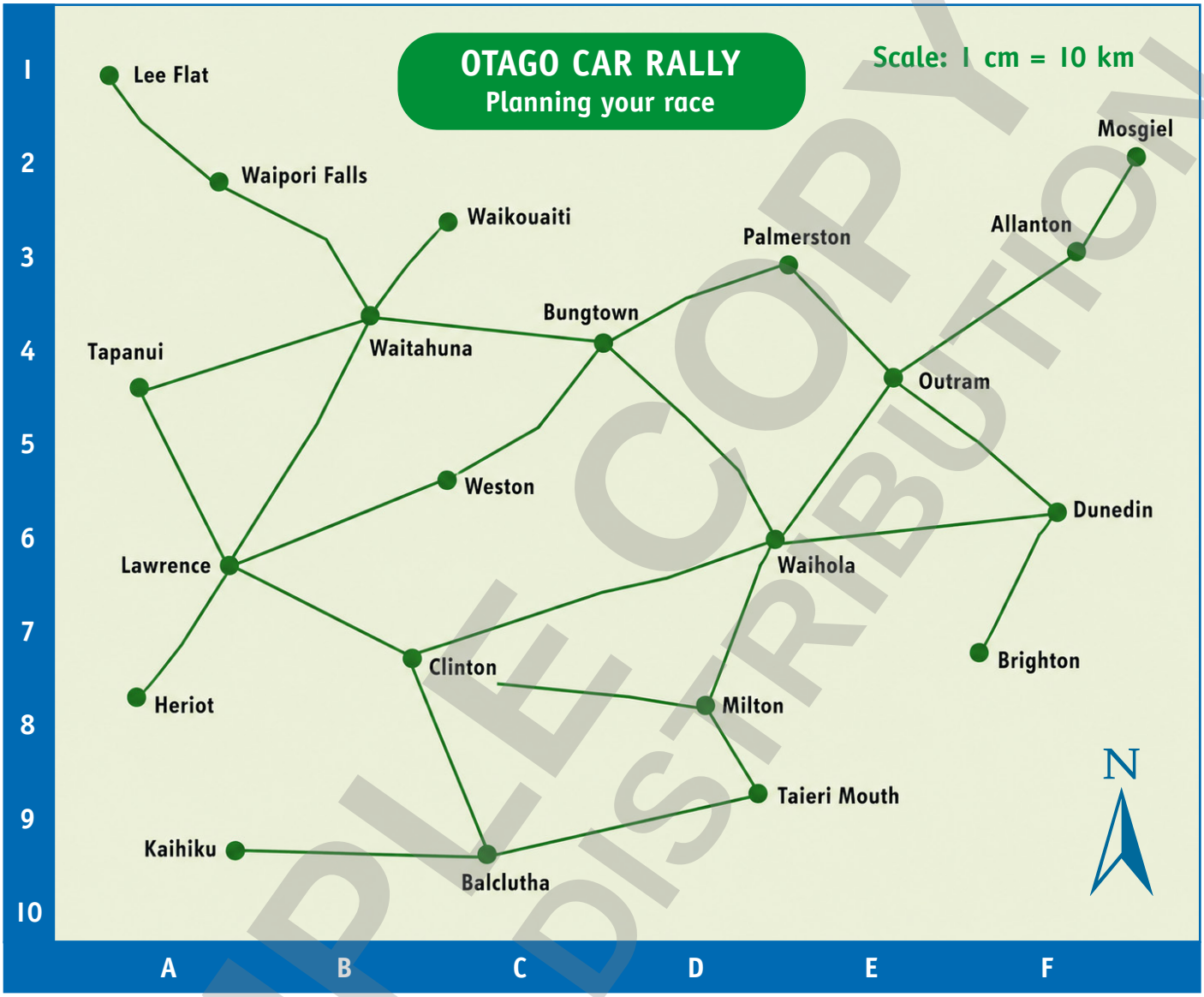
c east of Ferry Street Wharf. _____ d west of Beauty Beach. _____

e north of the library. _____ f east of the kiosk. _____

g north of the store. _____ h south of the motel. _____

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Distance and scale



1 Use the scale. 1 cm represents _____ km.

2 Write the grid references for: a Bungtown _____ b Outram _____ c Milton _____

3 What is the straight-line distance from Mosgiel to:

a Outram? _____ b Waihola? _____

4 A rally crew travels from Mosgiel to Lawrence, passing through Outram and Waitahuna.

a What is the straight-line distance from Mosgiel to Lawrence? _____

b What is the distance along the roads? _____

5 What is the straight-line distance from Lawrence to Milton? _____

6 Write directions for travelling from Lawrence to Milton using the roads shown on the map.

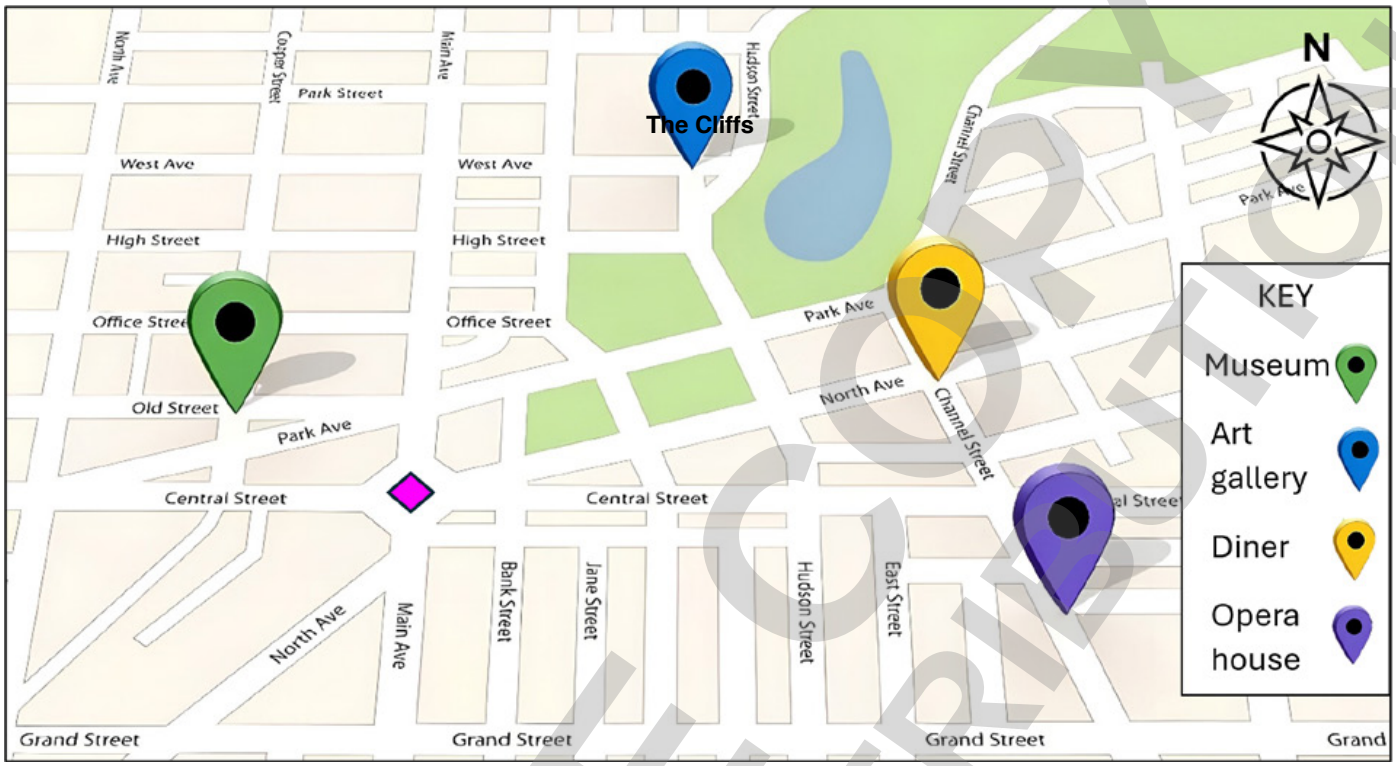
_____

7 Measure each section of your route. What is the total distance? _____

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Directions

TERM 2
Week 7



1 I stand right in the middle of the intersection of Central St and Main Ave, looking north.

a If I turn 90° to my left, what street am I looking up now? _____

b If I then turn 195° anticlockwise, what street am I looking up now? _____

2 To walk from here to the Art gallery, the following directions were given:
Walk east along Central Street, turn left onto Hudson Street, and head south.
The Art gallery is at the intersection with High Street.

a Circle where the directions went wrong.

b Write the correct directions: _____

_____

3 Complete these directions.

From the Art gallery, walk to the end of West Avenue and into the park. When you get to the lake, go _____ until you reach Park Avenue. Turn _____ and head up Park Avenue, then turn right at _____ Street. Head down to the intersection with _____ Avenue to find the Diner for lunch.

After lunch, continue down Channel Street to _____ Street. Head _____ on Central Street to the intersection with Main Avenue. At this intersection turn _____ and head _____. Turn onto Old Street and walk _____ until you arrive at the Museum.

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Geometry Pathways: Interpreting simple scales on maps, using directional language including the four main compass points, turn (in degrees), and distance (in m, km) to locate and describe positions and pathways

Make a map

TERM 2
Week 7

1 Label the columns and rows to create grid references for your map.

2 Choose a scale for your map: 1 cm = _____ km

3 Fill in the map from your imagination. Draw whatever type of landscape you like.
Name the places. Use a Key with symbols for common features.

4 Write 3 questions to go with your map.

a How far is it from _____ to _____?

b Write directions from _____ to _____.

c Follow these directions. Where do you end up?

Start at _____ and go _____

_____

_____

_____

5 Swap with a buddy and complete each other's questions.



Mastery Checklist

I can:
- ☐ use grid references to identify places on a map
- ☐ use compass points and degrees of turn for directions
- ☐ use scale to calculate distances

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Time units



60 seconds = 1 minute
60 minutes = 1 hour
24 hours = 1 day
7 days = 1 week

1 year = 365 or 366 days
1 decade = 10 years
1 century = 100 years
1 millennium = 1,000 years



1 Complete these statements.

a 14 days is a _____.

b 1 month can be _____ days.

c A leap year is _____ days. It happens _____.

2 Change seconds to minutes.

a 180 sec ÷ 60 = _____ min

b 360 sec ÷ 60 = _____ min

c 600 sec ÷ 60 = _____ min

d 2,400 sec ÷ 60 = _____ min

3 Change minutes to seconds.

a 4 min × 60 = _____ sec

b 9 min × 60 = _____ sec

c 12 min × 60 = _____ sec

d 30 min × 60 = _____ sec

4 Change hours to minutes.

a 2 hrs × 60 = _____ min

b 7 hrs × 60 = _____ min

c 11 hrs × 60 = _____ min

d 50 hrs × 60 = _____ min

5 Change minutes to hours.

a 300 min ÷ 60 = _____ hrs

b 480 min ÷ 60 = _____ hrs

c 1,200 min ÷ 60 = _____ hrs

d 4,200 min ÷ 60 = _____ hrs

6 How many hours?

a 2 days × 24 = _____ hrs

b 3 days × 24 = _____ hrs

c 5 days × 24 = _____ hrs

d 10 days × 24 = _____ hrs

7 How many weeks?

a 28 days ÷ 7 = _____ wks

b 77 days ÷ 7 = _____ wks

c 210 days ÷ 7 = _____ wks

d 350 days ÷ 7 = _____ wks

8 How many years?

a 4 millennia × _____ = _____ yrs

b 8 centuries × _____ = _____ yrs

c 7 decades × _____ = _____ yrs

d 12 millennia × _____ = _____ yrs

9 How many days?

a 4 years: _____ = _____ days

b 8 years: _____ = _____ days

c 1 decade: _____ = _____ days

d 96 hours: _____ = _____ days

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24-hour time

TERM 2
Week 8









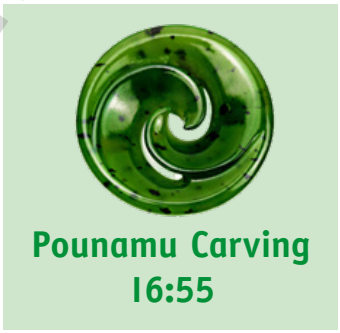












The local community centre is running a Community Skills Day with free workshops. Each poster shows the time the workshop begins. Every workshop lasts 1 hour 30 minutes.

1 Write the workshops in time order, from earliest to latest.

a _____ b _____ c _____ d _____

e _____ f _____ g _____ h _____

i _____ j _____

2 Which workshops start before midday? _____

_____

3 Jack arrives at 13:10. Which is the first workshop he can attend from the start?

_____

4 a Aroha wants to attend Photography and one other afternoon workshop. She does not want to miss any part of either workshop. Which other workshop should she choose to have the shortest break between them?

_____

b How long is the break between the end of Aroha's first workshop and the start of her next workshop?

_____

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Changing times

Look at page 87.

am stands for ante meridiem which means before midday.
pm stands for post meridiem which means after midday.

1 Write all the times in am or pm time from earliest to latest.

_____

_____

2 What time will these classes end? Use 24-hour time.

a Bird Watching _____ b Pottery _____

c Cupcake Decorating _____ d First Aid _____

e Harakeke Weaving _____ f Photography _____

g Waka Paddling _____ h Pounamu Carving _____



3 If Mala attends Photography what is the next class she can attend? _____

4 Write these times using am or pm.

a 09:00 _____ b 14:00 _____ c 22:00 _____ d 13:00 _____

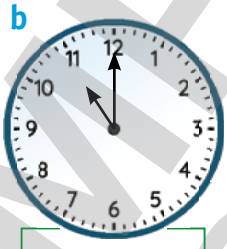
e 20:20 _____ f 23:40 _____ g 10:10 _____ h 16:15 _____

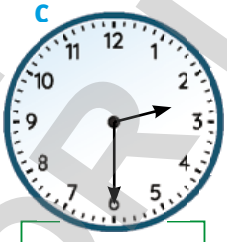
24-hour time
always uses 4 digits.
1 pm can be written as 13:00 or 1300.
1 am can be written as 01:00 or 0100.

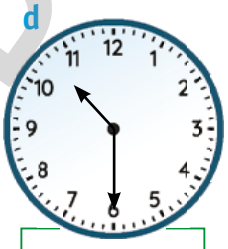
5 Write these times using 24-hour time.

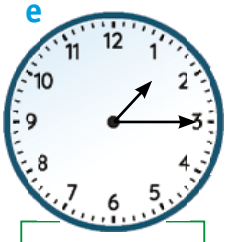
These are am times.

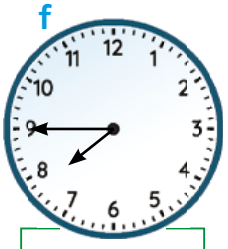
a  :

b  :

c  :

d  :

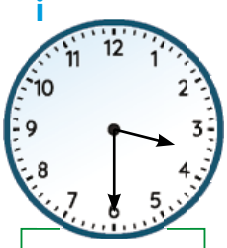
e  :

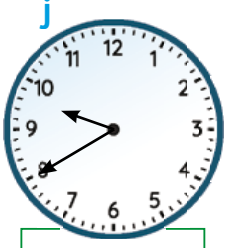
f  :

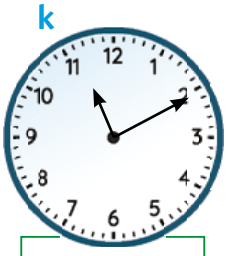
These are pm times.

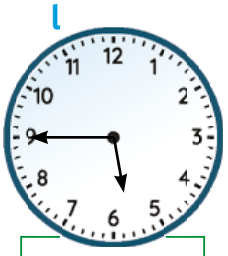
g  :

h  :

i  :

j  :

k  :

l  :

Challenge! Choose a time and write it in words. How many other ways can you represent this time?

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Timetable

Location	Ferry A	Ferry B	Ferry C	Ferry D
Northside Wharf	1150	1215	1240	1305
University Gardens Wharf	1154	1219	1244	
Eastwood Wharf	1159	1224	1249	
Great Dome Hotel Wharf	1205	1230	1255	
Star Street Wharf	1214	1239	1304	
Westside Wharf	1219	1244	1309	
Kew Bridge Wharf	1231	1256	1321	
State Park Wharf	1235	1300	1325	
City Central Wharf	1240	1305	1330	

This is part of the timetable for the river ferries in a busy city.
Use am and pm notation to answer these questions.

1 When does:

a **Ferry A** leave Eastwood? _____ b **Ferry B** leave State Park? _____

c **Ferry C** leave Westside? _____ d **Ferry A** leave Kew Bridge? _____

2 How long does it take:

a **Ferry A** to travel from Westside to Kew Bridge? _____

b **Ferry C** to travel from Westside to Kew Bridge? _____



3 How long is the trip from:

a Northside to University Gardens? _____ b Great Dome Hotel to Star Street? _____

c Kew Bridge to City Central? _____ d Star Street to State Park? _____

e Eastwood to City Central? _____ f University Gardens to Kew Bridge? _____

g How long is the whole trip? _____ h How long would a return trip be? _____

4 Complete the timetable for **Ferry D**.

5 What is the longest time you have to wait for a ferry at:

a University Gardens? _____ b Great Dome Hotel? _____ c Kew Bridge? _____

6 Jerry has to be at City Central at twenty-five past one.

What is the latest ferry he can catch from Star Street? _____



Challenge!

Work with a friend. Make up a transport timetable for an unusual form of transport, such as an airboat, seaplane or reindeer sleigh. Make the locations interesting. Use 24-hour time.



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Itineraries

1 Ruby is going on a cruise. She is planning her itinerary. Using the timetable, write the times Ruby can do her chosen activities.

a Bingo: _____ to _____

b Art auction: _____ to _____

c Lunch buffet: _____ to _____

d Ice cream: _____ to _____

e Trivia: _____ to _____

f Dinner at Oh La La: _____ to _____

g Captain's welcome: _____ to _____

h Glamour theme night: _____ to _____

2 Archie is going on the same cruise. What time can he do his preferred activities?

a Breakfast: _____ to _____

b Ice cream: _____ to _____

c Basketball: _____ to _____

d Teen meet-up: _____ to _____

e Gym class – Pump: _____ to _____

f Art class: _____ to _____

3 Are there any activities Archie may not be able to do due to timetable clashes with another activity? Explain.

_____

_____

_____

Challenge!

Write your own itinerary for a day on the cruise.



Mastery Checklist

I can:
- ☐ convert between time units
- ☐ read and interpret timetables
- ☐ convert between 12 and 24-hour time
- ☐ calculate elapsed time

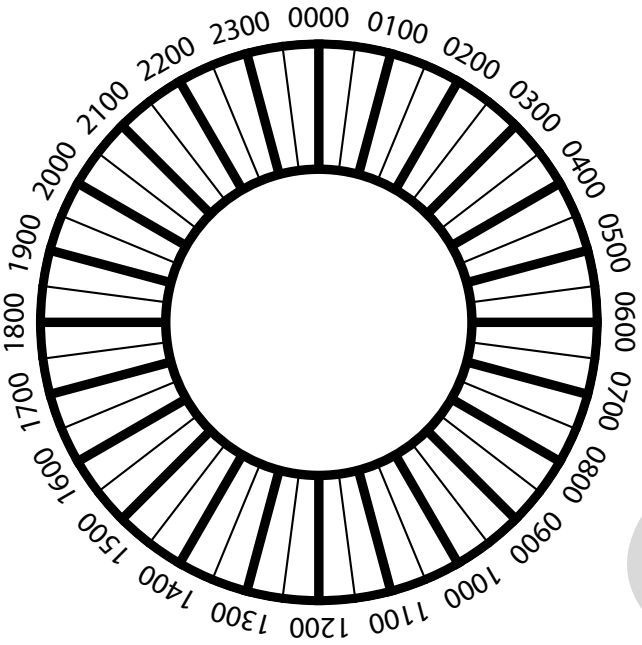
Welcome Aboard Princess M Cruises

TIMETABLE: ACTIVITIES FOR TODAY

9:00 am	Stretch class
9:00 am	Morning walk
9:30 am	Breakfast: La Viva Cafe
9:30 am	Trivia session 1
9:30 am	Gym class – Cardio
10:00 am	Bingo session 1
10:00 am	Library
10:15 am	Art auction
10:30 am	Splash competition
11:15 am	Trivia session 2
12:00 pm	Lunch buffet
12:30 pm	Ice cream open
1:00 pm	Basketball
1:00 pm	Name that song
2:00 pm	Gym class – Step
2:30 pm	Ice cream open
3:00 pm	Cafe Blue open
3:30 pm	Teen meet-up
4:00 pm	Kids dance party
5:00 pm	Bingo Session 2
6:00 pm	Oh La La dinner session 1
6:00 pm	Gym class – Stretch
6:30 pm	Ice cream open
7:00 pm	Captain's welcome
7:00 pm	Art class
7:30 pm	Gym class – Pump
8:00 pm	Oh La La dinner session 2
8:30 pm	Disco nights
9:00 pm	Glamour theme night
* All activies 1 hour duration	
* All dinner sessions 2 hours	

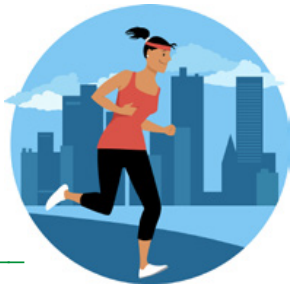
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Time



Colour	Time	Activity
☐	5:00 am – 6:45 am	Morning run
☐	6:45 am – 8:00 am	Breakfast, get ready for work
☐	8:00 am – 8:45 am	Drive to work
☐	8:45 am – 5:00 pm	Work
☐	5:00 pm – 5:45 pm	Drive home
☐	5:45 pm – 7:00 pm	Gym session
☐	7:00 pm – 7:30 pm	Shower
☐	7:30 pm – 8:15 pm	Have dinner
☐	8:15 pm – 10:00 pm	Watch TV and read
☐	10:00 pm – 5:00 am	Sleep

Carla is training for a marathon.



1 Colour each segment in the chart to show how she spends her day. Use a different colour for each activity.

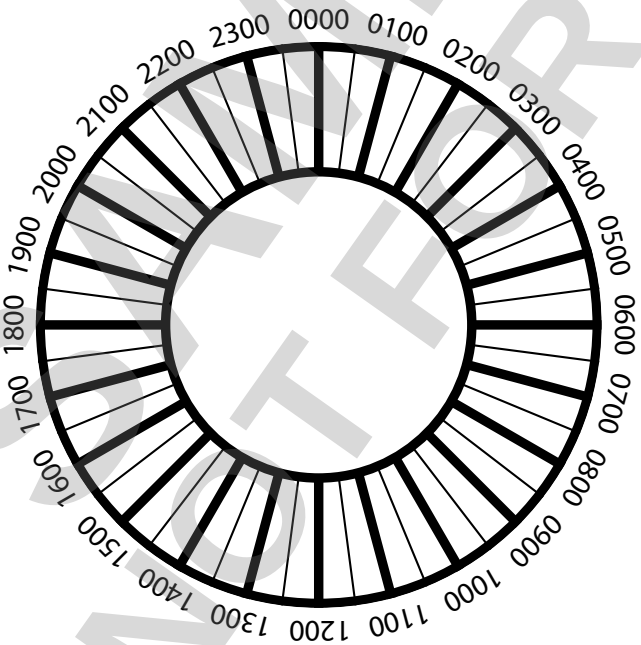
2 How long does Carla spend on each type of activity?

a Exercising _____ b Driving _____

c Sleeping _____ d Free time _____

e Self care (eating, showering etc) _____ f Work _____

3 Fill in the chart below for one of your school days. 4 Fill in the table with your activities.

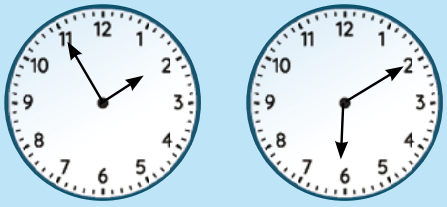


Colour	Activity	Duration

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Elapsed time

Elapsed time is how much time has passed between 2 different times.
To work out the **difference between 2 times**, count the hours and then the minutes.



1:55 pm to 6:10 pm

1:55 to 5:55 = 4 hours
5:55 to 6:10 = 15 minutes
Total elapsed time is 4 hours and 15 minutes.

1 Work out the time elapsed.

a 7:25 am and 8:56 am = _____ h _____ min

b 6:34 am and 8:56 am = _____ h _____ min

c 5:56 pm and 11:04 pm = _____ h _____ min

d 2:14 am and 2:12 pm = _____ h _____ min

e 10:45 am and 3:23 pm = _____ h _____ min

f 3:05 am and 10:24 pm = _____ h _____ min

g 5:36 am and 9:09 am = _____ h _____ min

h 6:45 am and 1:24 pm = _____ h _____ min

2 Calculate the time each shift ends and write it in 24-hour time.

a Meg starts at 4:30 am. She works for five hours and fifteen minutes. What time does she clock out? **a** [:]

b Jay starts at 9:55 am. He works for three hours and fifty-five minutes. What time does he clock out? **b** [:]

c Bob starts at 11:28 pm. He works for nine hours and fifty-six minutes. What time does he clock out? **c** [:]

d Lyn starts at 1:45 pm. She works for twelve hours and twelve minutes. What time does she clock out? **d** [:]

3 Show your calculations to solve the problem below.

A limousine driver needs to pick up a movie star from the airport at 6:15 pm. Before he leaves he needs to spend 25 minutes washing the car and 10 minutes changing into his uniform. The drive from home into the airport takes 45 minutes.

a Calculate the latest time the driver should start getting ready so he arrives at the airport on time?

_____

b The driver leaves for the airport twenty minutes ahead of schedule. What time does he leave?

_____

c On the way to the airport, he gets caught in a traffic jam which extends his journey by forty-five minutes. What time does the limousine driver arrive at the airport?

_____

d The flight that the movie star is on arrives thirty minutes late. Will she have to wait for the driver?

_____

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Measurement Measuring: Measuring duration in both 12- and 24-hour time systems; Finding elapsed time in minutes across an hour

Measuring time



We can use a **timer** or a stopwatch to measure amounts of time. Timers **start at 00:00** and count up in seconds and minutes.

This stopwatch shows **1** minute and **33** seconds.



1 Write each time in minutes and seconds. Then work out how many seconds in each time.

a 02 : 15 = _____ mins _____ secs = _____ secs

b 06 : 08 = _____

c 12 : 59 = _____

d 24 : 23 = _____

2 What is the new time? Show it on the timer.

a 1 min 20 secs + 35 secs [:]

b 5 min 12 secs + 48 secs [:]

c 19 min 5 sec – 40 secs [:]

d 30 secs + 1 min 45 secs [:]

3 **a** Order these from shortest to longest times.

4 : 58	5 : 43	3 : 24	4 : 29	5 : 45	3 : 25
:	:	:	:	:	:

b Then work out the difference between the shortest and longest time. _____

4 The timer currently shows 97:36. How much longer can it run before it reaches 99:59?

_____



5 The timer can show a maximum of 99:59. Which of these activities could be timed using this timer?

a a flight that takes 1 hr 35 min.

b a movie that runs for 1 hr 41 min.

c a fun run: 1 hr 38 min.

d a concert that lasts 1 hr 44 min.

SAMPLE COPY
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Duration

3	6	5	10	1
4	7	9	8	2



Work with a partner. Time each other with a stopwatch or timer as you complete the following tasks.

1 **Tick each card above in numerical order.**

a Your time [:] b Your partner's time [:]

c Who was faster? _____

2 **Circle each even number in numerical order.**

a Your time [:] b Your partner's time [:]

c Who was faster? _____

3 **Repeat one of the tasks.**

a Estimate how long you will take this time. _____ seconds.

b Time yourself. _____ seconds

c How close was your estimate? _____ seconds

4 a Estimate how long you think it will take you to do the following activities.

b Time each other as you complete each activity.

Activity	a Estimate	b Time
Recite the 6 times table		
Count to 150		
Write the alphabet 3 times		

5 Tick the activities where your estimate was within 5 seconds of the actual time.

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Time problem

Penny gets an allowance from her parents when she completes all her chores. They let her choose how she wants to be paid. Which option should she choose and why?

Option 1: Receive $50 on the first of each month

Option 2: Receive $12 each Sunday

Option 3: Receive $45 on each full moon

Use the calendar to work out which option is better and explain your reasoning.

Full moon

JANUARY

S	M	T	W	T	F	S
				1	2	
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

FEBRUARY

S	M	T	W	T	F	S
	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28

MARCH

S	M	T	W	T	F	S
1	2		4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

APRIL

S	M	T	W	T	F	S
			1		3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

MAY

S	M	T	W	T	F	S
						2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

JUNE

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28		30				

JULY

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28		30	31	

AUGUST

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27		29
30	31					

SEPTEMBER

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	
27	28	29	30			

OCTOBER

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25		27	28	29	30	31

NOVEMBER

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23		25	26	27	28
29	30					

DECEMBER

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23		25	26
27	28	29	30	31		

Working

Penny should choose option _____ because _____

_____

_____

I can solve problems by:

☐ understanding how calendars work ☐ calculating amounts of money

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Checkpoint 4

1 **a**
$$\begin{array}{r} 374 \\ 19 \\ +\ 208 \\ \hline \\ \hline \end{array}$$

b
$$\begin{array}{r} 9538 \\ -\ 5219 \\ \hline \\ \hline \end{array}$$

p 36

2 Write the first 5 multiples of: p 51

a 9 _____ _____ _____ _____ _____

b 11 _____ _____ _____ _____ _____

3 **a** 85 × 3 = _____ p 52

b 250 × 4 = _____

4 **a** 120 ÷ 8 = _____ p 53

b 144 ÷ 6 = _____

5 p 55-56

256 762 121 5,048 96 53 71 984

Which of these numbers are:

a multiples of 8? _____

b square numbers? _____

c divisible by 2 and 3? _____

d prime numbers? _____

6 3^3 = _____ × _____ × _____ p 57

= _____

7 Draw dots to show 10 is a triangular number. p 59

8 Solve. p 61-62

a
$$\begin{array}{r} 365 \\ \times\ \ 5 \\ \hline \\ \hline \end{array}$$

b
$$\begin{array}{r} 792 \\ \times\ \ 36 \\ \hline \\ \hline \end{array}$$

c 250 × 40 = _____

d 15 × 50 = _____ p 65

9 Work out the rule and complete the pattern.

a 3, 7, 11, 15, _____, _____, _____

Rule: _____

b 1, 2, 4, 8, _____, _____, _____

Rule: _____

c 0.3, 0.6, 0.9, _____, _____, _____

Rule: _____

10 What is the missing number? p 68

a 9 × ☐ = 54

b ☐ ÷ 3 = 12

11 Complete the table. p 73

a

Number of shapes	1	2	3	4	5
Number of sticks	6	10			

b How many sticks have been used after making 8 shapes? _____

12 A class has 32 students. Which group sizes can they make with no students left over? Circle all that apply. p 76

2 3 4 5 8

13 What is the remainder when you divide 27 by 5? _____ p 77

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Checkpoint 4

p 77

14 **a** 240 ÷ 40 = _____ **b** 750 ÷ 50 = _____

c 720 ÷ 60 = _____ **d** 1200 ÷ 30 = _____

e 150 ÷ 50 = _____ **f** 630 ÷ 90 = _____

p 79

15

a $9\overline{)658}$ **b** $7\overline{)941}$

p 86

16 Complete the time conversions.

a 4 minutes = _____ seconds

b 3 hours = _____ minutes

c 5 days = _____ hours

d 6 weeks = _____ days

17 A school camp lasts for 3 days and 6 hours. How many hours is this altogether?

_____ hours

p 88

18 **a** Write 18:45 using am or pm. _____

b Write 7:20 pm using 24-hour time. _____

Ferry Stop	Ferry A	Ferry B
North Wharf	10:35	11:05
Garden Wharf	10:47	11:17
Market Wharf	11:02	11:32
City Wharf	11:20	11:50

p 89

19 **a** What time does **Ferry B** leave Market Wharf? _____

b How long does **Ferry A** take to travel from North Wharf to City Wharf?

_____ minutes

p 91

20 A movie starts at 6:35 pm and finishes at 9:20 pm. How long does the movie last?

_____ h _____ min

p 92

21 Maia needs to arrive at netball practice at 5:15 pm. It takes her 20 minutes to get ready and 35 minutes to travel there.

What time should Maia start getting ready?

_____

Scale: 1 cm = 5 km



p 81-84

22 **a** What is located at **G3**? _____

b Write a grid reference for the lighthouse. _____

c Name one place that is north of the library.

_____

23 Use north, south, east or west to complete each statement.

a The school is _____ of the store.

b The kiosk is _____ of the library.

c The church is _____ of the castle.

24 Measure the straight-line distance from the lighthouse to the library.

About how far is this in real life?

_____ km

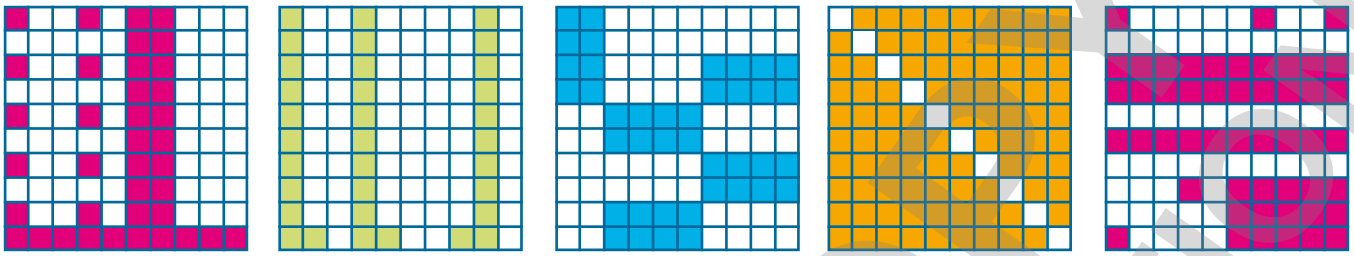
25 Draw your journey. Start at the castle. Travel south to the library, then continue south-west to the store. Where will you get to if you now go west?

_____

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Hundredths

a b c d e



1 Write the coloured part as a fraction and a decimal.

a ____/100 = _____ **b** ____/100 = _____ **c** ____/100 = _____ **d** ____/100 = _____ **e** ____/100 = _____

f Write these decimals in ascending order.

_____

2 Compare using <, > or =.

a 0.28 ☐ $\frac{28}{100}$ **b** $\frac{28}{100}$ ☐ 0.5 **c** 0.07 ☐ $\frac{7}{100}$

d $\frac{82}{100}$ ☐ 0.79 **e** 0.60 ☐ $\frac{6}{10}$ **f** $\frac{13}{100}$ ☐ 0.3

3 Write these in ascending order.

0.45 $\frac{18}{100}$ 0.08 $\frac{73}{100}$ 0.5 $\frac{39}{100}$

_____

4 True or false? Write T or F.

a 0.6 = $\frac{69}{100}$ _____ **b** $\frac{9}{100}$ is greater than 0.09 _____ **c** $\frac{75}{100}$ is less than 0.8 _____

d 0.08 = $\frac{8}{100}$ _____ **e** 0.5 is greater than $\frac{45}{100}$ _____ **f** $\frac{27}{100}$ = 0.027 _____

5 Write your own.

a A decimal greater than 0.6 but less than 0.7 _____

b A fraction with a denominator of 100 that is less than 0.25 _____

c A decimal equal to $\frac{45}{100}$ _____



6 Place these decimals on the number line.

0.08 0.35 0.47 0.63 0.9



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Fractions, decimals and percentages

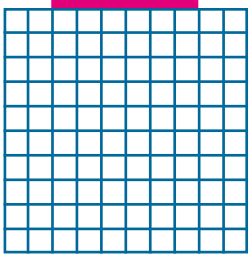
1 Complete the tables.

