

AUSTRALIAN
Signpost
MATHS



5

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Australian Signpost Maths Year 5 (AC V9.0) Curriculum Map

Strand	Code	Descriptor	Australian Signpost Maths 5 Lessons
Number	AC9M5N01	interpret, compare and order numbers with more than 2 decimal places, including numbers greater than one, using place value understanding; represent these on a number line	1:01 Numbers using millions 1:02 Large numbers 1:03 Using large numbers 1:07 Tenths and hundredths 1:14 Place value to thousandths 1:15 Place value and decimals 1:20-21 Comparing decimals 1:25 Using decimals
Number	AC9M5N02	express natural numbers as products of their factors, recognise multiples and determine if one number is divisible by another	2:01 Number facts, x 6, x 7, x 8, x 9 2:02 Learning your multiplication tables 2:11 Multiples 2:12 Factors 2:13 Factors and multiples 2:35 Divisibility 2:36 Factors and multiples 2:37 Using factors in multiplication 2:53 Using operations to solve problems
Number	AC9M5N03	compare and order fractions with the same and related denominators including mixed numerals, applying knowledge of factors and multiples; represent these fractions on a number line	1:05: The order of unit fractions 1:06 Mixed numbers 1:07 Tenths and hundredths 1:10 Fractions 1:11 Improper fractions, mixed numbers 1:17-19 Equivalent fractions
Number	AC9M5N04	recognise that 100% represents the complete whole and use percentages to describe, represent and compare relative size; connect familiar percentages to their decimal and fraction equivalents	1:08 Percentages 1:09 Using percentages
Number	AC9M5N05	solve problems involving addition and subtraction of fractions with the same or related denominators, using different strategies	1:04 Fractions 1:12 Addition of fractions 1:13 Subtraction of fractions 1:16 Addition and subtraction of fractions 1:22 Subtraction from whole numbers 1:23 Using fractions 1:24 Solving problems with fractions
Number	AC9M5N06	solve problems involving multiplication of larger numbers by one- or two-digit numbers, choosing efficient calculation strategies and using digital tools where appropriate; check the reasonableness of answers	2:31 Multiplying tens 2:32 Multiplying tens or hundreds 2:39 Mental strategies for multiplication 2:43 Multiplying 2-digit numbers 2:44-45 The extended form of multiplication 2:46-47 The contracted form of multiplication 2:54 Estimating products 2:55 Strategies for multiplication
Number	AC9M5N07	solve problems involving division, choosing efficient strategies and using digital tools where appropriate; interpret any remainder according to the context and express results as a whole number, decimal or fraction	2:17 Division with remainders 2:18 Division of 2-digit numbers 2:19 Using division facts 2:27-29 Dividing 2-digit numbers 2:30 Dividing 3-digit numbers 2:33 Dividing 3-digit numbers by 10 2:34 Dividing with zero in the answer 2:38 Averages 2:53 Using operations to solve problems

