

Mathletics

for the New Zealand
Curriculum

6

Mathematics



A 3P Learning Product

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Mathletics Student Book

Equivalent fractions Week 4

- Name the fraction coloured in each shape.
- Name fractions that are the same size.
- Write each pair of equivalent fractions.
- Write four different fractions that are equal to $\frac{1}{2}$.
- Explain why these fractions are equivalent.

Subtracting more fractions Week 5

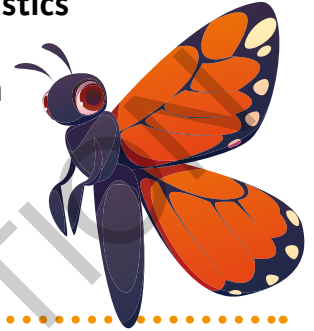
- Subtract and write the answer as a fraction.
- Paul has nine orange quarters. Her team ate 7 of them. What fraction is left?
- Find what is left.
- Convert mixed numbers to improper fractions to subtract. Write the answer as a simplified fraction or a mixed number.
- Arlo has one whole pizza and five eighths of another pizza in his fridge. He ate $\frac{3}{8}$ of a pizza for lunch. How much pizza is left?
- 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?
- How much farther did Luke travel?
- Four volunteers are filling animal water troughs. They start with 3 buckets of water. They use $\frac{1}{2}$ of a bucket for the goats. $\frac{1}{4}$ of a bucket for the horses. 12 buckets for the horses. How much water is left?

Mastery Checklist

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

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.

Subtraction of money Week 7

Yesterday's cakes CHEAP!

Apple tart \$1.75	Cherry tart \$1.85	Chocolate cake \$5.95	Cherry danish \$1.85
Fruit tart \$2.10	Gingerbread man \$1.25	Orange tart \$1.75	Peanut slice \$5.85

The kids in Jones Street love buying the stale cakes.

- Pete has \$2.
 - What cake can't he buy?
 - How much change will he get if he buys a peanut slice? a cherry danish? a gingerbread man?
- Toni has \$3. What did she buy if her change is:
 - \$2.05? b \$1.05? c \$1.85?
- Lucas has \$5. How much change will he get if he buys:
 - an apple tart? b an orange tart? c a cherry danish?
- Dale will get \$2.80 change if she buys the most expensive cake.
 - How much change would she get if she buys the cheapest cake?
 - Could she buy any three cakes? Why?

Problem solving Week 6

Fractions

Four pizza slices. Five friends each have the same-sized fruit pizza. They have eaten some and want to compare how much is left. Zoe has four eighths left. Kai has two quarters left. Charlie has five eighths left. Sophie has three fifths left. Jack has seven tenths left. Explain the fractions and compare. Who has the most fruit pizza left? Colour the fractions and compare.

Colour fractions and compare.

- Four animal cages are feeding rescued puppies. Each has the same-sized bag of puppy food. The bag is $\frac{1}{2}$ of a bag left. How much of a bag left? How much of a bag left? They decide to combine all the food and then share it equally. How much food will each puppy have after sharing equally?

I can solve problems by:

- ☐ understanding fractions
- ☐ drawing diagrams

Checkpoint 2

- Sam bought 1 cake. He paid with a \$5 note and received \$3.20 change. Which cake did he buy?
- Write each mass in grams.
- Order from lightest to heaviest.
- Write the volume of each in cubic centimetres.
- Work out the volume.
- Subtract, then add to check.
- Subtract, then add to check.

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.



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. $4 \times 4 \times 4$).	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. $1,283 \div 5 = 256$, 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. $1 \div 6$ of 31 is equivalent to $31 \div 6 = 5 \text{ R } 1$)	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. $1.3 \times 10 = 13$) 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 ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{3}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{3}{5}$, $\frac{4}{5}$) including fractions with denominators that are 10 or 100	99, 100, 106
	Converting decimal tenths and hundredths to fractions and percentages (e.g. $0.31 = \frac{31}{100} = 31\%$)	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. $\frac{2}{3}$ of 240)	104, 105
	Finding a whole set or amount when given a non-unit fraction, using multiplication and division facts (e.g. $\frac{3}{4}$ 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. $8 \times 7 \leq 8 \times 5 + 42$, 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

Year 6 Knowledge and Practices

The New Zealand Curriculum Mathematics and Statistics 2025

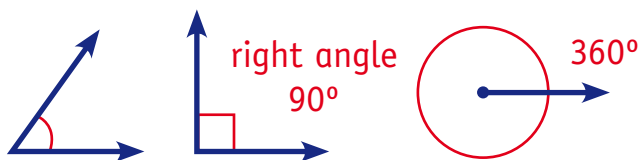
Knowledge	Practices	Pages
Measurement — Measuring		
Measurements can be approximated by referencing previously measured benchmark lengths, volumes, or areas.	Accurately measuring length with a ruler, mass (weight) with scales, capacity with measuring jugs, temperature with a thermometer, and duration 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

Dictionary

angle

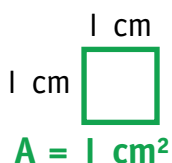
The amount of turning between two lines that meet at a point

Measured in degrees



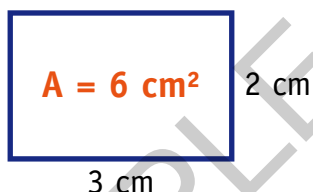
area

The size of a surface
Measured in squares
1 square centimetre = 1 cm²



Rectangular area
= length × width

$$A = L \times W$$



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)

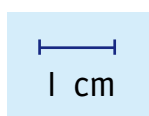


centimetre (cm)

A unit of length

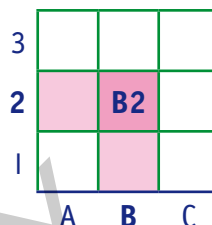
10 mm = 1 cm

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		12
Netball		6
Rugby		8
Chess		11

decimal number

A number that has a decimal point

e.g. 0.3, 75.1

descending order

In order from largest to smallest

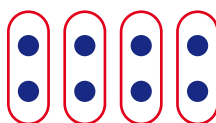
3,927, 1,423, 875, 610, 40

digit

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

division (÷)

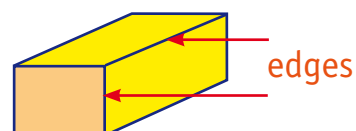
Sharing into equal groups



4 groups of 2
 $8 \div 2 = 4$

edge

Where two surfaces meet



Dictionary

equation

Number sentence

$$3 + 2 = 5$$

equivalent

Of equal value

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

estimate

Make a good guess



Around 20

$$21 + 38 = \text{about } 20 + 40 = \text{around } 60$$

face

A flat surface of a solid shape



factor

A number that divides into another number exactly

A number to be multiplied

factor $\times$ factor = product

$$3 \times 4 = 12 \quad 12 \div 4 = 3$$

3 and 4 are factors of 12

fraction

A part of a whole or a group



$$\frac{1}{2} \rightarrow \text{numerator}$$

$$2 \rightarrow \text{denominator}$$

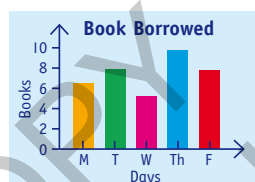
grams (g)

A unit of mass (weight)

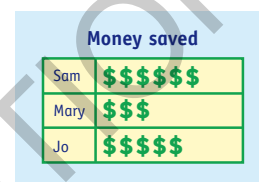
$$1,000 \text{ g} = 1 \text{ kg}$$

graph

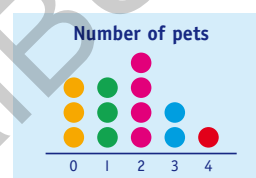
A diagram that shows a collection of data



bar graph



picture graph



dot plot

improper fraction

A fraction greater than 1

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

kilogram (kg)

A unit of mass for weighing things

$$1 \text{ kilogram} = 1,000 \text{ grams}$$

$$1,000 \text{ kilograms} = 1 \text{ tonne}$$

litre (L)

A unit of capacity

$$1 \text{ L} = 1,000 \text{ millilitres (mL)}$$

mass (weight)

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

metre (m)

A unit of length

$$1 \text{ m} = 100 \text{ cm} \quad 1,000 \text{ m} = 1 \text{ km}$$

Dictionary

millilitre (mL)

A unit of capacity

$$1,000 \text{ mL} = 1 \text{ L}$$

millimetre (mm)

A unit of length

$$10 \text{ mm} = 1 \text{ cm}$$

mixed numbers

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

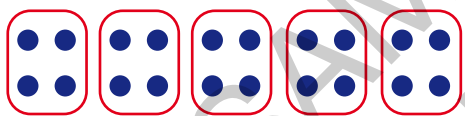
multiple

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



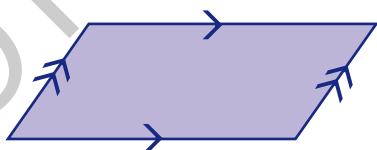
$$5 \times 4 = 20$$

$$6 \times 35 =$$

6	$6 \times 30 = 180$	$6 \times 5 = 30$
	30	5

parallelogram

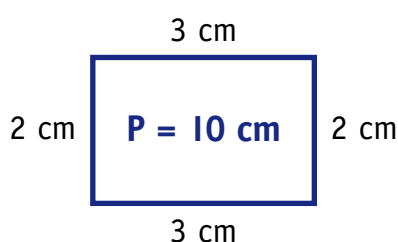
A quadrilateral with opposite sides parallel



perimeter

Distance around the outside

Add side lengths: $3 + 3 + 2 + 2 = 10 \text{ cm}$



place value

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

$$396 = 300 + 90 + 6$$

$$754 = 7 \text{ hundreds} + 5 \text{ tens} + 4 \text{ ones}$$

$$8.57 = 8 \text{ ones} + 5 \text{ tenths} + 7 \text{ hundredths}$$

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.



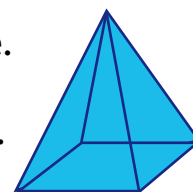
triangular prism

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.