	Fraction	Decimal	Percent
a	$\frac{3}{10}$		
b	$\frac{45}{100}$		
c		0.6	
d			80%
e	$\frac{7}{20}$		
f	$\frac{65}{100}$		

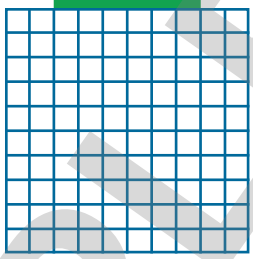
	Fraction	Decimal	Percent
g	$\frac{1}{5}$		
h	$\frac{3}{4}$		
i	$\frac{9}{10}$		
j		0.15	
k			55%
l	$\frac{16}{25}$		

2 Colour to show:

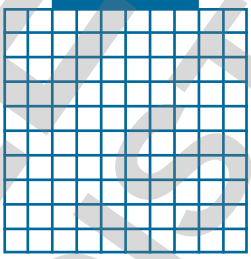
a 20%



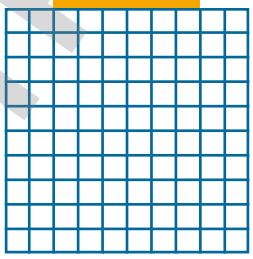
b 50%



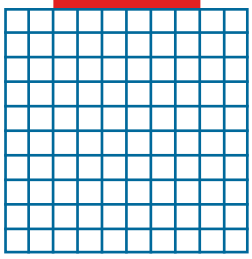
c 75%



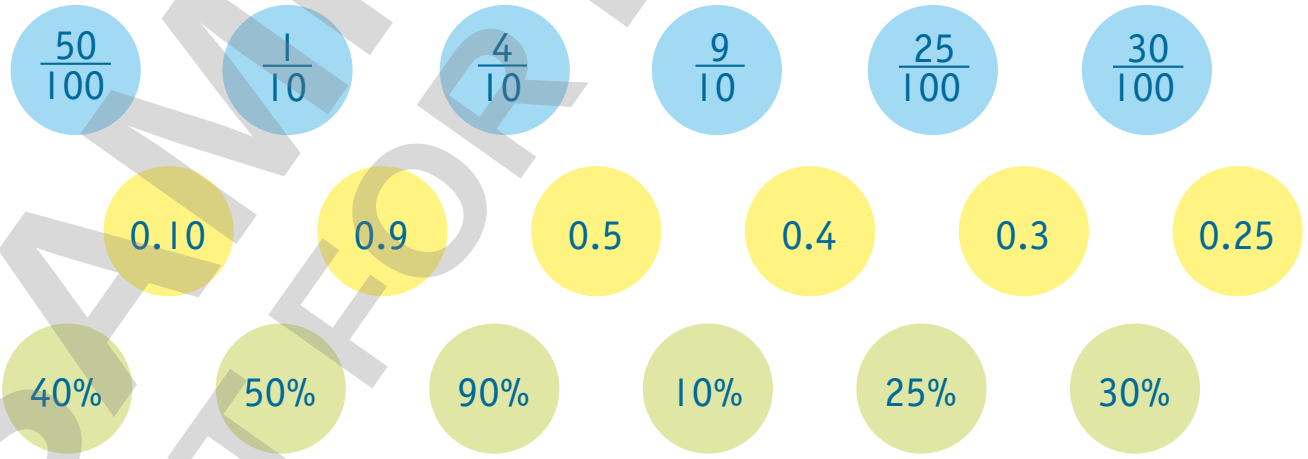
d 10%



e 80%



3 Match the fraction to its decimal and percentage.



4 Compare using <, > or =.

a 45% ☐ 0.45

b 70% ☐ $\frac{7}{10}$

c 65% ☐ 0.56

d 0.8 ☐ 80%

e $\frac{25}{100}$ ☐ 20%

f $\frac{9}{10}$ ☐ 95%

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Everyday percentages

TERM 3
Week 1

Some percentages are easy to find.

10% = divide by 10
50% = halve
25% = halve, then halve again.

5% = find 10%, then halve.

75% = find 50% and 25%. Add them together.

1 Find each amount.

a 10% of 80 = _____ **b** 25% of 40 = _____

c 50% of 68 = _____ **d** 75% of 20 = _____

e 20% of 60 = _____ **f** 5% of 200 = _____

2 Write the percentage.

a 18 out of 100 students walk to school. _____%

b 65 out of 100 books were borrowed. _____%

c 92 out of 100 trees survived. _____%

d 7 out of 100 people chose blue. _____%

3 Which is greater?

a 45% or 0.4 _____ **b** $\frac{3}{5}$ or 55% _____ **c** 0.8 or 75% _____

4 Find:

a 75% of 1 hour = _____ minutes **b** 50% of 1 minute = _____ seconds

c 20% of $30 = _____ **d** 10% of 1 decade = _____ year

e 25% of 1 dozen = _____ **f** 75% of 1 year = _____ months

5 Solve.

a 25% of a class of 32 students wear glasses. How many students is that? _____

b 50% of 96 apples were sold. How many were sold? _____

c A sports team won 80% of its 20 games. How many games did it win? _____

d A library has 100 new books. 35% are fiction. How many fiction books are there? _____

6 Three students describe one amount in different ways.

- Ava says 40%
- Tane says $\frac{2}{5}$
- Chloe says 0.4

Are these 3 amounts the same? _____ Explain your answer? _____

_____

_____

Challenge!

Write each set of cards in ascending order.

a 0.405 | 40% | $\frac{39}{100}$ | 0.395

b $\frac{4}{5}$ | 78% | $\frac{81}{100}$ | 0.805

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Number Rational numbers: Memorising decimal and percentage equivalents of common fractions (½, ⅕, ¼) including fractions with denominators that are 10 or 100; Finding common percentages of whole numbers

Calculating percentages

1 Write each percentage as an equivalent fraction, then calculate.

a 25% of $40
= $\frac{1}{4}$ of $40
= $ _____

b 20% of $50
= _____
= $ _____

c 10% of $60
= _____
= $ _____

d 50% of $120
= _____
= $ _____

e 10% of 1 metre
= _____
= _____ cm

f 50% of 1 km
= _____
= _____ m

g 20% of 10 metres
= _____
= _____ m

h 25% of 10 metres
= _____
= _____ m

i 25% of 1 hour
= _____
= _____ minutes

j 10% of 1 hour
= _____
= _____ minutes

k 50% of 1 day
= _____
= _____ hours

l 25% of 1 day
= _____
= _____ hours

DISCOUNT IS ALWAYS SUBTRACTED

2 What is the price after the discount?

a 25% OFF All skates



• $80

b 20% OFF Back to school



• $15

c 10% OFF Shirts



• $35

3 The Smiths are shopping for a new chair. They are confused by the deals offered. Calculate which chair will be the cheapest after the discount. _____

a • $1,500



Cost _____

b • $1,250



Cost _____

c • $1,600



Cost _____

Mastery Checklist

I can:
- ☐ convert between fractions, decimals and percentages
- ☐ calculate percentages of whole number amounts
- ☐ compare fraction, decimal and percentage amounts

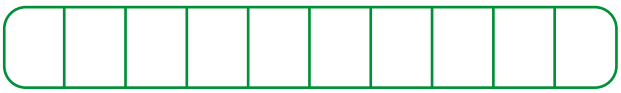
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Fractions, decimals and percentages

1 Ana has 0.65 of her battery left. Nikau has 68% of his battery left.
Tui has $\frac{7}{10}$ of her battery left. Daniel has $\frac{3}{5}$ of his battery left.

a Draw the battery level for each phone.

Ana's phone



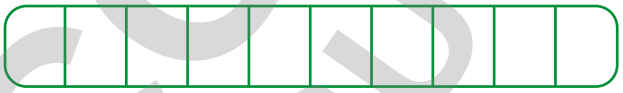
Nikau's phone



Tui's phone



Daniel's phone



b Complete the table.

Name	Percentage	Decimal	Fraction
Ana		0.65	
Nikau	68%		
Tui			$\frac{7}{10}$
Daniel			$\frac{3}{5}$

2 Whose phone has the most battery charge left? _____



3 Students are raising money for new playground equipment.

Student	Goal	Raised so far
Emma	$100	45%
Leo	$100	$\frac{3}{5}$
Mia	$100	$75
Noah	$100	0.8

a Complete the table.

Student	Fraction	Decimal	Percentage	Amount Raised
Emma			45%	
Leo				
Mia				
Noah				

b Who has raised the most money? _____

c How much more does Emma need to reach her goal? _____

d How much more does Noah need? _____

I can solve problems by:

☐ comparing fractions, decimals and percentages ☐ converting between fractions, decimals and percentages

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Prices: discounts and GST

TERM 3
Week 2

1 Fill in the missing information.

Item	Fraction	Percentage discount	$ discount	Sale price
a  $30 **20% off**	$\frac{20}{100}$	20%	$6	$30 − $6 = _____
b  $210 **50% off**				
c  $60 **25% off**				
d  $60 **10% off**				
e  $20 **75% off**				

2 Add 15% GST to each price tag.

a **Price $30**
+ 15% GST _____
Final price _____

b **Price $75**
+ 15% GST _____
Final price _____

Add GST

Cost Price	**$40**
15% GST	**+$6**
Total	**$46**

c **Price $1,200**
+ 15% GST _____
Final price _____

d **Price $500**
+ 15% GST _____
Final price _____

e **Price $135**
+ 15% GST _____
Final price _____

3 James likes a jacket with a full price of $120.
It is reduced by 25%.
James gets an extra 15% off the reduced price.
How much does James pay for the jacket?

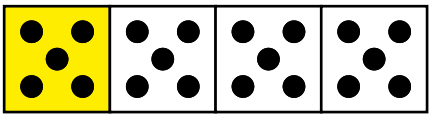
_____

4 A backpack costs $80.
Shop A: 25% off
Shop B: Save $18
Which shop has the better deal?

_____

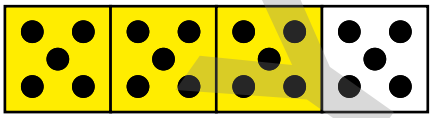
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Fractions of amounts



$\frac{1}{4}$ means divide by 4.

$\frac{1}{4}$ of 20 = 20 ÷ 4 = 5



To find $\frac{3}{4}$ of 20:

20 ÷ 4 = 5 then 5 × 3 = 15

1 Mark each fraction of a metre on the number line. Write each amount in centimetres.



a $\frac{1}{2}$ m = _____ cm b $\frac{1}{4}$ m = _____ cm c $\frac{1}{10}$ m = _____ cm

d $\frac{3}{10}$ m = _____ e $\frac{2}{10}$ m = _____ f $\frac{8}{10}$ m = _____

2 Mark the fractions of a kilometre and write how many metres.



a $\frac{1}{2}$ km = _____ m b $\frac{1}{5}$ km = _____ m c $\frac{3}{5}$ km = _____ m

d $\frac{1}{10}$ km = _____ m e $\frac{1}{4}$ km = _____ m f $\frac{3}{4}$ km = _____ m

3 Mark each fraction of 20 on the number line.



a $\frac{1}{4}$ of 20 = _____ b $\frac{3}{4}$ of 20 = _____ c $\frac{1}{10}$ of 20 = _____

d $\frac{7}{10}$ of 20 = _____ e $\frac{1}{5}$ of 20 = _____ f $\frac{3}{5}$ of 20 = _____

4 Calculate the following by dividing then multiplying.

a $\frac{1}{3}$ of 15 _____ b $\frac{2}{3}$ of 21 _____ c $\frac{1}{6}$ of 30 _____

d $\frac{5}{6}$ of 36 _____ e $\frac{1}{8}$ of 48 _____ f $\frac{3}{8}$ of 40 _____

g $\frac{5}{8}$ of 56 _____ h $\frac{7}{8}$ of 64 _____ i $\frac{9}{10}$ of 70 _____

5 There are 90 children. $\frac{1}{3}$ are late and $\frac{1}{6}$ are early. How many arrive on time?

_____ late _____ early _____ on time

Challenge!

What is $\frac{1}{2}$ of $31? _____ What is $\frac{1}{4}$ of $31? _____

What is $\frac{1}{10}$ of $31? _____ What is $\frac{1}{5}$ of $31? _____

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Number Operations: Connecting finding unit fractions of whole numbers to division (with remainders);
Number Rational numbers: Finding a non-unit fraction of a whole number, using multiplication and division facts and where the answer is a whole number

Finding amounts



Find $\frac{2}{3}$ of 21 tomatoes

Number ÷ denominator × numerator

× $\frac{2}{3}$ of 21 = 14 tomatoes

÷

Find the whole given $\frac{2}{7}$ = 6 tomatoes

Number ÷ numerator × denominator

÷

× $\frac{2}{7}$ = 6, whole = 21 tomatoes

1 Work out the quantities.

a $\frac{1}{5}$ of 20 onions = _____ onions

b $\frac{1}{2}$ of 30 capsicums = _____ capsicums

c $\frac{1}{4}$ of 28 oranges = _____ oranges

d $\frac{1}{10}$ of 50 apples = _____ apples

e $\frac{1}{2}$ of 120 plums = _____ plums

f $\frac{3}{4}$ of 100 grapes = _____ grapes

g $\frac{2}{5}$ of 60 apricots = _____ apricots

h $\frac{2}{10}$ of 80 carrots = _____ carrots

i $\frac{7}{10}$ of 70 cucumbers = _____ cucumbers

j $\frac{3}{5}$ of 25 mangoes = _____ mangoes

k $\frac{5}{10}$ of 70 zucchinis = _____ zucchinis

l $\frac{4}{5}$ of 40 rockmelons = _____ rockmelons

m $\frac{6}{10}$ of 30 watermelons = _____ watermelons

n $\frac{9}{10}$ of 40 apples = _____ apples

2 Find each whole amount.

a $\frac{1}{2}$ = 13, whole = _____

b $\frac{1}{4}$ = 7, whole = _____

c $\frac{1}{5}$ = 9, whole = _____

d $\frac{3}{4}$ = 18, whole = _____

e $\frac{2}{5}$ = 16, whole = _____

f $\frac{4}{5}$ = 24, whole = _____

3 Find each whole quantity.

a $\frac{3}{5}$ of _____ sausages = 15 sausages

b $\frac{4}{10}$ of _____ bread rolls = 20 bread rolls

c $\frac{2}{5}$ of _____ onions = 8 onions

d $\frac{7}{10}$ of _____ zucchinis = 70 zucchinis

e $\frac{4}{5}$ of _____ capsicums = 8 capsicums

f $\frac{3}{10}$ of _____ olives = 18 olives

g $\frac{8}{10}$ of _____ salamis = 64 salamis

h $\frac{6}{10}$ of _____ pumpkins = 24 pumpkins

i $\frac{2}{10}$ of _____ grapefruit = 6 grapefruit



Challenge!

A school has 72 year 6 students. $\frac{5}{8}$ of them play sport.

$\frac{2}{3}$ of those students play netball.

How many year 6 students play netball? _____

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Percentages of amounts

To find a percentage:
10% of 120 = $\frac{1}{10}$ of 120
= 120 ÷ 10 = 12
12 is 10% of 120.

1 Complete the table of equivalent fractions, decimals and percentages.

Fraction	Equiv. Fraction	Decimal	Percent	of $1	of $10	of $100	of 1 m
a $\frac{1}{2}$	$\frac{\quad}{100}$			50c			50 cm
b $\frac{1}{4}$							
c $\frac{3}{4}$							
d $\frac{1}{5}$							
e $\frac{2}{5}$							
f $\frac{3}{5}$							
g $\frac{4}{5}$							
h $\frac{9}{10}$							

2 a 50% of $120 _____ b 10% of 2 km _____ c 50% of 300 _____
d 25% of 1 kg _____ e 10% of 180 _____ f 25% of 16 _____
g 300 m = 10% of _____ h $2.50 = 25% of _____ i 500 L = 5% of _____

12 fish = 10% of Miro's collection
How many altogether?
12 = $\frac{1}{10}$ of the collection
12 × 10 = 120 fish altogether

3 a 50% = 6 m. The full length is _____.
b 25% = 40 g. The total mass is _____.
c 20% = 125 L. The full amount is _____.
d 10% = $12,000. 100% is _____.

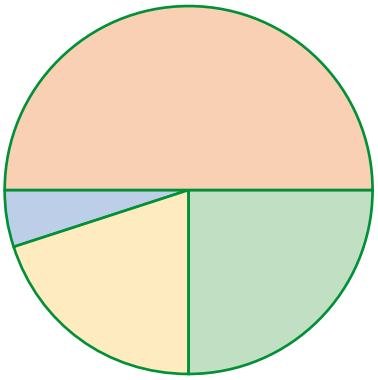
50%, 25%, 20%, 5%

4 At Tom's school 50% of all students take the bus. 20% walk to school. 25% arrive in a car. 5% ride their bikes.

a Label the pie chart at the right to show which type of transport each section represents.

b If there are 2,000 students at Tom's school, how many students take each type of transport?

Bus _____ Car _____ Bike _____ Walk _____



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Number Rational numbers: Memorising decimal and percentage equivalents of common fractions; Finding common percentages of whole numbers; Finding the whole (100%) when given a percentage; Finding equivalent fractions; **Number** Financial mathematics: Calculating 10%, 25%, and 50% of whole dollar amounts

Missing values

TERM 3
Week 2



1 In a plushie factory, 25% of the total profits are from dogs, 10% from cats, 50% from bears and _____ % from bunnies.

2 50% of the factory expenses are wages, 25% is transport and the rest is materials. If wages cost $50,000, materials cost _____.

3 Profits this year have gone down by 25%, which is a $20,000 decrease. Last year's profits were _____. This year's profits are _____.

4 Last year a chocolate factory's expenses were $460,000. This year's expenses are 10% more, a total of _____.



5 Production costs are 25% of a factory's total expenses. If production costs are $40,000, what are the total expenses? _____.

6 At an animal shelter, 20 cats make up 10% of all the animals. If 25% of the animals are dogs, how many dogs are there? _____

7 Last year, 1,500 people attended the school fete. This year, attendance increased by 20%. How many people attended this year? _____

8 Alene spent 20% of her money on a T-shirt. She now has $75 left. How much did she have to begin with? _____



9 In the Super Skater Shop, 50% of skateboards sold are dark blue, 25% are red, 10% are black, and the rest are mixed colours. If 50 skateboards are dark blue, how many skateboards sold are:

a red? _____ b black? _____ c mixed? _____

10 Write <, > or = to make these statements true.

a 50% of 20 _____ 25% of 50 b 10% of 60 _____ 50% of 20 c 25% of 1 _____ 10% of 10

d 20% of 40 _____ $\frac{1}{5}$ of 40 e $\frac{1}{2}$ of 10 _____ 20% of 5 f $\frac{1}{4}$ of 60 _____ 50% of 20

g 0.6 of 80 _____ 50% of 90 h 0.75 of 40 _____ 25% of 100 i 10% of 300 _____ 0.2 of 600

11 Write a percentage to make these statements true.

a 25% of 16 > _____ of 20 b 20% of 30 = _____ of 60 c 10% of 320 < _____ of 200

d 50% of 28 < _____ of 20 e 10% of 80 > _____ of 100 f 20% of 25 = _____ of 50

g 10% of 120 = _____ of 60 h 25% of 44 < _____ of 60 i 50% of 220 > _____ of 300

Mastery Checklist

I can:
- ☐ calculate percentages of amounts
- ☐ calculate fractions of amounts
- ☐ find the whole, given a fraction
- ☐ find the whole, given a percentage

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Metric units

Metric prefixes

centi- = one-hundredth ($\frac{1}{100}$) of the base unit (e.g. 1 centimetre (cm) = $\frac{1}{100}$ of a metre)

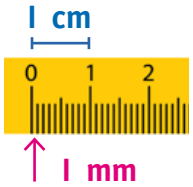
milli- = one-thousandth ($\frac{1}{1,000}$) of the base unit (e.g. 1 millimetre (mm) = $\frac{1}{1,000}$ of a metre)

kilo- = 1,000 times larger than the base unit (e.g. 1 kilometre (km) = 1,000 metres)

Metric length



base unit = metre = 1 m



centimetre 1 m ÷ 100 = 1 cm

millimetre 1 m ÷ 1,000 = 1 mm



kilometre 1 m × 1,000 = 1,000 m = 1 km

1 Change metres to kilometres.

a 3,000 m ÷ 1,000 = _____ km

b 8,000 m ÷ 1,000 = _____ km

c 13,000 m ÷ 1,000 = _____ km

d 145,000 m ÷ 1,000 = _____ km

2 Change kilometres to metres.

a 4 km × 1,000 = _____ m

b 7 km × 1,000 = _____ m

c 34 km × 1,000 = _____ m

d 729 km × 1,000 = _____ m

3 Change metres to centimetres.

a 2 m × 100 = _____ cm

b 6 m × 100 = _____ cm

c 17 m × 100 = _____ cm

d 272 m × 100 = _____ cm

4 Change centimetres to metres.

a 5,000 cm ÷ 100 = _____ m

b 9,000 cm ÷ 100 = _____ m

c 56,000 cm ÷ 100 = _____ m

d 538,000 cm ÷ 100 = _____ m

5 Change metres to millimetres.

a 4 m × 1,000 = _____ mm

b 9 m × 1,000 = _____ mm

c 21 m × 1,000 = _____ mm

d 451 m × 1,000 = _____ mm

6 Change millimetres to metres.

a 7,000 mm ÷ 1,000 = _____ m

b 8,000 mm ÷ 1,000 = _____ m

c 48,000 mm ÷ 1,000 = _____ m

d 839,000 mm ÷ 1,000 = _____ m

Challenge! A walking track is 2.35 km long. How long is the track in:

metres? _____ centimetres? _____ millimetres? _____

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Measurement Measuring: Converting metric units of length (m and cm); Prefixes are added to base metric units to signify larger or smaller quantities; Converting between metric units can involve multiplying and dividing by 10, 100 or 1,000

Millimetres, centimetres, metres

millimetre mm
centimetre cm
metre m
kilometre km
10 mm = 1 cm
100 cm = 1 m
1,000 mm = 1 m
1,000 m = 1 km

1 Colour **red** the things best measured in **millimetres**, **yellow** the things best measured in **centimetres**, and **blue** the things best measured in **metres**.

a width of a pencil
b length of classroom
c width of a river
d width of a maths book
e length of a hair ribbon
f height of a pole vault
g length of a flea's leg
h length of a train



13 mm = 1·3 cm
215 cm = 2·15 m



2 Change to millimetres.

a 3 cm _____ **b** 12 cm _____
c 5.5 cm _____ **d** 6.8 cm _____

3 Change to centimetres.

a 50 mm _____ **b** 72 mm _____ **c** 98 mm _____ **d** 160 mm _____
e 385 mm _____ **f** 2 m _____ **g** 5.91 m _____ **h** 12.04 m _____

4 Change to metres.

a 700 cm _____ **b** 1,200 cm _____ **c** 815 cm _____ **d** 372 cm _____
e 5,813 cm _____ **f** 2 m 61 cm _____ **g** 11 m 15 cm _____ **h** 17 km _____



5 **a** Estimate the length in millimetres of the sides on these regular shapes. Estimate the perimeter.
b Measure the length of one side. Calculate the perimeters.

	a Estimation			**b Measurement**		
	Side length	**Number of sides**	**Perimeter**	**Side length**	**Number of sides**	**Perimeter**
A						
B						
C						
D						

6 Convert the measured perimeters to centimetres.

A _____ **B** _____ **C** _____ **D** _____

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Kilometres

TERM 3
Week 3

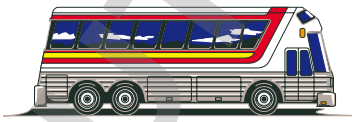
1 Estimate the distance travelled by each person in kilometres.





kilometre (km)
1 km = 1,000 m
Long distances are measured in kilometres.

2 Colour the distances you would measure in kilometres.



a the length of a bus

b the distance to Australia

c the width of the playground

d your height

e the length of a river

f the length of the North Island

g the width of a road

3 Change to kilometres.

a 5,600 m = _____ km

b 1,250 m = _____ km

c 9,075 m = _____ km

d 15,350 m = _____ km

e 36,025 m = _____ km

4 Change to kilometres and metres.

a 3,275 m = ___ km _____ m

b 8,746 m = ___ km _____ m

c 12,060 m = ___ km _____ m

d 11,803 m = ___ km _____ m

e 24,005 m = ___ km _____ m

f 36,203 m = ___ km _____ m

5 Change to metres.

a 6.4 km = _____ m

b 10.25 km = _____ m

c 4.075 km = _____ m

d 17 km 350 m = _____ m

e 43 km 8 m = _____ m

f 1 km 615 m = _____ m

g 3 km 750 m = _____ m

h 9 km 208 m = _____ m

i 28 km 85 m = _____ m

6 Write the shortest distance between:



a Round Cove and Split Junction. _____

b Flat Point and Joiner. _____

c Joiner and Bert's Beach. _____

d Flat Point and Round Cove. _____

e How far is it to drive around the island?

_____

f Estimate the length of the island and its width.

_____

Challenge! Use the internet to find the distance in kilometres from your school to Auckland, Wellington, Christchurch and Dunedin.

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Measurement Measuring: Converting metric units of length (m and cm), including combining mixed units; Estimating length, using appropriate metric units

Estimating length

TERM 3
Week 3



1 What measurement tool would you use to measure the length of:

a a book? _____ b your garden? _____

c the perimeter of your school? _____ d a hair ribbon? _____

e some curtain fabric? _____ f your fingernail? _____

g the road between two towns? _____ h a ship's anchor chain? _____

i a skipping rope? _____ j a football field? _____

2 What unit of measurement would you use for each of the items in question 1?

a _____ b _____ c _____ d _____ e _____

f _____ g _____ h _____ i _____ j _____

3 Estimate the length of:

a your little finger _____ b the whiteboard _____ c the teacher's desk _____

d a pen _____ e this book _____ f your classroom _____

g the window _____ h the door _____ i your big toe _____

j Explain how you estimated these lengths. _____

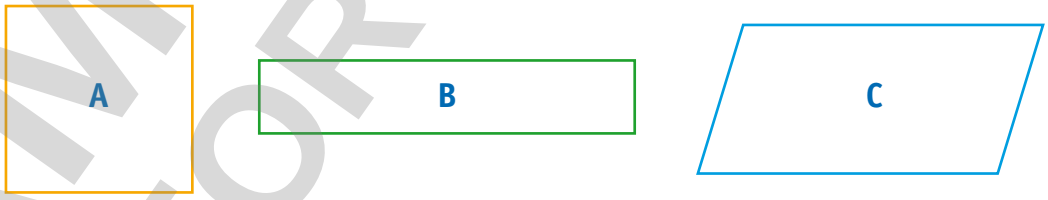
_____

4 Measure accurately each item in question 3.

a _____ b _____ c _____ d _____ e _____

f _____ g _____ h _____ i _____

j Circle the answers that are close to your estimates.



5 a Estimate the length and width of each shape in millimetres. Estimate the perimeter.

b Measure the length and width of each shape in millimetres. Calculate the perimeter.

c Convert the measured perimeters to centimetres with decimals.

	a Estimation in mm			b Measurement in mm			c Convert to cm
	Length	Width	Perimeter	Length	Width	Perimeter	Perimeter
A							
B							
C							

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Perimeter rules

1 Find the perimeter for each square.

a 3.6 m

P = ☐

b 12.5 cm

P = ☐

c 0.85 m

P = ☐

d 7.25 cm

P = ☐

e Write the rule for finding the perimeter of a square.

☐

2 Find the perimeter for each rectangle.

a 8.4 m, 2.6 m

b 6.25 cm, 3.5 cm

c 5.8 m, 1.25 m

d 2.5 cm, 18 mm

a P = ☐ **b** P = ☐ **c** P = ☐ **d** P = ☐

e Write the rule for finding the perimeter of a rectangle.

☐

3 **a** Lily is fencing a rectangular swimming pool area. It is 12.36 m long and 7.45 m wide. There is a 1.2 m wide gate where no fencing is needed. How much fencing will she need?

☐



b Chen has 1.5 m of ribbon. He puts ribbon around the edge of 3 birthday cards. Each card is 14.6 cm high and 7.8 cm wide. Will he have enough ribbon?

☐



Mastery Checklist I can:

- ☐ estimate and measure lengths in metric units
- ☐ convert between metric units of length
- ☐ measure and calculate perimeters of squares and rectangles
- ☐ find the rule to calculate perimeter for squares and rectangles

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Area and perimeter

a 

b 

c 

d 

e 

f 

1 Measure the length and width of each tile to the nearest millimetre.
Record each measurement in centimetres.

a L = _____ W = _____ b L = _____ W = _____ c L = _____ W = _____

d L = _____ W = _____ e L = _____ W = _____ f L = _____ W = _____

2 Write a formula for:

a perimeter of a rectangle: P = _____

b area of a rectangle: A = _____

3 Predict:

a Which tile has the greatest perimeter? _____ b Which tile has the greatest area? _____

4 Calculate the perimeter of each tile.

a _____ cm b _____ cm c _____ cm d _____ cm e _____ cm f _____ cm

g Which tile has the greatest perimeter? _____ h Was your prediction correct? _____

5 Calculate the area of each tile. Show the multiplication you use.

a A = _____ × _____ = _____ cm^2 b A = _____ × _____ = _____ cm^2

c A = _____ × _____ = _____ cm^2 d A = _____ × _____ = _____ cm^2

e A = _____ × _____ = _____ cm^2 f A = _____ × _____ = _____ cm^2

g Which tile has the greatest area? _____ h Was your prediction correct? _____

6 A rectangular tile has an area of 48 cm^2. Write three different pairs of possible dimensions.

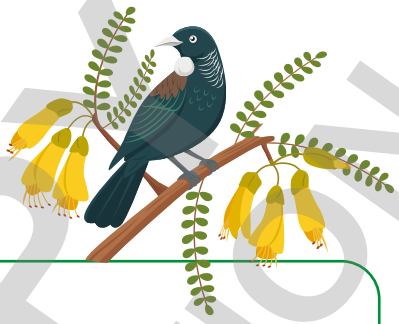
a _____ cm × _____ cm b _____ cm × _____ cm c _____ cm × _____ cm

d Calculate the perimeter of each rectangle. a _____ b _____ c _____

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Area of a rectangle

Area is measured in square units.
1 square metre = 1 m^2
1 square centimetre = 1 cm^2



1 Draw three rectangles.

a L = 8 cm W = 3 cm

b L = 12 cm W = 2 cm

c L = 6 cm W = 4 cm

2 Work out the area for each using the formula A = L × W.

a A = _____ × _____
= _____

b A = _____ × _____
= _____

c A = _____ × _____
= _____

d What do you notice? _____

3 Work out the perimeter of each.

a P = ____ + ____ + ____ + ____
= _____

b P = ____ + ____ + ____ + ____
= _____

c P = ____ + ____ + ____ + ____
= _____

d What do you notice? _____

4 Write the length and width of two different rectangles with an area of 20 cm^2.

a L = _____ cm W = _____ cm

b L = _____ cm W = _____ cm

5 What are their perimeters? a P = _____ b P = _____

c Can you make another rectangle with an area of 20 cm^2?

L = _____ cm W = _____ cm P = _____ cm

d What do you notice about the shape of a rectangle as its perimeter gets smaller?

_____

Challenge!

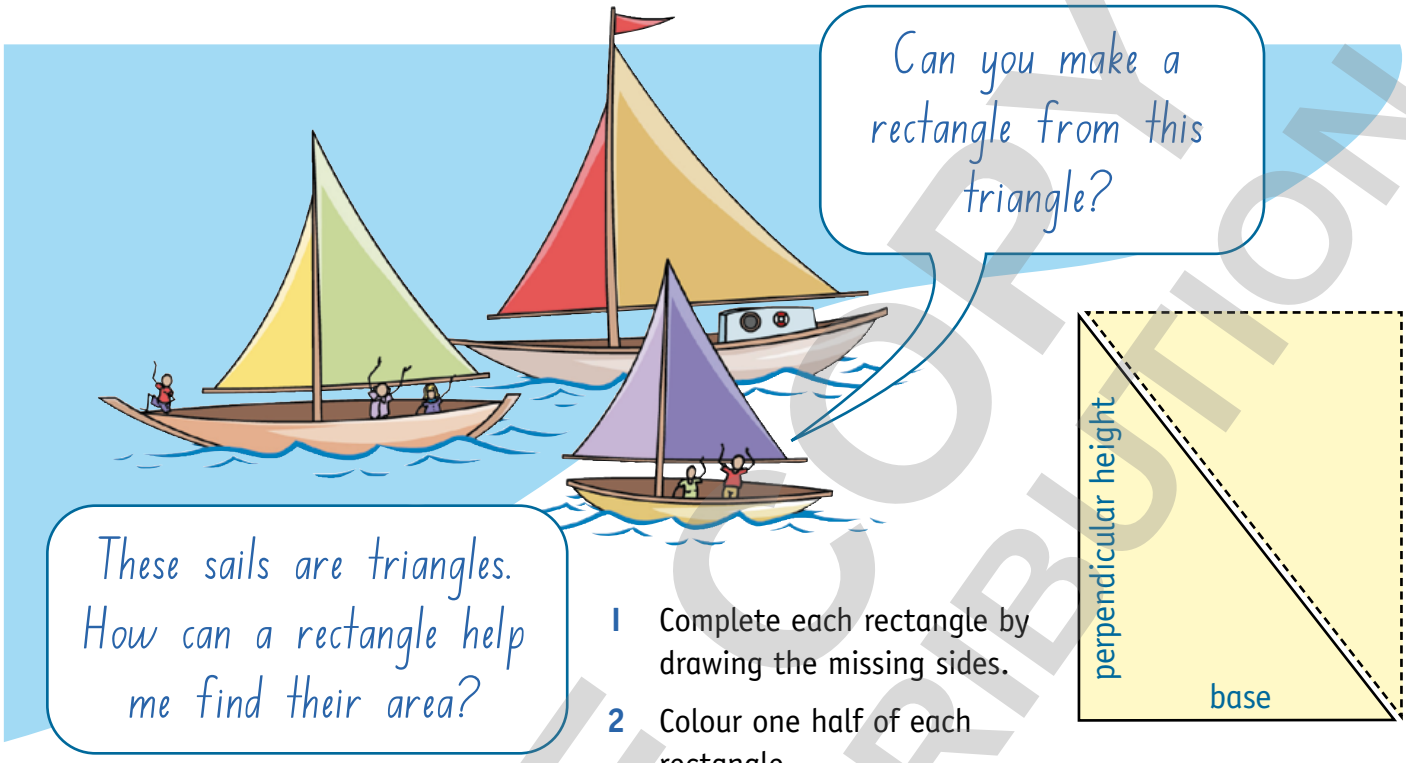
Use a sheet of centimetre grid paper to plan your new garden. You might want to include a pool, a shed, a barbecue area, etc. If each 1 cm^2 represents 1 m^2, work out the area occupied by each item in your garden.



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Measurement Measuring: Visualising, estimating, and calculating (using multiplication) the areas of rectangles (in cm^2 and m^2)

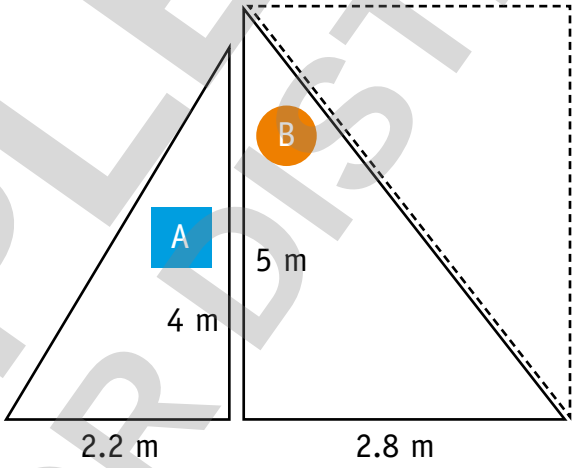
Areas of right triangles



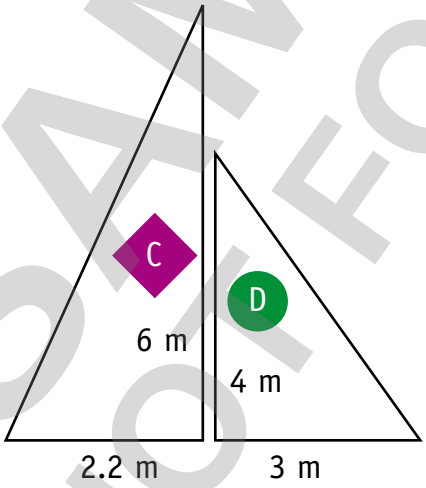
1 Complete each rectangle by drawing the missing sides.