Australian Signpost Maths Year 5 (AC V9.0) Curriculum Map

Number	AC9M5N08	check and explain the reasonableness of solutions to problems including financial contexts using estimation strategies appropriate to the context	2:06-7 Addition to 999 2:08 Using the addition algorithm 2:09 Subtraction with trading 2:23 Addition to 9999 2:25 Subtraction from 1000s 2:49-50 Estimating by rounding 2:54 Estimating products
Number	AC9M5N09	use mathematical modelling to solve practical problems involving additive and multiplicative situations including financial contexts; formulate the problems, choosing operations and efficient calculation strategies, using digital tools where appropriate; interpret and communicate solutions in terms of the situation	2:04 Rounding 2:05 Strategies, + and - 2:06-7 Addition to 999 2:08 Using the addition algorithm 2:09 Subtraction with trading 2:10 Subtraction to 999 2:14 Addition of money 2:15 Subtraction of money 2:16 Shopping 2:20 Subtraction to 999 2:21 Subtraction from hundreds 2:22-23 Addition to 9999 2:24 Subtraction to 9999 2:25 Subtraction from 1000s 2:26 Subtraction from 1000s strategy 2:38 Averages 2:48 Problems involving change of units 2:51 Using your income 2:52 Making a budget 2:53 Using operations to solve problems 2:56-59 Multiplication by 2-digit numbers
Number	AC9M5N10	create and use algorithms involving a sequence of steps and decisions and digital tools to experiment with factors, multiples and divisibility; identify, interpret and describe emerging patterns	1:26 Patterns and percentages 2:08 Using the addition algorithm 2:40-42 Algebraic thinking
Algebra	AC9M5A01	recognise and explain the connection between multiplication and division as inverse operations and use this to develop families of number facts	2:01 Number facts, $\times 6$, $\times 7$, $\times 8$, $\times 9$ 2:03 Division facts 2:18 Division of 2-digit numbers 2:19 Using division facts
Algebra	AC9M5A02	find unknown values in numerical equations involving multiplication and division using the properties of numbers and operations	2:40-42 Algebraic thinking 2:60 Finding missing numbers
Measurement	AC9M5M01	choose appropriate metric units when measuring the length, mass and capacity of objects; use smaller units or a combination of units to obtain a more accurate measure	3:01 Kilometres 3:02 Kilometres and metres 3:13 Using measurement scales 3:14 Millimetres 3:15 Converting length measurements 3:18 Grams and kilograms 3:19 Measuring mass 3:22 Measuring volume in mL 3:23 Capacity and volume 3:24 Measuring capacity

Australian Signpost Maths Year 5 (AC V9.0) Curriculum Map

Measurement	AC9M5M02	solve practical problems involving the perimeter and area of regular and irregular shapes using appropriate metric units	3:03-4 Perimeter 3:05 Calculating area 3:06 Square metres 3:07 Area 3:08 Problem solving 3:14 Millimetres 3:20 Perimeter 3:21 Exploring perimeter and area 3:25 Hectares 3:26 Square kilometres
Measurement	AC9M5M03	compare 12- and 24-hour time systems and solve practical problems involving the conversion between them	3:08 Problem solving 3:09 Time units 3:10 24-hour time 3:11 Using 12- and 24-hour time 3:12 24-hour time problems 3:16 24-hour time 3:17 Problems involving time
Measurement	AC9M5M04	estimate, construct and measure angles in degrees, using appropriate tools including a protractor, and relate these measures to angle names	4:07 Using a protractor 4:08 Angle types in degrees 4:09 Using a protractor 4:10 Classifying angles 4:14 Measuring angles of rotation 4:19 Drawing angles 4:20 Angles greater than 180° 4:23 Using angles
Space	AC9M5SP01	connect objects to their nets and build objects from their nets using spatial and geometric reasoning	4:01 3D space 4:02 Prisms and pyramids 4:05 Nets 4:16 Views and nets of 3D objects
Space	AC9M5SP02	construct a grid coordinate system that uses coordinates to locate positions within a space; use coordinates and directional language to describe position and movement	4:06 Describing position 4:11 Compass directions 4:12 Reading a map 4:17 Coordinates on the number plane 4:18 Using coordinates 4:21 Mapping Australia
Space	AC9M5SP03	describe and perform translations, reflections and rotations of shapes, using dynamic geometric software where appropriate; recognise what changes and what remains the same, and identify any symmetries	4:03 Reflection, translation, rotation 4:04 Flip, slide, turn 4:13 Rotational symmetry 4:14 Measuring angles of rotation 4:15 Rotational symmetry 4:22 Using transformations
Statistics	AC9M5ST01	acquire, validate and represent data for nominal and ordinal categorical and discrete numerical variables, to address a question of interest or purpose using software including spreadsheets; discuss and report on data distributions in terms of highest frequency (mode) and shape, in the context of the data	5:01 Reading graphs 5:02 Drawing graphs 5:03 Drawing picture graphs 5:08 Dot plots 5:16 Collecting data 5:17 Data collected over time 5:20 Bar and sector graphs 5:21 Reasoning with graphs