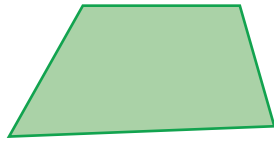


square pyramid

Dictionary

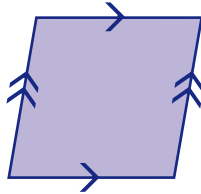
quadrilateral

A 2D shape with 4 straight sides

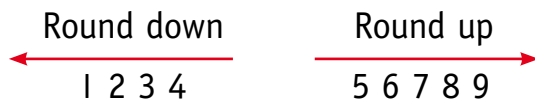


rhombus

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



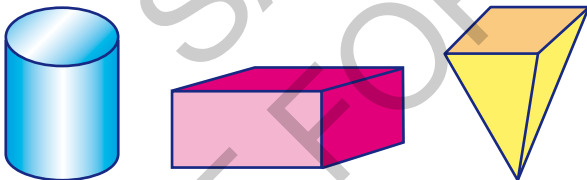
rounding (to nearest 10)



e.g. $675 \rightarrow 700$
(rounded to the nearest 100)
 $4,492 \rightarrow 4,000$
(rounded to the nearest 1,000)

three-dimensional objects (3D)

Solid shapes that have length, width and height



time



analogue



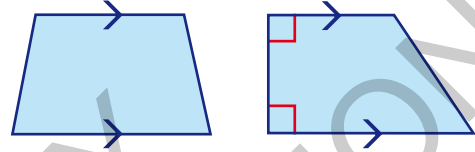
digital

1 hour = 60 minutes
1 minute = 60 seconds

trapezium

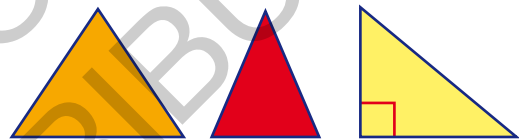
A quadrilateral that has one pair of parallel sides

Some have 2 right angles



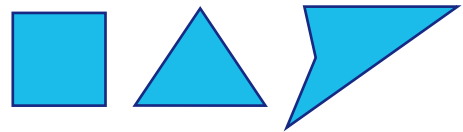
triangle

A 2D shape with 3 straight sides



two-dimensional shapes (2D)

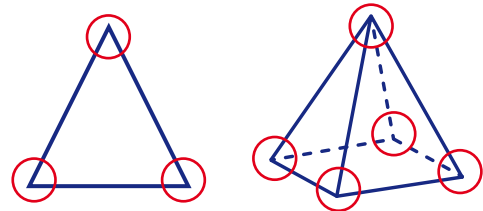
Shapes that only have length and width



vertex

2D: where 2 straight lines meet

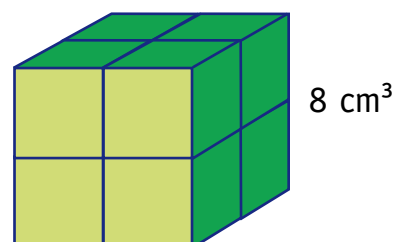
3D: where 3 or more edges meet

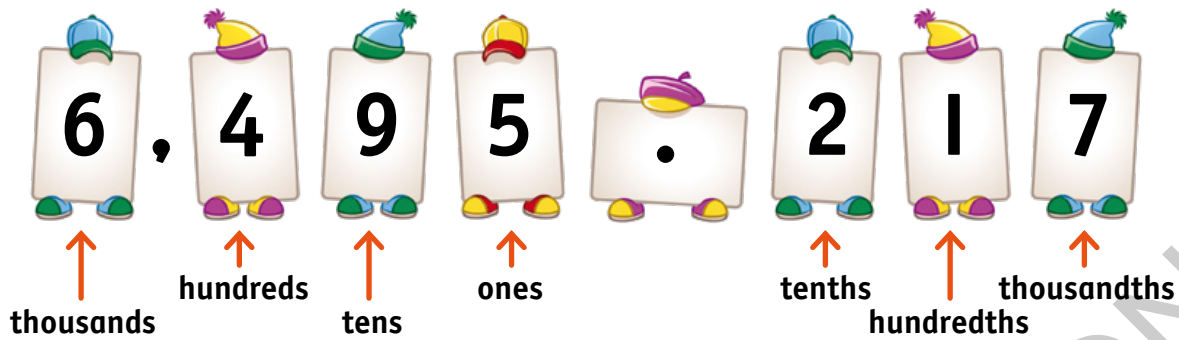


1 vertex, 3 vertices

volume

The amount of space a solid object takes up





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

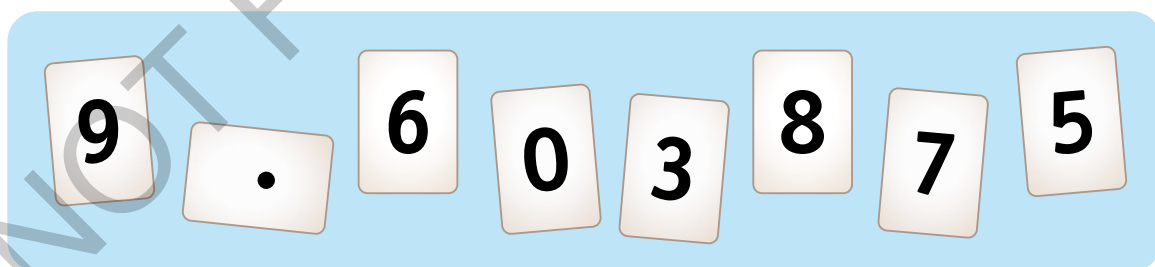
- a 6,384.2 tens b 7,418.364 _____ c 824.632 _____
 d 1.038 _____ e 564.380 _____ f 8,002.4 _____
 g 248.241 _____ h 4,201.873 _____ i 6,423.368 _____
 j 389.2 _____ k 659.008 _____ l 392.860 _____

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

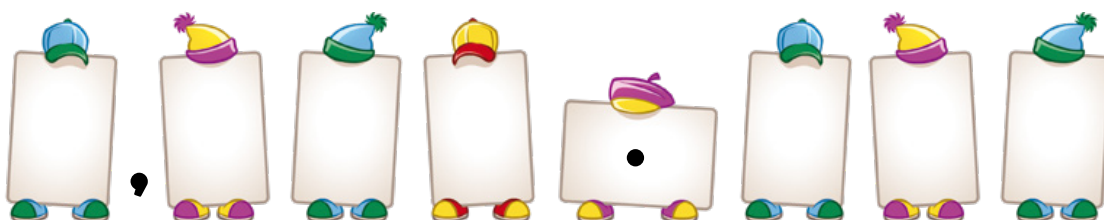
0 in the tenths place

3 in the thousandths place

8 in the tens place

7 in the thousands place

5 in the hundredths place



More place value

TERM 1
Week 1

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



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)



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

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	.			?

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? _____

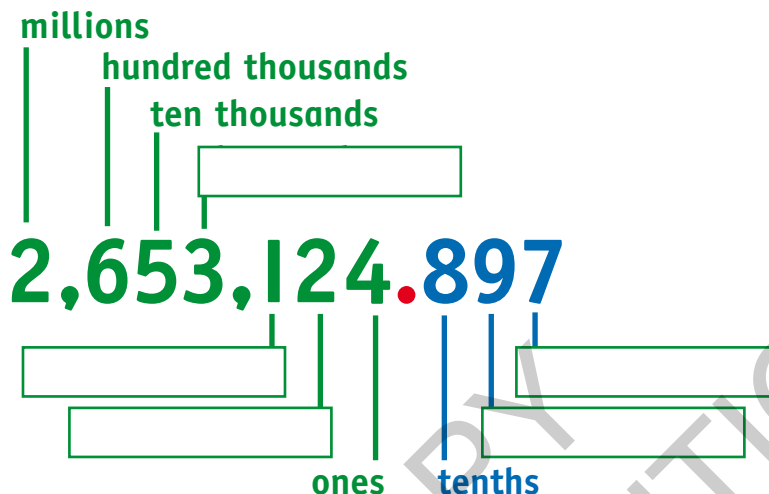
Explain your answer.



I can solve problems by:

- ☐ understanding decimal place value ☐ checking answers

1 Complete the labels.



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 _____



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.

$\times 10$ makes each digit 10 times greater

$\times 100$ makes each digit 100 times greater

e.g. $7.31 \times 10 = 73.1$
 $8.52 \times 100 = 852$

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.

$\div 10$ makes each digit 10 times smaller

$\div 100$ makes each digit 100 times smaller

e.g. $12.34 \div 10 = 1.234$
 $12.34 \div 100 = 0.1234$

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? _____

1 Complete the tables.

a Multiply by 100.

Number	$\times 100$
3.6	
8.25	
0.47	
12.09	

b Divide by 10.

Number	$\div 10$
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
$42 \div 100$	Yes / No	Yes / No	Yes / No
7.85×100	Yes / No	Yes / No	Yes / No

3 Find the missing number.

a _____ $\times 10 = 56.3$

b _____ $\times 100 = 472$

c _____ $\div 10 = 3.4$

d _____ $\div 100 = 0.87$

e $6.3 \times$ _____ $= 630$

f $84 \div$ _____ $= 0.84$

g $0.728 \times$ _____ $= 72.8$

h _____ $\div 1,000 = 0.506$

i $4.26 \times$ _____ $= 4,260$

j _____ $\times 1,000 = 6.42$

4 Circle the larger number.

a 3.45×10 or 3.45×100

b $67.2 \div 10$ or $67.2 \div 100$

c 0.89×100 or $89 \div 100$

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 $4.27 \times 100 = 4,2700$

Why is Olivia incorrect?

b Jacob says $650 \div 10 = 6,500$

Explain his mistake.