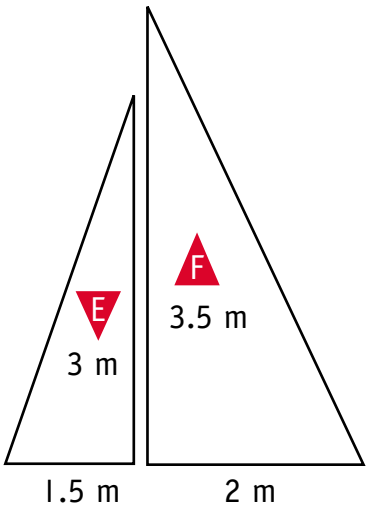
2 Colour one half of each rectangle.





perpendicular height





3 Complete the sentence: The area of the sail is _____ the area of the rectangle.

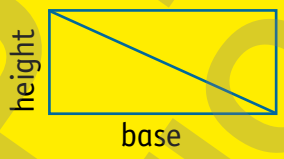
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Areas of triangles

1 Complete the table by calculating the area of each rectangle on page 115. Halve it to make the area of each triangle.

	Area of rectangle (m^2)	Area of triangle (m^2)
Sail A base _____ height _____		
Sail B base _____ height _____		
Sail C base _____ height _____		
Sail D base _____ height _____		
Sail E base _____ height _____		
Sail F base _____ height _____		

Area of a rectangle = length × width (OR base × height)



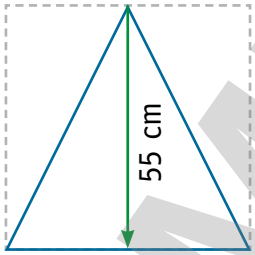
Half the rectangle is a triangle.



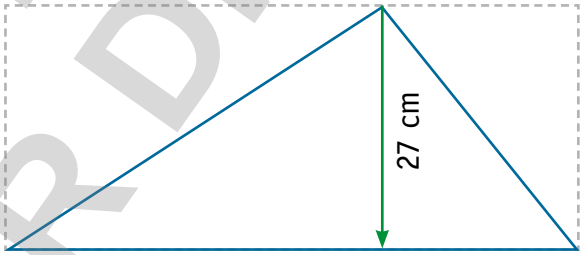
Use the perpendicular height of each triangle to form a rectangle.
Find the area of half of each rectangle.

2 Use the perpendicular height to calculate the area of each triangle.

a



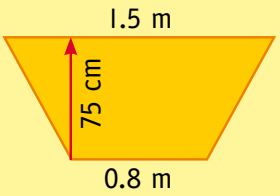
b



3 Write a rule to explain how to work out the area of each triangle.
Use the words height, base, multiply, half, square centimetres or metres (cm^2, m^2).

Challenge!

What is the area of this trapezium?
Write how you worked it out.



Mastery Checklist

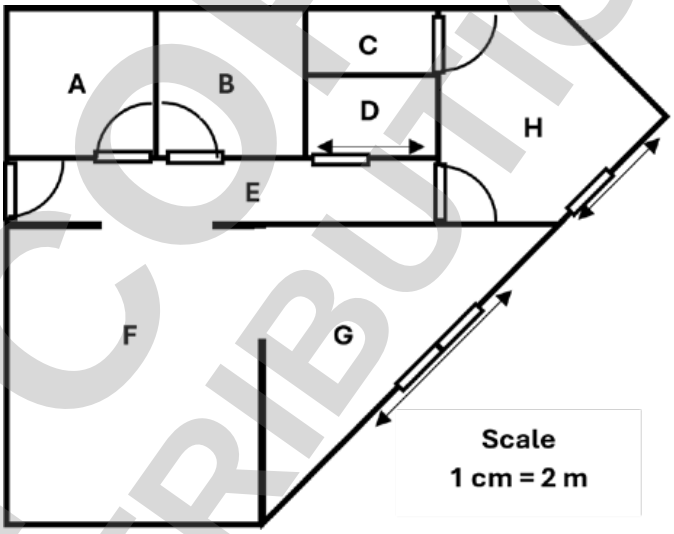
I can:
- ☐ measure side lengths and calculate perimeters
- ☐ calculate areas of rectangles using a formula
- ☐ calculate areas of right-angled triangles using a formula

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Measurement Measuring: Visualising, estimating, and calculating (using multiplication) the areas of right-angled triangles (in cm^2 and m^2)

House plans

Molly and Nabin want to sell their house. This is the floor plan.
They need the measurements of each room and the total area of the house.



1 Measure the length and width of these rooms in centimetres.

A L _____ W _____
B L _____ W _____
C L _____ W _____
D L _____ W _____
E L _____ W _____
F L _____ W _____

2 Use the scale to convert the room measurements to metres.

A L _____ W _____
B L _____ W _____
C L _____ W _____
D L _____ W _____
E L _____ W _____
F L _____ W _____



3 Find the area of each room in square metres.

A _____ **B** _____ **C** _____
D _____ **E** _____ **F** _____

4 Find the area of room **G**. Show your thinking.

_____
_____

5 Find the area of room **H**. Show your thinking.

_____
_____

6 What is the total floor area of this house? _____

I can solve problems by:

☐ using a scale ☐ calculating the areas of rectangles and triangles

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Divide up to 5 digits

1 Divide this number by 2, 3, 4, 5, 6, 7, 8, 9.
Write an algorithm for each.



Before starting, predict (yes/no) whether there will be an exact answer and estimate the answer.

a $2\overline{)750}$ P _____ Est. _____

b $\overline{)}$ P _____ Est. _____

c $\overline{)}$ P _____ Est. _____

d $\overline{)}$ P _____ Est. _____

e $\overline{)}$ P _____ Est. _____

f $\overline{)}$ P _____ Est. _____

g $\overline{)}$ P _____ Est. _____

h $\overline{)}$ P _____ Est. _____

2

a $3\overline{)3,471}$

b $4\overline{)5,932}$

c $7\overline{)8,463}$



d $5\overline{)8,960}$

e $6\overline{)7,776}$

f $4\overline{)7,192}$

g $9\overline{)27,956}$

h $3\overline{)48,827}$

i $7\overline{)53,124}$

j $8\overline{)41,385}$

k $5\overline{)25,360}$

l $9\overline{)36,600}$

m $4\overline{)27,695}$

n $6\overline{)60,023}$

Challenge! Fill in the missing numbers.

a $\begin{array}{r} 9\ 7 \\ 6\overline{)5\square 2} \end{array}$

b $\begin{array}{r} 2\ 4\square \\ 4\overline{)\square\ 9\ 2} \end{array}$

c $\begin{array}{r} 1\ 6\square \\ 7\overline{)1,\square\square 1} \end{array}$

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Remainders as fractions

$7\overline{)59}$ $8\text{ r}3$ $\quad$ $7\overline{)59}$ $8\frac{3}{7}$ *Write remainders as fractions.*



1 Divide. Write each remainder as a fraction.

a $9\overline{)87}$ **b** $7\overline{)53}$ **c** $8\overline{)69}$ **d** $4\overline{)595}$ **e** $7\overline{)802}$

f $6\overline{)921}$ **g** $8\overline{)807}$ **h** $3\overline{)891}$ **i** $7\overline{)617}$ **j** $6\overline{)745}$

2 Divide these larger numbers. Write each remainder as a fraction.

a $5\overline{)3,527}$ **b** $3\overline{)3,113}$ **c** $7\overline{)3,532}$ **d** $8\overline{)4,059}$

e $4\overline{)12,306}$ **f** $6\overline{)48,554}$ **g** $5\overline{)99,004}$ **h** $7\overline{)29,461}$

3 Solve each problem. Think carefully about what the remainder means.

a 15 pizzas are shared equally among 9 people. How much pizza does each person get?

b 234 stickers are shared equally among 5 children. How many whole stickers does each child get? What happens to the stickers left over?

c 3,245 trees are planted as evenly as possible across 6 areas.
How many trees could be planted in each area? What could happen to the remaining trees.

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Remainders as decimals

TERM 3
Week 5

1 Divide. Write each answer as a decimal.

a $6\overline{)75}$ **b** $5\overline{)41}$ **c** $4\overline{)91}$

d $5\overline{)238}$ **e** $4\overline{)146}$ **f** $8\overline{)306}$

When there is a remainder, continue the division into decimal places. Add a decimal point and zeros to the dividend.

$$4\overline{)37.00} \quad 9.25$$

2 Solve each problem. Show your working and give your answer as a decimal.

	Working
a How many kilometres per day will I need to ride to cover 118 km in 5 days? ☐	
b I have 490 g of sand to move. I split it equally between 4 bags. How much is in each bag? ☐	
c I shared 754 mL of juice equally between 8 cups. How much juice in each cup? ☐	
d My dog walks 3,285 metres a day across 2 walks. How long is each walk? ☐	
e Over 6 days the dam needs to let out 87,321 litres of water. How much should it release each day? ☐	

3 **a** How many carriages will be needed to transport the whole school of 362 students if 50 can fit in one carriage?

_____ ÷ _____ = _____ r _____

= _____ carriages

b Car trailers can fit 8 cars on one load. How many loads are required to transport 124 cars?

_____ ÷ _____ = _____ r _____

= _____ loads

c How many containers that can hold 30 marbles will be required to pack 1,431 marbles?

_____ ÷ _____ = _____ r _____

= _____ containers

Challenge! **Divide and compare.** Kiwi Maths Magazine costs $45.30 for 6 months, plus 60c delivery per issue. But an 8-month subscription costs $65.60 with free delivery.

Which subscription costs less per issue? How much less? ☐

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Number Operations: Dividing up to five-digit whole numbers by a one-digit divisor, with a remainder; Representing remainders from division as rounded decimals, as appropriate to the context

Review

1 Subtract each number from 300.

a 167 _____ **b** 75 _____ **c** 287 _____

d 125 _____ **e** 206 _____ **f** 12 _____

Add to check subtraction.
300 – 65 = 235
235 + 65 = 300

2 What is the difference between:

a 65 and 49? _____ **b** 70 and 57? _____ **c** 120 and 58? _____ **d** 89 and 14? _____

e 100 and 38? _____ **f** 16 and 61? _____ **g** 27 and 72? _____ **h** 48 and 51? _____

3 **a**

	48
−6	
−3	
−9	
−10	
−16	

b

	112
−15	
−20	
−7	
−12	
−32	

c

	253
−42	
−36	
−19	
−107	
−28	

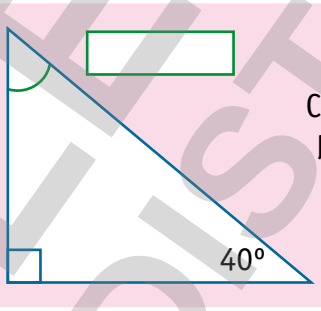
d

	309
−7	
−51	
−19	
−198	
−10	

The sum of the angles of a triangle is 180°. What is the size of the missing angles?

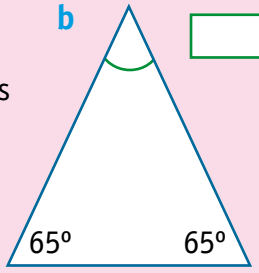
180° – ___° = ___°

4 **a**



Check answers by adding to make 180°.

b



5 Do I make a profit (P) or loss (L)? By how much?

a **Bought** $4,500 **Sold** $6,250 _____

b **Bought** $3,275 **Sold** $4,390 _____

c **Bought** $10,850 **Sold** $8,345 _____



Challenge!

Look for the pattern in each equation.

a 57 – 13 = 97 – ☐

b 85 – 19 = 75 – ☐

c 30 – ☐ = 40 – 16

d 68 – ☐ = 98 – 42

e 110 – 47 = 80 – ☐

f 26 – 11 = 46 – ☐

Pattern _____

_____

_____

_____

Mastery Checklist

I can:

- ☐ divide numbers up to five digits by a single digit
- ☐ represent remainders a whole numbers, fractions and decimals
- ☐ use division to calculate the average of a set of numbers

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Checkpoint 5

Shade one bubble.

1 Which three values are equivalent?

0.4, 40%, $\frac{2}{5}$	0.4, 4%, $\frac{2}{5}$	0.04, 40%, $\frac{4}{5}$	0.4, 40%, $\frac{4}{5}$
○	○	○	○

2 A jacket costs $80 and is reduced by 25%. What is the sale price?

$20	$55	$60	$65
○	○	○	○

Write your answer in the box.

3 $\frac{3}{5}$ of a class is 18 students.

How many students are in the whole class?

☐ students

Shade one bubble.

4 A hiking track is 3.75 km long. How many metres is this?

375 m	3,075 m	3,750 m	37,500 m
○	○	○	○

5 A rectangular garden is 8.5 m long and 4 m wide. What is its perimeter?

12.5 m	25 m	34 m	68 m
○	○	○	○

6 A triangle has a base of 12 cm and a perpendicular height of 7 cm. What is its area?

19 cm^2	42 cm^2	84 cm^2	168 cm^2
○	○	○	○

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Checkpoint 5

Write your answers in the boxes.

7 A rectangular playground has an area of 96 m².

Its width is 8 m. What is its length?

☐ m

8 Calculate.

27,956 ÷ 9 = ☐ remainder ☐

9 $\frac{3}{5}$ of a group is 24 students.

How many students are in the whole group?

☐ students

10 25% of the library display is 35 books.

How many books are in the display?

☐ books

11 A school has 245 students travelling to camp.

Each bus can carry 48 students.

What is the smallest number of buses needed?

Shade one bubble.

5	6	7	8
○	○	○	○

12 A school has 120 Year 6 students.

35% of the students play a winter sport.

How many students do not play a winter sport? ☐

Show your working.

Write your answer in the box.

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Operations

Let me see!
That's 21 x 4.
That's 84!

16 + 5 × 4?





I know!
That's 16 + 20!
That equals 36!



18 − 6 ÷ 3

18 − 6 = 12, then
12 ÷ 3 = 4

6 ÷ 3 = 2, then
18 − 2 = 16



Order of operations
Work × and ÷ left to right.
Then + and − left to right.
5 + 9 × 4 + 6 ÷ 2 − 4 = ?
5 + 36 + 3 − 4 = 40

Who is correct? Explain why. Then use the correct order of operations to solve these questions.

1 Work out these expressions.

a 15 + 7 × 3 = _____

b 64 ÷ 8 + 12 = _____

c 25 + 46 + 18 ÷ 3 = _____

d 98 − 34 + 15 − 9 × 2 = _____

e 100 − 32 + 8 − 4 × 16 = _____

f 7 × 25 + 1,500 − 250 × 2 = _____

g 6 × 9 + 24 ÷ 8 = _____

h 81 ÷ 9 + 7 × 5 = _____

i 14 + 48 ÷ 6 = _____

j 90 − 8 × 7 = _____

2 Circle the correct answer.

a 12 + 8 × 5 = 52 100 60

b 36 ÷ 6 + 4 = 10 3.6 24

c 40 − 12 ÷ 3 = 36 28 9

d 7 × 6 − 8 = 34 76 40

3 Write the missing number.

a _____ × 4 + 7 = 31

b 60 − _____ × 5 = 20

c 72 ÷ _____ + 6 = 15

d 5 × _____ − 8 = 42

e 8 × _____ + 12 = 52

f 84 ÷ _____ − 2 = 12

4 Solve. In each pair, circle the expression with greater value.

a 15 + 7 × 4 15 × 3 + 7

b 48 ÷ 6 + 9 48 ÷ 4 + 6

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Grouping symbols

Work grouping symbols first.
( ) Round brackets
[ ] Square brackets
Solve the innermost set first.
2 × ([6 + 5] + 2) = ?
2 × (11 + 2) = 26

1 Work out these expressions.

a 7 + 6 × 3 = _____ **b** 24 ÷ 6 − 4 = _____

c 23 − 10 ÷ 2 = _____ **d** (3 + 8) × 6 = _____

e 48 ÷ (18 − 12) = _____ **f** 16 ÷ 4 + 8 = _____

g (4 + 7) × (13 − 8) = _____ **h** 17 − (2 + 3) = _____

2 Add brackets to make each equation true.

a 7 + 8 ÷ 3 = 5 **b** 19 − 6 + 2 = 11 **c** 6 × 4 + 2 = 36

d 18 ÷ 9 − 3 = 3 **e** 7 + 9 ÷ 4 = 4 **f** 18 ÷ 6 ÷ 3 = 9

3 Work out each expression. Show the steps.



a 16 ÷ 4 + (10 − 3) = 16 ÷ 4 + 7
= _____

b 16 ÷ 4 + (10 − 3) = _____
= _____

c 36 − [20 + 2 × 2] = _____
= _____

d (5 + 7) ÷ 3 + 8 = _____
= _____

e 9 × 7 − 30 ÷ 10 = _____
= _____

f [8 + (6 + 2)] × 8 = _____
= _____

g 24 ÷ 8 × 2 + 34 = _____
= _____

h 6 + 8 − 7 × 2 = _____
= _____

i [(50 + 60) ÷ 5] ÷ 2 = _____
= _____

j (9 + 3) × (18 − 15) = _____
= _____

4 Write four expressions that use grouping symbols. Include at least one with nested grouping symbols. Give them to a partner to solve. Make sure you know the answers.

a _____ = _____
= _____

b _____ = _____
= _____

c _____ = _____
= _____

d _____ = _____
= _____

Challenge! Add brackets to each expression in two different ways.
Work out the two different answers.

a 8 + 4 × 3 − 2 **b** 24 ÷ 6 + 2 × 3 **c** 18 − 6 ÷ 3 + 4

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Order of operations

TERM 3
Week 6

The same set of numbers can have a different outcome when expressed differently.
e.g. **(62 – 15) × 2 = 94** **62 – (15 × 2) = 32**

Order of operations: GEMA
1 Grouping ( ) [ ]
2 Exponents a^x
3 Multiply and divide × ÷
4 Add and subtract + –
$(2 + 4) + 3^2 \times 2$
$= 6 + 9 \times 2$
$= 6 + 18 = 24$

1 a $6 \times 4 + 5 =$ _____ b $7 + 8 \times 3 =$ _____
c $3 \times (5 + 8) =$ _____ d $8 \times 9 - 12 =$ _____
e $15 - 16 \div 4 =$ _____ f $24 \div (10 - 4) =$ _____
g $(32 + 16) \div 8 =$ _____ h $(5 + 3) \times 6 + 2 =$ _____
i $15 - 15 \div 15 =$ _____ j $(120 - 25) \div 5 =$ _____
k $7 \times 2 \times 2 + 16 =$ _____ l $12 + 4 \times 9 - 10 =$ _____
m $(3 \times 4) + (7 \times 6) =$ _____ n $10 - 36 \div 9 \times 2 =$ _____

2 Solve, showing your working.

a $(27 \div 3) \times (3 + 6) =$ _____
b $27 \div (3 \times 3) + 6 =$ _____
c $27 \div 3 \times 3 + 6 =$ _____
d $(36 - 4) \times (3 \times 2) + 8 =$ _____
e $(36 - 4) \times 3 \times (2 + 8) =$ _____
f $[(36 - 4) \times 3] \times 2 + 8 =$ _____
g $12 \times (7 + 3 - 2) =$ _____
h $[(8 \times 9 + 4) - 12] \div 4 =$ _____
i $(15 \div 15 \times 2) - 2 =$ _____

3 Write and solve your own expressions using 5 numbers and at least two operations. Do not use brackets.

a _____ b _____
c _____ d _____

4 Solve the expression. Add brackets to change the answer and work out the new answer.

a $8 + 4 \times 3 - 2 =$ _____
With brackets: _____ = _____
b $18 - 6 \div 3 + 4 =$ _____
With brackets: _____ = _____
c $5 \times 4 + 8 \div 2 =$ _____
With brackets: _____ = _____
d $24 \div 6 + 2 \times 3 =$ _____
With brackets: _____ = _____

5 Add brackets in two different ways. Work out each answer.

a $12 - 4 \times 2 + 3$
_____ = _____
_____ = _____
b $24 \div 4 + 2 \times 3$
_____ = _____
_____ = _____

Challenge!

Choose 5 of these numbers. Use each number once to make an expression. Add brackets to make as many different answers as you can.

5 3 8 2 0
6 4 1 9 10 12

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Applying order of operations

1 Are the brackets needed? Cross out the brackets that do not change the answer.

a $8 \times 4 + (16 \times 2) - 6$

b $15 \times 8 - 4 \times (2 \times 3) - 10$

c $(72 - 10) \times 22$

d $32 \div 4 + \{(3 \times 18) - 2\} + 6 \times 11$

Expression or equation?
An expression is a mathematical phrase.
An equation shows that two expressions are equal.
$5 + 3 \times 2$ is an expression.
$5 + 3 \times 2 = 11$ is an equation.

2 Work inside the innermost brackets first. Show your working.

a $6 \times [20 - (8 + 4)]$

b $72 \div [3 \times (7 - 3)]$

c $5 + [4 \times (15 - 9)]$

d $100 - [6 \times (12 - 7) + 10]$

Solve the equations and give values to the letters to read the message.



3

7	15	40	32	8	15	40	32	4	15	10	

a $C = 35 \div (3 + 2)$

b $E = 5^2 + 3^2 - 1^2 - 1$

c $\frac{1}{5} \times 45 - 1^2 = H$

d $M = 3 \times 17 - (6 + 5)$

e $0.8 \times 5 = N$

f $W = (6 \times 10) \div (3 \times 2)$

g $O = 8 + 49 \div 7$

4

6	5	3	9	8	1	2	5	6	8	7	2	4	10	5	6

a $56 \div A = 8$

$A =$ _____

b $E + 24 = 30 - 1$

$E =$ _____

c $45 - 5^2 = 2 \times I$

$I =$ _____

d $M = 64 \div 2^3$

$M =$ _____

e $81 \div N = 27$

$N =$ _____

f $42 \div (6 \times 7) = O$

$O =$ _____

g $21 - 3 \times 4 = D$

$D =$ _____

h $121 \div 11^2 + 1 = R$

$R =$ _____

i $144 \div (S \times 2) = 12$

$S =$ _____

j $T \times (5 + 4) = 36$

$T =$ _____

Use inverse operations
$20 + Y = 17 + 6$
$Y = 17 + 6 - 20$
$Y = 3$

Mastery Checklist

I can:
- ☐ use the correct order of operations
- ☐ work with grouping symbols, including nested brackets
- ☐ find missing values using inverse operations

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Working backwards

Write an equation for each problem.
Then work backwards using inverse operations to find the starting number.

1 I have a number. I add 10 and multiply by 3. I then divide by 4, subtract 2 and multiply by 9 to arrive at 63. What was my number?

2 I am thinking of a number. I multiply it by 6, add 12, then subtract the product of 2 and 5. I end up with 92. What was my number?

3 I take a number, divide it by the sum of 6 and 2, add 15 and 6 and end up at 1 less than 37. What number did I take?

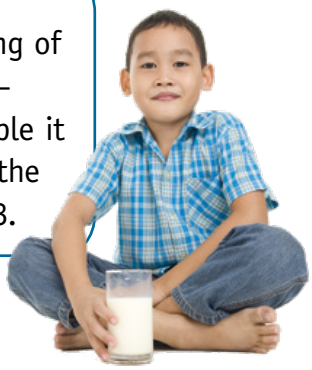
I can solve problems by:

☐ representing a problem with an equation ☐ working backwards using inverse operations

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Number sentences

A
I am thinking of a number — when I double it and add 9, the answer is 23.



B
I am thinking of a number — when I halve it and subtract 8, the answer is 5.



C
I am thinking of a number — when I multiply it by 6 and add 2, the answer is 56.

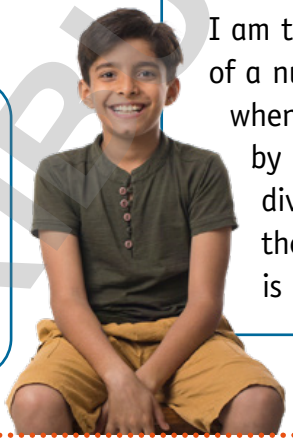


D
I am thinking of a number — when I add 7 and then divide by 3, the answer is 11.





E
I am thinking of a number — when I subtract 9 and then multiply by 9, the answer is 81.



F
I am thinking of a number — when I multiply by 7 then divide by 4, the answer is 14.

Each child is thinking of a special number.

1 Write a number sentence to find each special number. Call the number ☐, e.g. ☐ + 5 = 7, ☐ = 2

A _____ **B** _____

C _____ **D** _____

E _____ **F** _____

2 Write four special number problems for a friend to solve.





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Problems and equations

An equation shows that two expressions are equal.
10 + 10 = 30 – ?
20 = 30 – ?
? = 10

1 Match an equation from the coloured box to each problem. Then solve it.

a Andy rides his bike 15 km to school and 15 km home each day. Jake says that's 5 km more than he rides to school and back. How far does Jake ride his bike?

_____ _____

b Three baby elephants have slurped up 20 L of water each. The mother elephant has drunk all her water, but needs 15 L more to equal the baby elephants' total. How much has the mother elephant drunk?

_____ _____

c Seven children have donated $6 each to their class's charity. Their friends are not impressed and say that is half their total donation. How much have the friends donated?

_____ _____

d Six cyclists in a relay have ridden 15 km each. Three riders wish to do the same number of km in a relay. How far will they each have to ride to cover the same distance?

_____ _____

A $3 \times 2 \times 14 = 7 \times 2 \times ?$ **B** $3 \times ? = 6 \times 15$ **C** $250 - 55 = ? - 5$

D $3 \times 20 = ? + 15$

E $? \div 2 = 7 \times 6$ **F** $72 \div ? = 4 \times 2$ **G** $15 \times 2 = ? + 5$



e While I saved $250, my neighbour saved hard as well. I then spent $55 and had the same amount as she had after she spent only $5. How much had my neighbour saved?

_____ _____

f I read for 3 hours a day for 2 days and read 14 pages each hour. Mum read for 7 hours altogether and read the same number of pages. How many pages did Mum read each hour?

_____ _____

g Our netball club attracted 72 players in my age group. We formed into groups consisting of 4 pairs of children of equal ability. How many groups did we make?

_____ _____

2 Write a story problem that could be represented by this equation. Then solve it. $50 - ? = 3 \times 16$

_____

_____

_____

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Number Operations: Calculating expressions using the order of operations;
Algebra Equations and relationships: Completing open number sentences that involve all four operations, respecting the order of operations

Cost calculations

TERM 3
Week 7

- Read each question carefully.
- Use estimation strategies to approximate the answer.
- Show your working, and record your answer.

Problem	Estimate	Working	Answer
1 Discount shopping You have a 15% discount on a $38 toy. Estimate the final price after the discount using rounding to the nearest dollar.			
2 Groceries estimate Estimate the total cost of these grocery shops: $18.75, $42.50 and $32.25. Round to the nearest $10.			
3 Percentage increase A shirt was priced at $30 and now it is $36. Estimate the percentage increase using rounding.			
4 Budgeting estimate You want to spend 15% of your $120 savings. Estimate the amount left over using rounding.			
5 Movie Ticket estimate A movie ticket costs $10.75. Estimate the cost of 4 tickets using rounding.			
6 Petrol cost estimate You estimate your car will need 32 L of petrol for a road trip. Petrol costs $2.38 per litre. Use rounding to estimate the total cost.			
7 Sale and regular price A pair of shoes is labelled 30% off. The discounted price is $42. Estimate the original price using rounding.			
8 Expenditure estimate Mrs Jones has $200. She spends $75.10 on clothing, $25.70 on lunch and $22.95 on a book. Does she have $70 left for a gift?			

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Equations

TERM 3
Week 7

1 Write equations to solve the word problems.

a Davey had 14 hamsters but 3 died. Overnight 2 mother hamsters had 4 babies each. How many hamsters were now in Davey's cage?



Hamsters = _____ = _____

b Lina's expenses are: rent $150, food $85 and telephone $32 for the week. What are her total expenses?



Expenses = _____ = _____

c 32 boys are at rugby training. Seven get hurt, and Coach sends three teams of 6 to practise tackling. How many boys are left to run laps?



Boys = _____ = _____

d Grandma plants 12 rows of lettuces, each containing 8 plants. Grandpa plants 4 more rows of 6 lettuces, but 12 are eaten by caterpillars. How many lettuces remain to grow?



Lettuces = _____ = _____

e On the way to the train station, Nell rode 8 km before realising she had no money, so she rode back to get it. After getting some money, she rode 7 km towards the station before she found she had left her phone at home, so she rode back to get it. She then rode all the way to the station, a trip of 12 km, before boarding the train in a great hurry. How far did she ride altogether?

Kilometres = _____ = _____

2 **a** In the cattery, 5 cats had 4 kittens each, and 3 cats had 5 kittens each. There is room for 30 kittens. How many kittens must have homes found immediately?

Kittens = _____ = _____

b How many cats and kittens are in the cattery after homes are found for the first 10 kittens?

Cats and kittens = _____ = _____

Challenge!

Choose the number sentence you would use to solve this:

Mum and Dad took 10-yr-old twins, Mai and Anh, to the movies with Grandma and Grandpa, who are pensioners.

a $9.50 = $6 + $5.80

b $9.50 + $9.50 + $5.80 + $6 × 2

c $19 + $10.80 + $12

d 2 × $9.50 + $5.80 × 2 + 2 × $6



Mastery Checklist

I can:

- ☐ write equations to solve word problems
- ☐ write word problems with multiple steps
- ☐ use equivalent equations to solve word problems
- ☐ estimate answers to problems

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Best buy



The Supernova team are having a celebration for their win.

1 Compare the prices to find the best value for each item. Work out the cost for the same amount of each.

Pizza	large	12 slices	$22
	medium	8 slices	$15
	small	6 slices	$12

_____ is best value at $_____ per slice.

Drinks	3 L bottle	12 drinks	$4
	2 L bottle	8 drinks	$3.50



_____ is best value at $_____ per 200 mL drink.

Sweets	500 g bag	$4.80
	1 kg bag	$8.60



_____ is best value at $_____ per 100 g.

Cupcakes	10 for $8
	20 for $12



_____ is best value at $_____ each.

Working space

Challenge!

How many of each item is needed for the 6 friends if they have two of everything?

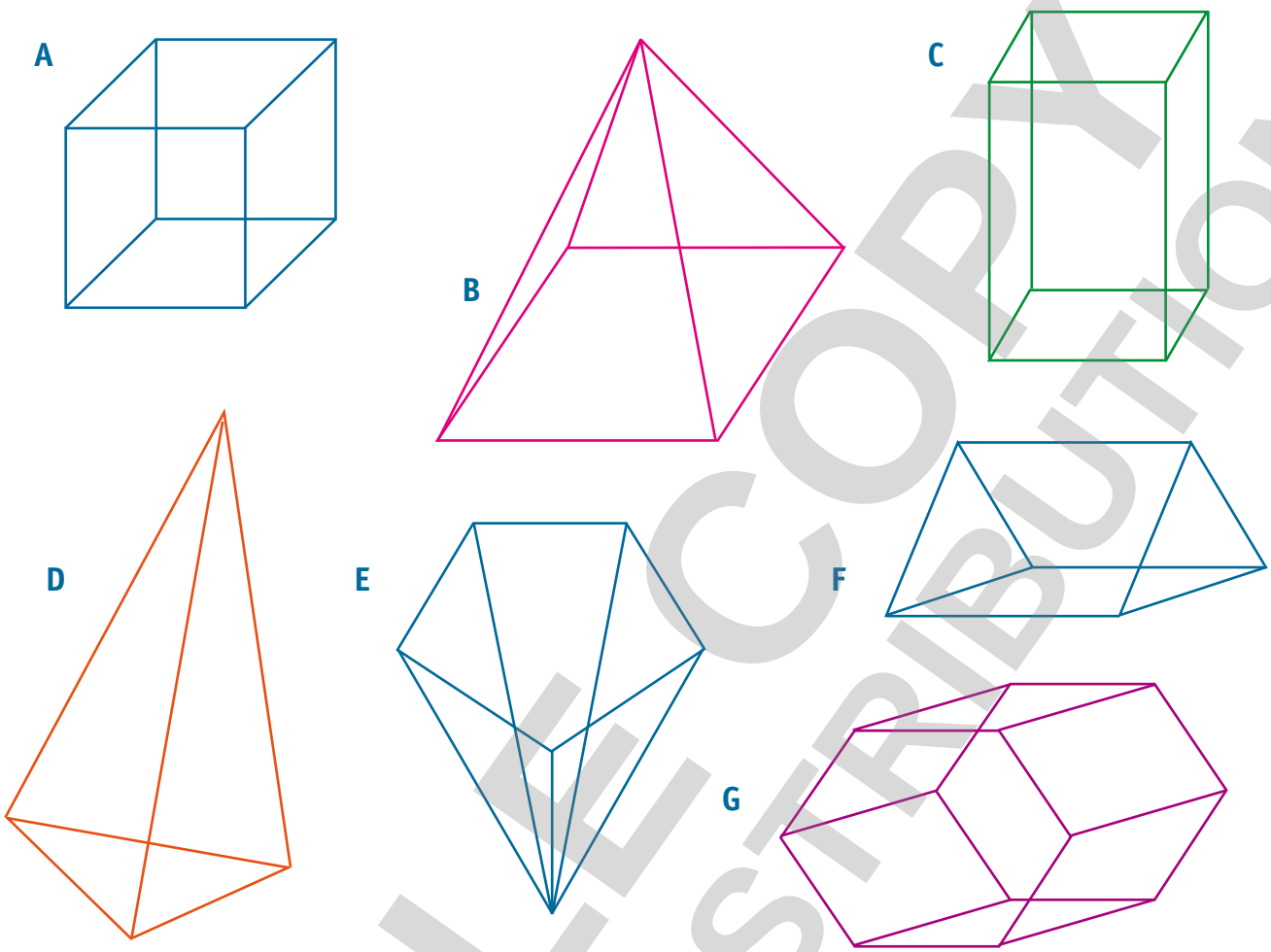
Pizza _____ Drink _____ Sweets _____ Cupcakes _____

I can solve problems by:

☐ adding, subtracting and multiplying decimals ☐ writing algorithms

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Prisms and pyramids



1 Colour the base shape on each object in yellow.

2 Name the 3D shapes.

A _____

B _____

C _____

D _____

E _____

F _____

G _____

3 Describe the faces of each 3D shape.

A _____

D _____

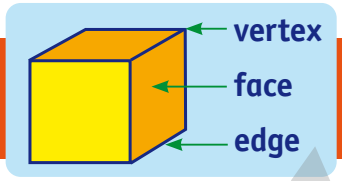
G _____

4 a Which 3D shapes have an apex? _____

b Circle each apex in blue.

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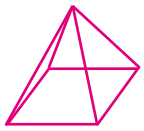
3D shape attributes



1 Complete this table for each 3D object on page 134.

Name	Number of faces	Number of edges	Number of vertices
A			
B			
C			
D			
E			
F			
G			

2 Compare objects **B** and **E** using the words **faces**, **edges** and **vertices**.

Shape	Things that are similar	Things that are different
 		

Comment _____

_____

3 Compare objects **C** and **G** using the words **faces**, **edges** and **vertices**.

Shape	Things that are similar	Things that are different
 		

Comment _____

_____

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Compare 3D shapes

1 Compare objects **D** and **F** using the words **faces**, **edges** and **vertices**.

Shape	Things that are similar	Things that are different
		
		

2 a What attributes do all prisms have? _____

_____

b What attributes do all pyramids have? _____

_____

3 Draw the 2D shape views for the 3D objects on page 134.

	Top view	Side view	Front view
A			
B			
C			
D			
E			
F			

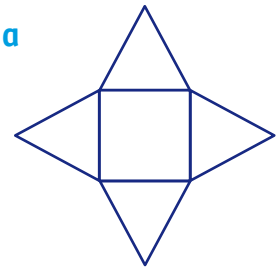
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Nets

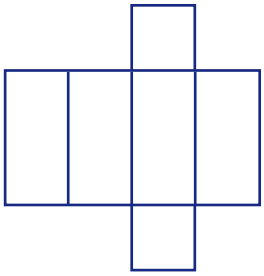
TERM 3
Week 8

1 Write the name of the 3D object that matches each net.

a



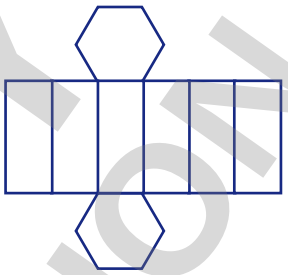
b



c



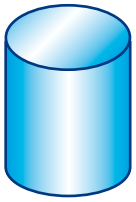
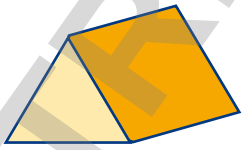
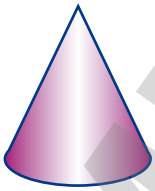
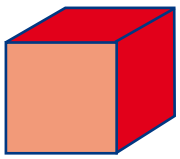
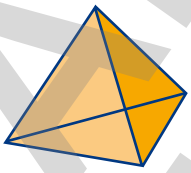
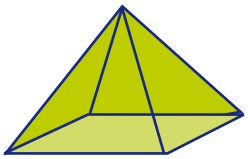
d



a _____ **b** _____

c _____ **d** _____

2 Draw a net for each 3D object.

Object	Net	Object	Net
a cylinder 		**b** triangular prism 	
c cone 		**d** cube 	
e triangular pyramid 		**f** rectangular pyramid 	

3 Explain the differences between prisms and pyramids.

_____

_____

Mastery Checklist I can:
- ☐ identify features and nets of 3D objects
- ☐ compare prisms and pyramids

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Geometry: 3D in the environment

Study the pictures of built and natural environments in New Zealand.