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Statistics	AC9M5ST02	interpret line graphs representing change over time; discuss the relationships that are represented and conclusions that can be made	5:09 More line graphs 5:10 Reading line graphs 5:11 Drawing line graphs 5:12 Matching graphs with stories 5:16 Collecting data 5:17 Data collected over time
Statistics	AC9M5ST03	plan and conduct statistical investigations by posing questions or identifying a problem and collecting relevant data; choose appropriate displays and interpret the data; communicate findings within the context of the investigation	5:04 Surveys 5:18 Data investigation 5:19 Using spreadsheets 5:22 Selecting a graph to use 5:23 Comparing types of graphs
Probability	AC9M5P01	list the possible outcomes of chance experiments involving equally likely outcomes and compare to those which are not equally likely	5:05 Choosing at random 5:06 Fair or unfair? 5:07 Comparing chances 5:13 Chance, as a fraction 5:14 Chance 5:15 Collecting chance data
Probability	AC9M5P02	conduct repeated chance experiments including those with and without equally likely outcomes, observe and record the results; use frequency to compare outcomes and estimate their likelihoods	5:15 Collecting chance data

SAMPLE PAPERS

Australian Signpost Maths 5 (AC V9.0) Suggested Program

Term 1

Week - Program	Page	Unit	Title	Strand	Curriculum Code/s	Curriculum sub-elements
Week 1	Revision and testing (Mentals unit 1)					
Week 2	Revision and testing (Mentals unit 2)					
Week 3	1	1:01	Numbers using millions	Number and algebra	AC9M5N01	Number and place value
	2	1:02	Large numbers	Number and algebra	AC9M5N01	Number and place value, Counting processes
	3	1:03	Using large numbers	Number and algebra	AC9M5N01	Number and place value, Counting processes
	27	2:01	Number facts, x 6, x 7, x 8, x 9	Operations and algebra	AC9M5A01 AC9M5N02	Multiplicative strategies. Algebraic thinking
	28	2:02	Learning your multiplication tables	Operations and algebra	AC9M5N02	Multiplicative strategies
Week 4	4	1:04	Fractions	Number and algebra	AC9M5N05	Interpreting fractions
	5	1:05	The order of unit fractions	Number and algebra	AC9M5N03	Interpreting fractions
	6	1:06	Mixed numbers	Number and algebra	AC9M5N03	Interpreting fractions
	6	2:03	Division facts	Operations and algebra	AC9M5A01	Algebraic thinking
Week 5	7	1:07	Tenths and hundredths	Number and algebra	AC9M5N01 AC9M5N03	Interpreting fractions, Number and algebra
	8	1:08	Percentages	Number and algebra	AC9M5N04	Proportional thinking
	9	1:09	Using percentages	Number and algebra	AC9M5N04	Proportional thinking
	87	3:01	Kilometres	Measurement	AC9M5M01	Understanding units of measurement (Length)
	88	3:02	Kilometres and metres	Measurement	AC9M5M01	Understanding units of measurement (Length)
Week 6	10	1:10	Fractions	Number and algebra	AC9M5N03	Interpreting fractions
	11	1:11	Improper fractions, mixed numbers	Number and algebra	AC9M5N03	Interpreting fractions
	89	3:03	Perimeter	Measurement	AC9M5M02	Understanding units of measurement (Perimeter)
	90	3:04	Perimeter	Measurement	AC9M5M02	Understanding units of measurement (Perimeter)

Australian Signpost Maths 5 (AC V9.0) Suggested Program

Term 1 cont.

Week 7	12	1:12	Addition of fractions	Number and algebra	AC9M5N05	Interpreting fractions, Additive strategies
	13	1:13	Subtraction of fractions	Number and algebra	AC9M5N05	Interpreting fractions, Additive strategies
	91	3:05	Calculating area	Measurement	AC9M5M02	Understanding units of measurement (Area)
	92	3:06	Square metres	Measurement	AC9M5M02	Understanding units of measurement (Area)
	136	5:01	Reading graphs	Statistics	AC9M5ST01	Interpreting and representing data
Week 8	14	1:14	Place value to thousandths	Number and algebra	AC9M5N01	Number and place value
	15	1:15	Place value and decimals	Number and algebra	AC9M5N01	Number and place value
	93	3:07	Area	Measurement	AC9M5M02	Understanding units of measurement (Area)
	94	3:08	Problem solving	Measurement	AC9M5M02 AC9M5M03	Understanding units of measurement, Measuring time
	137	5:02	Drawing graphs	Statistics	AC9M5ST01	Interpreting and representing data
Week 9	31	2:04	Rounding	Operations and algebra	AC9M5N09	Number and place value
	32	2:05	Strategies, + and -	Operations and algebra	AC9M5N09	Number and place value
	95	3:09	Time units	Measurement	AC9M5M03	Measuring time
	96	3:10	24-hour time	Measurement	AC9M5M03	Measuring time
	138	5:03	Drawing picture graphs	Statistics	AC9M5ST01	Interpreting and representing data
Week 10	32	2:06	Addition to 999	Operations and algebra	AC9M5N08 AC9M5N09	Additive strategies
	33	2:07	Addition to 999	Operations and algebra	AC9M5N08 AC9M5N09	Additive strategies
	34	2:08	Using the addition algorithm	Operations and algebra	AC9M5N08 AC9M5N09 AC9M5N10	Additive strategies