Multiply by 10, 100, 1,000

TERM 1
Week 2

1 Multiply by 10.

a $10 \times 2 =$ _____

c $4 \times 10 =$ _____

e $10 \times 10 =$ _____

g $10 \times 64 =$ _____

i $10 \times 773 =$ _____

k $293 \times 10 =$ _____

b $10 \times 61 =$ _____

d $8 \times 10 =$ _____

f $13 \times 10 =$ _____

h $59 \times 10 =$ _____

j $10 \times 189 =$ _____

l $420 \times 10 =$ _____

Multiply by 10

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

Each digit becomes
one place value larger.
e.g. $6 \times 10 = 60$

2 Multiply by 100.

a $7 \times 100 =$ _____

c $863 \times 100 =$ _____

e $100 \times 34 =$ _____

g $100 \times 33 =$ _____

i $4 \times 100 =$ _____

k $100 \times 62 =$ _____

b $100 \times 56 =$ _____

d $24 \times 100 =$ _____

f $97 \times 100 =$ _____

h $100 \times 20 =$ _____

j $349 \times 100 =$ _____

l $81 \times 100 =$ _____

Multiply by 100

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

Each digit becomes
two place values larger.
e.g. $6 \times 100 = 600$

3 Multiply by 1,000.

a $1,000 \times 3 =$ _____

c $1,000 \times 37 =$ _____

e $382 \times 1,000 =$ _____

g $1,000 \times 64 =$ _____

i $1,000 \times 1,000 =$ _____

k $139 \times 1,000 =$ _____

b $808 \times 1,000 =$ _____

d $1,000 \times 80 =$ _____

f $101 \times 1,000 =$ _____

h $123 \times 1,000 =$ _____

j $1,000 \times 433 =$ _____

l $1,000 \times 506 =$ _____

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. $6 \times 1,000 = 6,000$
 $1,000 \times 8.45 = 8,450$

4 a $10 \times 1.6 =$ _____

c $1,000 \times 3.1 =$ _____

e $1,000 \times 5.37 =$ _____

g $10 \times 7.591 =$ _____

i $1,000 \times 9.783 =$ _____

k $10 \times 73.9 =$ _____

m $10 \times 57.4 =$ _____

o $1,000 \times 92.81 =$ _____

b $100 \times 2.8 =$ _____

d $100 \times 4.25 =$ _____

f $10 \times 6.43 =$ _____

h $100 \times 8.629 =$ _____

j $100 \times 41.8 =$ _____

l $1,000 \times 65.2 =$ _____

n $100 \times 89.637 =$ _____

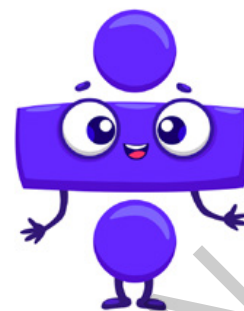
p $100 \times 14.102 =$ _____



Divide by 10, 100, 1,000

TERM 1
Week 2

- 1 a $80 \div 10 =$ _____ b $300 \div 10 =$ _____
c $4,200 \div 10 =$ _____ d $5,670 \div 10 =$ _____
e $900 \div 100 =$ _____ f $1,000 \div 100 =$ _____
g $7,500 \div 100 =$ _____ h $24,600 \div 100 =$ _____
i $3,000 \div 1,000 =$ _____ j $69,000 \div 1,000 =$ _____



2 Divide by 10.

- a $8.27 \div 10 =$ _____ b $47.1 \div 10 =$ _____
c $4.09 \div 10 =$ _____ d $334.63 \div 10 =$ _____
e $26.83 \div 10 =$ _____ f $201.2 \div 10 =$ _____
g $616.2 \div 10 =$ _____ h $9 \div 10 =$ _____
i $24.65 \div 10 =$ _____ j $534 \div 10 =$ _____
k $325.14 \div 10 =$ _____ l $0.03 \div 10 =$ _____

Divide by 10

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

Each digit becomes
one place value smaller.

e.g. $60 \div 10 = 6$

$32 \div 10 = 3.2$

3 Divide by 100.

- a $72 \div 100 =$ _____ b $36.4 \div 100 =$ _____
c $41.3 \div 100 =$ _____ d $0.8 \div 100 =$ _____
e $9 \div 100 =$ _____ f $97.43 \div 100 =$ _____
g $23.6 \div 100 =$ _____ h $8.24 \div 100 =$ _____
i $1.47 \div 100 =$ _____ j $43.6 \div 100 =$ _____
k $0.5 \div 100 =$ _____ l $3 \div 100 =$ _____

Divide by 100

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

Each digit becomes
two place values smaller.

e.g. $600 \div 100 = 6$

$32 \div 100 = 0.32$

4 Divide by 1,000.

- a $7.9 \div 1,000 =$ _____ b $0.92 \div 1,000 =$ _____
c $4.3 \div 1,000 =$ _____ d $440 \div 1,000 =$ _____
e $77 \div 1,000 =$ _____ f $2.36 \div 1,000 =$ _____
g $630 \div 1,000 =$ _____ h $0.7 \div 1,000 =$ _____
i $0.59 \div 1,000 =$ _____ j $380 \div 1,000 =$ _____
k $970 \div 1,000 =$ _____ l $0.401 \div 1,000 =$ _____

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. $6,000 \div 1,000 = 6$

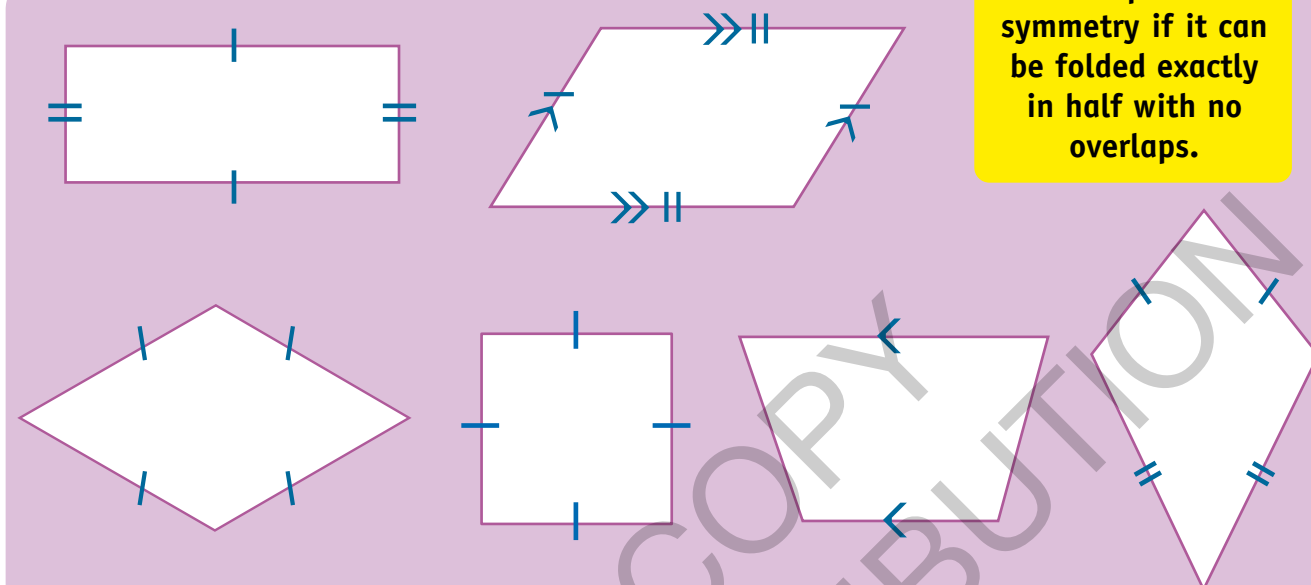
$32 \div 1,000 = 0.032$

Mastery Checklist

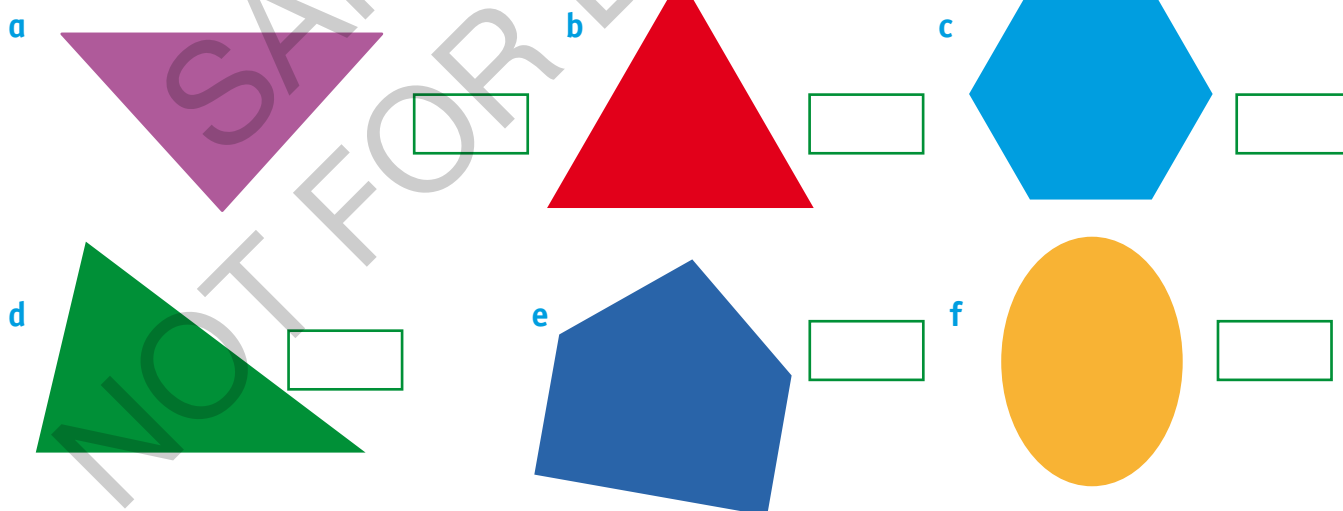
- I can: ☐ round numbers up to 7 digits to the nearest given place value
☐ round decimals to the nearest whole number or tenth
☐ multiply whole numbers and decimals by 10, 100 and 1,000
☐ divide whole numbers and decimals by 10, 100 and 1,000



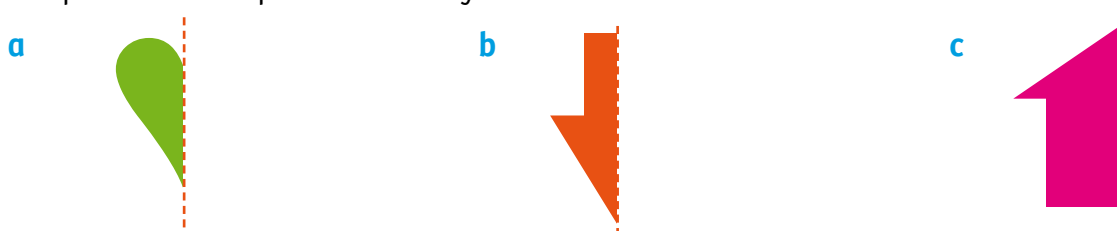
A shape has symmetry if it can be folded exactly in half with no overlaps.



- 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?



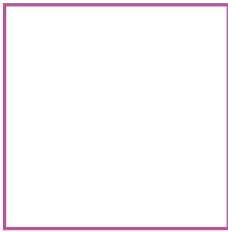
- 3 Complete each shape to make it symmetrical.



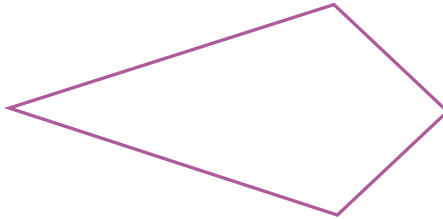
Challenge! Tick the shapes on this page that have rotational symmetry.