1 Circle the shapes you see more in built environments. Prisms Cylinders Pyramids Cones

2 Circle the shapes you see more in natural environments. Prisms Cylinders Pyramids Cones

3 Why do you think this is?

I can solve problems by:

☐ identifying 3D objects in the environment ☐ analysing features and uses

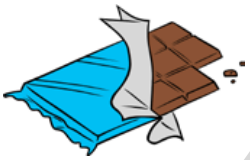
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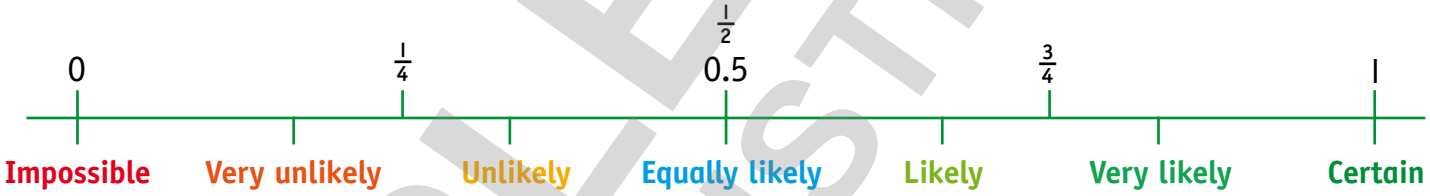
Probability

Probability describes how likely an outcome is to happen.
Probability is measured from 0 to 1.

TERM 3
Week 9

1 Put each event on the probability line.
Write the letter in its best place.

A A six-sided dice will show a 7. 	**B** The person to next enter the room will be male. 	**C** A coin toss will land heads. 	**D** We will play sport next week. 	**E** It will rain tomorrow. 
F The sun will rise tomorrow. 	**G** A chocolate bar will fall upwards. 	**H** A coin toss will land tails. 	**I** A door will open when you push it. 	**J** Your teacher will be taller than you. 



2 Complete the statements.

a An impossible event has a probability of _____.

b An equally likely event has a probability of _____ or _____.

c A certain event has a probability of _____.

3 Write **more** or **less** to complete these statements

a A probability less than $\frac{1}{2}$ means the event is _____ likely to happen.

b A probability greater than $\frac{1}{2}$ means the event is _____ likely to happen.

c A probability closer to 1 means an event is _____ likely to happen.

d A probability closer to 0 means an event is _____ likely to happen.

4 What is the probability of each event as a fraction, a decimal and a percentage.

	Event	Fraction	Decimal	Percentage
a	Picking 4 at random from 1, 2, 3, 4.			
b	Picking a number < 4 from 1, 2, 3, 4.			
c	Rolling a number less than 3 on a die.			

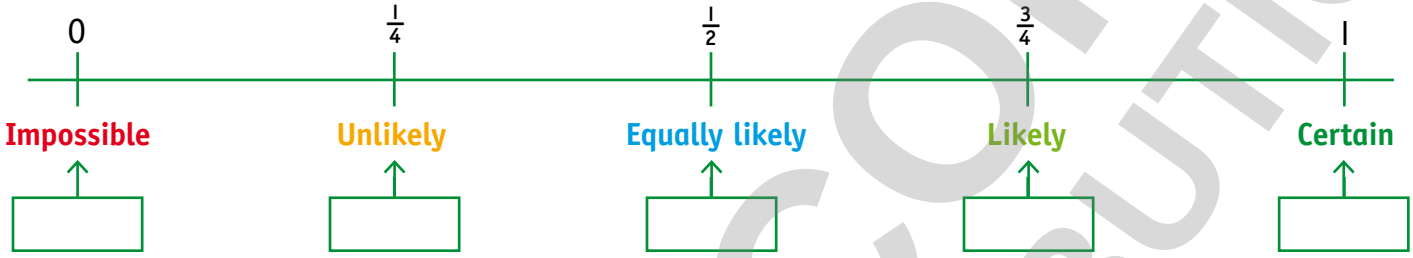
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Outcomes, events and sample space

TERM 3
Week 9

1 Place each event on the probability line. Write the letter in its best place.

A A six-sided dice will show a 7.	**B** A coin toss will land heads up. 	**C** A six-sided dice will show a number less than 7.	**D** A six-sided dice will show a 6. 	**E** A six-sided dice will show a number greater than 2.



2 A standard six-sided die is rolled.

a List the sample space. _____

b Which outcomes make up the event "roll an even number"? _____

c What is the probability of rolling an even number? _____

d Which outcomes make up the event "roll a number greater than 4"? _____

e What is the probability of this event? _____

The sample space is the set of all possible outcomes.
An event can be one of these outcomes.

3 A spinner has 8 equal sections numbered 1–8.

a Write all the possible outcomes. _____

_____

b What is the probability of landing on 5? _____ out of _____ = _____

c What is the probability of landing on an even number?

Even numbers: _____ _____ out of _____ = _____

d What is the probability of landing on a number greater than 5?

Numbers greater than 5: _____ _____ out of _____ = _____

e What is the probability of landing on a number less than 9?

_____ out of _____ = _____

f What do the probabilities of all 8 individual outcomes add to? _____

4 Complete the probabilities. A spinner has four colours. The probabilities are:

Red = $\frac{1}{4}$ Blue = $\frac{3}{8}$ Green = $\frac{1}{8}$ Yellow = _____

a What is the probability of landing on red or green? _____

b What is the probability of landing on blue or green? _____

c Choosing a red counter from a bag containing 1 red and 3 blue counters. _____

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Probability Experimental probability: Listing the sample space of an event: Calculating the probabilities of individual outcomes; Answering questions about the probability of combinations of outcomes, including checking that the sum of all the probabilities is 1; Calculating probabilities using a spinner, where each event is a fraction or combination of fractions on the spinner

Probability experiment





Work with a partner.

1 You have two dice. You are going to throw them 20 times and total their numbers each time.

a Which total would you predict to have the:

greatest frequency? _____ least frequency? _____

Why? _____

_____

b Take turns to throw the two dice. In table 1, record each throw as a sum of the two numbers, e.g. 3 + 3 goes in the row for 6.

Table 1

Total	Throws
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	

Table 2

Total	Thows
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	

c Were your predictions accurate? _____

2 a Repeat the experiment. Use Table 2.

b What do you think is the probability of a similar result? _____

c Why would you expect the probability of scores 2 and 12 occurring to be less frequent than that of 7?

_____

_____

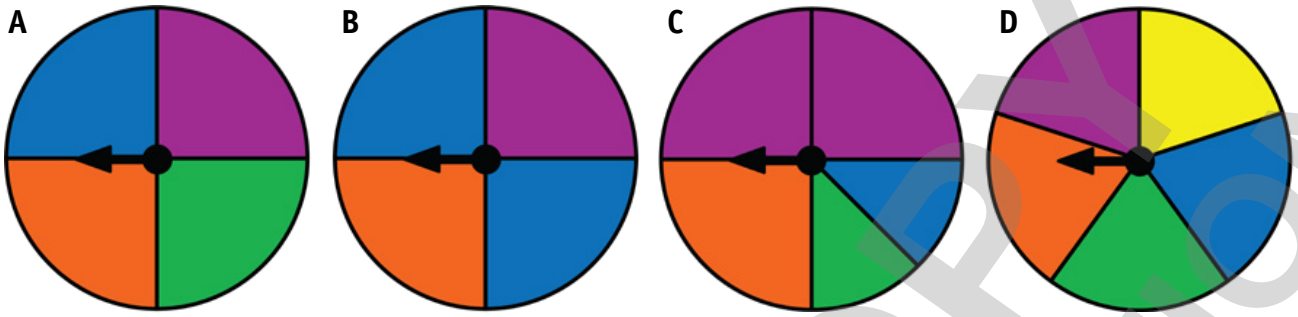
d When would you use this method in everyday life? _____

_____

_____

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Spinner probabilities



1 a Calculate the probability of landing on each colour for each spinner. Write each probability as a fraction.

b Check that the total of all the probabilities for each spinner = 1.

	Purple	Green	Blue	Orange	Yellow	Total
A						
B						
C						
D						

2 a What is the chance of landing on a purple or blue section when spinning each spinner?

A _____ B _____ C _____ D _____

b What is the chance of landing on orange, yellow or green when spinning each spinner?

A _____ B _____ C _____ D _____

c Which spinner has the highest probability of landing on purple? _____

d Across all spinners, which colour is least likely? _____

3 a For a fair game with 4 players, which spinner would you choose? _____

b Why? _____

c For a fair game with 5 players, which spinner would you choose? _____

d Why? _____

e Can you use any of these spinners for a fair game with 3 players? _____

f Why? _____

4 On a paper plate design your own colour spinner and colour it in.

a Is your spinner fair? _____

b Why? _____

c Why did you make it this way? _____

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Probability Experimental probability: Listing the sample space of an event; Calculating the probabilities of individual outcomes; Answering questions about the probability of combinations of outcomes, including checking that the sum of all the probabilities is 1; Calculating probabilities using a spinner, where each event is a fraction or combination of fractions on the spinner

Probability puzzles

TERM 3
Week 9

Solve the probability puzzles.

Write each answer as a fraction, a decimal and a percentage.

1 Coin toss

You toss a coin. What is the probability of getting heads?

Write your answer as a fraction, a decimal and a percentage.

Fraction: ☐

Decimal: ☐

Percentage: ☐



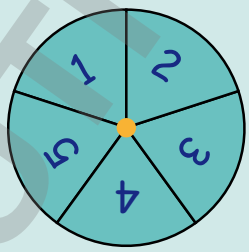
2 Spinner probability

A spinner has 5 equal sections numbered 1 to 5. What is the probability of landing on an even number?

Fraction: ☐

Decimal: ☐

Percentage: ☐



3 Rolling a dice

You roll a six-sided die. What is the probability of rolling a prime number?

Fraction: ☐

Decimal: ☐

Percentage: ☐



4 Colour probability

In a bag there are 5 red marbles, 3 blue marbles and 2 yellow marbles. You pick out one marble without looking. What is the probability of getting a blue marble?

Fraction: ☐

Decimal: ☐

Percentage: ☐



5 Deck of cards

You draw one card from a standard deck of 52 cards. What is the probability of drawing a diamond?

Fraction: ☐

Decimal: ☐

Percentage: ☐



6 Weather probability

The weather forecast says there is a 25% chance of rain tomorrow. What is the probability that it won't rain?

Fraction: ☐

Decimal: ☐

Percentage: ☐



Mastery Checklist

I can:

- ☐ express probability as a fraction, decimal and percentage
- ☐ conduct a chance experiment
- ☐ compare predictions with actual results

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Checkpoint 6

1 a Write $\frac{37}{100}$ as a decimal. _____ p98

b Write 0.64 as a fraction with a denominator of 100. _____

2 Write these numbers in ascending order. p 99

0.42, $\frac{9}{10}$, 0.7, $\frac{36}{100}$, 0.15

_____, _____, _____, _____, _____

3 Complete the table. p 100

Fraction	Decimal	Percent
$\frac{6}{10}$		
	0.35	
		75%

4 A pair of shoes costs $120. p 103

The shoes are 25% off.

What is the sale price? $_____

5 a $\frac{3}{5}$ of 45 = _____ p 104

b $\frac{7}{8}$ of 56 = _____

c $\frac{3}{10}$ of 90 = _____

6 Find the whole amount. p 105

a $\frac{2}{3}$ is 18. The whole number is _____

b $\frac{3}{5}$ is 24. The whole number is _____

7 Complete. p 105

a 25% of 240 = _____

b 20% of 350 = _____

c 15 is 10% of _____

d 45 is 25% of _____

8 Use <, > or = to complete. p 107

a 10% of 750 _____ 50% of 300

b 25% of 600 _____ 10% of 170

c $\frac{1}{4}$ of 16 _____ 20% of 20

d 1,000 − 330 _____ 100% of 3.3

e 7.45 + 2.5 _____ 10

9 Convert these lengths. p 108

a 4.6 km = _____ m

b 3.25 m = _____ cm

c 85 mm = _____ cm

d 2,750 mm = _____ m

10 A regular pentagon has sides that are each 6.5 cm long. p 108

What is its perimeter? _____ cm

11 Complete. p 109

a 7 m 35 cm = _____ m

b 4.08 m = _____ m _____ cm

c 2 km 450 m = _____ km

12 A walking track is 4 km 650 m long. p 110

Tia has walked 2,800 m.

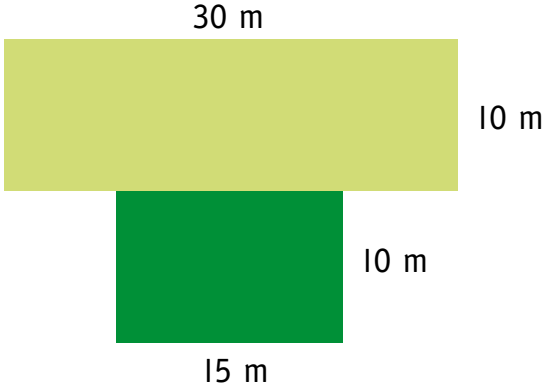
How much farther does she need to walk?

_____ km _____ m

13 Choose the most sensible measurement for the length of a classroom. p 111

8 mm **8 cm** **8 m** **8 km**

14 Work out the perimeter and the area. p 113



P = _____

A = _____

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Checkpoint 6

15 A rectangular garden is 9 m long and 6 m wide. p 112-113

a What is its perimeter? _____ m

b What is its area? _____ m²

16 A rectangle has an area of 48 cm².

Its width is 6 cm.

a What is its length? _____ cm

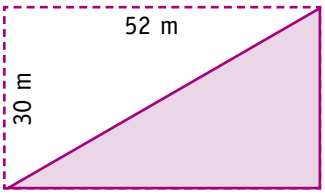
b What is its perimeter? _____ cm

17 A triangle has a base of 12 cm and a perpendicular height of 7 cm.

What is its area? _____ cm²

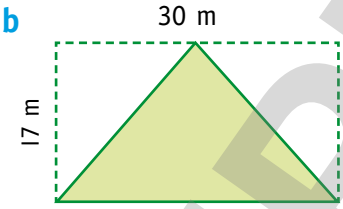
18 Find the area of the triangle. p 116

a





b





19 Calculate. p 118-119

a 4,368 ÷ 6 = _____

b 7,425 ÷ 8 = _____ r _____

20 Write the answer as a mixed number. p 135

a 53 ÷ 6 = _____

b 21,215 kg of rice is shared equally between 4 stores. p 135

How much rice does each store receive?

_____ kg

21 Calculate. p 135

Write the remainder as a decimal.

685 ÷ 4 = _____

22 A minibus can carry 8 students. p 140

How many minibuses are needed to transport 93 students?

_____ minibuses

23 Calculate. p 140

36 − 4 × 7 + 8 = _____

24 Add brackets to make this statement true.

18 − 6 ÷ 3 = 4

25 A triangular prism has 5 faces. p 140

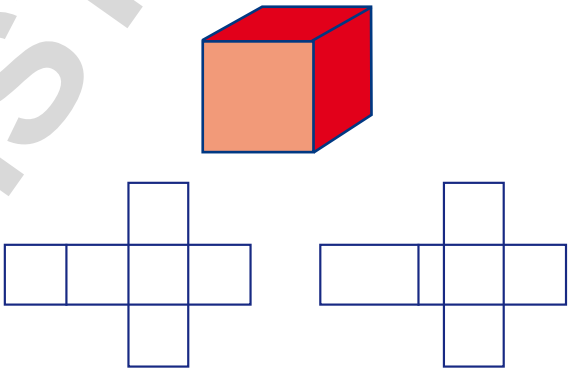
How many edges and vertices does it have?

Edges: _____ Vertices: _____

26 A pyramid has one base and its triangular faces meet at an p 140

_____.

27 Which net matches? p 137



28 A bag contains 10 counters. 3 are red and 7 are blue. What is the probability of choosing a red counter? p 140

_____

29 A standard six-sided die is rolled. p 140

a Write the outcomes for the event roll a number greater than 3. _____

b What is the probability of this event?

_____

c Write this probability as a decimal and a percentage.

Decimal: _____ Percentage: _____

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Integers

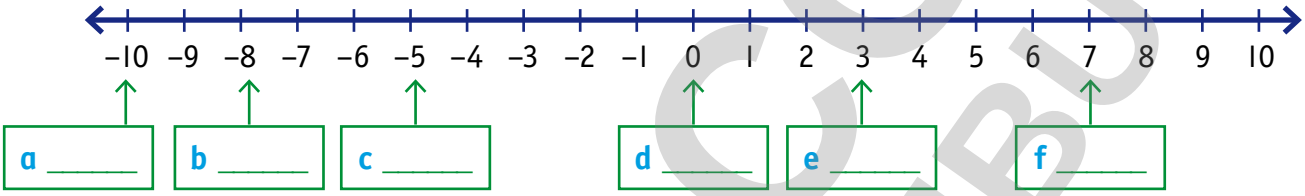
Integers are all the whole numbers, including positive numbers, negative numbers and zero.



1 Circle the integers.

−6 2.5 0 14 −9 3.2 −1 8 $\frac{1}{2}$ 10.5 $\frac{3}{8}$ −12

2 Which integer is shown?



3 Write the integer:

a one less than 0 _____

b three greater than 4 _____

c between −6 and −4 _____

d between −1 and 1 _____

e halfway between −2 and 2 _____

f five less than 3 _____

g two more than −8 _____

h halfway between −2 and 4 _____



4 Write the matching integer. Don't forget the unit of measurement.

a The temperature is 4 °C below zero. _____

b A diver is 8 metres below sea level. _____

c A lift is 3 floors above the ground floor. _____

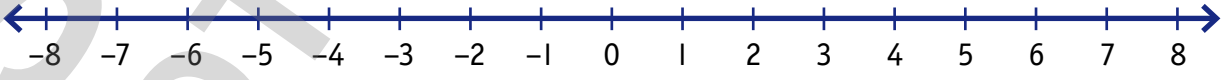
d A lift is 2 floors below the ground floor. _____

e A mountain is 120 metres above sea level. _____

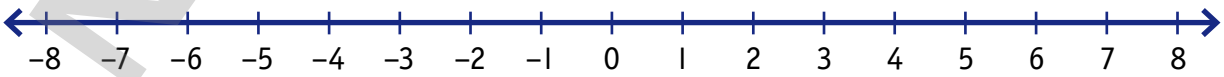
f A freezer is 18 °C below zero. _____

5 Show the rise in temperature of:

a 5 degrees from −5 °C.

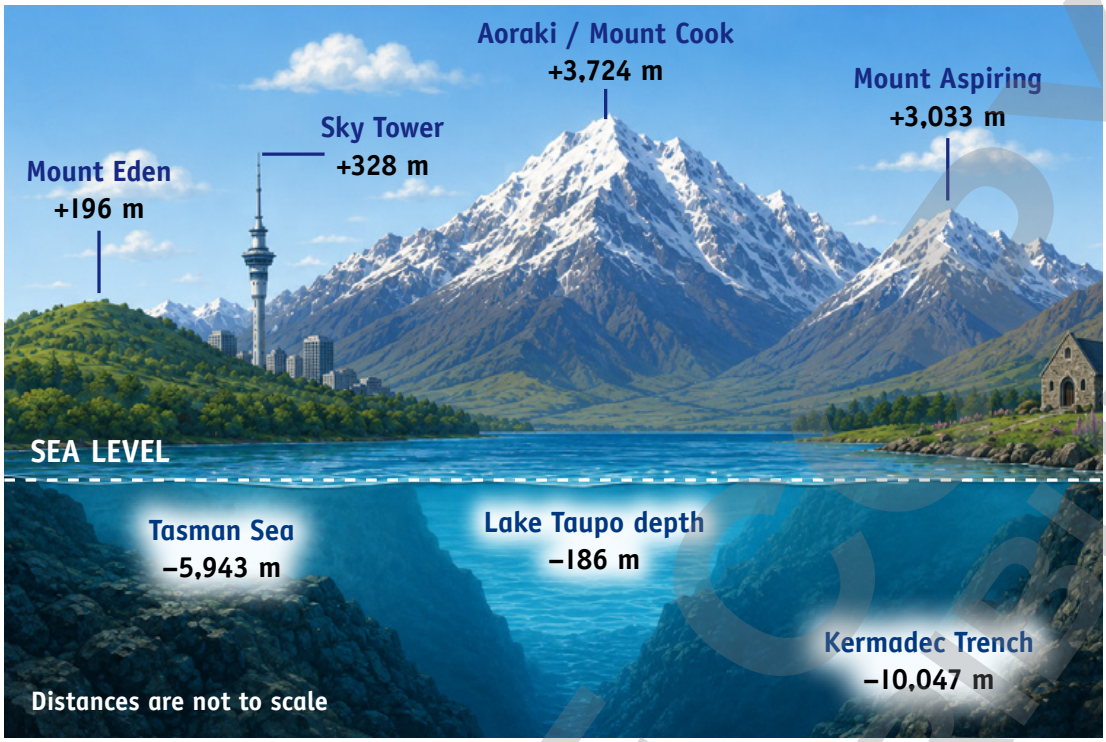


b 9 degrees from −6 °C.



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Integers



Heights above sea level are written as positive (+) numbers.

Depths below sea level are written as negative (−) numbers.

1 Write each height as metres above sea level, e.g. Mount Eden is 196 m above sea level.

a The top of Sky Tower is _____ b The peak of Mount Aspiring is _____

c The tallest peak of Aoraki / Mount Cook is _____

2 Write the depth of each as metres below sea level

a The sea floor of the Kermadec Trench is _____

b The deepest part of the Tasman Sea is _____

3 Mark these locations on the picture:

a A diver is 18 m below sea level.

b Draw **H** at +480 m to show a helicopter flying above sea level.

c Draw **S** at −5,000 m to show a research submarine.

4 Order these integers from least to greatest. +3,724, +196, −50, +3,033, 0, −10,047, −186

_____

5 How many metres between:

a the top of Sky Tower and a diver at −50 m. _____

b the bottom of Lake Taupo and the top of Aoraki/Mount Cook. _____

c the top of Mount Aspiring and the depth of the Tasman Sea. _____

6 Reason and explain.

A mountain is +1,200 m above sea level. A submarine is −800 m below sea level.

Which is further from sea level?

Explain your thinking. _____

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Skip counting with integers

Skip–counting patterns continue through zero, e.g. Count forwards in 2s: –6, –4, –2, 0, 2, 4, 6
Count backwards in 2s: 6, 4, 2, 0, –2, –4, –6

1 Continue the patterns.

a Count forwards by 2s. –8, –6, –4, _____, _____, _____, _____, _____

b Count forwards by 2s. –3, –1, 1, _____, _____, _____, _____, _____

c Count backwards by 3s. 7, 4, 1, _____, _____, _____, _____, _____

2 Count in 5s.

a Count forwards.
–15, –10, –5, _____, _____, _____

b Count forwards.
–20, –15, –10, _____, _____, _____

c Count backwards.
20, 15, 10, _____, _____, _____

d Count backwards.
10, 5, 0, _____, _____, _____

3 Count in 10s.

a Count forwards.
–40, –30, –20, _____, _____, _____

b Count forwards.
–10, 0, 10, _____, _____, _____

c Count backwards.
40, 30, 20, _____, _____, _____

d Count backwards.
25, 15, 5, _____, _____, _____

4 Fill in the missing numbers.

a –12, _____, –8, _____, –4, _____, 0

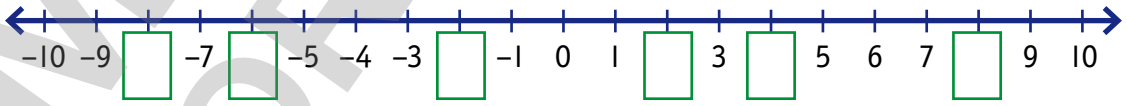
b 15, _____, 5, _____, –5, _____, –15

c –20, _____, 0, _____, 20, _____, 40

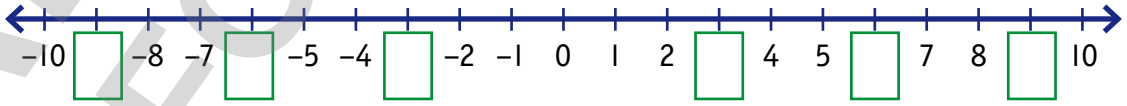
d 30, _____, 10, _____, –10, _____, –30

5 Complete the number lines.

a Count in 2s.



b Count in 3s.



6 Continue the pattern. What is the rule?

a –7, –4, –1, 2, 5, 8, _____, _____ Rule: _____

b 18, 13, 8, 3, –2, –7, _____, _____ Rule: _____

c –30, –20, –10, 0, 10, 20, _____, _____ Rule: _____

7 A diver is 24 metres below sea level. She rises 3 metres at a time.
Write the depths she reaches until she gets to the surface.

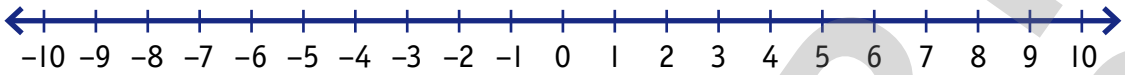
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Compare and order integers

You can compare integers using a number line. Numbers further to the right are greater.

e.g. −2 > −5 4 > −3 0 > −4



1 Use the number line. Which integer:

a is 3 places to the right of −4? _____

b is 5 places to the left of 2? _____

c is halfway between −6 and 0? _____

d is halfway between −2 and 4? _____

e is closest to zero? −7 −1 4

f is halfway between −8 and 2? _____

2 Use <, > or = to make each statement true.

a −4 ☐ −2 **b** 3 ☐ −1 **c** −6 ☐ −8 **d** 0 ☐ −3

e −5 ☐ 5 **f** −7 ☐ −7 **g** 2 ☐ 0 **h** −1 ☐ 1

3 Circle the greater integer.

a −2 −7 **b** −4 4 **c** −2 −1 **d** −14 −15

4 Circle the smaller integer.

a 1 −4 **b** −6 −1 **c** 0 3 **d** −8 −12

5 Order from least to greatest.

a −2, 4, −6, 1, 0 _____ **b** 5, −7, −1, 2, −4 _____

c −10, 8, 0, −3, 6 _____ **d** 7, −2, −9, 3, 0 _____

6 Order from greatest to least.

a −3, 8, 0, −6, 2 _____ **b** −10, 7, −1, 5, 0 _____

c 4, −8, 9, −2, 0 _____ **d** −5, 3, −1, 6, −7 _____

7 Find the missing integer.

a −8 < _____ < −6 **b** −2 < _____ < 0

c _____ < −9, but greater than −11 **d** _____ is halfway between −5 and 3.

8 Reason and explain.

Mia says: −8 is greater than −3 because 8 is greater than 3.

Do you agree? Explain your thinking.

_____

_____

_____

Challenge!



I am thinking of an integer.

- It is less than 0.
- It is greater than −10.
- It is closer to −10 than −6 is.
- It is an even number.

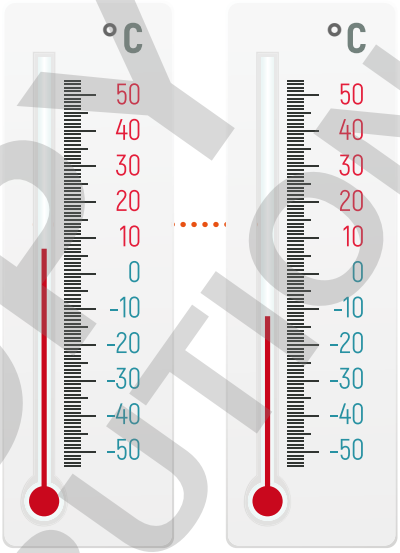
What integer could I be? ☐

Is there more than one possible answer? ☐

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Temperature

Temperature is measured in degrees Celsius (°C).
A thermometer shows temperature.
Temperatures above 0 °C are positive.
Temperatures below 0 °C are negative.
Water freezes at 0 °C.



1 Write the temperature. Circle the ones that match the thermometers.

a three degrees below zero _____ °C

b seven degrees above zero _____ °C

c one degree below zero _____ °C

d twelve degrees below zero _____ °C

2 Compare the temperatures. Use <, > or =.

a −4 °C ☐ 3 °C **b** 7 °C ☐ −2 °C **c** 0 °C ☐ −1 °C **d** −8 °C ☐ −5 °C

3 Order these temperatures from coldest to warmest.

−5 °C, 4 °C, −1 °C, 8 °C, 0 °C _____

4 Temperature changes.

a The temperature is −3 °C. It rises to 4 °C. How many degrees did it increase? _____ °C

b The temperature is 8 °C. It falls to −2 °C. How many degrees did it decrease? _____ °C

c The temperature is −5 °C. It rises to 1 °C. How many degrees did it increase? _____ °C

5 Choose the most reasonable temperature.

a A freezer −18 °C 5 °C 18 °C **b** A warm summer day −5 °C 22 °C 60 °C

c Water freezing 0 °C 10 °C 100 °C **d** Snow on a mountain −3 °C 18 °C 35 °C

e A classroom −10 °C 20 °C 45 °C

Place	Temperature
Wellington	5 °C
Christchurch	2 °C
Auckland	9 °C
Queenstown	−4 °C

6 Use the table.

a Which place is the warmest? _____

b Which place is the coldest? _____

c How many degrees warmer is Auckland than Queenstown?

_____

d Put the places in order from coldest to warmest.

_____

Mastery Checklist I can:

- ☐ recognise, locate and order positive and negative integers
- ☐ count forwards, backwards and skip-count with integers
- ☐ compare integers and explain my reasoning using a number line
- ☐ read, estimate and solve problems involving positive and negative temperatures

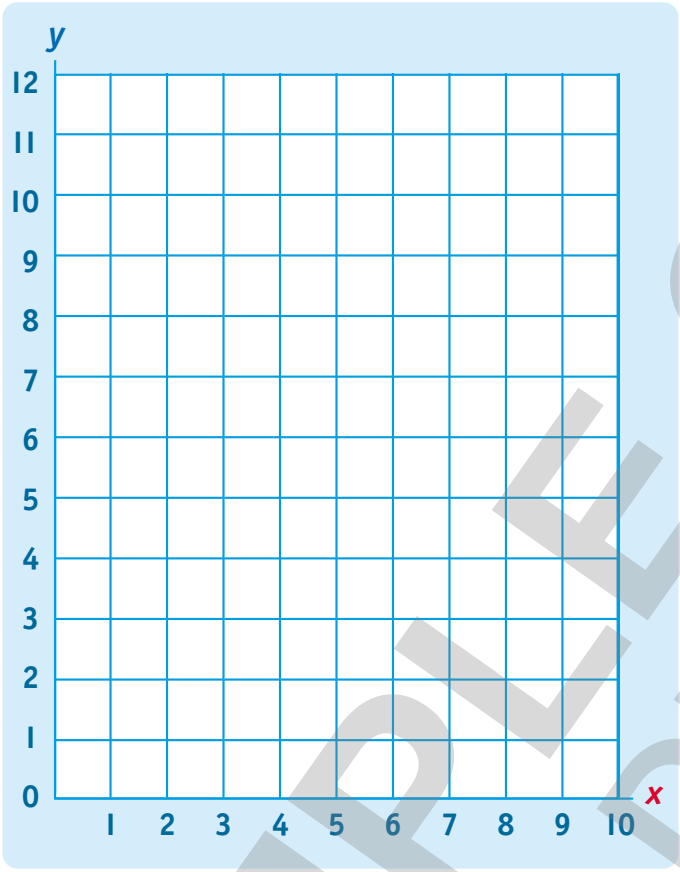
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First quadrant

Coordinates are written as an ordered pair (*x*, *y*). Read across the *x*-axis first, then up the *y*-axis.

1 Plot these points on the Cartesian number plane.

(0, 0), (1, 2), (2, 1), (3, 3), (4, 2), (5, 4), (6, 3), (7, 5), (8, 4), (9, 6), (10, 5)



a Join the points in order.

b Describe the pattern you see.

_____

_____

c What do you notice about the *x*-coordinates?

_____

2 Use the points you plotted to answer these questions.

a Which points have a *y*-coordinate of 3?

_____

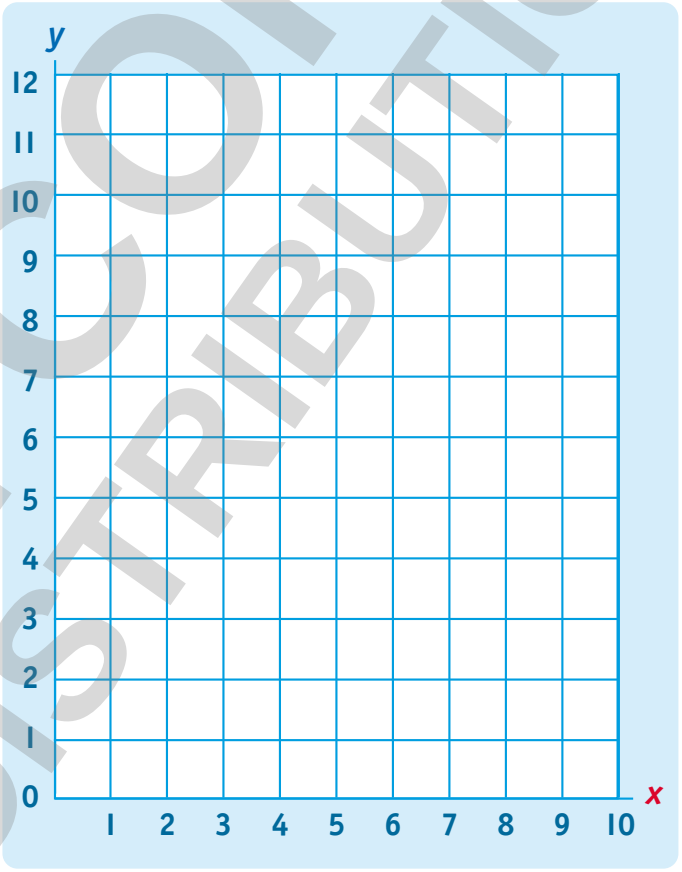
b What is the *y*-coordinate of the point (7, _____)?

c Which point lies on the y-axis? _____

3 Create your own coordinate pattern.

a Plot at least 8 points on the coordinate plane.

b Join the points in order to make a pattern.



c Record your ordered pairs in order.

_____

_____

d Swap your ordered pairs with a partner. Do not show them your graph.