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Term 2

Week - Program	Page	Unit	Title	Strand	Curriculum Code/s	Curriculum sub-elements
Week 11	35	2:09	Subtraction with trading	Operations and algebra	AC9M5N08 AC9M5N09	Additive strategies
	36	2:10	Subtraction to 999	Operations and algebra	AC9M5N09	Additive strategies
	97	3:11	Using 12- and 24-hour time	Measurement	AC9M5M03	Measuring time
	98	3:12	24-hour time problems	Measurement	AC9M5M03	Measuring time
Week 12	37	2:11	Multiples	Operations and algebra	AC9M5N02	Multiplicative strategies
	38	2:12	Factors	Operations and algebra	AC9M5N02	Multiplicative strategies
	39	2:13	Factors and multiples	Operations and algebra	AC9M5N02	Multiplicative strategies
	113	4:01	3D space	Space	AC9M5SP01	Understanding geometric properties (3D space)
	114	4:02	Prisms and pyramids	Space	AC9M5SP01	Understanding geometric properties (3D space)
Week 13	40	2:14	Addition of money	Operations and algebra	AC9M5N09	Additive strategies, Understanding money
	41	2:15	Subtraction of money	Operations and algebra	AC9M5N09	Additive strategies, Understanding money
	42	2:16	Shopping	Operations and algebra	AC9M5N09	Additive strategies, Understanding money
	115	4:03	Reflection, translation, rotation	Space	AC9M5SP03	Understanding geometric properties (2D space)
	116	4:04	Flip, slide, turn	Space	AC9M5SP03	Understanding geometric properties (2D space)
Week 14	43	2:17	Division with remainders	Operations and algebra	AC9M5N07	Multiplicative strategies
	44	2:18	Division of 2-digit numbers	Operations and algebra	AC9M5N07 AC9M5A01	Multiplicative strategies. Algebraic thinking
	45	2:19	Using division facts	Operations and algebra	AC9M5N07 AC9M5A01	Multiplicative strategies. Algebraic thinking
	117	4:05	Nets	Space	AC9M5SP01	Understanding geometric properties (3D space)
	118	4:06	Describing position	Space	AC9M5SP02	Positioning and locating
Week 15	46	2:20	Subtraction to 999	Operations and algebra	AC9M5N09	Additive strategies
	47	2:21	Subtraction from hundreds	Operations and algebra	AC9M5N09	Additive strategies
	119	4:07	Using a protractor	Space	AC9M5M04	Understanding geometric properties (Angles)
	120	4:08	Angle types in degrees	Space	AC9M5M04	Understanding geometric properties (Angles)

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Term 2 cont.