1 Tick the quadrilaterals that have rotational symmetry.

a



b



c

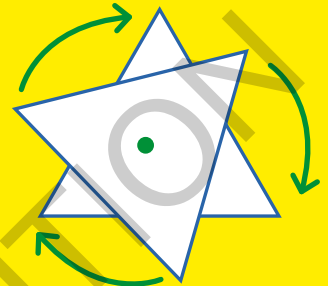


d



Rotational symmetry

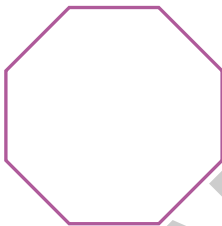
A shape has rotational symmetry if the shape matches the original before it's made one full turn.



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

2 Circle the shapes that have rotational symmetry.

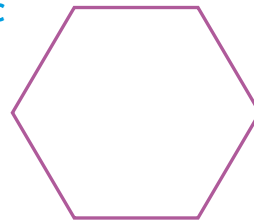
a



b



c



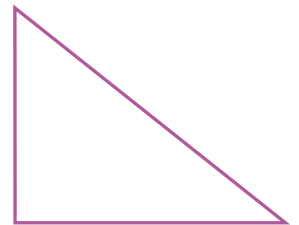
d



e



f



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

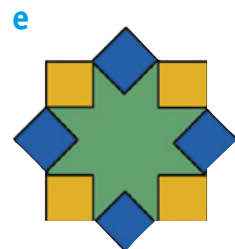
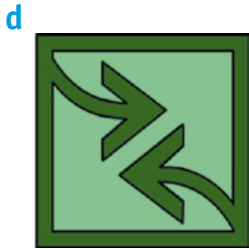
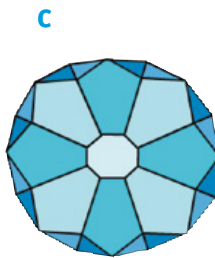
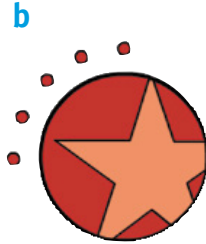
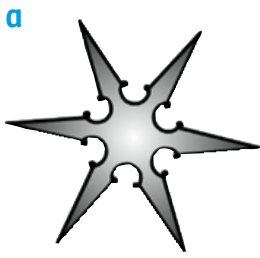
4 Draw all the possible lines of symmetry on each capital letter.

5 Which capital letters have rotational symmetry? _____

Order of rotational symmetry

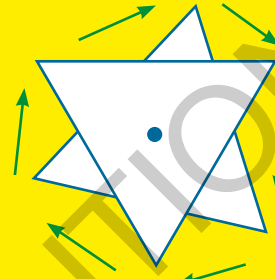
TERM 1
Week 3

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



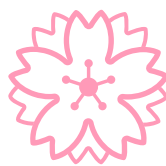
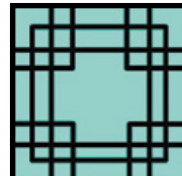
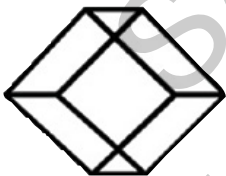
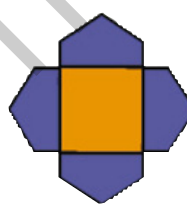
Order of rotational symmetry

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



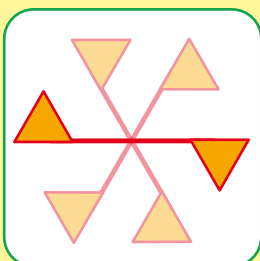
Trace the triangle. Pin the tracing on the original at the central point. Turn.

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



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

eg

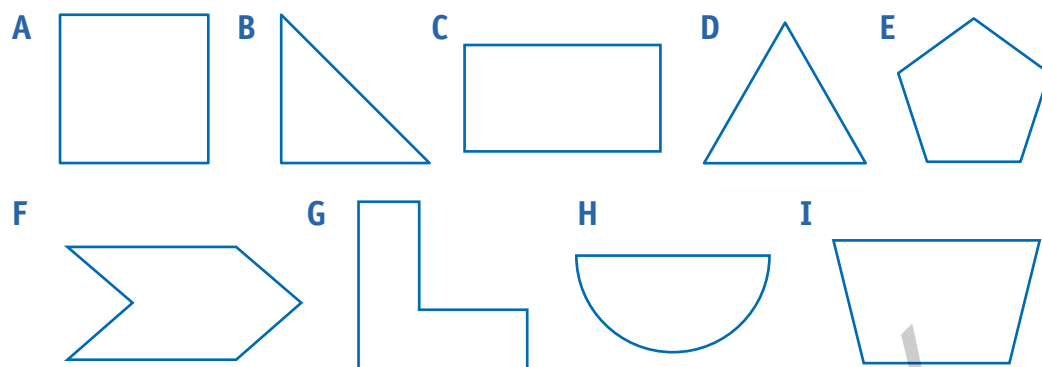


a



b





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

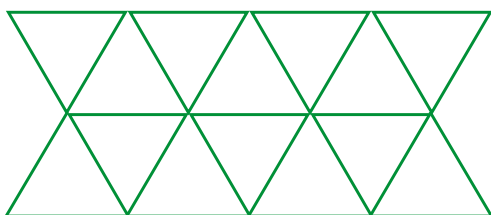


- 3 Name the transformations. Draw the missing term to continue each pattern.

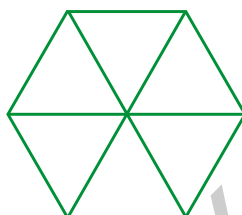
a					
		Side flip	180° turn	Side flip	180° turn
b					
c					



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.

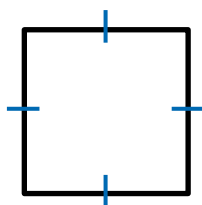
A **tessellation** is a pattern of repeated shapes that fit together without gaps and without overlapping.

1 Do all regular shapes tessellate? _____

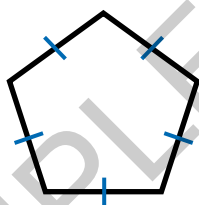
Draw a tessellation for each regular shape if you can.

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

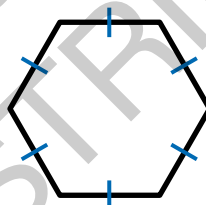
a Regular square



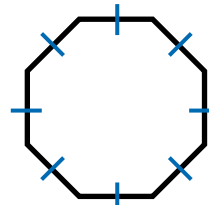
b Regular pentagon



c Regular hexagon



d Regular octagon



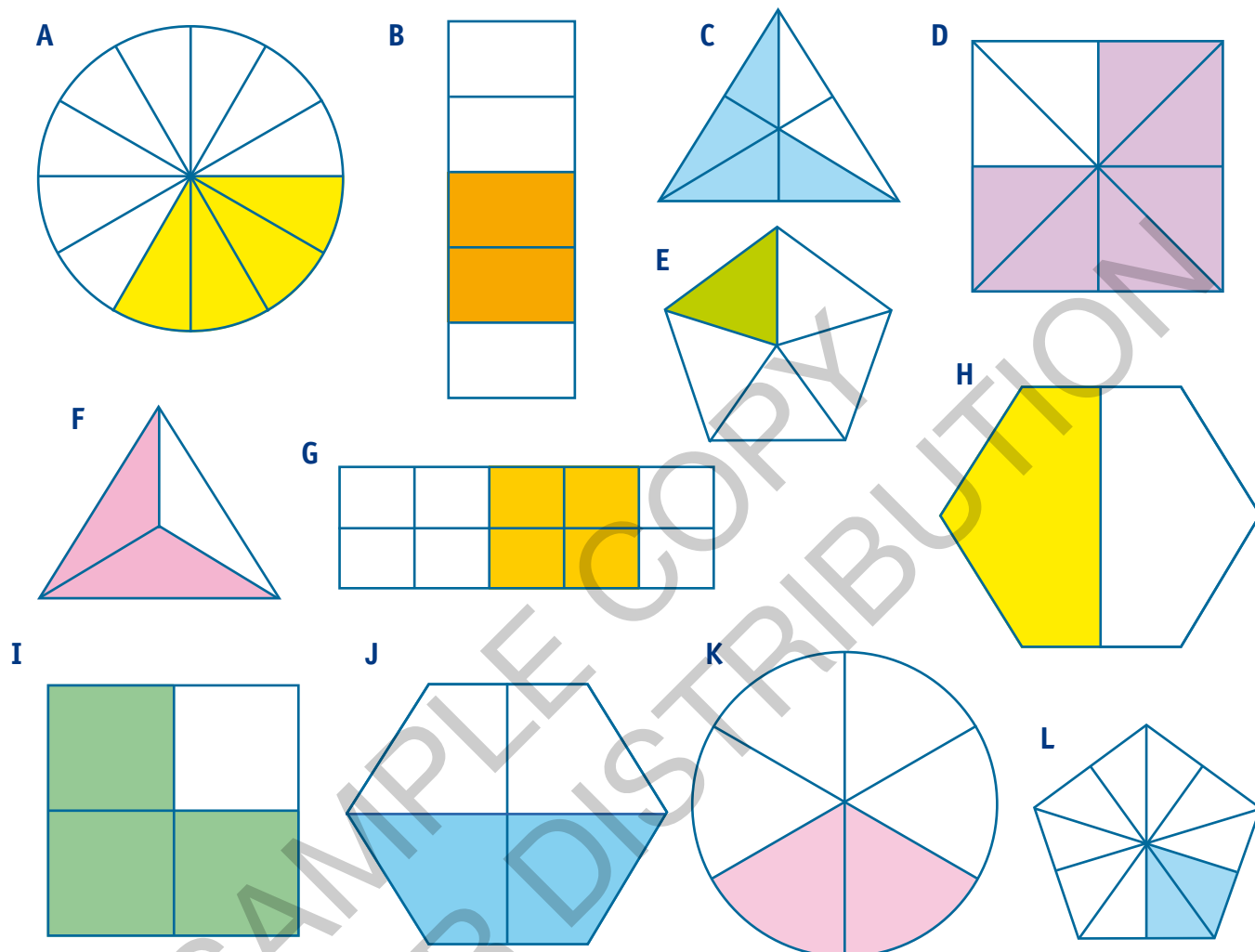
2 For each shape that tessellates, did you use rotation, reflection or translation?

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



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. _____

Making equivalent fractions

TERM 1
Week 4

- 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 $\frac{20}{50} = \frac{10}{\square} = \frac{\square}{5}$

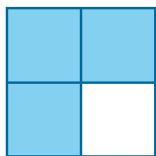
Fractions to 1

A fraction is equal to 1 whole when the numerator and denominator are the same.