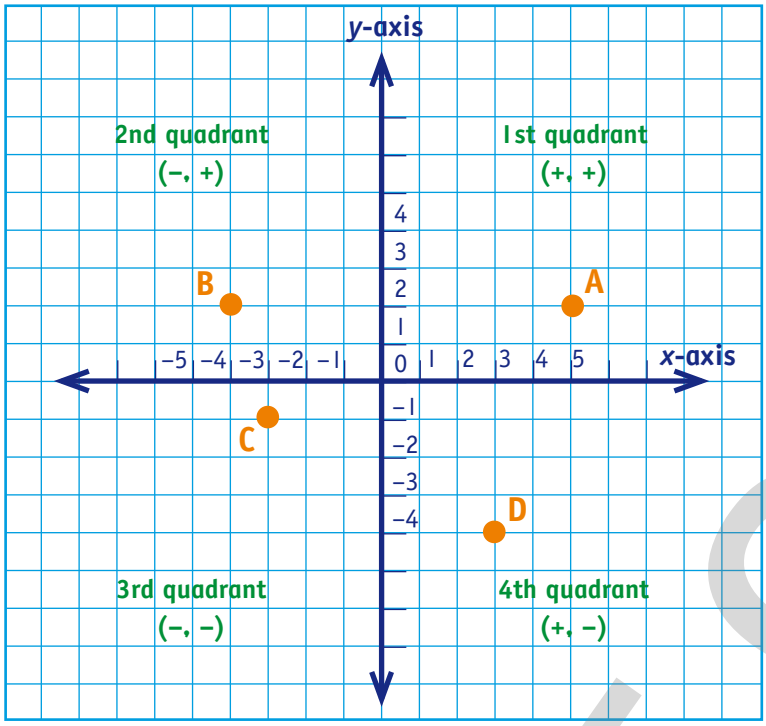
e Plot your partner's points and join them in order.

f Compare your graphs. Do they match?

_____

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The Cartesian plane



The Cartesian plane has two axes and four quadrants.

The ***x*-axis** runs horizontally and the ***y*-axis** runs vertically. They meet at the **origin (0, 0)**.

Coordinates are written as an ordered pair (*x*, *y*).

Read the ***x*-coordinate** first, then the ***y*-coordinate**.

A positive or negative sign tells you which direction to move from the origin.

A is (5, 2)
B is (–4, 2)
C is (–3, –1)
D is (3, –4)

1 Complete the Cartesian plane.

a Label the ***x*-axis** and ***y*-axis**.

b Mark the **origin**.

c Number each axis from –4 to 4.

2 Write the ordered pair for each point already plotted on the plane.

A _____ **B** _____ **C** _____

D _____ **E** _____

3 Where is each point located? Write 1st quadrant, 2nd quadrant, 3rd quadrant, 4th quadrant, *x*-axis or *y*-axis.

A _____ **B** _____

C _____ **D** _____

E _____

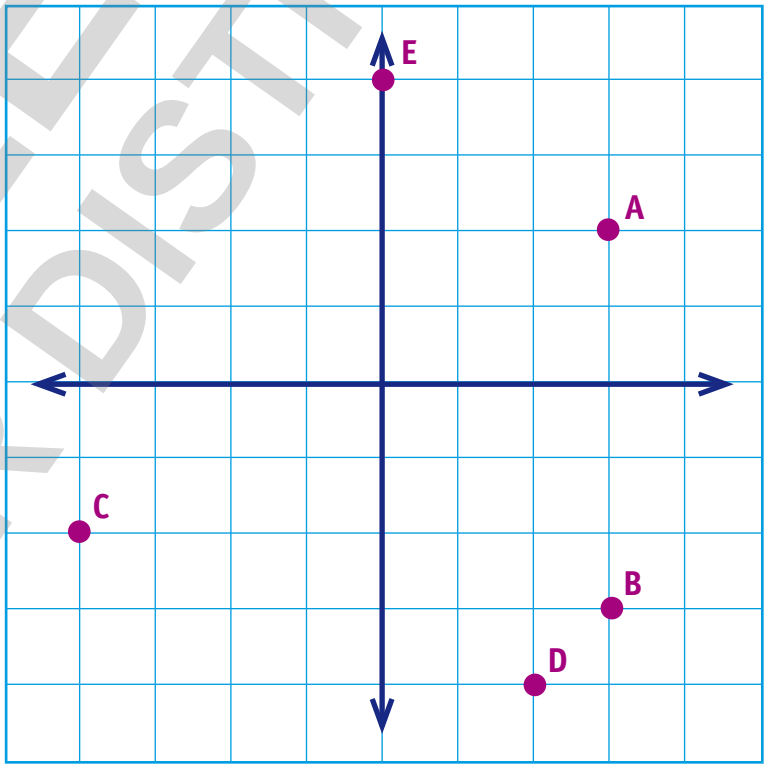
4 Without plotting them, decide where each point would lie.

a (–4, 5) _____

b (3, –2) _____

c (0, –4) _____

d (–4, –3) _____



Challenge!

Point **T** is at (–3, 2). Point **U** has the same *y*-coordinate as **T** but is in the 1st quadrant. Point **V** has the same *x*-coordinate as T but is in the 3rd quadrant.

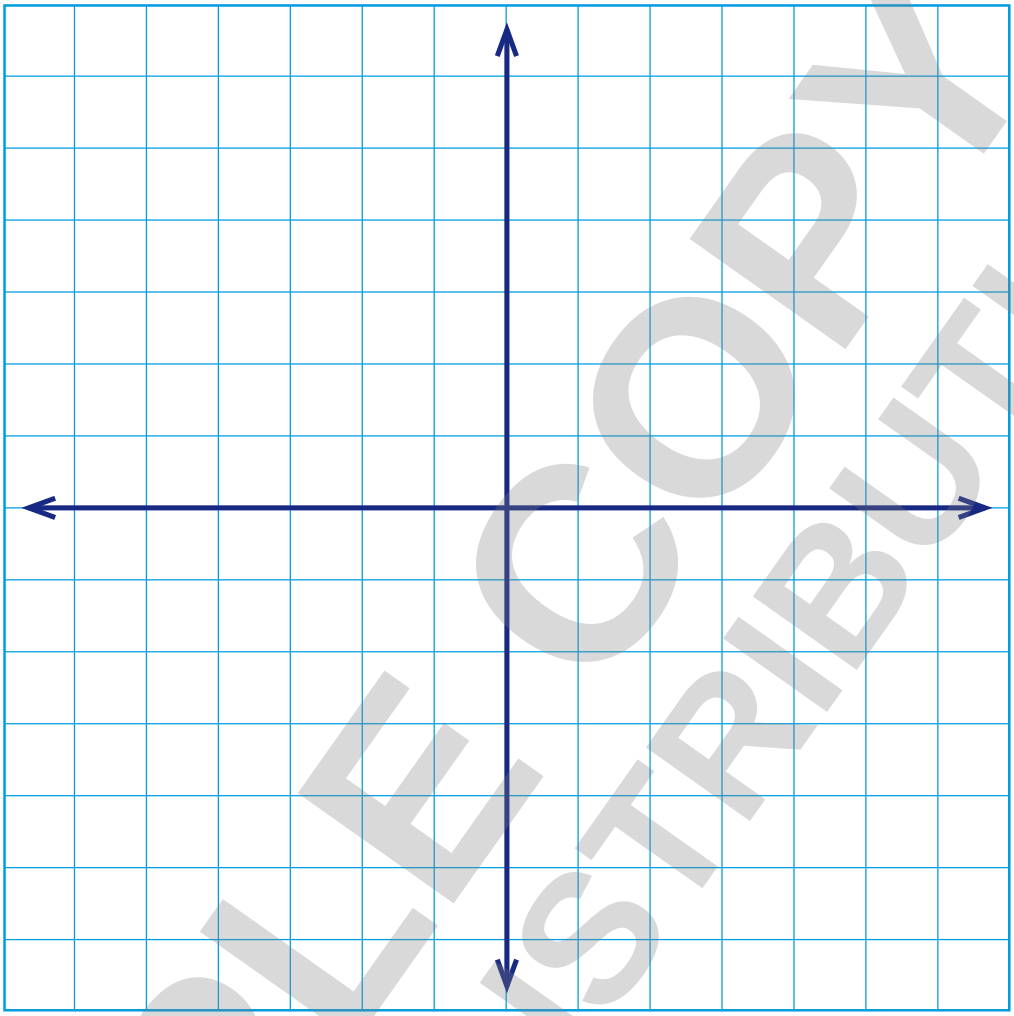
Write one possible coordinate for **U** and **V**.

U (_____,_____) **V** (_____,_____)

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Algebra Equations and relationships: Locating coordinate points on a coordinate plane, including points found on the *x*- or *y*-axis

Plotting points



1 Complete the Cartesian plane.
   a Label the ***x*-axis** and ***y*-axis**. b Mark the **origin**. c Number each axis from –6 to 6.

2 Plot and label these points:
   A (0, 6) **B** (–5, –5) **C** (6, 2) **D** (–6, 2) **E** (5, –5)

3 Where is each point located? Write the quadrant, or name the axis if the point lies on an axis.
   A _____ **B** _____ **C** _____ **D** _____ **E** _____

4 a Join the points in this order: **A → B → C → D → E → A**
   b What shape have you drawn? _____

5 Without plotting them, decide where each point would lie.
   a (–4, 6) _____ b (5, –3) _____ c (0, –6) _____ d (–1, 0) _____

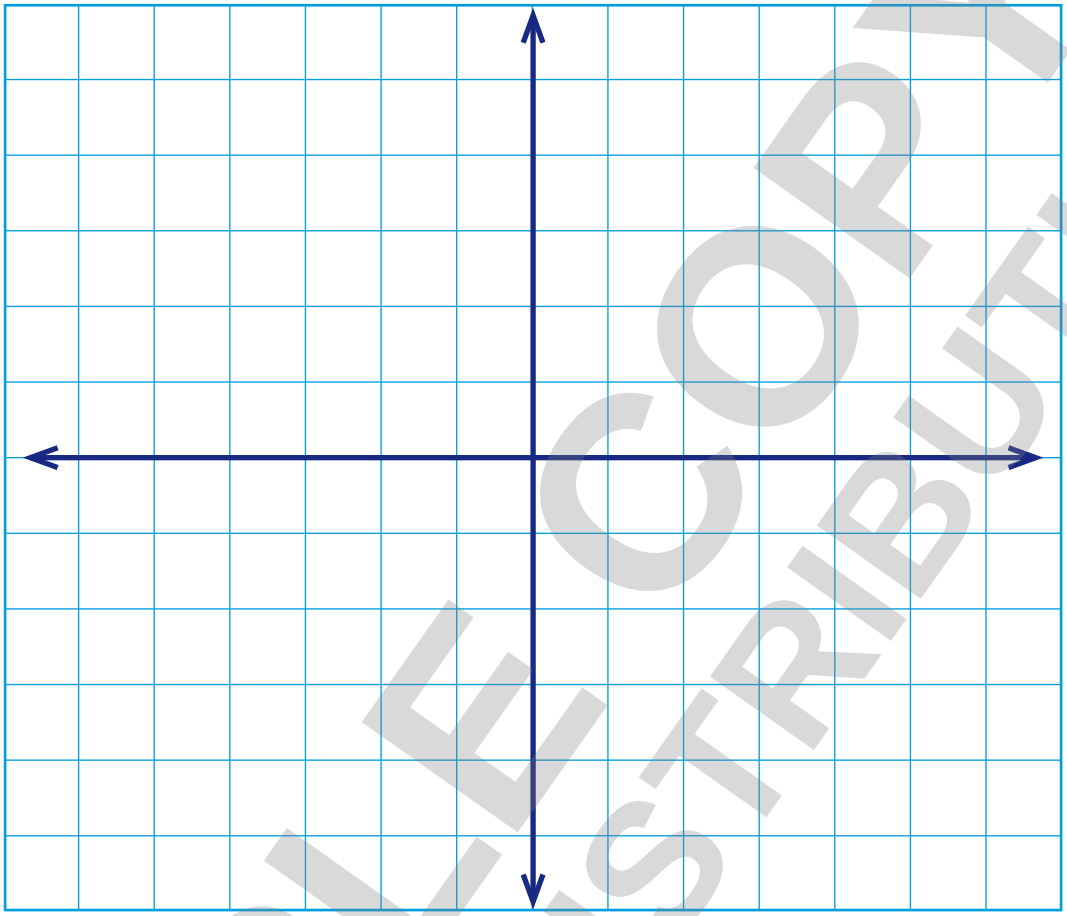
Challenge!

On 1 cm grid paper, draw and number a four-quadrant Cartesian plane. Draw a simple picture or shape using straight lines. It must have at least one vertex in each quadrant. Write the ordered pairs on a separate piece of paper. Swap with a partner. Can they draw your picture using only your coordinates?

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On the plane

1 Mark the axes, the origin and the scale on each axis. Hint: See page 153.



2 Iluka thinks these points are the vertices of a parallelogram: (–4, 3), (–4, –2), (2, –2), (2, 2).

a Plot the points in red and join them in order. Is Iluka correct? Explain your answer.

_____

b What should the fourth coordinate be to make a parallelogram? _____

3 **a** Three vertices of a square are: (–3, 4), (–3, 0), (1, 0). Plot the points in blue.

b Write the missing fourth coordinate. (_____, _____)

c Plot the point and complete the square.

4 Jedda is plotting a triangle with a vertical line of symmetry. Two vertices are (–5, –1) and (–1, –1).

a What could the third vertex be? (_____, _____)

b Plot the triangle in green and draw its line of symmetry. _____

5 Design your own symmetrical shape with at least 4 vertices.

a Write the coordinates of each vertex. _____

b Plot and join the vertices in orange.

c Draw the line of symmetry.

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Plotting patterns

A rule can generate many pairs of numbers.

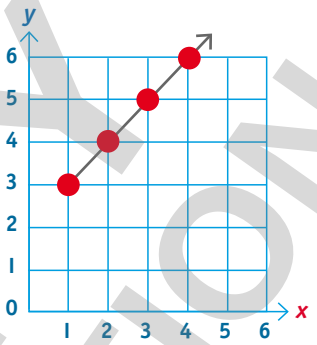
1. **Put the input number into the rule.**
2. **Work out the output.**
3. **Write the ordered pair.**
4. **Plot each point.**

Example

Rule: $y = x + 2$

x	1	2	3	4
y	3	4	5	6

Ordered pairs:
(1, 3), (2, 4), (3, 5), (4, 6)
The points form a pattern.



1 Complete the tables.

a Rule: $y = x + 1$

x	1	2	3	4	5
y					

b Rule: $y = 7 - x$

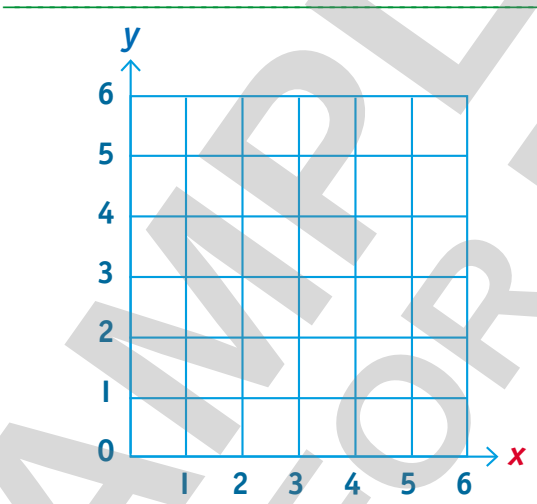
x	1	2	3	4	5
y					

2 Plot the two patterns on the grid. Use a different colour for each.

a Plot the points from Question 1a.

b Plot the points from Question 1b.

c What do you notice about the two patterns?

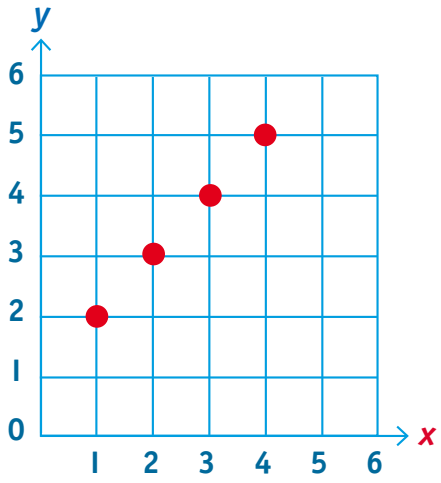


3 Which rule? These points have already been plotted.

(1, 2) (2, 3) (3, 4) (4, 5)

Circle the rule.

$y = x + 2$ $y = 2 \times x$ $y = x + 1$



Challenge! A pattern follows the rule $y = 2x - 1$.

a Write the first three ordered pairs when $x = 1, 2, 3$.

b Without drawing a graph, what will the point be when $x = 10$?

c Explain how you worked it out.

Mastery Checklist I can:

- ☐ use a rule to generate ordered pairs
- ☐ plot ordered pairs to show a pattern

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Tallies and picture graph

1 Use tally marks to show these counts. Books sold in a week:
Adventure 21, Young Adult 29, Thriller 11, Mystery 37, Comedy 15.

Tally marks are used to count large numbers. They are in groups of 5. The 5th mark makes a bundle.
𝍸 = 5



Book	Tally	Total
Adventure		
Young Adult		
Thriller		
Mystery		
Comedy		

Farmer Blake kept a tally of the number of boxes of mangoes that were picked each day for a week.

Day	Tally	Total
Sunday	𝍸 |	
Monday	𝍸 𝍸 𝍸	
Tuesday	𝍸 𝍸 ||	
Wednesday	𝍸 𝍸 𝍸 𝍸 |||	
Thursday	𝍸 𝍸 |||	
Friday	𝍸 𝍸 𝍸 |||	
Saturday	𝍸	

Sunday	★
Monday	
Tuesday	
Wednesday	
Thursday	
Friday	
Saturday	
Key ★ = 5 boxes	

2 Complete the **Total** column.

3 Why did she choose a 5-pointed star for the graph?

_____

4 **a** Use the key to complete the graph. **b** Give the graph a title.



5 How many boxes were picked on:

a Monday and Tuesday? _____ **b** Monday to Friday? _____

c the weekend? _____ **d** altogether? _____

6 On which day did she pick three times as many boxes as on Saturday? _____

7 On one day she had help for a few hours. Which day do you think it was? _____

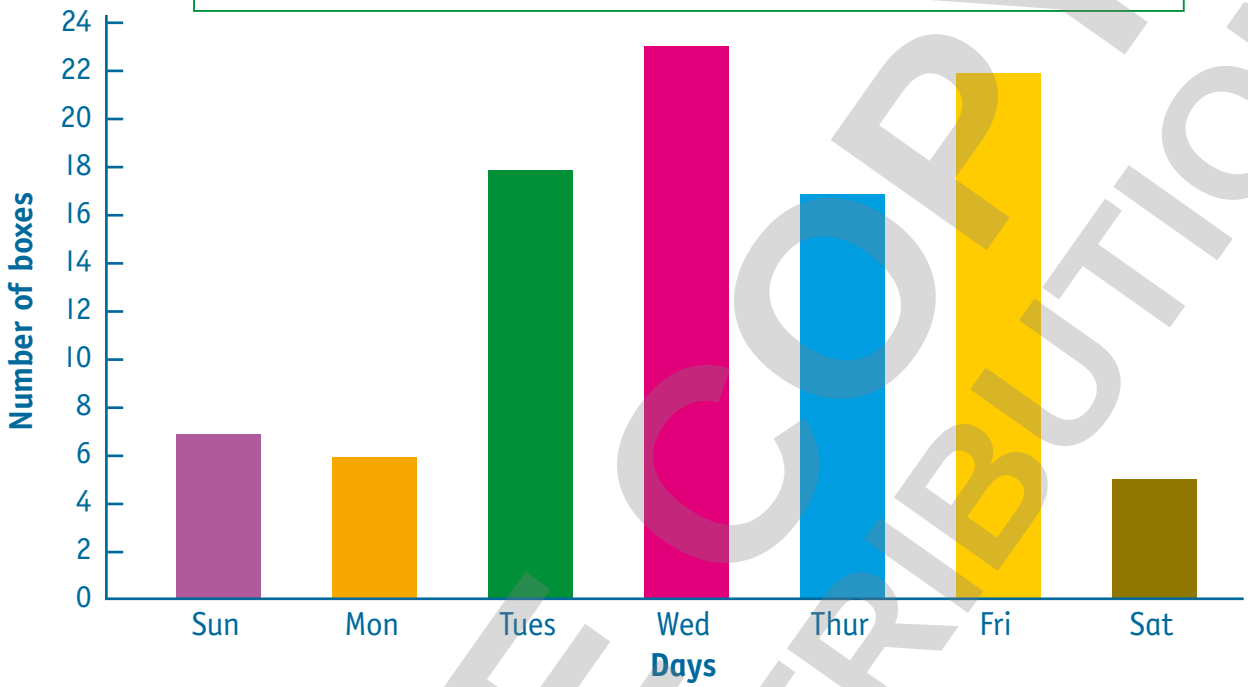
Why? _____

_____

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Bar graph and tables

The next week Farmer Blake decided to draw a bar graph.



1 Write a title for the graph.

2 a Complete her tally chart.

b How many boxes did she pick altogether that week? _____

c How does this compare with the previous week?

_____

Day	Tally	Total

3 On which day did she:

a pick the most? _____

b pick the least? _____

4 Write one possible reason:

a why so few boxes were picked on Monday. _____

b why so many boxes were picked on Wednesday. _____

5 What do you think happens on weekends? _____

6 a Is it easier for you to read the tally chart or the bar graph? _____

b Why? _____

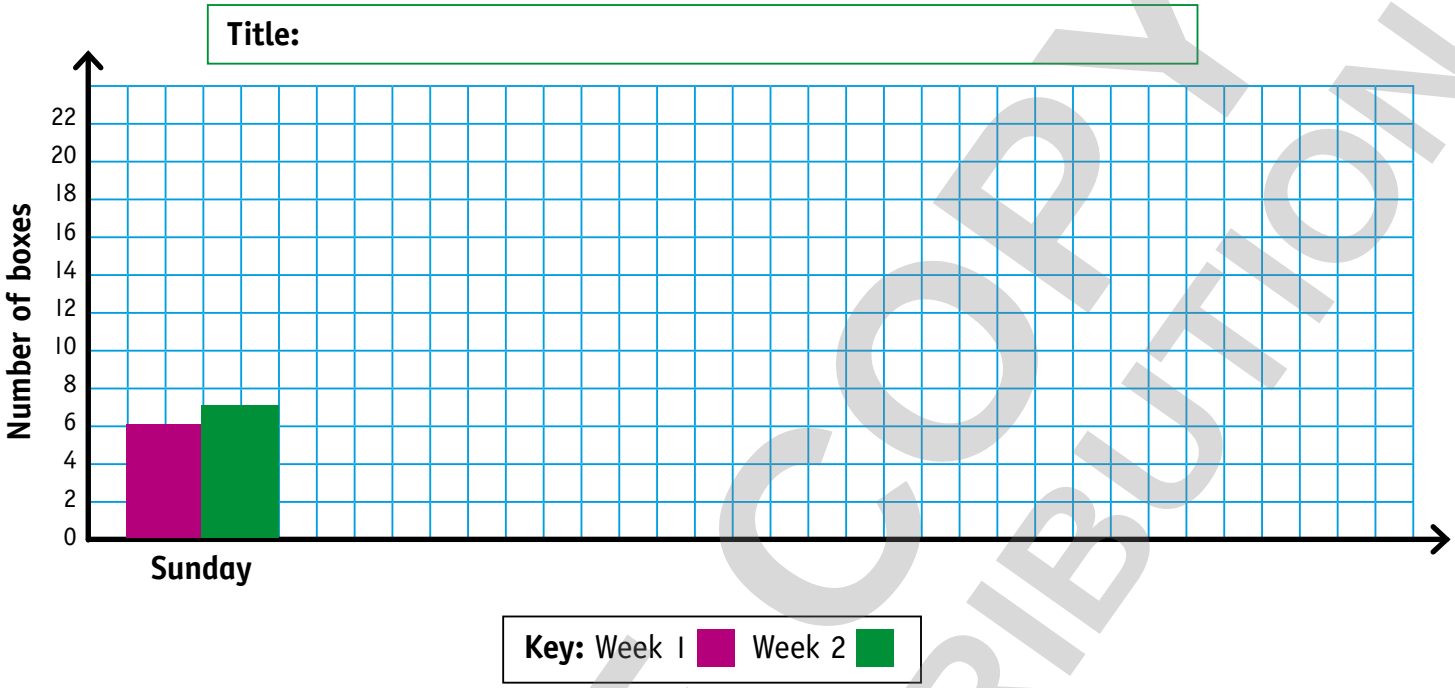
7 Fill in the table with the number of boxes picked in both weeks.

Day	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Week 1							
Week 2							

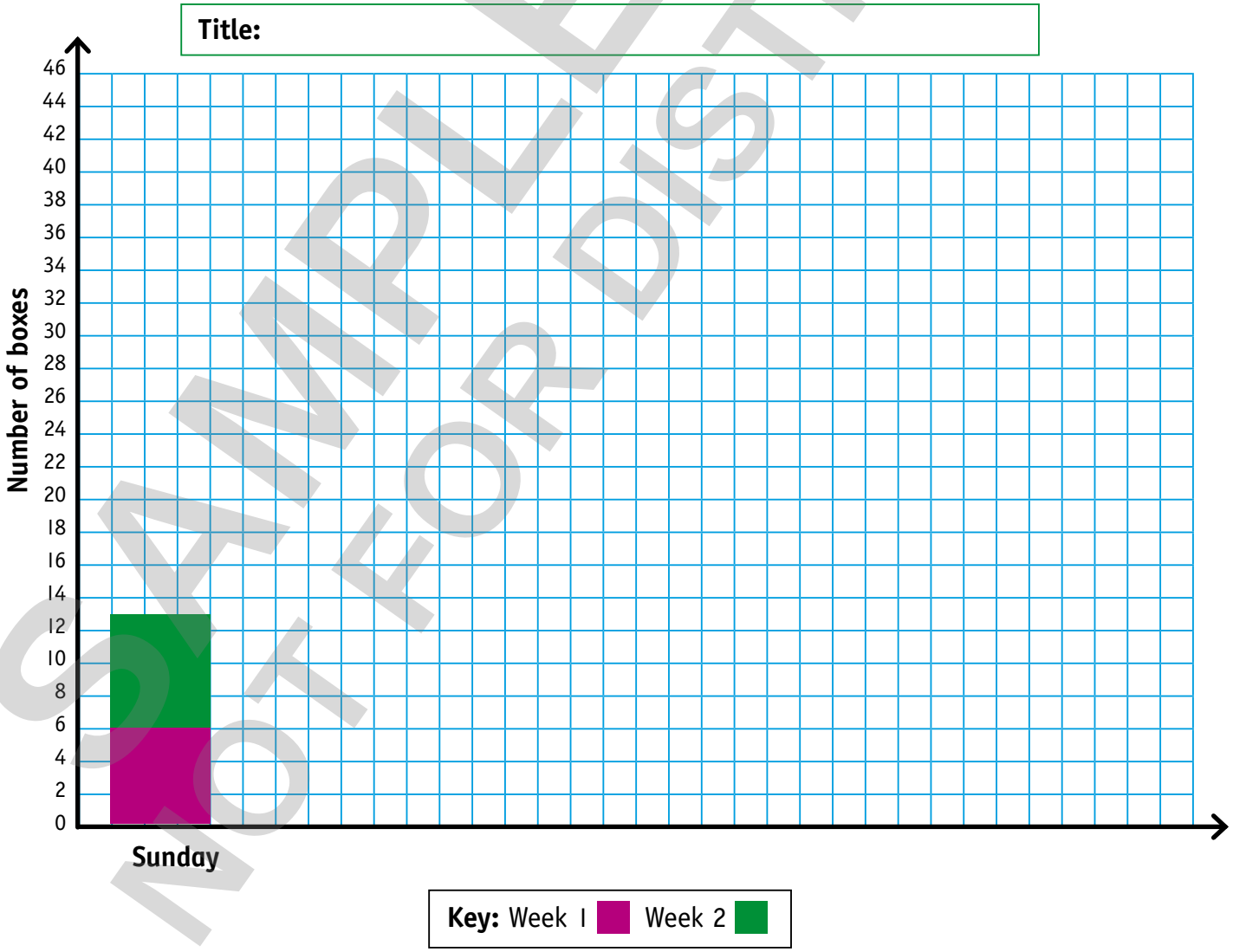
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Clustered and stacked bar graphs

1 Use the data in the table at the bottom of page 157 to complete this clustered bar graph.



2 Use the same data to make a stacked bar graph. Add a title to each graph.



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Interpret bar graphs

TERM 4
Week 3

Look at the graphs on page 158 to answer these questions.

1 a Explain the scale. _____

b Explain the key. _____

c Why is the second graph taller than the first one? _____

_____

2 a Which day had the same number of boxes in both weeks? _____

b Which day had almost the same number of boxes in both weeks? _____

c What was the difference in the numbers that were almost the same? _____

3 a Which day had the biggest difference between week 1 and week 2? _____

b What was the difference? _____

4 Which graph do you find easier to read to answer these questions?

clustered bar graph | stacked bar graph

5 What is the range for: a week 1? _____

b week 2? _____

c both weeks? _____

Range = highest number **minus** lowest number

6 What is the range for Monday to Friday in:

a week 1? _____

b week 2? _____

c both weeks? _____

7 a Draw a black line on each graph that goes from the top of each Week 1 bar to the next across the graph.

b Draw a red line on each graph that goes from the top of each Week 2 bar to the next.

8 What do these lines do? Tick the correct description.

☐ Go up, peak in the middle and then go back down

☐ Go straight across

☐ Go up and down a couple of times

☐ Go up all the way

9 Are the two lines going up and down around the same days? _____

10 Draw a blue line on one of the graphs to show your prediction for what will happen in Week 3.

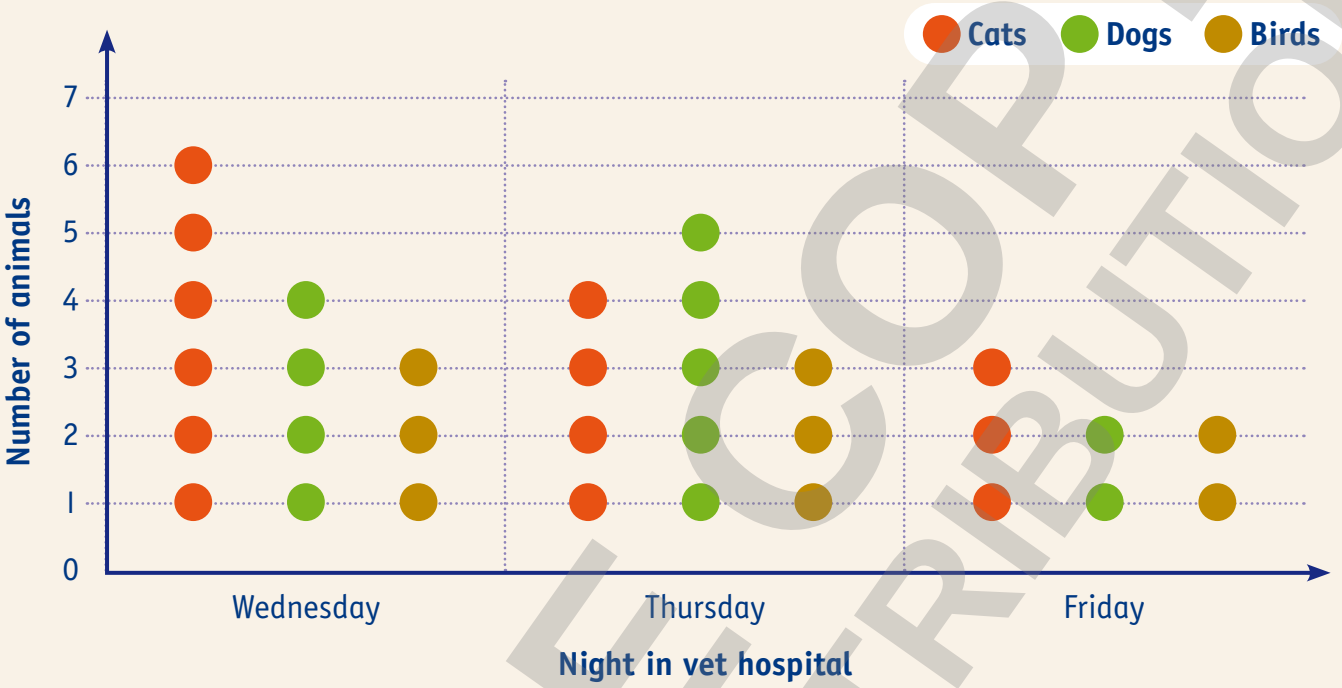
11 Which graph do you find easier to read to answer these questions?

clustered bar graph | stacked bar graph

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Dot plot

The vet nurse drew a dot plot to record how many animals spent the night in the vet hospital.



1 What does each dot represent? _____

2 Write a suitable title for the graph.

3 How many animals stayed in hospital on:

a Wednesday? _____ b Thursday? _____ c Friday? _____

4 a How many animals stayed over the three nights altogether? _____

b How many dogs stayed over the three nights? _____

c How many more cats than birds stayed altogether? _____

5 a Which animal stayed most often? _____

b How many fewer animals stayed on Friday than Wednesday? _____

c On which day was the difference between the number of cats and dogs greatest?

_____



6 What pattern do you notice in the number of animals staying overnight from Wednesday to Friday?

_____

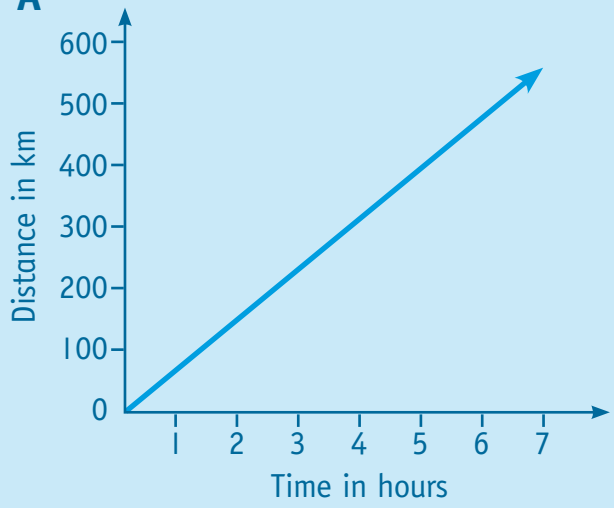
Mastery Checklist I can:

- ☐ read and write tally marks
- ☐ fill in and interpret data tables
- ☐ complete and interpret a picture graph
- ☐ complete and interpret clustered and stacked bar graphs
- ☐ interpret a dot plot

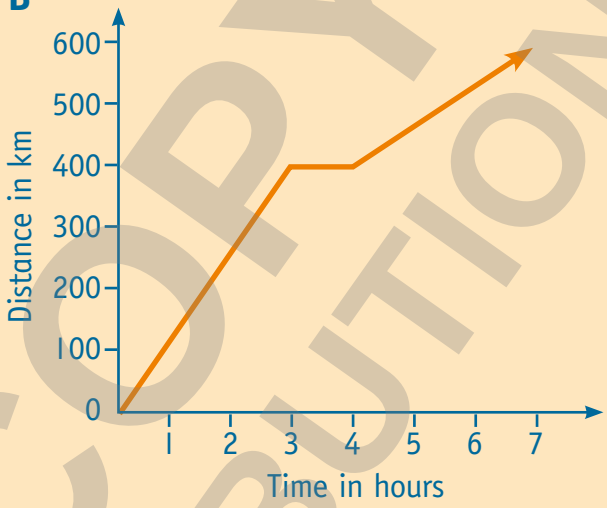
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Line graphs

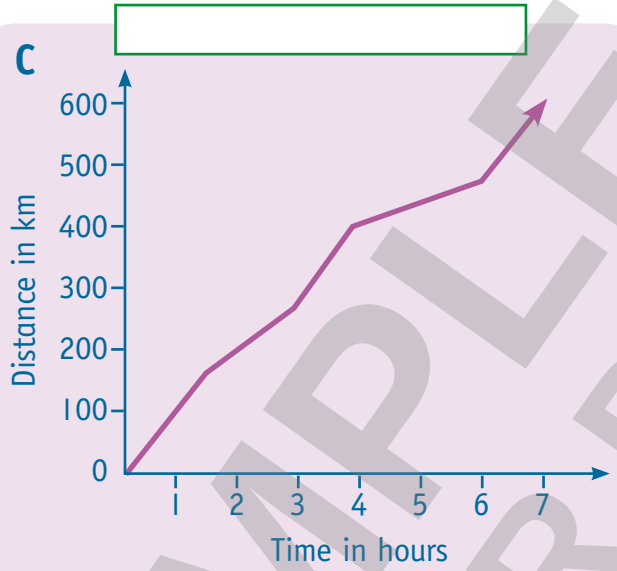
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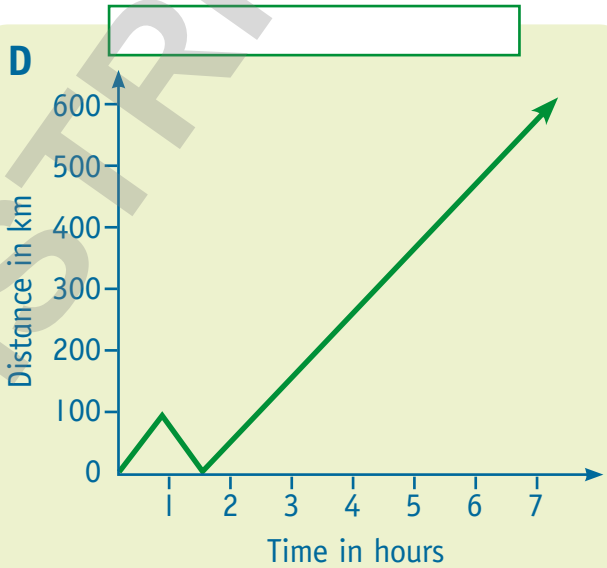
B



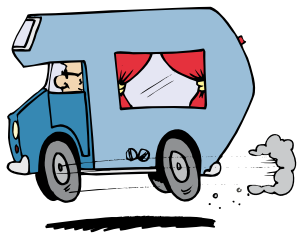
C



D



These are graphs about a holiday trip.