Week 16	48	2:22	Addition to 9999	Operations and algebra	AC9M5N09	Additive strategies
	49	2:23	Addition to 9999	Operations and algebra	AC9M5N08 AC9M5N09	Additive strategies
	121	4:09	Using a protractor	Space	AC9M5M04	Understanding geometric properties (Angles)
	122	4:10	Classifying angles	Space	AC9M5M04	Understanding geometric properties (Angles)
	139	5:04	Surveys	Statistics	AC9M5ST03	Interpreting and representing data
Week 17	50	2:24	Subtraction to 9999	Operations and algebra	AC9M5N09	Additive strategies
	51	2:25	Subtraction from 1000s	Operations and algebra	AC9M5N08 AC9M5N09	Additive strategies
	52	2:26	Subtraction from 1000s strategy	Operations and algebra	AC9M5N09	Additive strategies
	123	4:11	Compass directions	Space	AC9M5SP02	Positioning and locating
	124	4:12	Reading a map	Space	AC9M5SP02	Positioning and locating
Week 18	53	2:27	Dividing 2-digit numbers	Operations and algebra	AC9M5N07	Multiplicative strategies
	54	2:28	Dividing 2-digit numbers	Operations and algebra	AC9M5N07	Multiplicative strategies
	125	4:13	Rotational symmetry	Space	AC9M5SP03	Understanding geometric properties (2D space)
	126	4:14	Measuring angles of rotation	Space	AC9M5SP03 AC9M5M04	Understanding geometric properties (2D space, Angles)
	127	4:15	Rotational symmetry	Space	AC9M5SP03	Understanding geometric properties (2D space)
Week 19	55	2:29	Dividing 2-digit numbers	Operations and algebra	AC9M5N07	Multiplicative strategies
	56	2:30	Dividing 3-digit numbers	Operations and algebra	AC9M5N07	Multiplicative strategies
	140	5:05	Choosing at random	Probability	AC9M5P01	Understanding chance
	141	5:06	Fair or unfair?	Probability	AC9M5P01	Understanding chance
	142	5:07	Comparing chances	Probability	AC9M5P01	Understanding chance
Week 20	57	2:31	Multiplying tens	Operations and algebra	AC9M5N06	Multiplicative strategies
	58	2:32	Multiplying tens or hundreds	Operations and algebra	AC9M5N06	Multiplicative strategies

Australian Signpost Maths 5 (AC V9.0) Suggested Program

Term 3

Week - Program	Page	Unit	Title	Strand	Curriculum Code/s	Curriculum sub-elements
Week 21	16	1:16	Addition and subtraction of fractions	Number and algebra	AC9M5N05	Interpreting fractions, Additive strategies
	17	1:17	Equivalent fractions	Number and algebra	AC9M5N03	Interpreting fractions
	128	4:16	Views and nets of 3D objects	Space	AC9M5SP01	Understanding geometric properties (3D space)
	129	4:17	Coordinates on the number plane	Space	AC9M5SP02	Positioning and locating
	130	4:18	Using coordinates	Space	AC9M5SP02	Positioning and locating
Week 22	18	1:18	Equivalent fractions	Number and algebra	AC9M5N03	Interpreting fractions
	19	1:19	Equivalent fractions	Number and algebra	AC9M5N03	Interpreting fractions
	99	3:13	Using measurement scales	Measurement	AC9M5M01	Understanding units of measurement
	100	3:14	Millimetres	Measurement	AC9M5M01 AC9M5M02	Understanding units of measurement (Length)
	101	3:15	Converting length measurements	Measurement	AC9M5M01	Understanding units of measurement
Week 23	20	1:20	Comparing decimals	Number and algebra	AC9M5N01	Number and place value
	21	1:21	Comparing decimals	Number and algebra	AC9M5N01	Number and place value
	102	3:16	24-hour time	Measurement	AC9M5M03	Measuring time
	103	3:17	Problems involving time	Measurement	AC9M5M03	Measuring time
	143	5:08	Dot plots	Statistics	AC9M5ST01	Interpreting and representing data
Week 24	59	2:33	Dividing 3-digit numbers by 10	Operations and algebra	AC9M5N07	Multiplicative strategies
	60	2:34	Dividing with zero in the answer	Operations and algebra	AC9M5N07	Multiplicative strategies
	61	2:35	Divisibility	Operations and algebra	AC9M5N02	Multiplicative strategies
	104	3:18	Grams and kilograms	Measurement	AC9M5M01	Understanding units of measurement (Mass)
	105	3:19	Measuring mass	Measurement	AC9M5M01	Understanding units of measurement (Mass)
Week 25	62	2:36	Factors and multiples	Operations and algebra	AC9M5N02	Multiplicative strategies
	63	2:37	Using factors in multiplication	Operations and algebra	AC9M5N02	Multiplicative strategies
	64	2:38	Averages	Operations and algebra	AC9M5N07 AC9M5N09	Additive strategies, Multiplicative strategies

Australian Signpost Maths 5 (AC V9.0) Suggested Program

Term 3 cont.