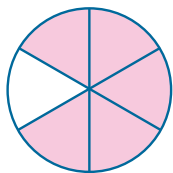
Examples: $\frac{1}{1}$ $\frac{2}{2}$ $\frac{3}{3}$ $\frac{4}{4}$ $\frac{8}{8}$

TERM 1
Week 4

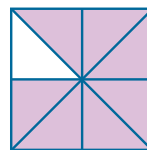
- 1 Complete the wholes. Colour the missing part of each shape.



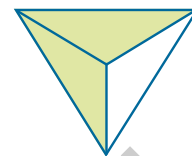
a $\frac{3}{4} + \frac{\square}{\square} = \frac{\square}{\square}$



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 $\frac{\square}{\square} = \frac{9}{9}$

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?

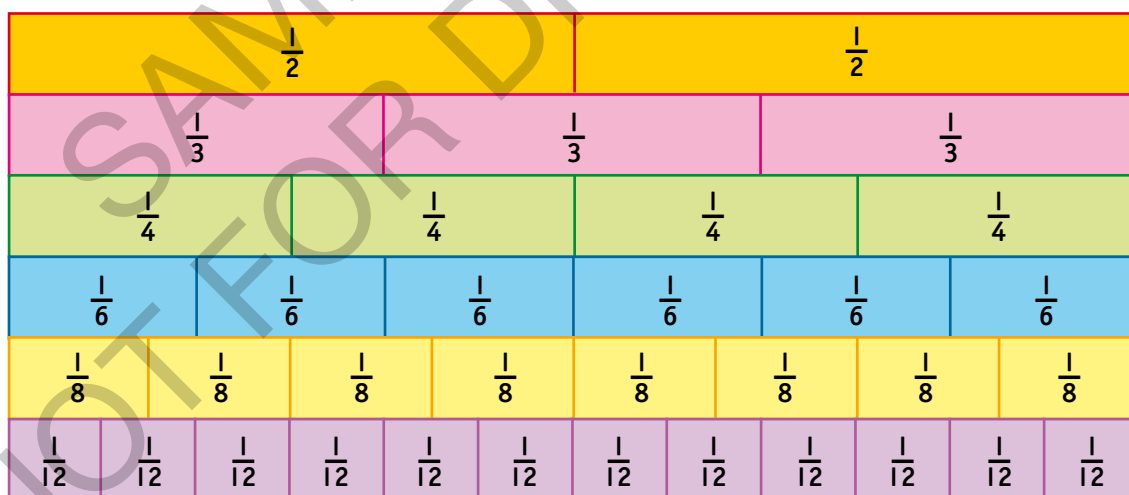
a $\frac{3}{8} + \frac{\square}{\square} = 1$

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 $\frac{4}{8} + \underline{\hspace{1cm}} = 1$ b $\frac{7}{12} + \underline{\hspace{1cm}} = 1$ c $\frac{5}{6} + \underline{\hspace{1cm}} = 1$ d $\frac{1}{3} + \underline{\hspace{1cm}} = 1$ e $\frac{3}{4} + \underline{\hspace{1cm}} = 1$

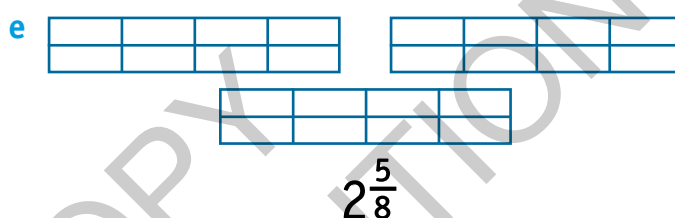
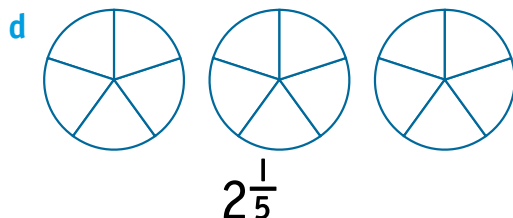
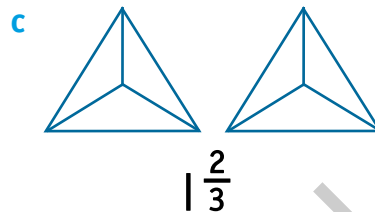
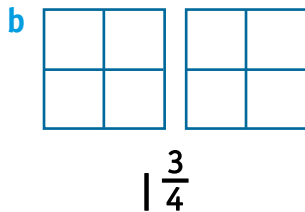
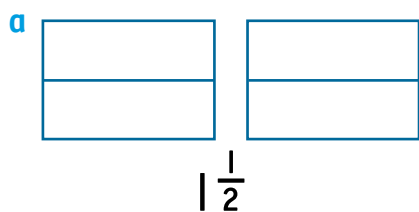
f $1 - \frac{4}{8} = \underline{\hspace{1cm}}$ g $1 - \frac{3}{8} = \underline{\hspace{1cm}}$ h $1 - \frac{2}{4} = \underline{\hspace{1cm}}$ i $1 - \frac{6}{12} = \underline{\hspace{1cm}}$ j $1 - \frac{2}{6} = \underline{\hspace{1cm}}$

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

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

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

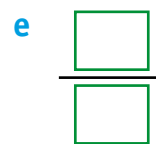
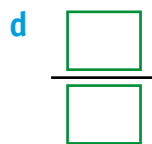
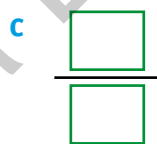
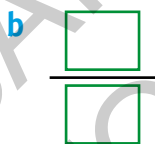
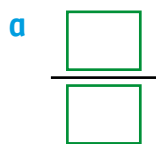
1 Colour.



2 Place these fractions on the number line.



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



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

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.

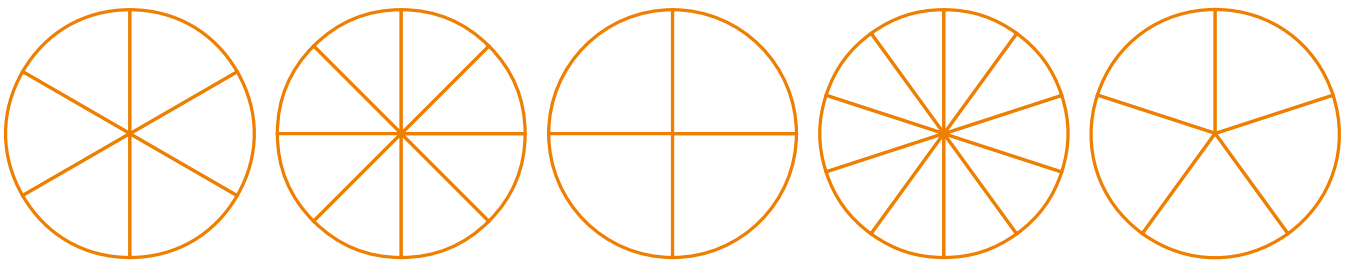
Jack has seven tenths left.

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

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 $\frac{13}{20} + \frac{5}{20} =$ _____

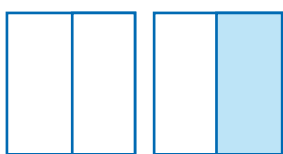
j $1\frac{5}{9} + \frac{2}{9} =$ _____

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

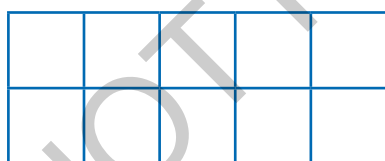


f $2 - \frac{1}{6} =$ _____

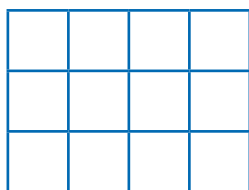


3 Use the diagrams to fill in the missing fraction.

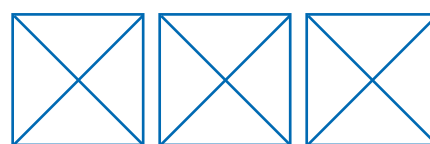
a $\frac{4}{10} + \frac{\boxed{}}{10} = 1$



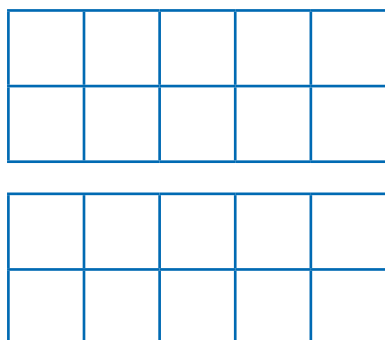
b $\frac{7}{12} + \frac{\boxed{}}{12} = 1$



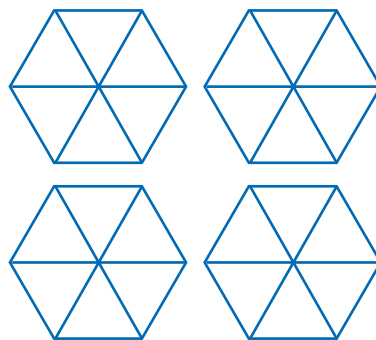
c $\frac{7}{4} + \frac{\boxed{}}{4} = 3$



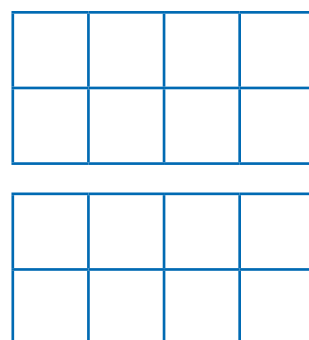
d $1\frac{3}{10} + \frac{\boxed{}}{10} = 2$



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



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



Adding more fractions

TERM 1
Week 5

- 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 $<$, $=$, $>$. 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 $\frac{2}{3} + \frac{5}{6}$		

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

- 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 $\frac{5}{8} + \frac{\boxed{}}{\boxed{}} = 1\frac{1}{8}$ b $\frac{3}{4} + \frac{\boxed{}}{\boxed{}} = 1\frac{1}{2}$ c $\frac{7}{10} + \frac{\boxed{}}{\boxed{}} = 1\frac{2}{5}$ d $\frac{2}{3} + \frac{\boxed{}}{\boxed{}} = 2$

- 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 _____

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 $1\frac{5}{7} - \frac{6}{7} =$
 $= \frac{11}{7} - \frac{6}{7} = \frac{5}{7}$
 $= \frac{5}{7}$

c $2\frac{4}{5} - \frac{7}{5} =$
 $= \frac{14}{5} - \frac{7}{5} = \frac{7}{5}$
 $= 1\frac{2}{5}$

d $1\frac{5}{8} - \frac{9}{8} =$
 $= \frac{13}{8} - \frac{9}{8} = \frac{4}{8}$
 $= \frac{1}{2}$

e $3\frac{2}{6} - 1\frac{3}{6} =$
 $= \frac{20}{6} - \frac{9}{6} = \frac{11}{6}$
 $= 1\frac{5}{6}$

f $3\frac{4}{9} - 1\frac{5}{9} =$
 $= \frac{31}{9} - \frac{14}{9} = \frac{17}{9}$
 $= 1\frac{8}{9}$

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

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 $\overline{) 237}$

- 5 Which is the same as:

$\$9.43 \times 100 = ?$

Shade one bubble. 