1 Read these stories. Which graph best tells each story?

   a We hadn't gone far when we realised we'd left the dog behind. We had to go back and get him. ____

   b We were slow sometimes, especially when we were stuck behind big trucks. But Dad worked out that our average speed was 85 km/h. ____

   c We wanted to get there quickly, so Dad drove straight through at a steady speed. ____

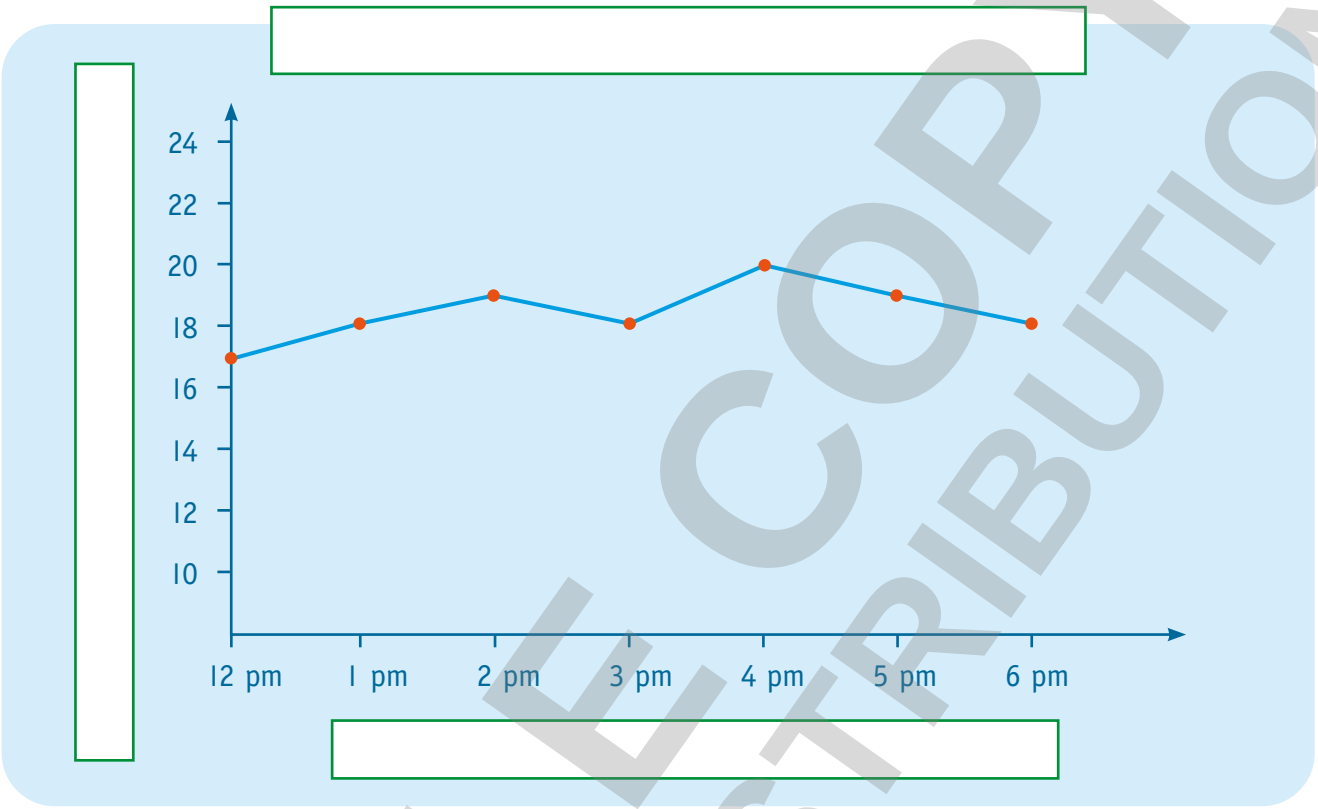
   d Dad and Jo shared the driving. We had to go more slowly when Jo drove after lunch, as she is only a new driver. ____

2 Write a title for each graph.

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Reading a line graph

The swimming pool manager graphed the temperature of the pool water on a cool afternoon. He wanted to find out if the heating system was working properly.



Range: highest number minus lowest number
e.g. 10° – 4°. The range is 6°.
Average: add a set of numbers and divide by how many numbers are in the set.
e.g. $3 + $4 + $5 + $5 + $3 = $20
$20 ÷ 5 = $4. The average is $4.

1 a Give the graph a title.

b Write the labels for both axes.

2 What is the range? _____

3 What was the average temperature this afternoon? _____

4 When did the extremes occur? _____

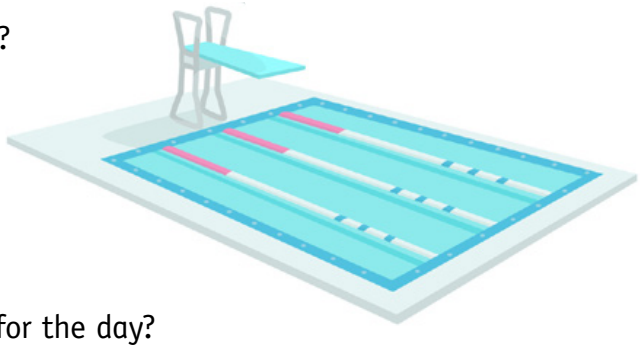
5 Between what hours was the greatest increase in temperature? _____

6 What might have caused the change between 5 pm and 6 pm? _____

7 Estimate the temperature at 1:30 pm. _____

8 Tick the questions that this graph can answer.

- ☐ What is the latest time the temperature was taken?
- ☐ How many people were in the pool at 12:00?
- ☐ At what time was the first temperature taken?
- ☐ When did the manager go home?
- ☐ Was the temperature too hot?
- ☐ Is the heating system controlling the heat evenly for the day?



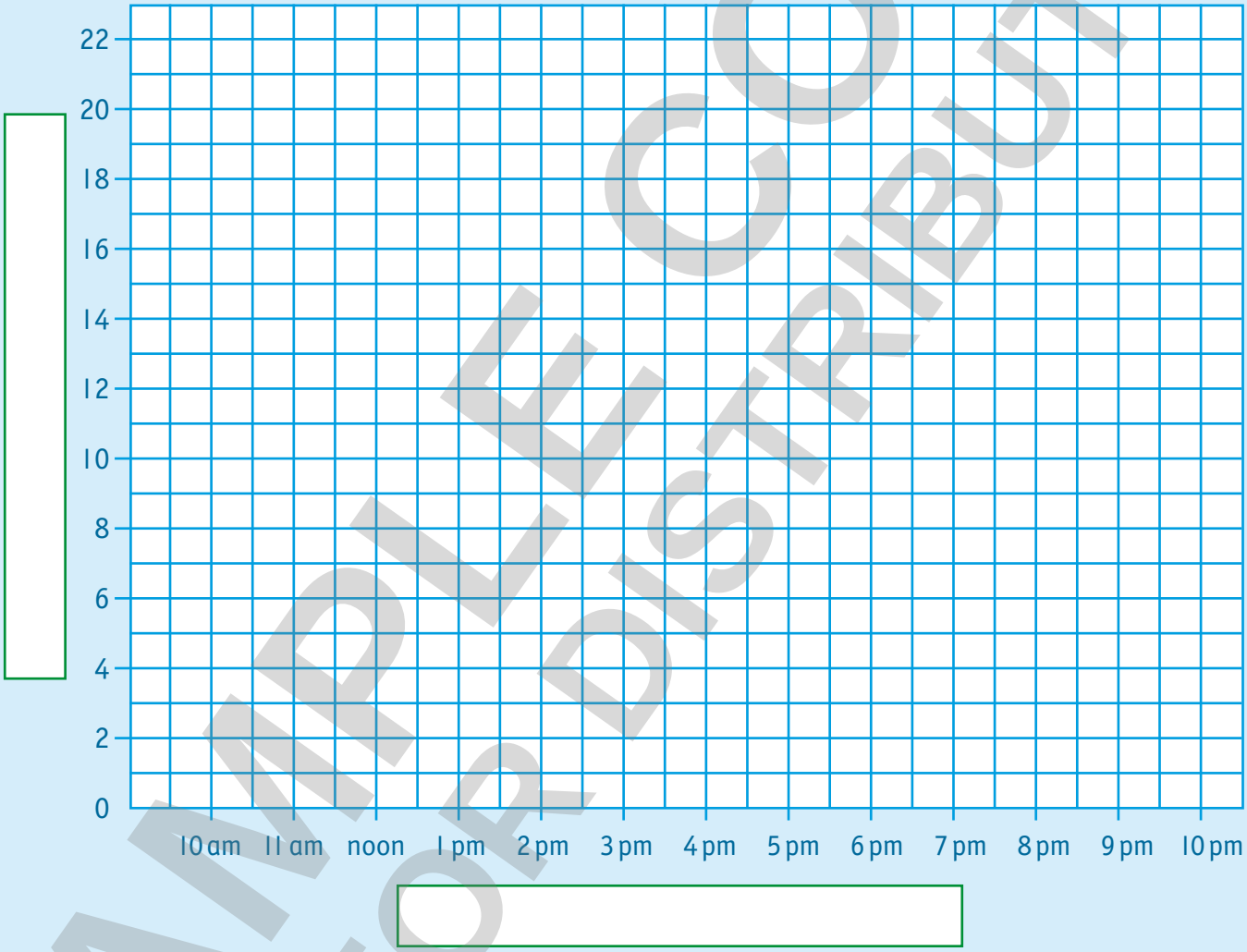
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Drawing a line graph

On Saturday Dan recorded the temperature every hour from 10 am to 10 pm.

Time	10 am	11 am	noon	1 pm	2 pm	3 pm	4 pm	5 pm	6 pm	7 pm	8 pm	9 pm	10 pm
Temperature	17 °C	18 °C	20 °C	21 °C	19 °C	18 °C	16 °C	16 °C	14 °C	13 °C	13 °C	12 °C	10 °C

1 Draw a line graph to show this information.



2 Write a title for the graph.

3 Label both axes.

4 What is the range? _____

5 What is the mean (average)? _____

6 Describe the trend of the line in the graph.

The temperature went _____ until _____ and then it _____

_____.

Challenge!

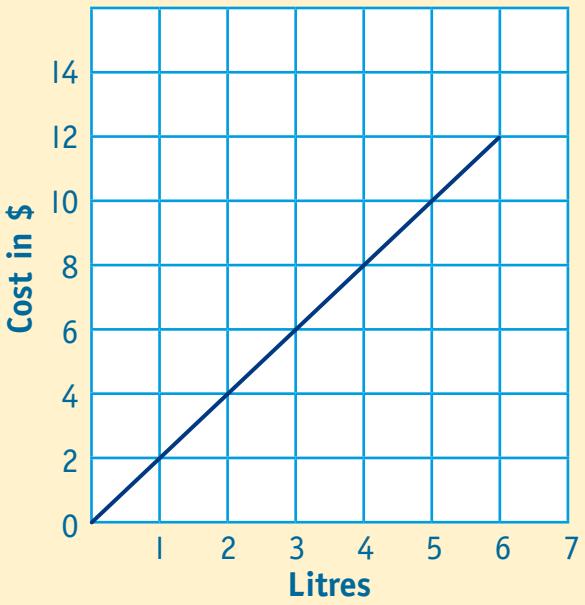
Look online to find examples of line graphs. Print them and paste them onto cardboard. Give each a title. Make a class display.



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Reading costs from line graphs

1 Use this line graph to find the cost of oil.

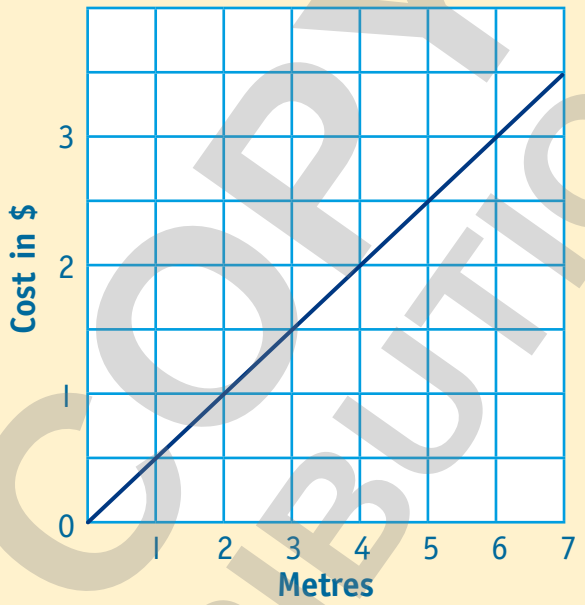


What is the cost of:

a 3 litres _____ **b** 2.5 litres? _____

c 4.5 litres? _____ **d** 0.5 litres? _____

2 Use this line graph to find the cost of rope.

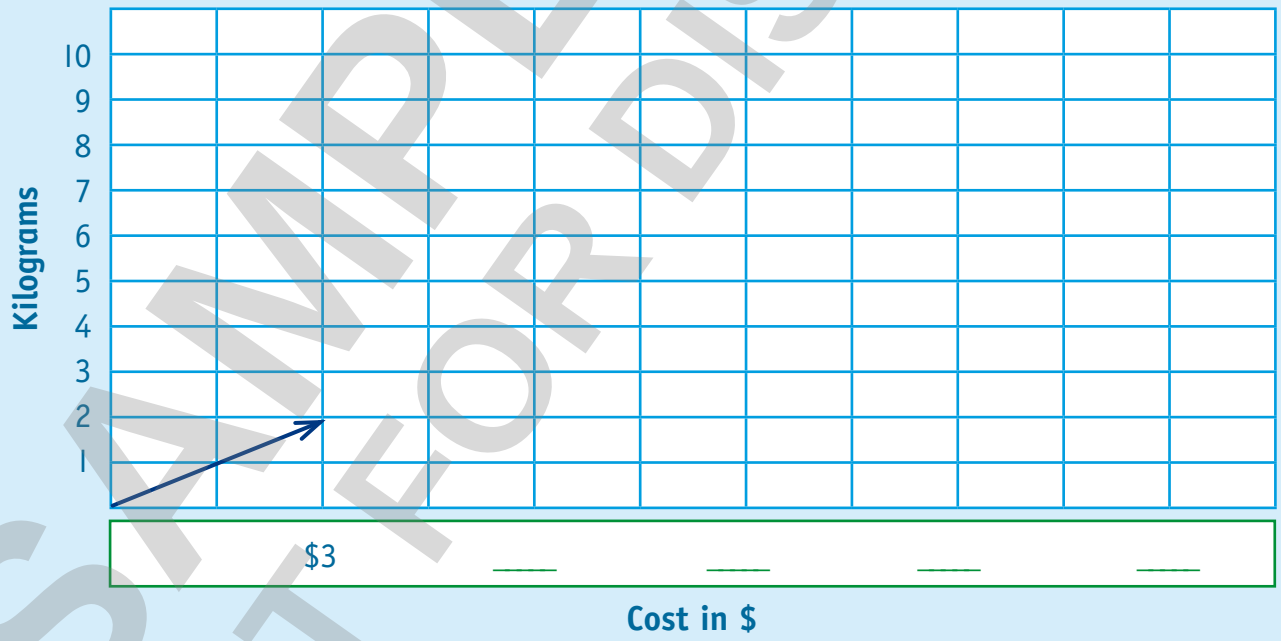


What is the cost of:

a 1 metre? _____ **b** 6 metres? _____

c 3 metres? _____ **d** 2.5 metres? _____

3 **a** Complete the graph to show the cost of potatoes from 0 to 10 kg at $1.50 per kg.



b What is the cost of 3.5 kg? _____

Mastery Checklist I can:

- ☐ match graphs to real-world events
- ☐ interpret a line graph
- ☐ draw a line graph
- ☐ answer questions about a line graph

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Collecting data to answer a question

Scientists, weather experts and sports coaches collect data over time to answer questions. First, make a prediction. Then collect your data, organise it in a table and draw a line graph. Finally, use your graph to answer questions and make a prediction.

1 Choose one investigation.

- ☐ How many cars drive past in 30 minutes each day?
- ☐ How many students are absent each day from our class?
- ☐ What is the temperature at lunchtime each day?
- ☐ How many books are borrowed from the library each day?

Before collecting any data, make a prediction.

I predict _____

because _____.

2 Collect your data. Record your results over five days.

Day	Mon	Tue	Wed	Thu	Fri
Data					

3 Draw a line graph. Remember to:

- give your graph a title
- label both axes
- choose an appropriate scale
- join the points with straight lines.



4 **a** What is the range of your data?

_____

b What is the mean (average)? _____

_____

5 Describe the trend. The data generally:

_____

6 Make a prediction.

If the pattern continues, what do you predict for the next day?

_____

_____

I can solve problems by:

☐ collecting and organising data ☐ using data to find patterns and make predictions

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Two-way tables

At school camp, teachers split students up into two groups.
Below is the data they collected from their time away. Study these tables.

Students on time	Yellow team	Blue team
Breakfast	32	26
Lunch	28	40
Dinner	28	42

Meals	Yellow team	Blue team
Chicken	60	52
Pasta	48	62
Salad	55	55

Task	Yellow team	Blue team
Bed-making	40	40
Tables	52	32
Washing-up	46	46

Drinks	Yellow team	Blue team
Water	50	48
Juice	56	58
Milk	45	45

1 Use the tables to answer the questions.

a Look at the **Students on time** table.
At which meal was the difference between the two teams greatest? _____

b How many more Blue team students than Yellow team students were on time for lunch? _____

c Which task was completed by the greatest number of students altogether? _____

d How many students altogether chose pasta? _____

e Which drink was chosen by the same number of students from each team? _____

f For which two categories was the difference between the teams exactly 2 students?
_____ and _____

2 Tick the best answers.

a Yellow and blue were the same at:

- ☐ drinking milk, bed-making and eating salads.
- ☐ bed-making, eating salads and drinking juice.
- ☐ drinking water, washing up and eating salads.
- ☐ being on time, drinking milk and bed-making.

b Which statement is true?

- ☐ Blue are better at completing set tasks.
- ☐ Blue are better at being on time.
- ☐ Blue drink more fluids than yellow.

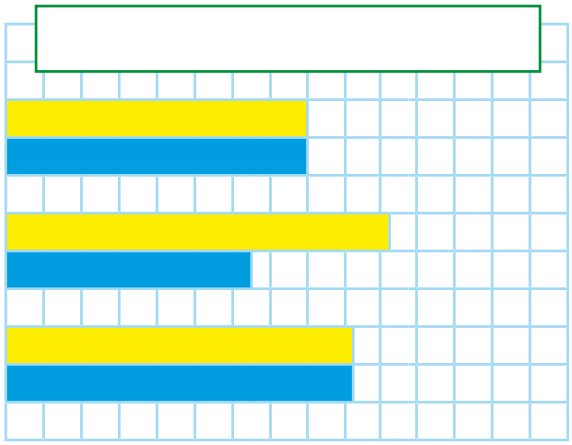


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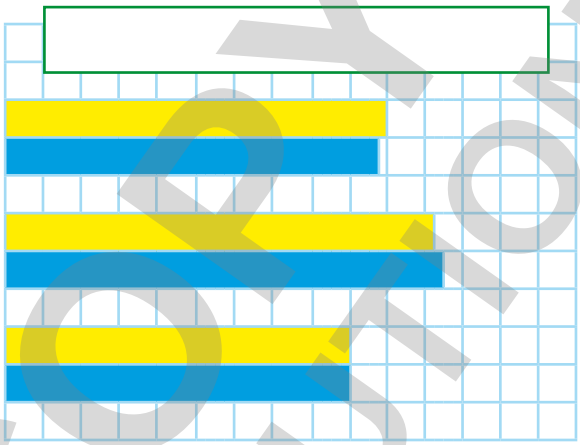
Two-way column graphs

Label each column graph to match a two-way table on page 166.

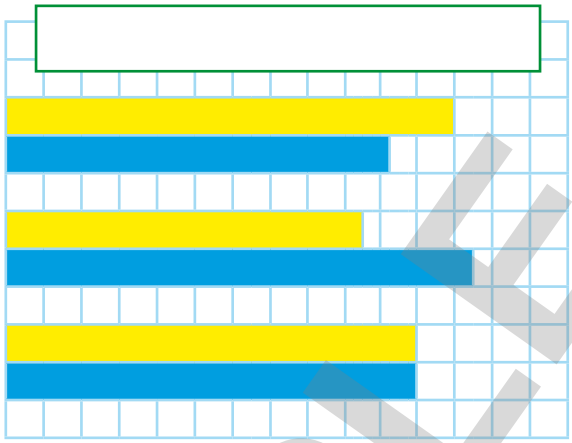
1 a



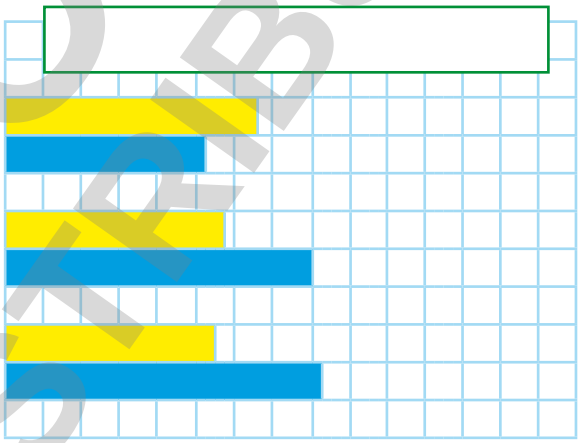
b



c



d



2 In which category is there the greatest difference between the yellow team and the blue team?

_____

3 In which category is the result for yellow and blue closest? _____

4 Which set of data is easiest to interpret: column graphs or two-way tables? _____

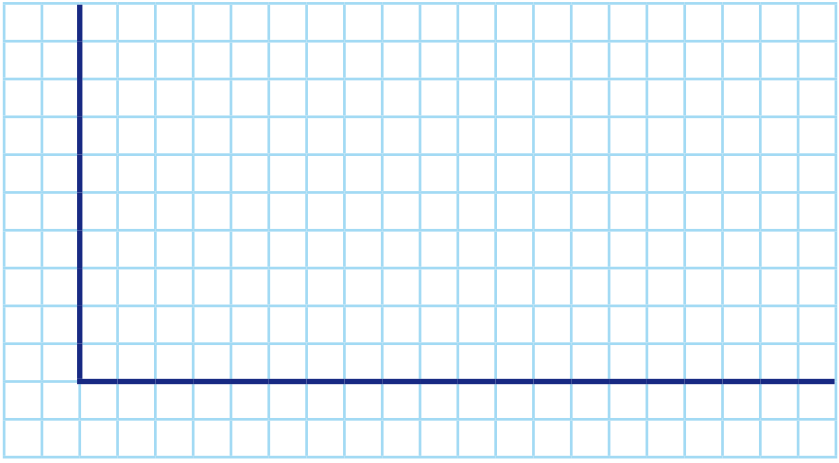
Why? _____

_____

5 Make a horizontal side-by-side column graph from this two-way table.

Height	Men	Women
Over 170 cm	8	5
150 to 170 cm	7	10





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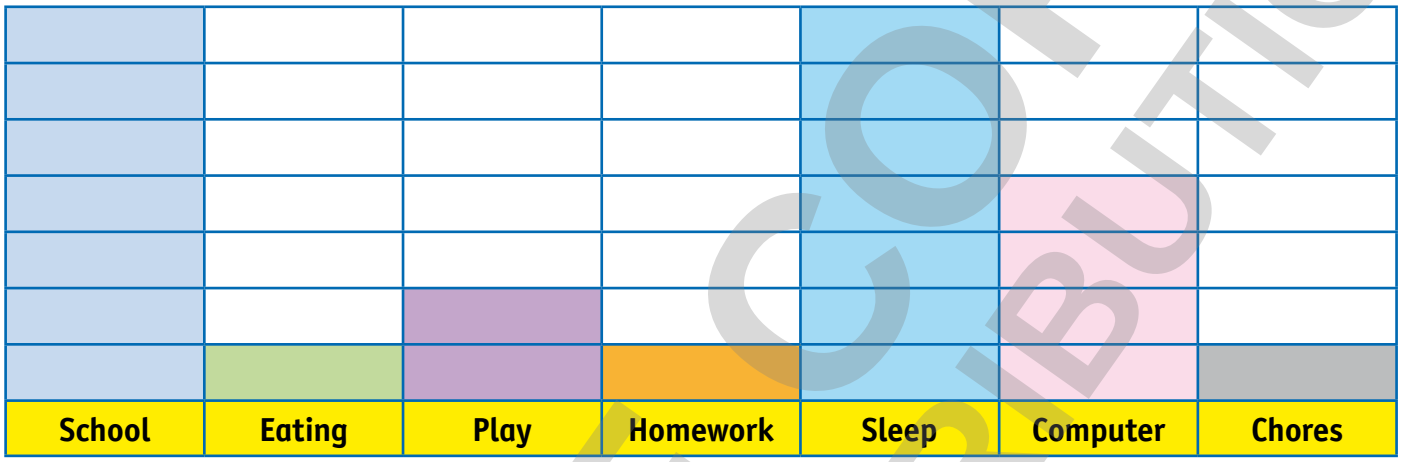
Media claims and graphs

TERM 4
Week 5

Graphs can provide evidence for a claim, but they do not always tell the whole story.
Look carefully at what each graph shows and what it does not show.

Study each graph and the claim made about it.
Is there enough information to support the claim? Explain.

How Children Spend Their Time



1 Researchers claim that children are spending more time in front of a computer. This is reducing the amount of sleep they have, which affects their schoolwork.

a What information does the graph show? _____

b Does the graph provide enough evidence to support the claim? Yes / No

c What other information would you need to know? _____

Children With No Cavities



2 Claim: Younger children have better dental health than older children.

a What does the graph actually show? _____

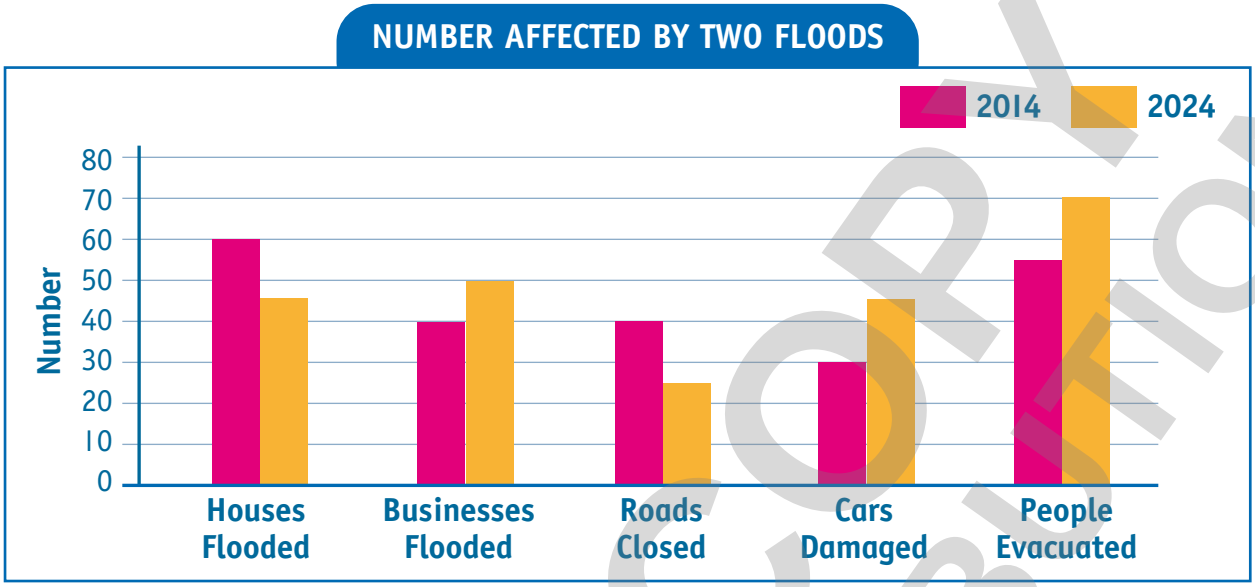
b Is there enough information to support this claim? Yes / No

c What else would you need to know? _____

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Making comparisons

TERM 4
Week 5



1 Which statements are true? Tick them.

a More houses were flooded in 2014 than in 2024. ☐

b More businesses were flooded in 2024 than in 2014. ☐

c The same number of roads were closed in both years. ☐

d More cars were damaged in 2024 than in 2014. ☐

e The greatest difference between the two floods was in the number of people evacuated. ☐

2 Use the graph.

a How many more people were evacuated in 2024 than in 2014? _____

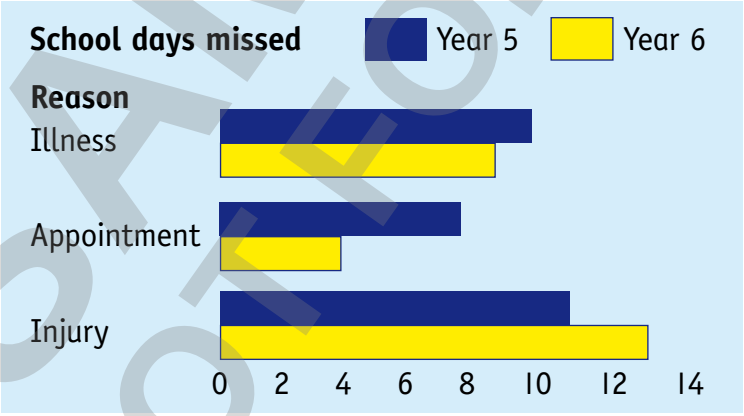
b What was the difference in the number of houses flooded? _____

c Which category shows the smallest difference between the two years? _____

d In which categories was the 2024 number greater than the 2014 number?

_____

3 Study this side-by-side graph.



True or false?

a One year group has a better record than the other in all areas. _____

b This graph measures reasons for school days being missed. _____

c The Year 5 and Year 6 total days missed is the same. _____

Mastery Checklist I can:

- ☐ interpret two-way tables and graphs
- ☐ graph data from a two-way table
- ☐ investigate how data is presented in media reports

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Checkpoint 7

1 Follow the correct order of operations. p 125

a $30 + 4^2 \times 3 - 16$

= _____

b $25 - 15 \div 3 + 6$

= _____

c $\frac{1}{2}$ of $54 - 6 \times 3$

= _____

d $(72 \div 8 - 7) \times 2$

= _____

2 **a** $\frac{5}{8}$ of the children went by bus and $\frac{1}{8}$ drove in cars. What fraction travelled? _____ p 23

b $\frac{3}{4} - \frac{3}{8}$ = _____

c From 1 take $\frac{5}{12}$. _____

3 **a** Circle all the integers. p 146

−7 2.5 0 −12 $4\frac{1}{4}$ 18 −0.6

b Write these integers from least to greatest.

+8 −15 0 −3 +12 −9

_____, _____, _____, _____, _____, _____

4 Write the integer for each situation. p 147

a A temperature of 6° C below zero.

_____

b A lookout 245 m above sea level.

_____

c A submarine 80 m below sea level.

_____

5 Find the difference between each pair of temperatures. p 147

a −4 °C and +7 °C = _____ °C

b −12 °C and −3 °C = _____ °C

c +5 °C and −8 °C = _____ °C

6 Complete each integer pattern. p 148

a −14, −10, −6, _____, _____, _____

b 11, 6, 1, _____, _____, _____

c −24, −16, −8, _____, _____, _____

7 Compare using <, > or =. 149

a −6 _____ −2

b −4 _____ 3

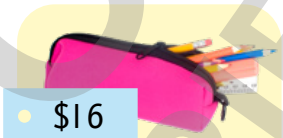
c 0 _____ −7

8 The temperature is −6 °C in the morning. By midday it has risen to 5 °C. How many degrees has the temperature increased? p 150

_____ °C

9 Calculate the new price. p 103

a Discount 25%



$16

_____

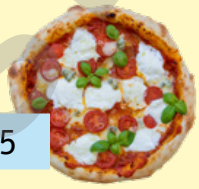
b Discount 10%



$25

_____

c Add 15% GST



$15

_____

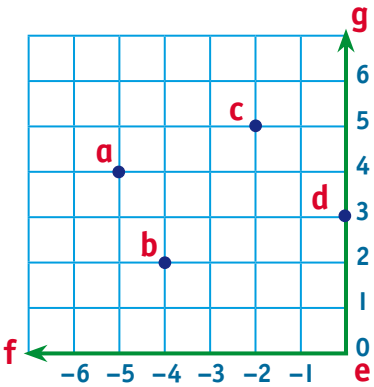
d Add 15% GST



$340

_____

10 Name these points on the second quadrant of the Cartesian plane. p 152



a _____

b _____

c _____

d _____

e the _____

f the x-_____

g the _____-axis

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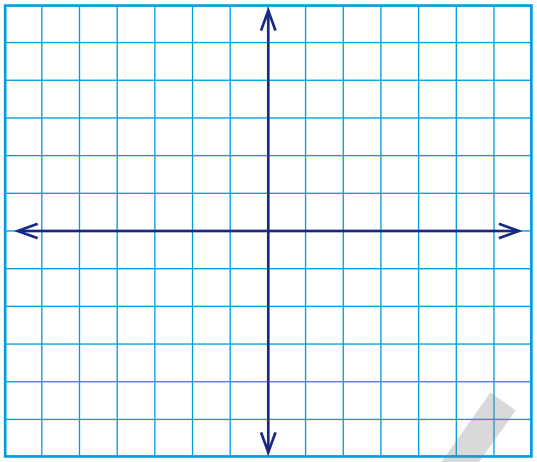
Checkpoint 7

11 **a** Plot and label these points: p 154

A (–3, 2) **B** (2, 2) **C** (2, –2) **D** (–3, –2)

b Join the points in order.
What shape have you made?

_____



12 **a** Complete the table for the rule $y = x + 2$. p 155

x	1	2	3	4
y				

b Write the four ordered pairs.

_____ _____ _____ _____

13 This data shows the number of goals scored by 10 players. p 160

Goals: 0, 1, 1, 2, 2, 2, 3, 3, 4, 5

a What was the most common number of goals? _____

b How many players scored 3 or more goals? _____

14 True or false? When you throw a regular die, the probability of scoring: p 142-143

a 1, 2 or 3 is 50% _____

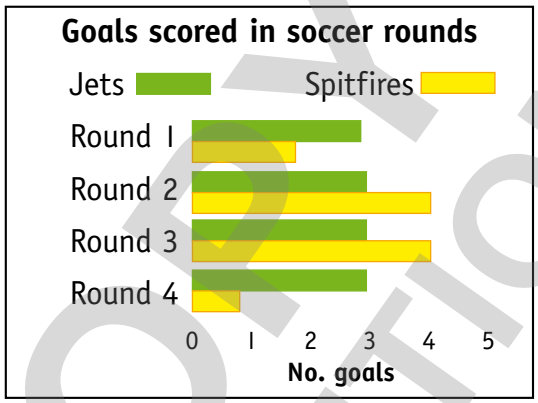
b an even number is 100% _____

c an odd number is $\frac{1}{3}$ _____

d a 6 is $\frac{1}{6}$ _____

e a 1 is 0% _____

15 p 157



True or false?