Week 25 cont.	106	3:20	Perimeter	Measurement	AC9M5M02	Understanding units of measurement (Perimeter)
	107	3:21	Exploring perimeter and area	Measurement	AC9M5M02	Understanding units of measurement (Perimeter and Area)
Week 26	65	2:39	Mental strategies for multiplication	Operations and algebra	AC9M5N06	Multiplicative strategies
	66	2:40	Algebraic thinking	Operations and algebra	AC9M5N10 AC9M5A02	Number patterns and algebraic thinking
	67	2:41	Algebraic thinking	Operations and algebra	AC9M5N10 AC9M5A02	Number patterns and algebraic thinking
	144	5:09	More line graphs	Statistics	AC9M5ST02	Interpreting and representing data
	145	5:10	Reading line graphs	Statistics	AC9M5ST02	Interpreting and representing data
Week 27	68	2:42	Algebraic thinking	Operations and algebra	AC9M5N10 AC9M5A02	Number patterns and algebraic thinking
	69	2:43	Multiplying 2-digit numbers	Operations and algebra	AC9M5N06	Multiplicative strategies
	70	2:44	The extended form of multiplication	Operations and algebra	AC9M5N06	Multiplicative strategies
	71	2:45	The extended form of multiplication	Operations and algebra	AC9M5N06	Multiplicative strategies
	146	5:11	Drawing line graphs	Statistics	AC9M5ST02	Interpreting and representing data
Week 28	72	2:46	The contracted form of multiplication	Operations and algebra	AC9M5N06	Multiplicative strategies
	73	2:47	The contracted form of multiplication	Operations and algebra	AC9M5N06	Multiplicative strategies
	74	2:48	Problems involving change of units	Operations and algebra	AC9M5N09	Additive strategies, Multiplicative strategies
	147	5:12	Matching graphs with stories	Statistics	AC9M5ST02	Interpreting and representing data
Week 29	75	2:49	Estimating by rounding	Operations and algebra	AC9M5N08	Additive strategies, Number and place value
	76	2:50	Estimating by rounding	Operations and algebra	AC9M5N08	Additive strategies, Number and place value
	148	5:13	Chance, as a fraction	Probability	AC9M5P01	Understanding chance
	149	5:14	Chance	Probability	AC9M5P01	Understanding chance
Week 30	150	5:15	Collecting chance data	Statistics	AC9M5P01 AC9M5P02	Understanding chance
	151	5:16	Collecting data	Statistics	AC9M5ST01 AC9M5ST02	Interpreting and representing data

Australian Signpost Maths 5 (AC V9.0) Suggested Program

Term 4

Week - Program	Page	Unit	Title	Strand	Curriculum Code/s	Curriculum sub-elements
Week 31	22	1:22	Subtraction from whole numbers	Number and algebra	AC9M5N05	Interpreting fractions
	23	1:23	Using fractions	Number and algebra	AC9M5N05	Interpreting fractions
	108	3:22	Measuring volume in mL	Measurement	AC9M5M01	Understanding units of measurement (Volume)
	109	3:23	Capacity and volume	Measurement	AC9M5M01	Understanding units of measurement (Capacity and Volume)
	110	3:24	Measuring capacity	Measurement	AC9M5M01	Understanding units of measurement (Capacity)
Week 32	24	1:24	Solving problems with fractions	Number and algebra	AC9M5N05	Interpreting fractions
	25	1:25	Using decimals	Number and algebra	AC9M5N01	Number and place value
	77	2:51	Using your income	Operations and algebra	AC9M5N09	Additive strategies, Understanding money
	78	2:52	Making a budget	Operations and algebra	AC9M5N09	Additive strategies, Understanding money
	79	2:53	Using operations to solve problems	Operations and algebra	AC9M5N02 AC9M5N07 AC9M5N09	Additive strategies, Multiplicative strategies
Week 33	26	1:26	Patterns and percentages	Number and algebra	AC9M5N10	Interpreting fractions, Proportional thinking, Number patterns and algebraic thinking
	80	2:54	Estimating products	Operations and algebra	AC9M5N06 AC9M5N08	Multiplicative strategies
	81	2:55	Strategies for multiplication	Operations and algebra	AC9M5N06	Multiplicative strategies
	111	3:25	Hectares	Measurement	AC9M5M02	Understanding units of measurement (Area)
	112	3:26	Square kilometres	Measurement	AC9M5M02	Understanding units of measurement (Area)
Week 34	82	2:56	Multiplication by 2-digit numbers	Operations and algebra	AC9M5N09	Multiplicative strategies
	83	2:57	Multiplication by 2-digit numbers	Operations and algebra	AC9M5N09	Multiplicative strategies
	152	5:17	Data collected over time	Statistics	AC9M5ST01 AC9M5ST02	Interpreting and representing data
	153	5:18	Data investigation	Statistics	AC9M5ST03	Interpreting and representing data
	154	5:19	Using spreadsheets	Statistics	AC9M5ST03	Interpreting and representing data