\$90.43
☐

\$943.00
☐

\$94.30
☐

\$900.43
☐

6

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

$\frac{10}{12}$
☐

$\frac{11}{12}$
☐

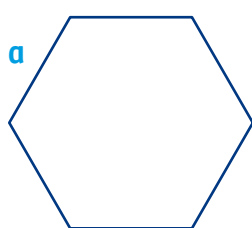
$\frac{12}{12}$
☐

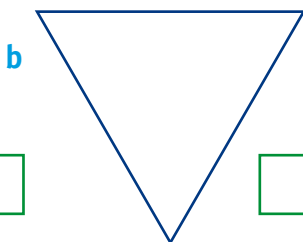
$\frac{13}{12}$
☐

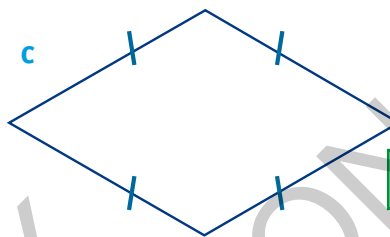
Checkpoint 1

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

Write your answer
in the boxes.







- 8 Write equivalent fractions.

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

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

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

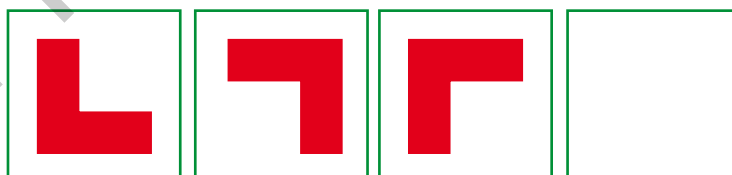
d $\frac{1}{5}, \frac{\square}{10}, \frac{\square}{15}, \frac{\square}{20}, \frac{\square}{100}$

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

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

- 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?

<
☐

>
☐

=
☐

+
☐

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.

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.

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.

a $46 + 38 =$ _____

b $72 + 27 =$ _____

c $39 + 55 =$ _____

d $23 + 69 =$ _____

e $68 + 64 =$ _____

f $19 + 77 =$ _____

g $57 + 83 =$ _____

h $84 + 97 =$ _____

Compensation strategy

$$38 + 42 = 38 + 40 + 2$$

$$= 78 + 2$$

$$= 80$$

$$53 + 39 = 53 + 40 - 1$$

$$= 93 - 1$$

$$= 92$$

Jump strategy

$$53 + 38$$

$$53 + 30 = 83$$

$$83 + 8 = 91$$

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 $46 + 59 + 37 =$	

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

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

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

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

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

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

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

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

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

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

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

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

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

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



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

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

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



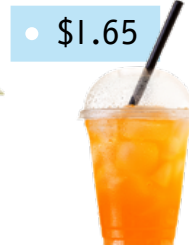
• \$3.50



• \$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?



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
$$\begin{array}{r} 68 \\ 49 \\ 81 \\ + 26 \\ \hline \end{array}$$

b
$$\begin{array}{r} 75 \\ 18 \\ 54 \\ + 37 \\ \hline \end{array}$$

c
$$\begin{array}{r} 265 \\ + 578 \\ \hline \end{array}$$

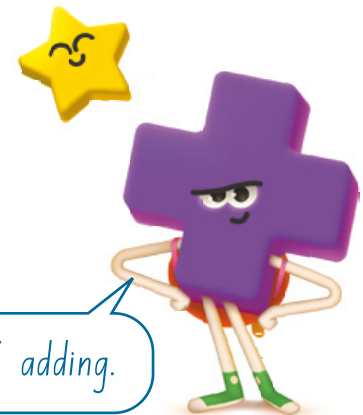
d
$$\begin{array}{r} 408 \\ + 395 \\ \hline \end{array}$$

Est. _____

Est. _____

Est. _____

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? _____

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Places are important.



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

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

Est. $\underline{\hspace{2cm}}$

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

Est. $\underline{\hspace{2cm}}$

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

Est. $\underline{\hspace{2cm}}$

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

Est. $\underline{\hspace{2cm}}$

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

Est. $\underline{\hspace{2cm}}$

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

Est. $\underline{\hspace{2cm}}$

+, - 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

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.

b give the smallest sum possible.

Largest sum = _____

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.

b give the smallest sum possible.

Largest sum = _____

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

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? _____

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.

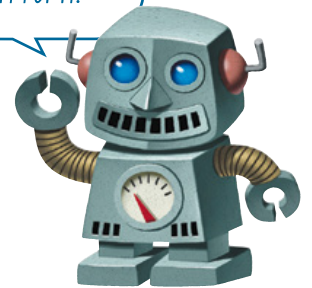
a

—	31	84	68	42	96	75	53	27
19								

b

—	41	79	50	37	74	90	63	82
29								

Look for a pattern.



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!

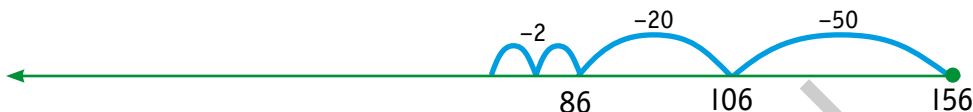
- a Estimate. $603 - 174 - 156 - 98$
 b Calculate the exact answer.
 c Was your estimate a good one?

Number lines

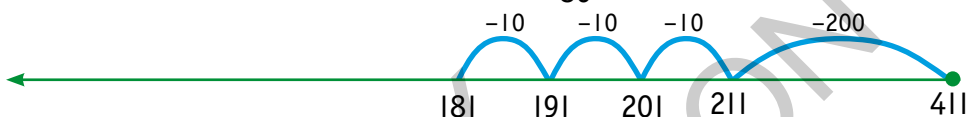
You choose whether to take big jumps or small jumps. Both are correct.

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
$$\begin{array}{r} 471 \\ - 237 \\ \hline \end{array}$$

b
$$\begin{array}{r} 583 \\ - 165 \\ \hline \end{array}$$

c
$$\begin{array}{r} 637 \\ - 418 \\ \hline \end{array}$$

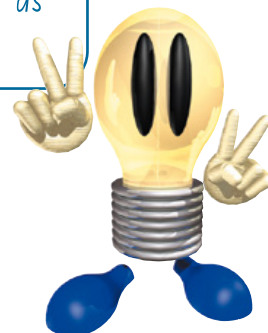
d
$$\begin{array}{r} 990 \\ - 726 \\ \hline \end{array}$$

e
$$\begin{array}{r} 556 \\ - 339 \\ \hline \end{array}$$

f
$$\begin{array}{r} 782 \\ - 537 \\ \hline \end{array}$$

g
$$\begin{array}{r} 894 \\ - 547 \\ \hline \end{array}$$

Remember!
71 is the same as
 $60 + 11$.



3 Trade in the hundreds.

a
$$\begin{array}{r} 736 \\ - 264 \\ \hline \end{array}$$

b
$$\begin{array}{r} 885 \\ - 691 \\ \hline \end{array}$$

c
$$\begin{array}{r} 614 \\ - 330 \\ \hline \end{array}$$

d
$$\begin{array}{r} 577 \\ - 185 \\ \hline \end{array}$$

e
$$\begin{array}{r} 949 \\ - 492 \\ \hline \end{array}$$

f
$$\begin{array}{r} 428 \\ - 156 \\ \hline \end{array}$$

g
$$\begin{array}{r} 653 \\ - 470 \\ \hline \end{array}$$

h
$$\begin{array}{r} 862 \\ - 581 \\ \hline \end{array}$$

i
$$\begin{array}{r} 716 \\ - 455 \\ \hline \end{array}$$

j
$$\begin{array}{r} 537 \\ - 391 \\ \hline \end{array}$$

k
$$\begin{array}{r} 725 \\ - 247 \\ \hline \end{array}$$

l
$$\begin{array}{r} 348 \\ - 186 \\ \hline \end{array}$$

m
$$\begin{array}{r} 693 \\ - 389 \\ \hline \end{array}$$

n
$$\begin{array}{r} 857 \\ - 278 \\ \hline \end{array}$$

o
$$\begin{array}{r} 906 \\ - 618 \\ \hline \end{array}$$

Subtraction algorithms

TERM 1
Week 7

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

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

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

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

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

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

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

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

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
$$\begin{array}{r} 3.9 \\ - 1.7 \\ \hline \end{array}$$

Est. _____

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

Est. _____

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

Est. _____

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

Est. _____

HINT

Put the decimal point in the answer first.

$$\begin{array}{r} 5.45 \\ - 3.43 \\ \hline 2.02 \end{array}$$

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

Est. _____

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

Est. _____

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

Est. _____

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

Est. _____

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?



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

a
$$\begin{array}{r} 627 \\ - 263 \\ \hline \end{array}$$

b
$$\begin{array}{r} 835 \\ - 548 \\ \hline \end{array}$$

c
$$\begin{array}{r} 410 \\ - 168 \\ \hline \end{array}$$

d
$$\begin{array}{r} 727 \\ - 590 \\ \hline \end{array}$$

Check.

a
$$\begin{array}{r} 263 \\ + \\ \hline \end{array}$$

b
$$\begin{array}{r} 548 \\ + \\ \hline \end{array}$$

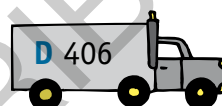
c
$$\begin{array}{r} \\ + \\ \hline \end{array}$$

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

Checking
Use + to check subtraction.

$$\begin{array}{r} 815 \\ - 278 \\ \hline 537 \\ \text{Check } 537 \\ + 278 \\ \hline 815 \end{array}$$

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.