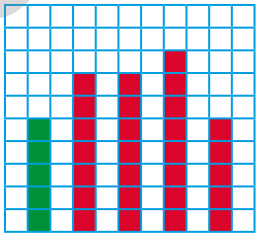
a The Jets scored more goals than the Spitfires in 2 of the 4 rounds. _____

b The Jets scored an average of 3 goals per round. _____

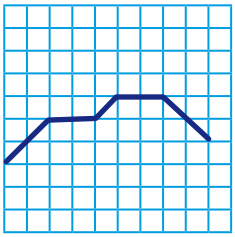
c The Spitfires scored the same number of goals in Rounds 2 and3. _____

16 Sales at a café rose gradually for two months, stayed at their highest level for two months, then fell. Circle the graph that illustrates this information most accurately. p 157-162

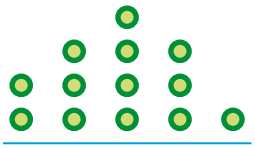
a



b



c



d



e Give a reason for your choice.

_____

_____

17 A student wants to show how the temperature changed each day for two weeks. Which would be the best way to display the data? p 162

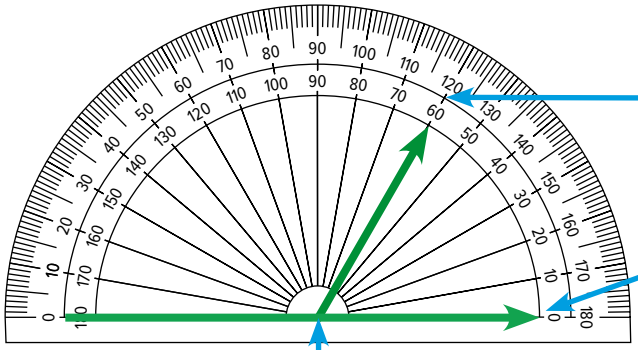
A picture graph **B** line graph

C tally chart **D** pie chart

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Angles to 180°

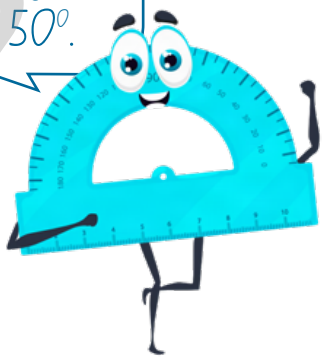
Use a protractor to measure angles.



Read the number for this arm to tell the angle size. (60°)

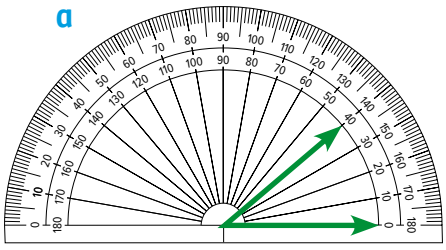
Align this arm along the base line. (0°)

The vertex is at the centre point.

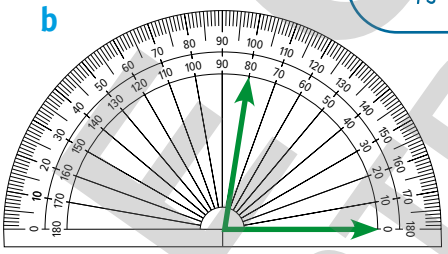


1 Write the size of each angle.

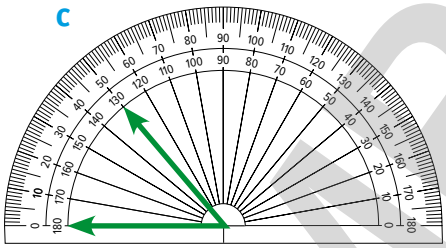
a



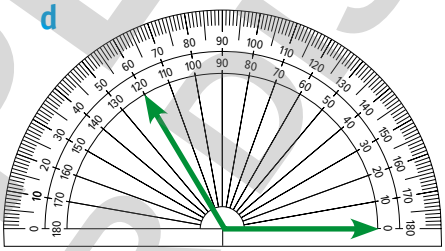
b



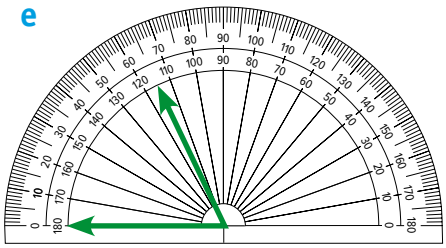
c



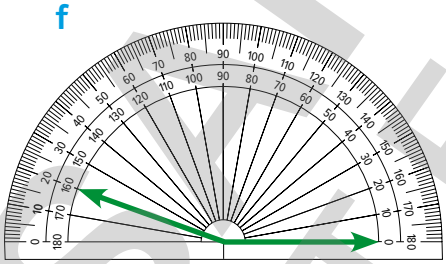
d



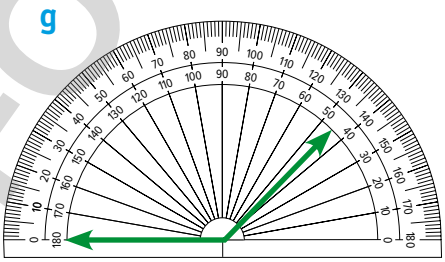
e



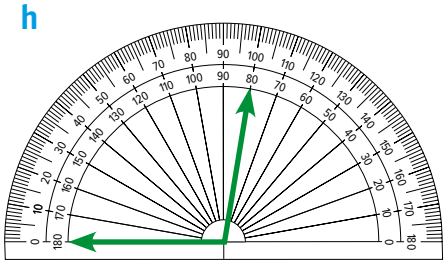
f



g



h



Challenge! Work with a friend. Look around and use your protractor to find:

a 3 angles less than 40°

b 3 angles between 40° and 90°

c 3 angles of 90°

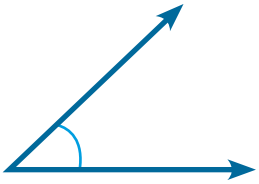
d 3 angles more than 90°

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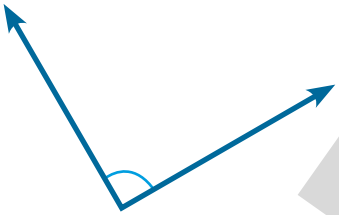
Measuring angles to 180°

estimate and measure to check

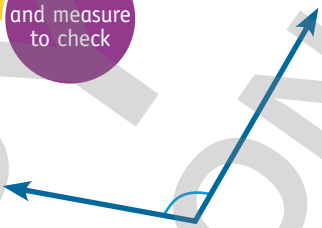
1 Estimate the size of each angle. Then measure it accurately.

a 

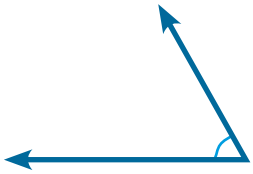
Est. _____ Actual _____

b 

Est. _____ Actual _____

c 

Est. _____ Actual _____

d 

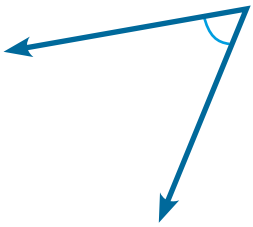
Est. _____ Actual _____

e 

Est. _____ Actual _____

f 

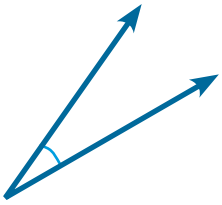
Est. _____ Actual _____

g 

Est. _____ Actual _____

h 

Est. _____ Actual _____

i 

Est. _____ Actual _____

use a protractor

2 Use a protractor to draw these angles.

a 35°

b 130°

c 20°

d 116°

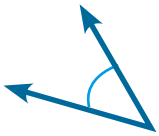
e 68°

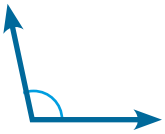
f 109°

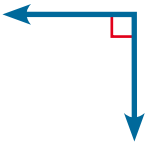
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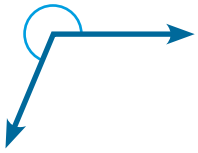
Angles to 360°

1 Write each angle type.

a 

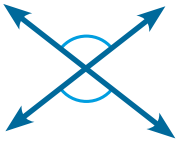
b 

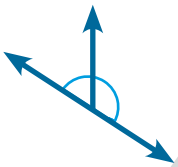
c 

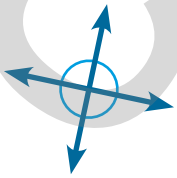
d 

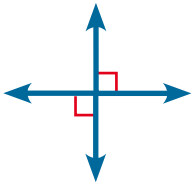
e 

f 

g 

h 

i 

j 

k 

l 

Acute angles less than 90°

Right angles always 90°

Obtuse angles more than 90° less than 180°

Straight angles always 180°

Reflex angles more than 180° less than 360°

Revolutions are always 360°

Vertically opposite angles are equal

Adjacent angles on a straight line add to 180°

Angles at a point add to 360°

2 Draw:

a a reflex angle.

b vertically opposite angles.

c a straight angle.

d four angles at a point.

e a revolution.

f two adjacent angles.

3 True ✓ or false ✗? Write the correct number if necessary.

a vertically opposite angles = 360° ☐ _____

b 360° is a straight angle. ☐ _____

c 140° is a reflex angle. ☐ _____

d 200° is an obtuse angle. ☐ _____

e 90° is a right angle. ☐ _____

f angles at a point = 320° ☐ _____

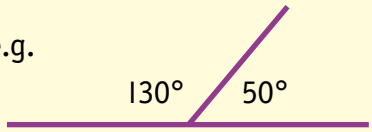
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Measurement Measuring: Classifying, measuring, and constructing angles up to 360°, using a protractor; Identifying and describing angles at a point, angles on a straight line, and vertically opposite angles, using angle notation

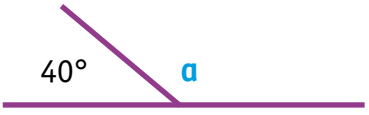
Angles

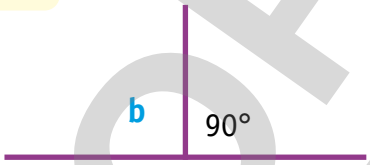
1 Supplementary angles add up to 180°, making a straight line. Fill in the missing angles.

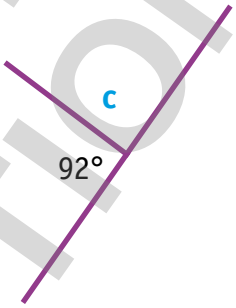
e.g.



130° + 50° = 180°







a _____

b _____

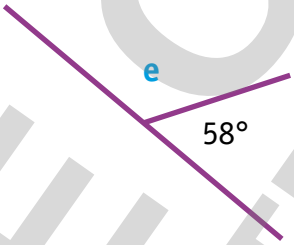
c _____

d _____

e _____

f _____

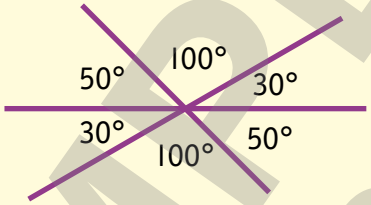




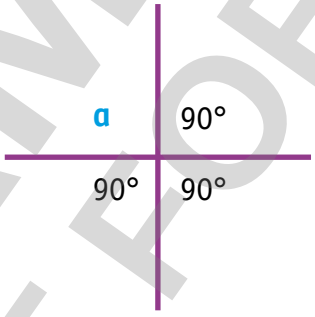


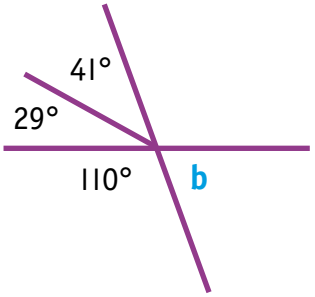
2 Angles at a point add up to 360°, making a revolution. Write the missing angles.

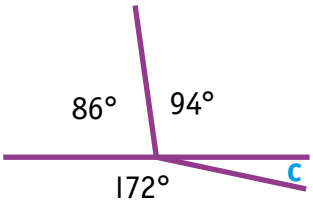
e.g.



50° + 100° + 30° + 30° + 100° + 50° = 360°







a _____

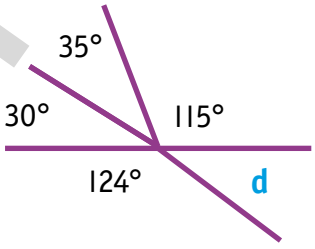
b _____

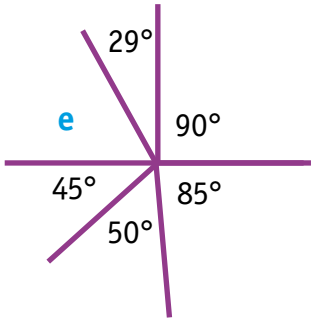
c _____

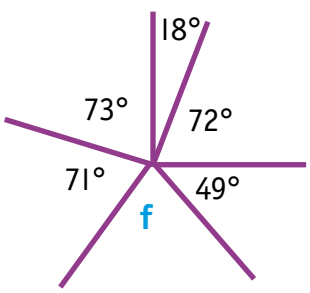
d _____

e _____

f _____





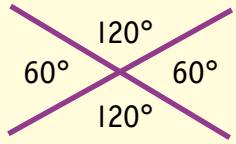


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More angles

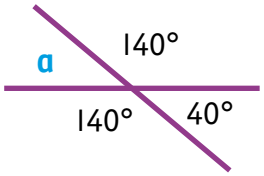
TERM 4
Week 6

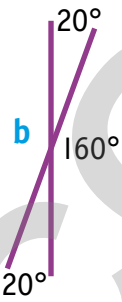
1 Vertically opposite angles are equal. Write the missing angles.

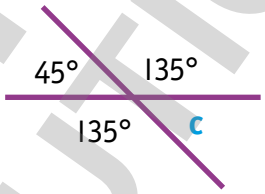
e.g. 

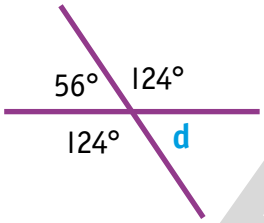
120° + 60° + 120° + 60° = 360°

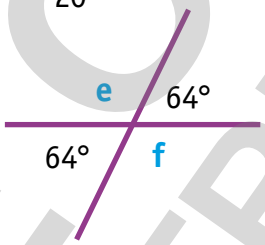
a _____
b _____
c _____
d _____
e _____
f _____
g _____
h _____

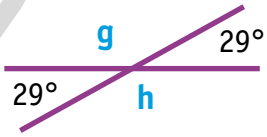




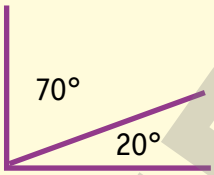








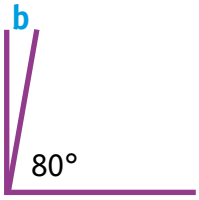
2 Complementary angles add up to 90°. Fill in the missing angles.

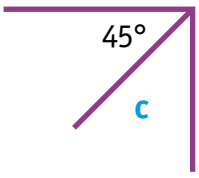
e.g. 

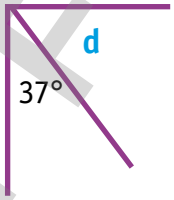
70° + 20° = 90°

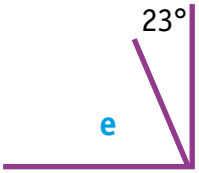
a _____
b _____
c _____
d _____
e _____
f _____

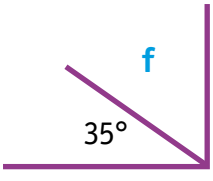












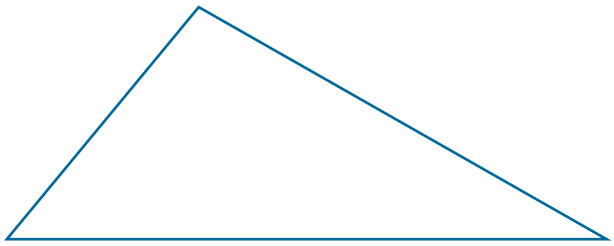
Mastery Checklist I can:
- ☐ measure and draw angles using protractors
- ☐ classify angles as acute, right, obtuse, straight, reflex and revolution
- ☐ identify angles at a point, on a straight line, and vertically opposite
- ☐ find unknown angles

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Triangle angle sum

1 a Measure each angle in the triangle.

b Add the angles. _____



2 a Measure each angle.

b Add the angles. _____



3 The sum of the angles in a triangle is always _____.

4 To prove that the angles of a triangle add up to 180°, carry out the following investigation.

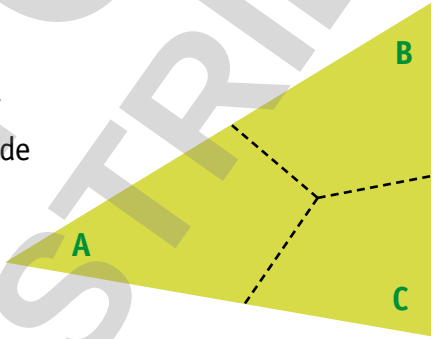
a On coloured paper, draw any triangle with sides of between 5 cm and 10 cm.

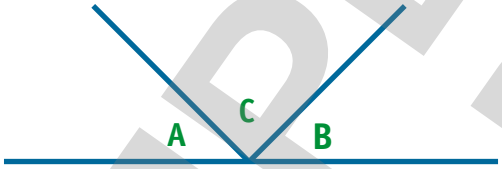
b Mark each angle with letters **A**, **B** and **C**.

c Cut the triangle in three to isolate each angle.

d Place the angles labelled **A**, **B** and **C** side by side to form a straight line on white paper.

e Write a sentence to explain your findings.





_____

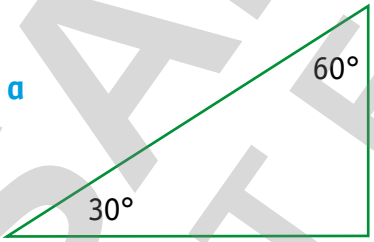
_____

_____

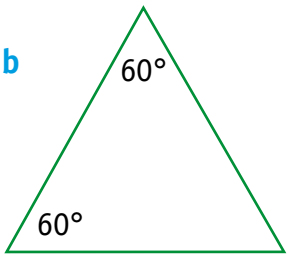
construct a geometric proof

5 Write the size of the missing angle in each triangle.

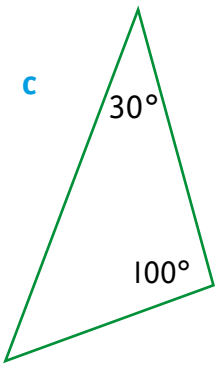
a



b



c



d



e

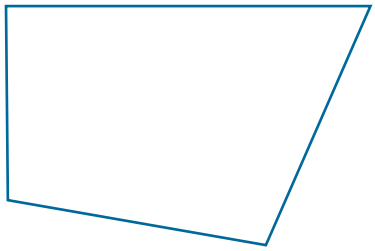


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More angle sums

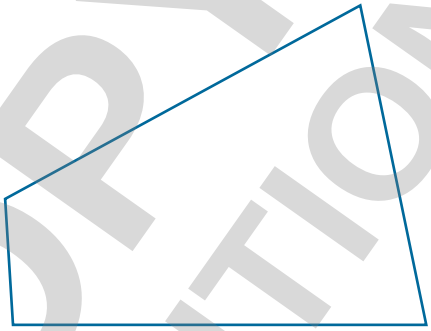
1 **a** Measure each angle in the quadrilateral.

b Add the angles. _____



2 **a** Measure each angle.

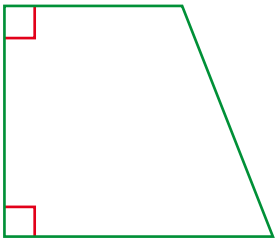
b Add the angles. _____



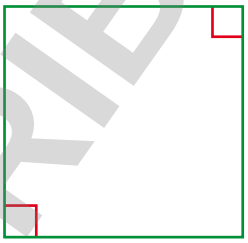
3 The sum of the angles in a quadrilateral is always _____.

4 Label the missing angles with a measurement.

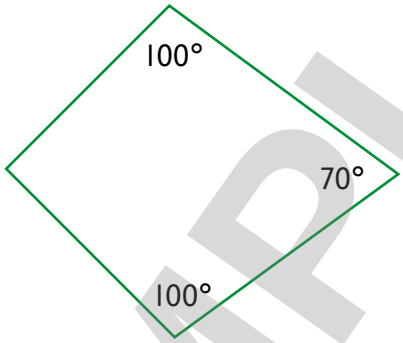
a



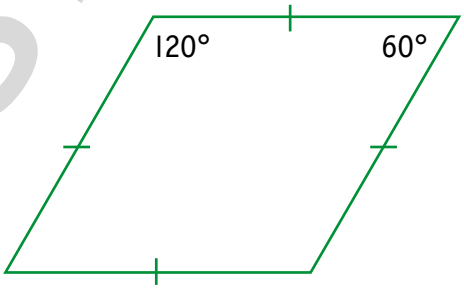
b



c



d



e



5 Measure the angles in these regular polygons and add them.

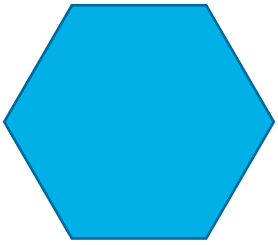
a



Angle size _____

Angle sum _____

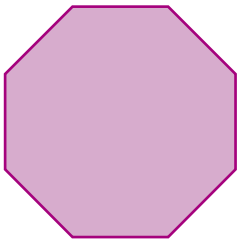
b



Angle size _____

Angle sum _____

c



Angle size _____

Angle sum _____

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Types of triangles

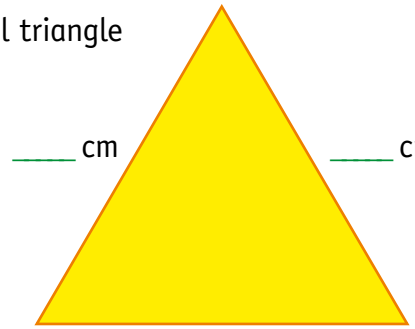
TERM 4
Week 7

1 a Measure with a ruler and write the measurements on the sides of these triangles.

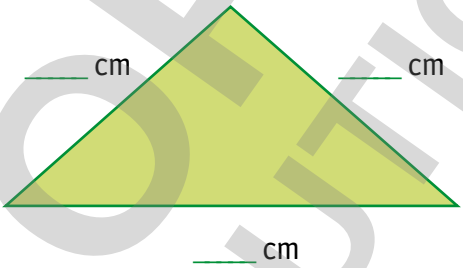
b Measure with a protractor and write the measurements in the angles of these triangles.

use a ruler and protractor

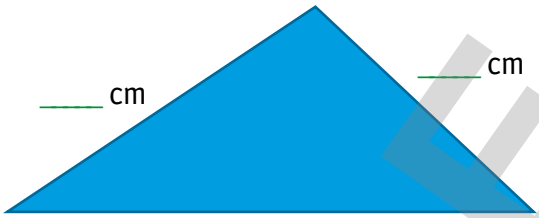
A Equilateral triangle



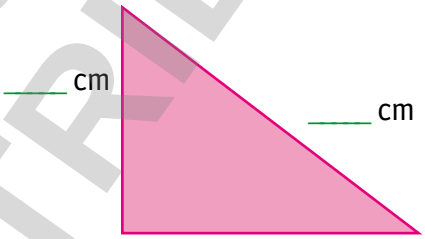
B Isosceles triangle



C Scalene triangle



D Right-angled triangle



2 Complete these statements.

a An equilateral triangle has _____ equal sides and _____ equal angles.

b An isosceles triangle has _____ equal sides and _____ equal angles.

c A scalene triangle has _____ equal sides and _____ equal angles.

3 a A right-angled triangle has _____ right angle.

b In an equilateral triangle all three angles measure _____ .

4 Use your ruler and a protractor to draw:

use a ruler and protractor

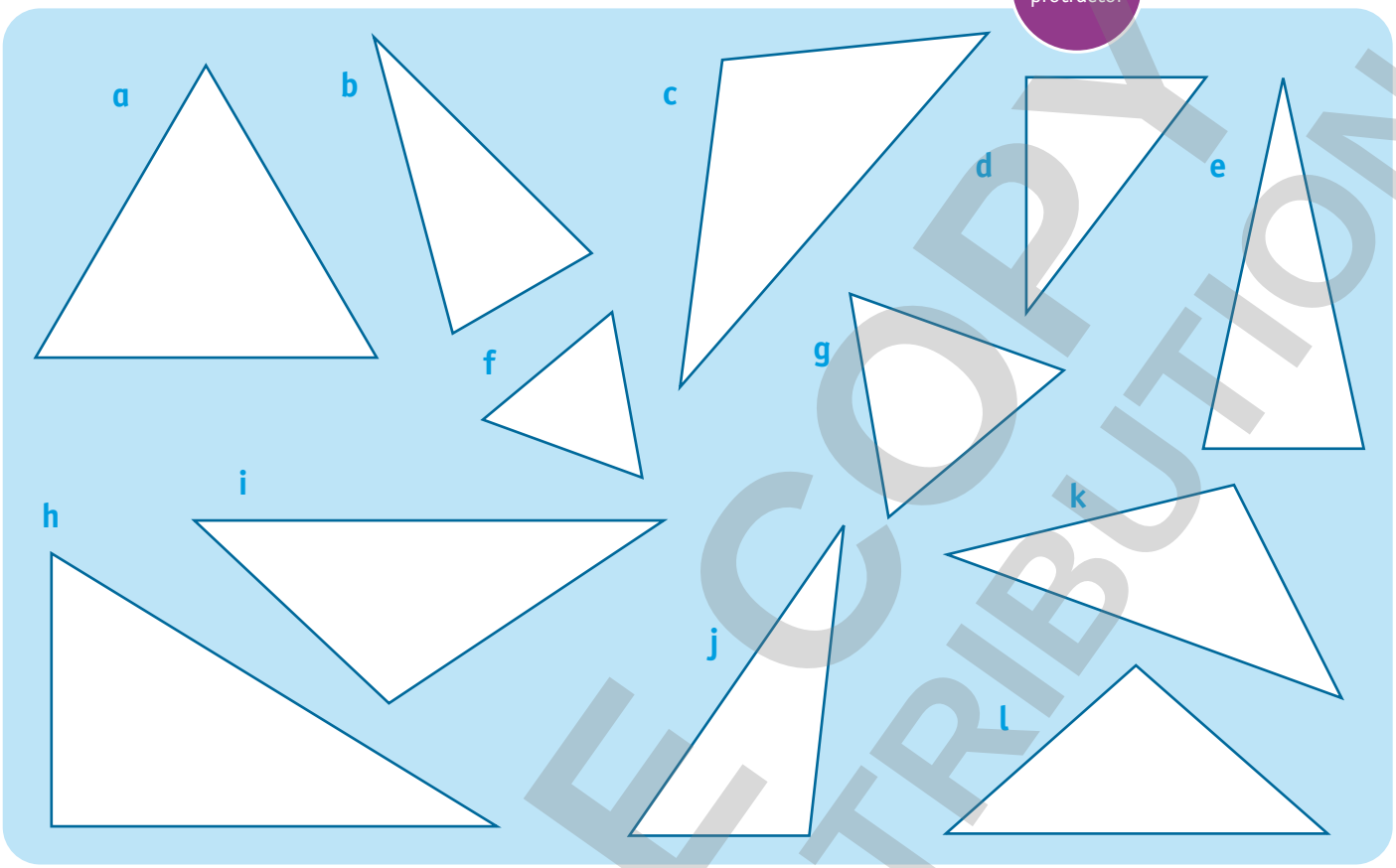
a an equilateral triangle.

b an isosceles triangle.

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More triangles

use a protractor



1 Use a protractor to measure the angles in each triangle above. Colour the right-angled triangles red, the scalene triangles yellow, the isosceles triangles blue and the equilateral triangles green.

2 a Draw an isosceles triangle that has a right angle. Label the equal sides.

b Draw a scalene triangle that has an obtuse angle. Label the obtuse angle.

Challenge!

Can you draw an equilateral triangle with a right angle? Why or why not? Illustrate.

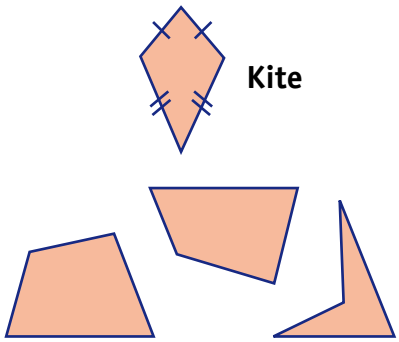
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Geometry Shapes: Identifying, classifying, and explaining similarities and differences between 2D shapes (including different types of triangles)

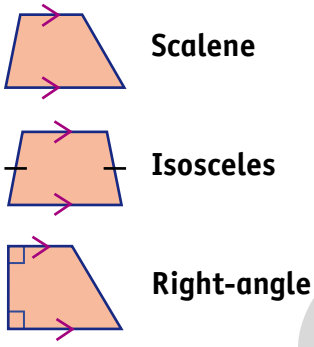
Quadrilaterals

TERM 4
Week 7

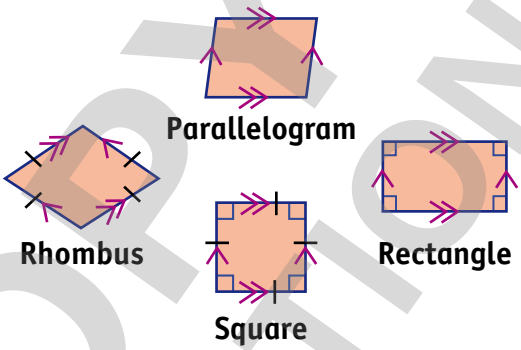
A Irregular quadrilaterals



B Trapeziums



C Parallelograms



Use the shape diagrams above to identify similarities and differences.

Tip! The word adjacent means next to, beside, side by side.

1 These shapes are grouped by their number of parallel sides.

A The shapes have _____ parallel sides.

B The _____ have _____ parallel sides.

C The _____ have _____ parallel sides.

2 Describe the sides of a kite. _____

_____

3 Describe the differences between the three types of trapeziums.

_____

_____

_____

4 Why are the rhombus, rectangle and square grouped as parallelograms?

_____

5 Describe the side length and angle attributes of a

a parallelogram: _____

b rhombus: _____

c rectangle: _____

d square: _____

6 Colour the parallelograms blue. Colour the trapeziums red.



Mastery Checklist

I can:

- ☐ classify triangles by their sides and angles
- ☐ identify regular and irregular quadrilaterals
- ☐ use angle properties to find missing angles in triangles
- ☐ use angle properties to find missing angles in quadrilaterals

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Cubic centimetres

volume experiment

Activity • Cubic centimetres

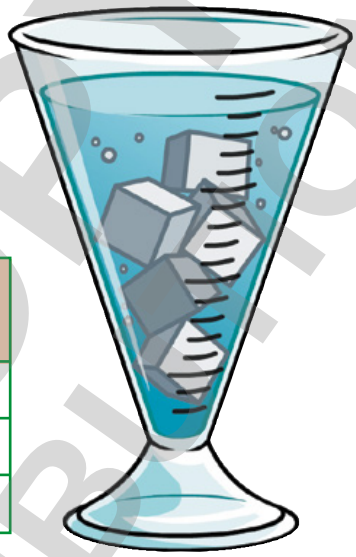
1 Work in a group of 4.

You need a medicine measure and some cubic centimetre blocks.

a Place 10 mL of water in the measure.

b Put in 5 cubic centimetre blocks.

c What is the new water level?



Water level	Number of cubic centimetre blocks	New water level
10 mL	5	
	8	
	12	

d Repeat with 8 blocks and 12 blocks.

e Discuss the results with your group.

f What did you find? _____

_____

2 Complete the table.

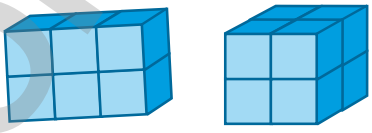
Prism	Volume in cm^3	Capacity in mL
a 2 cm × 2 cm × 2 cm	8 cm^3	
b 3 cm × 2 cm × 1 cm		
c 4 cm × 3 cm × 2 cm		
d 3 cm × 3 cm × 2 cm		

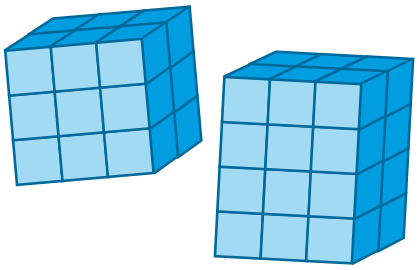
Remember

cm^3 → cubic centimetre

mL → millilitre

1 cm^3 = 1 mL





3 a If the volume of a prism is 1,000 cm^3, what is the capacity? _____

b What are the dimensions of a prism with a capacity of 1 L? _____

c Build, using cubic centimetre blocks, a prism with a volume of 24 cm^3.

Challenge!

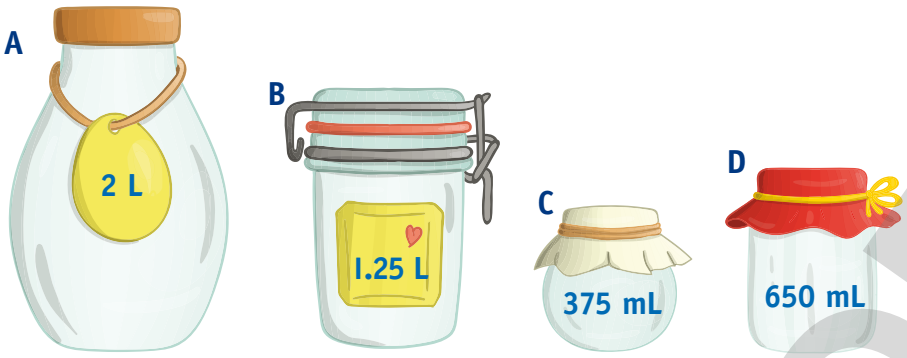
Use isometric dot paper to draw 4 different prisms with a capacity of 1 L. Label their dimensions.



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Measurement Measuring: Calculating (using multiplication) the volumes of rectangular prisms (in cm^3); Accurately measuring capacity with measuring jugs using appropriate metric units or a combination of units

Volume and capacity



Capacity is the amount of liquid a container can hold.



1 Write each capacity in both litres and millilitres.

Container	Litres	Millilitres
A	2 L	mL
B	1.25 L	mL
C	L	375 mL
D	L	650 mL

1 L = 1,000 mL
1,000 mL = 1 L
200 mL = 0.2 L
1,600 mL = 1.6 L

2 Find the difference in capacity between:

a A and B _____ b B and C _____

c A and D _____ d C and D _____

Write each answer in millilitres.

3 Find the total capacity. Write each answer in litres.

a B + C = _____ b C + D = _____

c A + B + D = _____ d A + B + C + D = _____

4 A 5 L container is empty. How much more is needed after pouring in:

a A and B? _____ b A, C and D? _____

c two lots of B and one lot of C? _____

5 A drink dispenser holds 8 L. It already contains 3.65 L.

a How much more liquid can it hold? _____ b How many millilitres is this? _____

6 A 2 L bottle contains 1,475 mL of water.

a How much more water is needed to fill it? _____

b If 350 mL is poured out instead, how much remains? _____

7 Amanda says: 1.8 L is greater than 1,850 mL because 1.8 is greater than 1.

Is Amanda correct? _____

Explain how you know. _____

_____

Challenge!

A container holds 4 L when full.
It is $\frac{3}{4}$ full. Then 650 mL is poured out.