Australian Signpost Maths 5 (AC V9.0) Suggested Program

Term 4 cont.

Week 35	84	2:58	Multiplication by 2-digit numbers	Operations and algebra	AC9M5N09	Multiplicative strategies
	85	2:59	Multiplication by 2-digit numbers	Operations and algebra	AC9M5N09	Multiplicative strategies
	131	4:19	Drawing angles	Space	AC9M5M04	Understanding geometric properties (Angles)
	132	4:20	Angles greater than 180°	Space	AC9M5M04	Understanding geometric properties (Angles)
Week 36	133	4:21	Mapping Australia	Space	AC9M5SP02	Positioning and locating
	134	4:22	Using transformations	Space	AC9M5SP03	Understanding geometric properties (2D space)
	135	4:23	Using angles	Space	AC9M5M04	Understanding geometric properties (Angles)
	155	5:20	Bar and sector graphs	Statistics	AC9M5ST01	Interpreting and representing data
	156	5:21	Reasoning with graphs	Statistics	AC9M5ST01	Interpreting and representing data
Week 37	86	2:60	Finding missing numbers	Operations and algebra	AC9M5A02	Number patterns and algebraic thinking, Multiplicative strategies
Week 36	157	5:22	Selecting a graph to use	Statistics	AC9M5ST03	Interpreting and representing data
Week 36	158	5:23	Comparing types of graphs	Statistics	AC9M5ST03	Interpreting and representing data

SAMPLE PAGE

What is Australian Signpost Maths?

Australian Signpost Maths is a mathematics program providing direction and support for teaching and learning. The series covers the content and skills presented in the Australian Curriculum (v9) Mathematics F–10.

A Student Book and an online Teacher Resource are provided for Foundation.

For Years 1 to 6, a Student Book, an online Teacher Resource and a Mentals Book are provided for each year level. The online Teacher Resources provide a wealth of support for teachers.

The content has been carefully sequenced within each year level and across the F–6 series to take into account students' expected mathematical development. However, from the rich and varied material provided, teachers can develop individual learning programs to meet the needs of each student.

The Student Books are designed to support explicit teaching methods. Many group activities are provided in Activity, Investigation and Fun spots within the Student Books and the online Teacher Resource.

To maximise the benefits of the program, the Student Book, the online Teacher Resource and the Mentals Book should be used together.



Student Books



Mentals Books



Teacher Resource



Structure of Australian Signpost Maths

In the Year 3 to 6 books, the worksheet pages cover all three elements: Number sense and algebra, Measurement and geometry, and Statistics and probability. These are presented in five chapters:

- Number and algebra
- Operations and algebra
- Measurement
- Space
- Statistics and probability.

This gives teachers flexibility in programming.

The contents cross-reference allows teachers to quickly find the pages where each concept has been covered.

Within the program, explicit teaching, critical and creative thinking, language development and identification and treatment of weaknesses are given high priority.