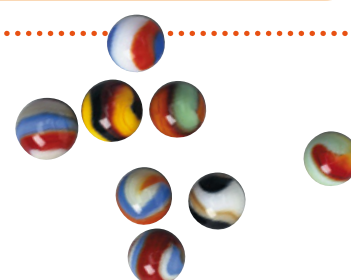


Work backwards

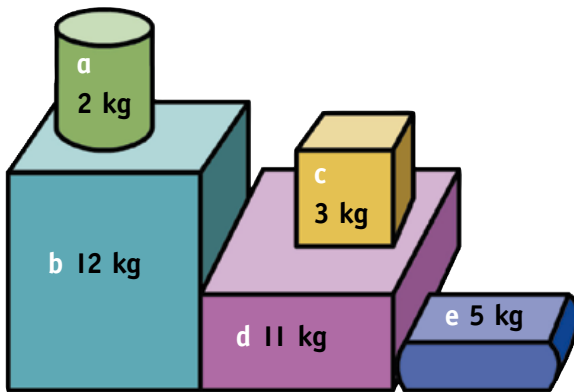
Lui was a marble champion. In June he won 614, July 293, August 504 and September 110. He then had 1,917 marbles altogether. How many did he begin with?

Mastery Checklist

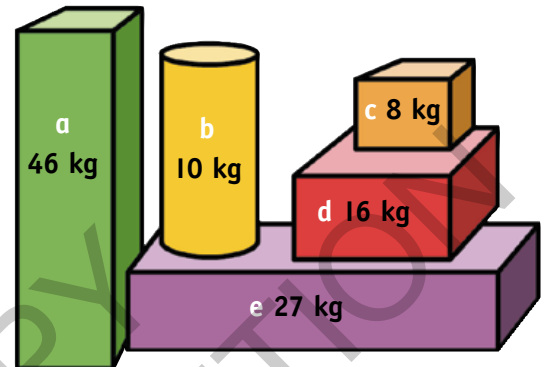
- I can:
- ☐ use a variety of mental strategies to subtract
 - ☐ use number lines and algorithms to subtract
 - ☐ subtract numbers up to 6 places and decimals to 3 places
 - ☐ check answers using inverse operations



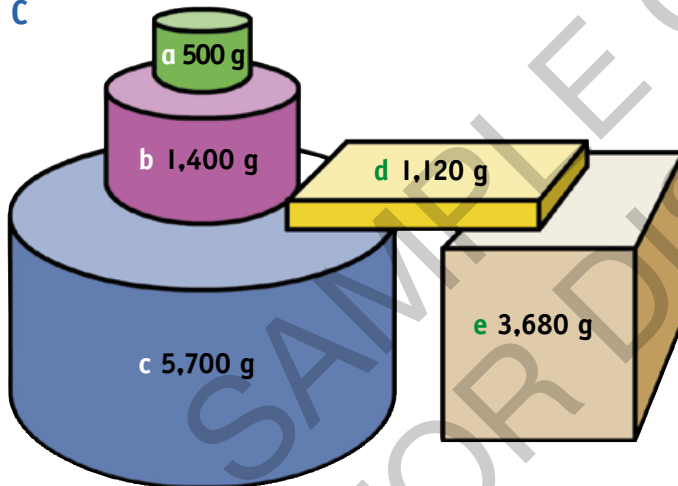
A



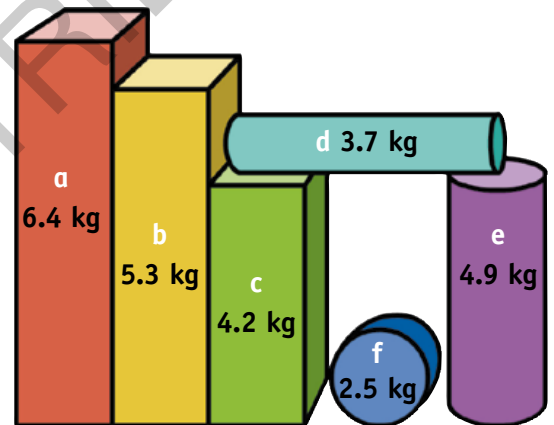
B



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? _____

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 _____

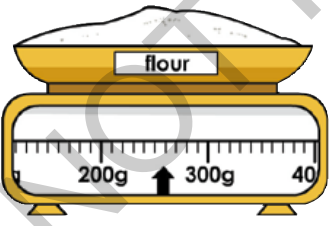
- 5 Write the mass to the nearest 100 g.

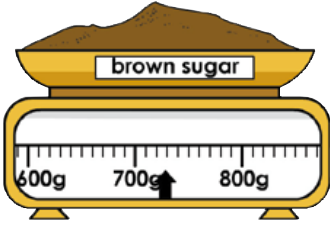
a  663 g

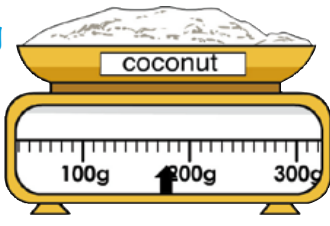
b  815 g

c  472 g

d  948 g

e  200g 300g 400g

f  600g 700g 800g

g  100g 200g 300g

Mass

gram – g
kilogram – kg
1,000 g = 1 kg

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.



Estimating mass



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. _____

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 g _____

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



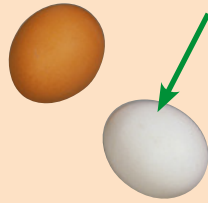
a 4.5



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



Problem solving

TERM 1
Week 8

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.

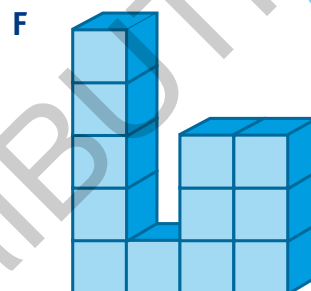
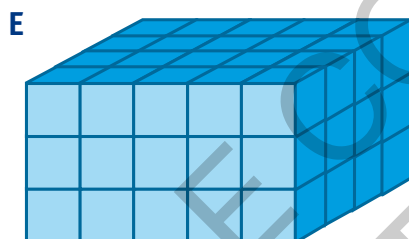
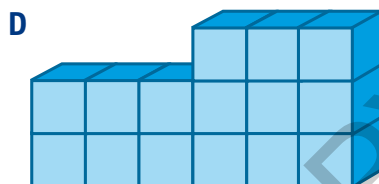
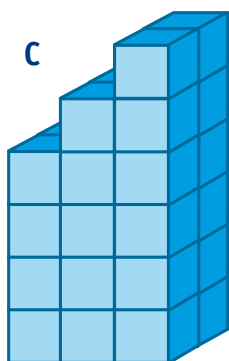
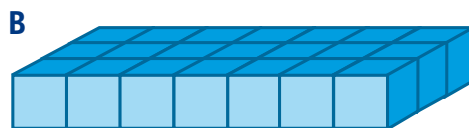
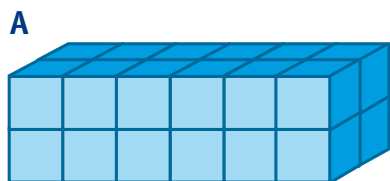
Tare:

Aggregate:

I can solve problems by:

☐ understanding mass and using division ☐ writing algorithms

1 Build each model using cubic centimetre blocks.



Volume

the amount of space something occupies.



Dimensions = $1 \times 2 \times 3$

Volume = 6 cubic units

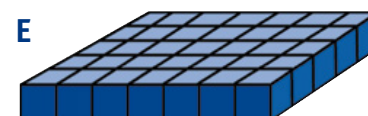
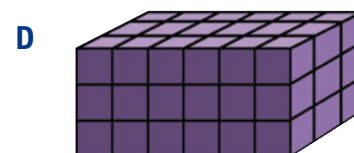
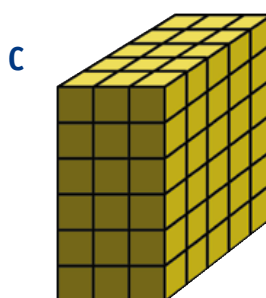
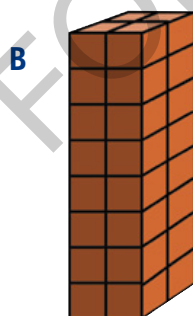
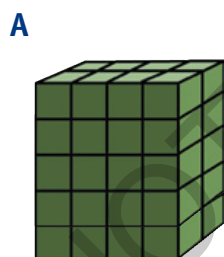


2 How many blocks did you use?

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** _____



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**? _____

Activity • Work with a friend

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

a Estimate how many cubic centimetre blocks would fit inside the box. _____ cm^3

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 $\times$ Width $\times$ Height

= _____ $\times$ _____ $\times$ _____

= _____ cm^3

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



$$1 \text{ cm} \times 1 \text{ cm} \times 1 \text{ cm} = 1 \text{ cm}^3$$



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

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

a _____ cm^3 **b** _____ cm^3 **c** _____ cm^3 **d** _____ cm^3

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. _____ cm^3

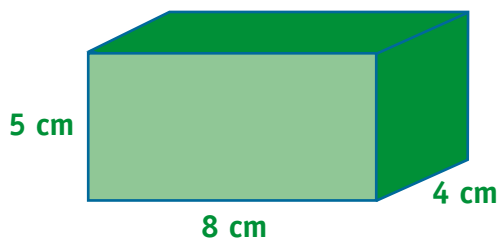
6 Name an object that is likely to have a volume of:

- a** about 10 cm^3 _____
- b** about 50 cm^3 _____
- c** about 100 cm^3 _____
- d** more than 200 cm^3 _____

Volume of a rectangular prism

TERM 1
Week 9

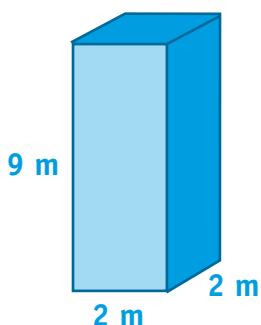
To find the volume of a rectangular prism, multiply the length by the width by the height.
The answer will be in cubic units.



$$\begin{aligned}\text{Volume} &= \text{length (l)} \times \text{width (w)} \times \text{height (h)} \\ &= 8 \text{ cm} \times 5 \text{ cm} \times 4 \text{ cm} \\ &= 160 \text{ cm}^3\end{aligned}$$

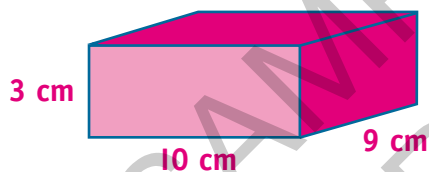
I Work out the volume.