How much liquid remains? ☐

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Estimating capacity

1 Estimate first, then measure. Estimate the capacity of each container. Then measure it using a measuring jug.

1 L = 1,000 mL



	Container	Estimate	Measured capacity
a	cup		
b	water bottle		
c	bowl		
d	bucket		

e Which of your estimates was closest? _____

2 Tick the most appropriate unit.

a A teaspoon ☐ mL ☐ L

b A bath ☐ mL ☐ L

c A juice box ☐ mL ☐ L

d A fish tank ☐ mL ☐ L

e A large saucepan ☐ mL ☐ L

f A watering can ☐ mL ☐ L

3 Convert the capacities.

a 2 L = _____ mL

b 500 mL = _____ L

c 4 L 250 mL = _____ mL

d 1,750 mL = _____ L _____ mL

e 3,200 mL = _____ L _____ mL

f 7 L = _____ mL

4 Which container holds more? Use >, < or =.

a 750 mL ☐ 1 L

b 2 L ☐ 1,800 mL

c 1,250 mL ☐ 1 L 500 mL

d 3,500 mL ☐ 3 L 500 mL

5 Which estimate is most sensible?

a A bucket used for cleaning holds about:
- ☐ 750 mL
- ☐ 7 L
- ☐ 70 L

b A kettle holds about:
- ☐ 200 mL
- ☐ 2 L
- ☐ 20 L

c A watering can for the garden holds about:
- ☐ 500 mL
- ☐ 5 L
- ☐ 50 L

d Two teaspoons hold about:
- ☐ 100 mL
- ☐ 10 mL
- ☐ 1 L

Mastery Checklist I can:
- ☐ experiment with volume and capacity
- ☐ measure and compare capacities in litres and millilitres
- ☐ convert between capacity units
- ☐ estimate the capacity of containers

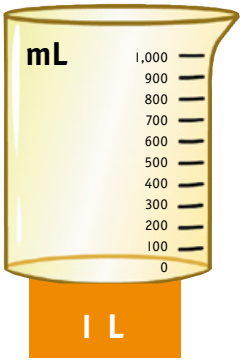
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Measurement Measuring: Estimating (using benchmarks) capacity, using appropriate metric units or a combination of units; Accurately measuring capacity with measuring jugs using appropriate metric units or a combination of units

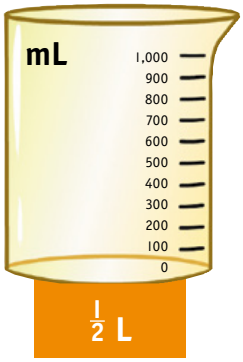
Measure exactly

1 Colour to show:

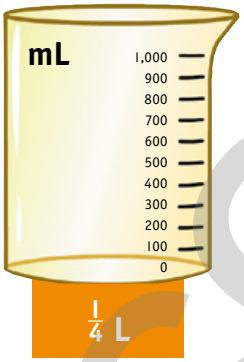
a



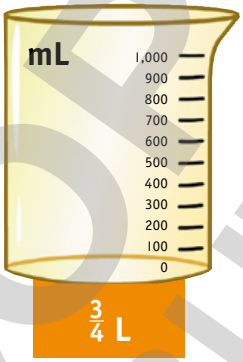
b



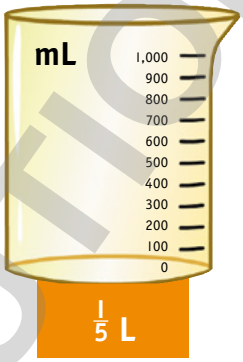
c



d



e



2 You need to put exactly 3 L 160 mL of liquid plant food into a bucket. The only measures you have are 1 L, $\frac{1}{2}$ L, $\frac{1}{5}$ L and 30 mL. How will you measure the liquid? Show your working.

3 A container holds 4 L. It already has 1 L 650 mL in it.

How much more liquid is needed to fill it? _____ L _____ mL

4 Maia needs exactly 2 L 750 mL of water. She has a 1 L jug, a $\frac{1}{2}$ L jug and a 250 mL cup.

a Find one way she could measure exactly 2 L 750 mL. _____

b Can you find a different way? _____

Challenge!

You have a 1 L jug, a 300 mL cup and a 50 mL cup. Find two different ways to measure exactly 2 L 450 mL. Which way uses the fewest measures?

I can solve problems by:

☐ understanding capacity ☐ drawing diagrams

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Review • Number

1 A climbing team is making its way up Mount Everest (8,849 m).
They begin the day at 6,450 m. During the day they:

- climb 420 m
- descend 180 m
- climb 360 m
- descend 90 m

What altitude do they reach at the end of the day? _____ m

2 The temperature at Everest Base Camp changes during the night.
At 6:00 pm the temperature is –5 °C. Write each temperature as it changes.

8 pm: down 4 °C _____ 2 am: down 2 °C _____ 4 am: down 3 °C _____

6 am: up 1 °C _____ 9 am: up 5 °C _____

3 The expedition plans to climb four Himalayan mountains.



Mountain	Height (m)	Rounded to the nearest 100 m
Ama Dablam	6,812	
Cho Oyu	8,188	
Lhotse	8,516	
Makalu	8,485	

a Which mountain is the highest? _____

b Round each height to the nearest 100 metres.

4 The team has packed 72 repair kits. Write all the factor pairs of 72.

_____

5 The tents are arranged in a perfect square. There are 81 tents altogether.

a Which multiplication fact shows this? _____

b Write the square number using index notation. _____

6 Over several years, four mountain parks recorded these visitor numbers.

National Park	Visitors
Aoraki/Mount Cook	398,420
Tongariro	403,980
Fiordland	399,850
Mount Aspiring	401,205



a Order the parks from least visitors to most visitors.

_____

b Which park had a number of visitors closest to 400,000? _____

7 During five years, the mountain rescue helicopter service flew a total of 684,575 km.
Round this distance to the nearest:

a million _____ b hundred thousand _____

c ten thousand _____ d thousand _____

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Review • Operations



1 The team packs:

- 1,458 m of climbing rope
- 2,765 m of safety rope
- 1,987 m of guide rope

a How many metres of rope do they have altogether? _____

They use 2,846 m during training.

b How many metres of rope remain? _____

2 There are 540 climbers travelling in 12 groups. Each group needs three tents.

How many tents are needed altogether? _____

Show your working. _____

3 The expedition has 1,283 energy bars.

They are shared equally between 5 climbing teams.



a How many bars does each team receive? _____

b How many bars are left over? _____

4 One emergency food pack is shared equally between 6 climbers.

There are 31 muesli bars in the pack.

a How many whole bars does each climber receive? _____

b Write the amount each climber receives as a mixed number. _____

5 A rescue helicopter has 248 bottles of water. They are shared equally among 8 camps.

How much water does each camp receive? _____

6 There are 24 climbers. Each climber needs 36 m of cord.

a How many metres of cord are needed altogether? _____

b The cord comes in 100 m rolls. How many rolls must the team take? _____

7 Work out each expression.

a $(48 + 36) \div 7 =$ _____ **b** $180 - 6 \times 25 =$ _____ **c** $(320 \div 8) + 45 =$ _____

d $12 + 5 \times (18 - 9) =$ _____

8 Use +, −, × or ÷ to make each sentence true.

a $48 \square 6 + 4 = 12$ **b** $60 - 8 \square 4 = 28$ **c** $100 \square 5 \times 2 = 110$

Challenge! The team has 156 metres of rope. They cut it into equal lengths. Find three different ways they could do this.

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Review • Rational numbers

TERM 4
Week 9

The climbers stop at The Mountain Café before beginning their expedition.
Help the café prepare food and supplies.





1 Complete the table.

Menu	Today's Discount. Take off			
Original Price	**Fraction**	**Decimal**	**Percentage**	**New Price**
Rice and vegies $12	$\frac{1}{2}$			
Burger $8.80	$\frac{1}{4}$			
Fries $5.50	$\frac{1}{5}$			
Soup $6.30		0.30		
Bread Roll $3			80%	

2 The café sells these drink sizes.











Large coffee 0.65 L **Juice** $\frac{3}{5}$ L **Sparkling water** 700 mL **Water** 0.8 L **Soft drink** $\frac{5}{8}$ L

Order them from smallest to largest.

_____

3 The café cuts cakes into different numbers of slices.
Write an equivalent decimal point for each.

$\frac{3}{4}$ = _____ $\frac{2}{5}$ = _____ $\frac{5}{8}$ = _____ $\frac{8}{10}$ = _____

4 The Mountain Café baked 240 pies today.
Complete the table.

Pie flavour	Amount baked	Number of pies
apple	25%	
blueberry	0.2	
berry	$\frac{3}{20}$	
mince	$\frac{3}{10}$	
apricot	$\frac{1}{10}$	



5 75% of today's 120 customers ordered a hot chocolate.
How many customers ordered a hot chocolate? _____

6 The café had $2\frac{3}{4}$ kg of chocolate. They used $1\frac{5}{8}$ kg today.
How much chocolate is left? _____

7 $\frac{3}{4}$ of a dessert tray contains 90 slices.
How many slices are in the whole tray? _____

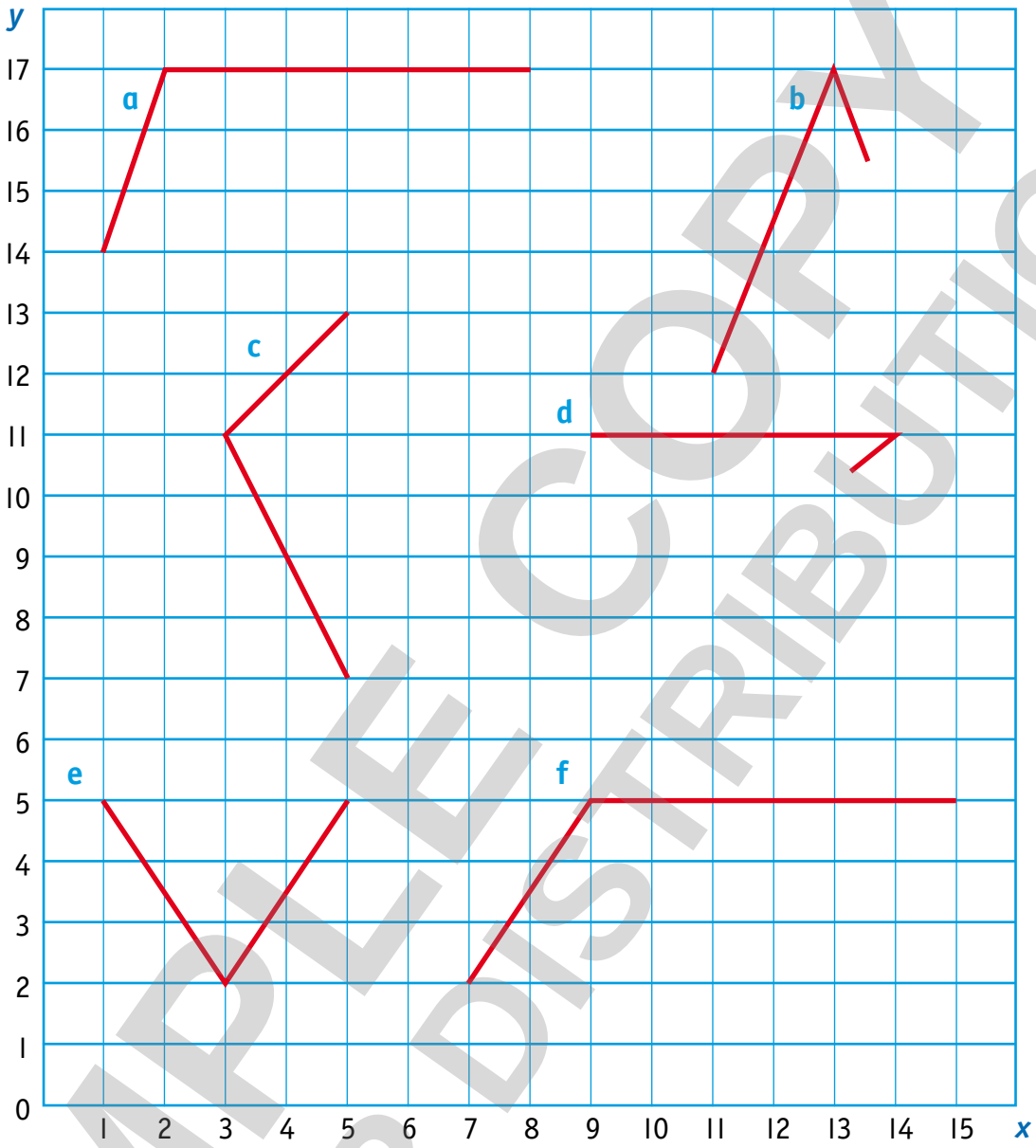
Challenge!

The café has 20 L of soup.

By lunchtime, 35% has been sold, 4.2 L has been spilled, the rest is shared equally into 8 containers.

How much soup goes into each container? Show your working.

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1 Each diagram shows two sides of a polygon. Plot the given point, complete the shape and name it. Classify triangles as either equilateral, isosceles or scalene.

a (9, 14) _____

b (15, 12) _____

c (7, 11) _____

d (9, 7) _____

e (3, 8) _____

f (13, 2) _____

Remember to read the *x* axis first, and the *y* axis second.

x → (4, 10) ← *y*

2 Measure the angles in each triangle. Did you name each triangle correctly?

3 Which triangle has rotational symmetry?

_____

Draw a diagram

On centimetre square paper make up some shapes of your own. Swap with a friend.

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Review • Measurement

TERM 4
Week 9

1 Choose the best estimate.

a A climbing backpack weighs about

☐ 500 g ☐ 10 kg ☐ 150 kg

b A drink bottle holds about

☐ 750 mL ☐ 75 L ☐ 75 mL

c An ice axe's length is about

☐ 70 cm ☐ 7 m ☐ 7 cm

d Outside temperature at Base Camp overnight is about

☐ −10 °C ☐ 28 °C ☐ 100 °C

2 Convert each measurement.

a 4 m = _____ cm

b 850 cm = _____ m _____ cm

c 3 kg 450 g = _____ kg

d 6.2 kg = _____ kg _____ g

e 2 L 750 mL = _____ L

f 3,500 mL = _____ L _____ mL

3 Find the area and volume.

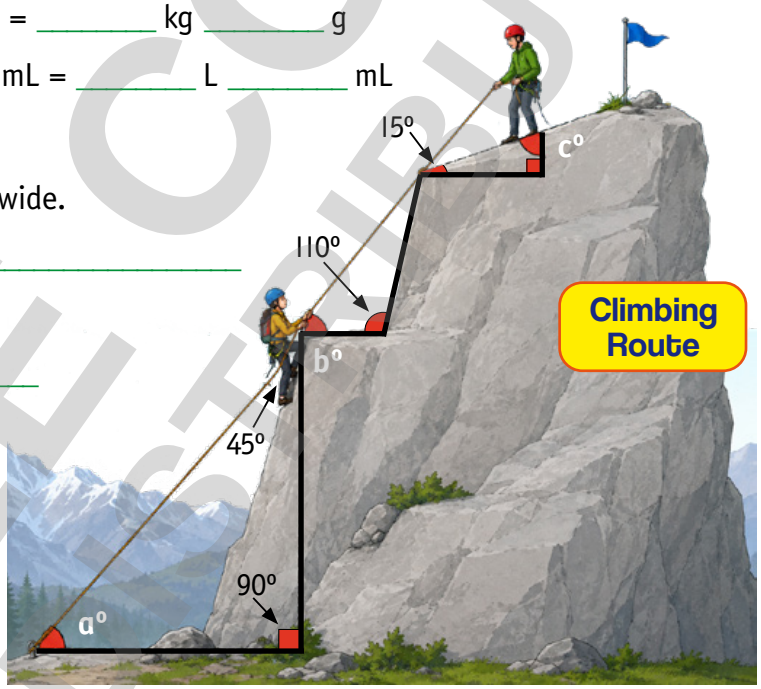
a The floor of a tent is 4 m long and 3 m wide.

What is the area of the tent floor? _____

b The storage crate is 4 m × 3 m × 2 m.

What is its volume? _____

4 Find the missing angles on the diagram.



a _____

b _____

c _____

5 Journey to Base Camp.

The team leaves Kathmandu at 8:45 am. They arrive at Base Camp at 2:20 pm.

How long is the journey? _____

6 This is the expedition timetable.

Activity	Time
Breakfast	6:30 am
Equipment check	7:15 am
Leave camp	8:00 am
Lunch stop	12:20 pm
Return to camp	4:45 pm

a How long is there between breakfast and leaving camp? _____

b How long is the walk from leaving camp until lunch? _____

c How long are the climbers away from camp? _____

Challenge! The expedition leader says: Our storage box has a volume of 24 m³.

What could the measurements be? _____

Can you find another possible box with the same volume?

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Review • Statistics and probability



The expedition team records the temperature at Base Camp each day to help plan their climb.

1 Base Camp Temperatures. The team recorded these midday temperatures.

Day	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Temperature (°C)	−6	−4	−3	−2	−5	−1	0

a Draw a line graph using the data.

b Calculate the mean (average) temperature. _____

c Calculate the range. _____

d Describe the trend. _____

e Predict the temperature on the next Monday. Explain your thinking.

_____

2 A climbing club surveyed students about their favourite outdoor activity.

Hiking, **Rock climbing**, **Mountain biking**, **Skiing**

Which graph would be the best way to display the data?

☐ line graph ☐ column graph ☐ pie chart

Explain your choice.

_____



3 A newspaper reports: Temperatures are getting warmer every day!

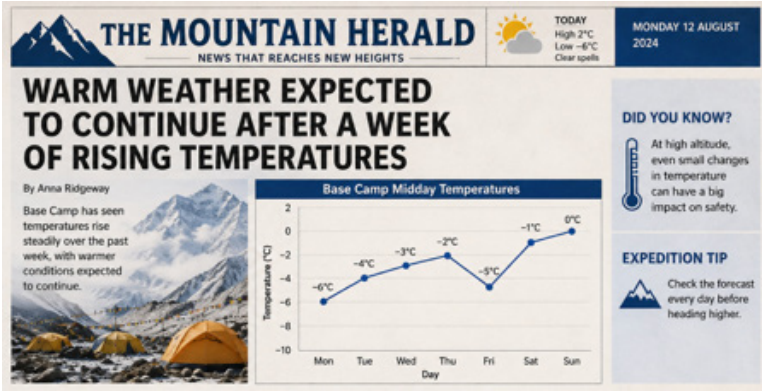
Look at the graph in Question 1.
Do you agree? Explain why or why not.

_____

_____

_____

_____



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Checkpoint 8

1 Find two prime numbers which add to make: p 55

a 12 _____ **b** 84 _____

2 **a** Draw a diagram to show that 21 is a triangular number. p 59

3 p 29, 35

a
$$\begin{array}{r} 508 \\ -\ 37 \\ \hline \\ \hline \end{array}$$

b
$$\begin{array}{r} 385 \\ 94 \\ 610 \\ +\ 336 \\ \hline \\ \hline \end{array}$$

4 p 62

a
$$\begin{array}{r} 708 \\ \times\ 29 \\ \hline \\ \hline \\ \hline \end{array}$$

b
$$\begin{array}{r} 860 \\ \times\ 72 \\ \hline \\ \hline \\ \hline \end{array}$$

5 p 124

a $18 + 9 \times 37 =$ _____

b $68 \times 0 + 5 =$ _____

6 $P = 72 \div 2^3$ p 126

$P =$ _____

7 Write an equation for each story and work out the answer. p 130-132

a Toby calls friends in Wellington for 4 mins at 39c per minute and cousins in Dunedin for 5 minutes at 52c per minute.
What is his phone bill? _____

b What is the price for 6 adult tickets at $15 each and 3 children's tickets at half price?

_____

8 What is the remainder? p 119

a $8\overline{)305}$ Remainder = _____

b $5\overline{)3,682}$ Remainder = _____

c $8\overline{)5,823}$ Remainder = _____

9 p 121

a Bought for $2,350
Sold for $2,785
Profit = _____

b Bought for $10,000
Sold for $8,650
Loss = _____



10 **Cooking Lesson** p 132

Ingredients for 1 person:

$\frac{1}{2}$ cup choc-chips $\frac{1}{3}$ cup peanuts
$\frac{1}{4}$ cup butter $\frac{1}{5}$ cup condensed milk

Ingredients for 8 people:

_____ _____
_____ _____

11 Write in descending order. p 98

a $\frac{2}{3}$, $\frac{3}{4}$, $\frac{4}{5}$, 0.82

_____

b 0.25, $\frac{2}{9}$, $\frac{1}{12}$, $\frac{3}{5}$

_____

c 0.45, 0.405, 0.004, 0.045

_____

d $\frac{9}{10}$, $\frac{3}{4}$, $\frac{5}{8}$, $\frac{1}{1}$

_____

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Checkpoint 8

12 Add. p 22

a $\frac{1}{4} + \frac{5}{12} =$ _____

b $\frac{3}{12} + \frac{1}{3} =$ _____

13 p 19

a $\frac{2}{3} + \frac{\square}{\square} = 1$ b $\frac{4}{5} + \frac{\square}{\square} = 1$

14 Round to the nearest tenth. p 77

a 12.462 _____ b 65.317 _____

15 Round to the nearest whole number. p 7

a 7.469 _____ b 324.099 _____

16 Multiply by 10.

a 2.45 _____ b 13.06 _____

17 Subtract 0.58 from: p 36

a 1.65 _____ b 2.005 _____

18 Add 6.27 to: p 31

a 13.058 _____ b 1.6 _____

19

9 t per load	47.7 t	____ loads

20 Divide.

a $5\overline{)19.05}$ b $4\overline{)17.36}$

21 Complete the number patterns. p 67

A	1.5	2	2.5			4
B	1.5	3	4.5			
C	1.5	2.5	3.5			

22 What is the 6th term in each pattern? p 67

a 100, 99, 97, 94, 90 _____

b $\frac{1}{2}$, 1, 2, 4 _____

c 1.4, 1.6, 1.8 _____

d 1, 4, 9, 16, 25 _____

23 Complete the table to show the area of squares with side lengths increasing by 1 m. Then write the rule. p 72

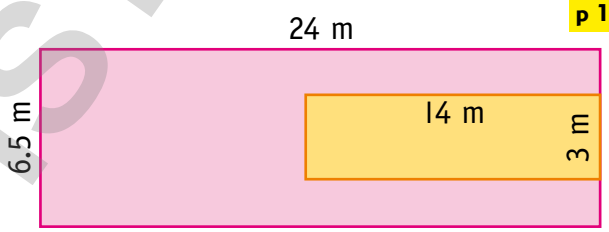
Sides	3 m	4 m	5 m	6 m
Area	9 m²			

Rule: _____

24 What is the perimeter of a rectangular room with an area of 30 m² and a length of 6 m? p 113

_____

25 p 113



a Area of  _____

b Area of  _____

26 a What other dimensions of the orange shape would result in the same area? p 114

_____

b What would be the new perimeter?

_____

27 p 179



Write the area. _____

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Checkpoint 8

28 Find the areas.

a 100 m × 100 m = _____

b 200 m × 50 m = _____

c 250 m × 40 m = _____

29 Study the bus timetable. p 89

Stop	pm	pm	pm
Jinga Mall	3:25	3:55	4:10
Little St	3:28	3:58	4:13
Pryor St	3:33	–	4:18
Wallend St	3:39	–	4:24
Freear	3:44	4:08	4:29
Jolly St	3:49	–	4:34
Dreem Wharf	4:02	4:22	4:47

a If you miss the 3:25 at Jinga Mall by a minute, how long do you wait for the next bus? _____

b Arriving at the Jolly St stop at 4:10, how long must I wait for the next bus? _____

c What is the best bus to catch from Pryor St to catch a 4:30 ferry from the wharf? _____

d How long is the shortest bus trip from the Mall to the Ferry? _____

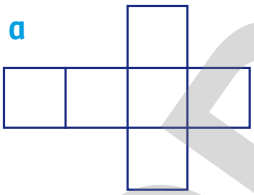
30 Find the distance travelled. p 183

a 60 km/h for 5 hrs _____

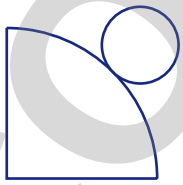
b 80 km/h for 4.5 hrs _____

c 10 m/sec for $\frac{1}{2}$ min _____

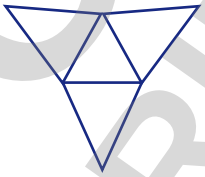
31 What shape can be made from each net? p 137

a 

_____

b 

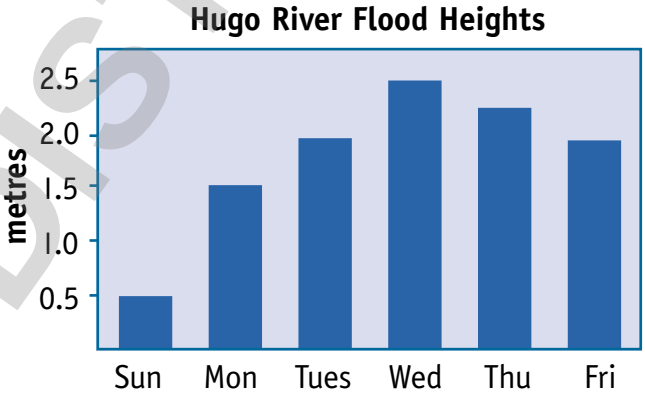
_____

c 

_____

_____

32 Draw a line graph from this bar graph. p 163



metres

33 You pick 30 red marbles and no other colours out of a bag of 40 different coloured marbles. You could think that: p 139

_____

_____

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Checkpoint 8

Shade one bubble.

34 I boarded the train at 08:37.

The trip took $12\frac{1}{2}$ hours.

Which clock shows when my trip ended?

p 92

12:30	21:07	20:37	21:17
○	○	○	○

35 Beau had to drive for 6 hours to visit his mum who lived 500 km away.

For 4 hours, he averaged 84 km/h.

How much further did he still have to travel?



82 km	416 km	150 km	164 km
○	○	○	○

36 Round to the nearest tenth.

p 7

57.943

57.9	58.0	57.94	57.90
○	○	○	○

37 Add 3.7 to 9.08.

p 31

12.7	12.78	12.8	12.87
○	○	○	○

38 Solve.

p 69

$$60 - M = 5 \times 9$$

M = 13	M = 14	M = 15	M = 16
○	○	○	○

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Fast facts

Multiply

7 × 8 = _____	6 × 4 = _____	9 × 3 = _____	8 × 6 = _____	12 × 4 = _____
5 × 7 = _____	9 × 8 = _____	6 × 7 = _____	4 × 8 = _____	11 × 6 = _____
12 × 5 = _____	7 × 7 = _____	12 × 11 = _____	6 × 9 = _____	12 × 7 = _____
12 × 9 = _____	8 × 8 = _____	7 × 3 = _____	9 × 5 = _____	11 × 8 = _____
5 × 5 = _____	4 × 9 = _____	7 × 9 = _____	3 × 8 = _____	12 × 6 = _____
11 × 5 = _____	6 × 6 = _____	9 × 4 = _____	7 × 5 = _____	11 × 7 = _____
4 × 7 = _____	9 × 9 = _____	4 × 5 = _____	6 × 5 = _____	12 × 8 = _____
11 × 11 = _____	12 × 12 = _____	4 × 4 = _____	6 × 3 = _____	11 × 9 = _____

Divide

56 ÷ 7 = _____	24 ÷ 6 = _____	27 ÷ 9 = _____	48 ÷ 8 = _____	48 ÷ 12 = _____
35 ÷ 5 = _____	72 ÷ 9 = _____	42 ÷ 6 = _____	32 ÷ 4 = _____	66 ÷ 11 = _____
27 ÷ 3 = _____	49 ÷ 7 = _____	32 ÷ 8 = _____	54 ÷ 6 = _____	84 ÷ 12 = _____
24 ÷ 4 = _____	64 ÷ 8 = _____	21 ÷ 7 = _____	45 ÷ 9 = _____	88 ÷ 11 = _____
48 ÷ 6 = _____	36 ÷ 4 = _____	63 ÷ 7 = _____	24 ÷ 3 = _____	72 ÷ 12 = _____
56 ÷ 8 = _____	36 ÷ 6 = _____	36 ÷ 9 = _____	35 ÷ 7 = _____	77 ÷ 11 = _____
28 ÷ 4 = _____	81 ÷ 9 = _____	24 ÷ 8 = _____	30 ÷ 6 = _____	96 ÷ 12 = _____
42 ÷ 7 = _____	72 ÷ 8 = _____	16 ÷ 4 = _____	18 ÷ 6 = _____	99 ÷ 11 = _____

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Fast facts

Multiply by 10s, 100s and 1,000s

6 × 40 = _____	8 × 70 = _____	30 × 4 = _____	9 × 50 = _____	7 × 80 = _____
5 × 90 = _____	60 × 6 = _____	4 × 70 = _____	80 × 3 = _____	9 × 60 = _____
7 × 300 = _____	400 × 6 = _____	8 × 500 = _____	900 × 4 = _____	3 × 700 = _____
600 × 5 = _____	9 × 800 = _____	200 × 7 = _____	6 × 900 = _____	400 × 8 = _____
30 × 40 = _____	60 × 70 = _____	80 × 50 = _____	90 × 30 = _____	40 × 60 = _____
70 × 80 = _____	50 × 90 = _____	20 × 60 = _____	40 × 90 = _____	30 × 70 = _____
11 × 400 = _____	12 × 300 = _____	700 × 11 = _____	500 × 12 = _____	12 × 800 = _____
6 × 4,000 = _____	8 × 7,000 = _____	3,000 × 9 = _____	11 × 6,000 = _____	5,000 × 12 = _____

Divide by 10s, 100s, and 1,000s

240 ÷ 6 = _____	560 ÷ 8 = _____	270 ÷ 3 = _____	450 ÷ 9 = _____	560 ÷ 7 = _____
450 ÷ 5 = _____	360 ÷ 6 = _____	280 ÷ 4 = _____	240 ÷ 8 = _____	540 ÷ 9 = _____
2,100 ÷ 7 = _____	2,400 ÷ 6 = _____	4,000 ÷ 8 = _____	3,600 ÷ 4 = _____	2,100 ÷ 3 = _____
3,000 ÷ 5 = _____	7,200 ÷ 9 = _____	1,400 ÷ 7 = _____	5,400 ÷ 6 = _____	3,200 ÷ 8 = _____
1,200 ÷ 30 = _____	4,200 ÷ 60 = _____	4,000 ÷ 80 = _____	2,700 ÷ 90 = _____	2,400 ÷ 40 = _____
5,600 ÷ 70 = _____	4,500 ÷ 50 = _____	1,200 ÷ 20 = _____	3,600 ÷ 40 = _____	2,100 ÷ 30 = _____
4,400 ÷ 11 = _____	3,600 ÷ 12 = _____	7,700 ÷ 11 = _____	6,000 ÷ 12 = _____	9,600 ÷ 12 = _____
24,000 ÷ 6 = _____	56,000 ÷ 8 = _____	27,000 ÷ 9 = _____	66,000 ÷ 11 = _____	60,000 ÷ 12 = _____

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Fast facts

Multiply decimals by 10s, 100s and 1,000s

4.2 × 10 = _____	3.5 × 10 = _____	7.1 × 10 = _____	6.8 × 10 = _____	9.4 × 10 = _____
2.36 × 10 = _____	4.75 × 10 = _____	8.09 × 10 = _____	1.24 × 10 = _____	6.03 × 10 = _____
3.4 × 100 = _____	7.2 × 100 = _____	5.6 × 100 = _____	1.9 × 100 = _____	8.3 × 100 = _____
2.45 × 100 = _____	6.08 × 100 = _____	0.72 × 100 = _____	3.16 × 100 = _____	9.05 × 100 = _____
4.7 × 1,000 = _____	2.6 × 1,000 = _____	8.3 × 1,000 = _____	5.9 × 1,000 = _____	1.4 × 1,000 = _____
3.25 × 1,000 = _____	7.04 × 1,000 = _____	0.86 × 1,000 = _____	4.09 × 1,000 = _____	2.57 × 1,000 = _____
0.6 × 10 = _____	0.38 × 100 = _____	0.047 × 1,000 = _____	0.905 × 100 = _____	0.008 × 1,000 = _____
12.05 × 10 = _____	4.006 × 100 = _____	0.072 × 1,000 = _____	15.09 × 100 = _____	2.008 × 1,000 = _____

Divide decimals

2.0 ÷ 10 = _____	35.0 ÷ 10 = _____	71.0 ÷ 10 = _____	68.0 ÷ 10 = _____	94.0 ÷ 10 = _____
23.6 ÷ 10 = _____	47.5 ÷ 10 = _____	80.9 ÷ 10 = _____	12.4 ÷ 10 = _____	60.3 ÷ 10 = _____
340 ÷ 100 = _____	720 ÷ 100 = _____	560 ÷ 100 = _____	190 ÷ 100 = _____	830 ÷ 100 = _____
245 ÷ 100 = _____	608 ÷ 100 = _____	72 ÷ 100 = _____	316 ÷ 100 = _____	905 ÷ 100 = _____
4,700 ÷ 1,000 = _____	2,600 ÷ 1,000 = _____	8,300 ÷ 1,000 = _____	5,900 ÷ 1,000 = _____	1,400 ÷ 1,000 = _____
3,250 ÷ 1,000 = _____	7,040 ÷ 1,000 = _____	860 ÷ 1,000 = _____	4,090 ÷ 1,000 = _____	2,570 ÷ 1,000 = _____
6 ÷ 10 = _____	38 ÷ 100 = _____	47 ÷ 1,000 = _____	90.5 ÷ 100 = _____	8 ÷ 1,000 = _____
12.05 ÷ 10 = _____	4.06 ÷ 100 = _____	7.2 ÷ 1,000 = _____	15.09 ÷ 100 = _____	2.8 ÷ 1,000 = _____

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Fast facts

Equivalent fractions, decimals and percentages

$\frac{1}{2}$ = _____%	0.25 = _____%	$\frac{3}{4}$ = _____	20% = _____	0.1 = _____%
$\frac{1}{5}$ = _____%	0.5 = _____	25% = _____	$\frac{4}{5}$ = _____%	0.75 = _____%
$\frac{1}{10}$ = _____	40% = _____	$\frac{3}{5}$ = _____%	0.8 = _____	50% = _____
$\frac{2}{5}$ = _____%	0.6 = _____%	30% = _____	$\frac{1}{4}$ = _____	0.9 = _____%
70% = _____	$\frac{3}{8}$ = _____%	0.2 = _____	$\frac{3}{4}$ = _____%	60% = _____
$\frac{5}{8}$ = _____%	0.4 = _____	80% = _____	$\frac{1}{10}$ = _____%	0.3 = _____%
$\frac{5}{8}$ = _____	0.375 = _____%	$\frac{3}{8}$ = _____	75% = _____	0.625 = _____%
90% = _____	$\frac{4}{5}$ = _____	0.05 = _____%	5% = _____	$\frac{1}{4}$ = _____%

Find a fraction or percentage

$\frac{1}{2}$ of 48 = _____	$\frac{1}{4}$ of 80 = _____	10% of 70 = _____	50% of 86 = _____	$\frac{1}{5}$ of 60 = _____
$\frac{3}{4}$ of 40 = _____	20% of 90 = _____	$\frac{1}{3}$ of 72 = _____	25% of 60 = _____	$\frac{2}{5}$ of 50 = _____
$\frac{1}{2}$ of 126 = _____	$\frac{1}{5}$ of 150 = _____	10% of 340 = _____	75% of 80 = _____	$\frac{2}{3}$ of 90 = _____
$\frac{1}{4}$ of 220 = _____	40% of 70 = _____	$\frac{3}{5}$ of 100 = _____	50% of 138 = _____	30% of 120 = _____
$\frac{1}{8}$ of 96 = _____	25% of 240 = _____	$\frac{3}{4}$ of 120 = _____	20% of 350 = _____	$\frac{3}{8}$ of 80 = _____
$\frac{5}{8}$ of 80 = _____	60% of 90 = _____	$\frac{4}{5}$ of 150 = _____	5% of 200 = _____	70% of 80 = _____
$\frac{3}{8}$ of 160 = _____	15% of 200 = _____	$\frac{5}{6}$ of 120 = _____	35% of 200 = _____	$\frac{7}{8}$ of 80 = _____
12.5% of 80 = _____	62.5% of 80 = _____	37.5% of 160 = _____	75% of 240 = _____	5% of 360 = _____

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Mathletics

You are a star!

He tino whetū koe!

What amazing work!
Year 6 has now
been completed.



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