a



$$\begin{aligned}\text{Volume} &= \text{length (l)} \times \text{width (w)} \times \text{height (h)} \\ &= \underline{\quad} \times \underline{\quad} \times \underline{\quad} \\ &= \underline{\quad} \text{ m}^3\end{aligned}$$

b



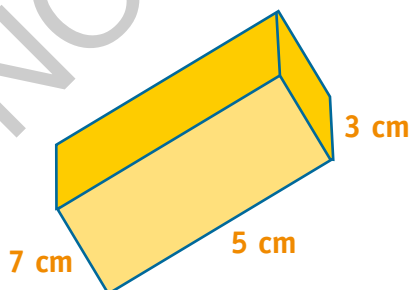
$$\begin{aligned}\text{Volume} &= l \times w \times h \\ &= \underline{\quad} \times \underline{\quad} \times \underline{\quad} \\ &= \underline{\quad} \text{ cm}^3\end{aligned}$$

c



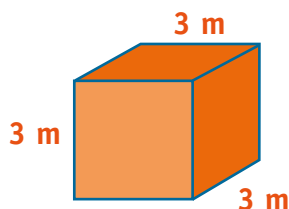
$$\begin{aligned}\text{Volume} &= l \times w \times h \\ &= \underline{\quad} \times \underline{\quad} \times \underline{\quad} \\ &= \underline{\quad} \text{ m}^3\end{aligned}$$

d



$$\begin{aligned}\text{Volume} &= l \times w \times h \\ &= \underline{\quad} \times \underline{\quad} \times \underline{\quad} \\ &= \underline{\quad} \text{ cm}^3\end{aligned}$$

e

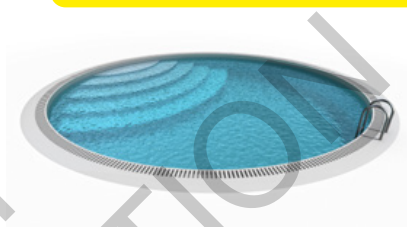


$$\begin{aligned}\text{Volume} &= l \times w \times h \\ &= \underline{\quad} \times \underline{\quad} \times \underline{\quad} \\ &= \underline{\quad} \text{ m}^3\end{aligned}$$

- 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.

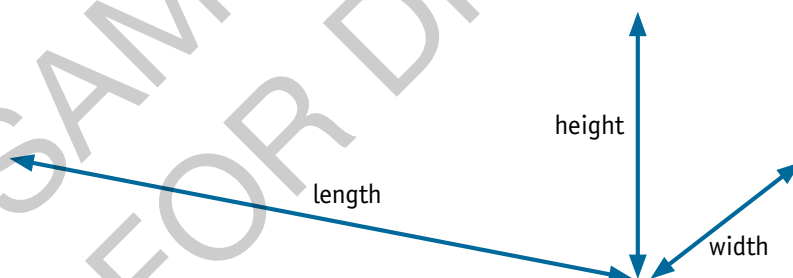


A cubic metre
The volume of large objects can be measured in cubic metres (m^3).
 $1 \text{ m} \times 1 \text{ m} \times 1 \text{ m} = 1 \text{ m}^3$



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

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.

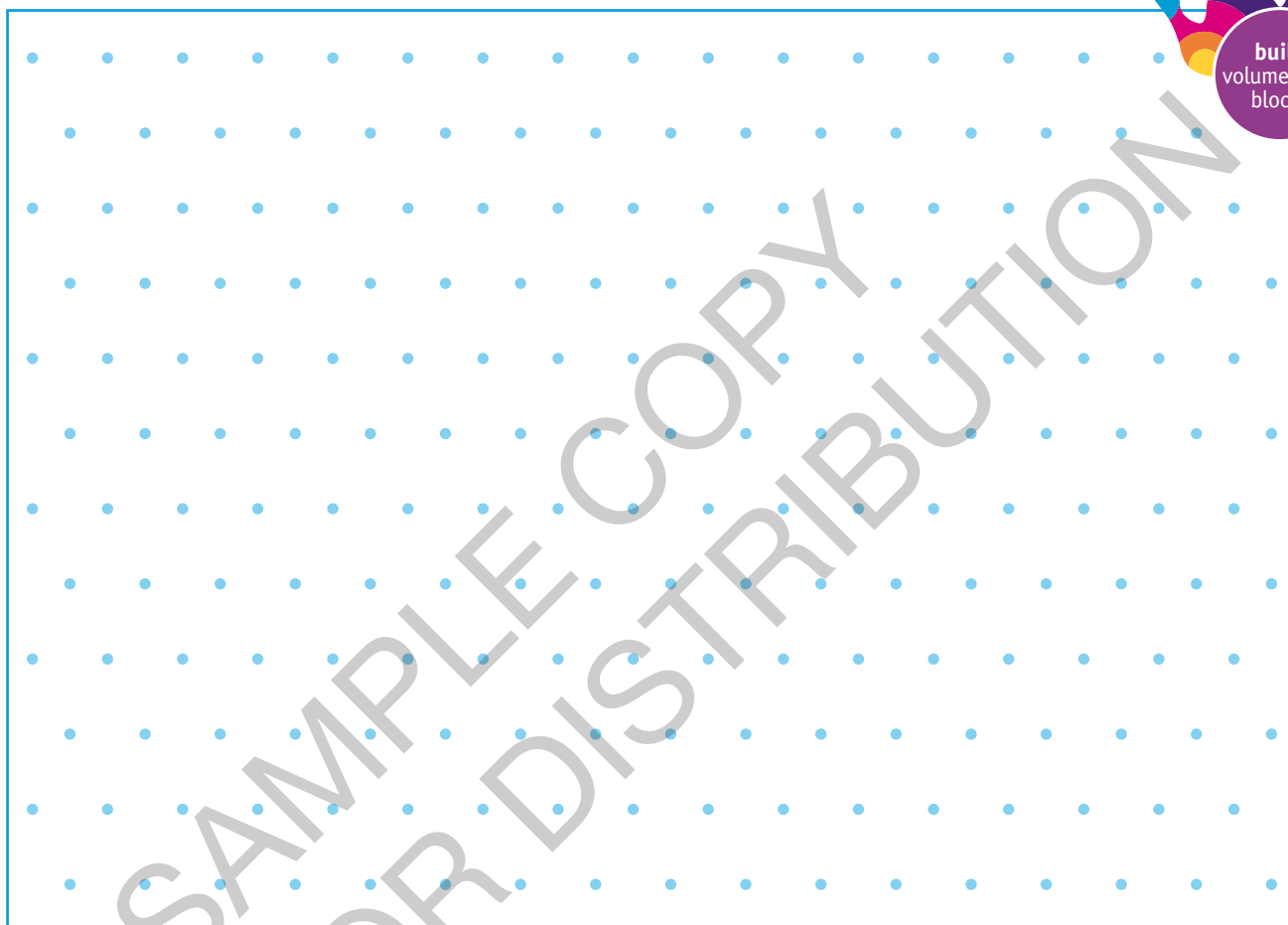
How many cubic metre blocks are needed to complete the pyramid?

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

Rectangular prism volume

TERM 1
Week 9

- 1 Use centimetre cubes to build three different rectangular prisms with a volume of 36 cm^3 .
- 2 Draw these models below. Label them **A**, **B**, **C**.



- 3 Fill in the table using your models.

Volume	Length	Width	Height
A 36 cm^3			
B 36 cm^3			
C 36 cm^3			

- 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

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 $1.895 \times 10 =$ _____ p 10

b $1.895 \times 100 =$ _____

c $1.895 \times 1,000 =$ _____

9 a $1.895 \div 10 =$ _____ p 11

b $1.895 \div 100 =$ _____

c $1.895 \div 1,000 =$ _____

10 a Reflect this shape. p 15



b Turn 90° anticlockwise.



11 Write the missing fraction. p 19

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

12 Compare using $<$, $>$ or $=$. p 20

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

13 Complete the missing fraction. p 24

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

14 a $73 + 19 =$ _____ p 28

b $37 + 55 =$ _____

15 a $\begin{array}{r} 403 \\ + 294 \\ \hline \end{array}$ b $\begin{array}{r} 574 \\ + 228 \\ \hline \end{array}$ c $\begin{array}{r} 358 \\ + 429 \\ \hline \end{array}$ p 29

16 Use the number line. p 30

$689 + 246 =$ _____



17 a $\begin{array}{r} 21.05 \\ 5.73 \\ + 0.10 \\ \hline \end{array}$ b $\begin{array}{r} 8.20 \\ 94.75 \\ + 13.06 \\ \hline \end{array}$ p 31

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



• \$5.20/kg



• \$7.40/kg

p 33



• \$6.50/kg



• \$9.80/kg

Pete had \$10.

What change does he get if he buys 1 kg of:

a bananas? _____ b grapes? _____

c apples? _____ d strawberries? _____

20 a $39 - 28 =$ _____

p 34

b $61 - 32 =$ _____

21 Use the number line.

p 35

$411 - 128 =$ _____



22 a $\begin{array}{r} 7.804 \\ - 5.520 \\ \hline \end{array}$

b $\begin{array}{r} 8.259 \\ - 4.036 \\ \hline \end{array}$

p 36

23 Subtract, then add to check.

p 37

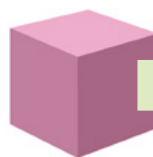
a $\begin{array}{r} 527 \\ - 263 \\ \hline \end{array}$ check $\begin{array}{r} 263 \\ + \\ \hline \end{array}$

b $\begin{array}{r} 604 \\ - 278 \\ \hline \end{array}$ check $\begin{array}{r} 278 \\ + \\ \hline \end{array}$

- 24 a What is the total mass? _____

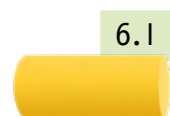
p 38

A



13 kg

B



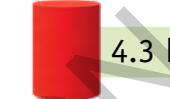
6.1 kg

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.

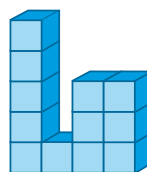
p 41

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

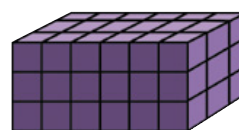
- 27 Write the volume of each in cubic centimetres.

p 43

a

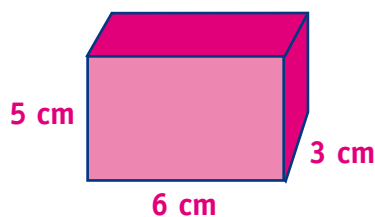


b



- 28 Work out the volume.

p 45



Volume = $l \times w \times h$

= _____ $\times$ _____ $\times$ _____

= _____ cm^3