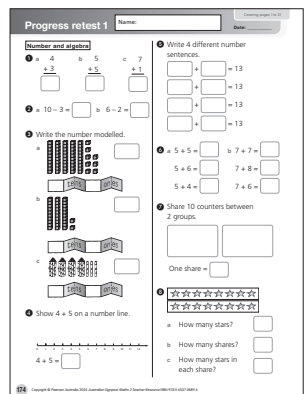
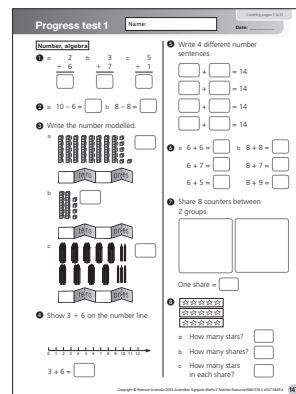
Identification and addressing areas of need

Five progress tests are designed to identify each student's areas of need, and the follow-up program after each of the tests is designed to address these needs. A reference

to the relevant worksheet page is given for each test question. A remediation record page is used to track the student's progress.

These testing resources can be found in the online Teacher Resource.







Parallel progress retests are provided for further testing after remediation has taken place.



Special features of Australian Signpost Maths

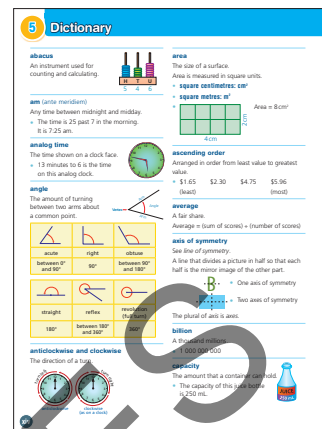
- The traffic light icons**

These are found on the top right of each worksheet page in the Student Books. They allow students to assess their own progress and give feedback to the teacher.

-   **Green:** I found this work easy.
-   **Orange:** I found some work on the page difficult.
-   **Red:** I don't understand the work on this page.

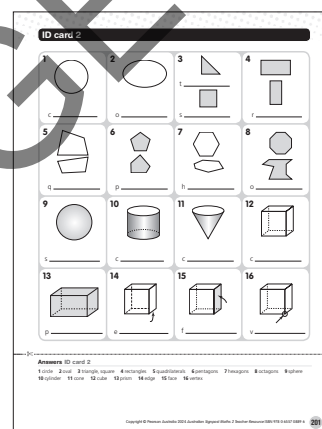
- Dictionary**

Terms used in the Student Book and terms that should be understood at this level are recorded here to provide a reference for students and teachers. This is found on pages xiv–xxv of this book.



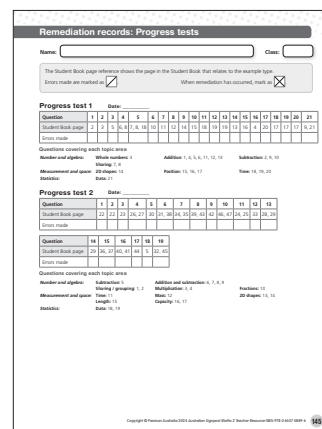
- ID cards (Years 1 to 6)**

These cards review the language of Mathematics by asking students to identify common terms, shapes and symbols. They are designed to be reused and are found in the online Teacher Resource and in the front of the Mentals Books.



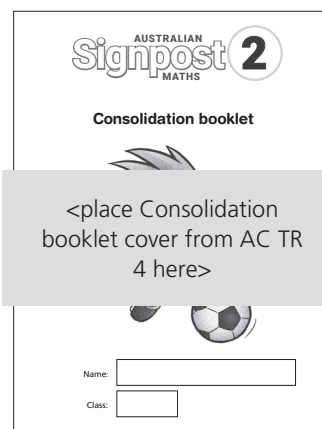
- Progress tests**

These allow the teacher to identify each student's strengths and needs. Cross-references for each question direct teachers and students to the pages where that work is introduced. Tables are provided to record the follow-up that takes place and parallel tests are provided for retesting. These tests can be found in the online Teacher Resource.



- Year 5 Consolidation booklet**

This 32 page booklet is found in the online Teacher Resource. It is designed to reinforce work completed in class and provides practice of important skills and addition and subtraction facts. The booklet can be used when there is limited supervision or when a student finishes classwork early.



- Answers**

These are supplied in the Student Book and the online Teacher Resource.

- Blackline masters (BLM)**

References are made to the blackline masters in the Teacher Resource suggestions provided for each student work page.

- Differentiation**

Each student work page has a Teacher Resource page to support it. Cross-references direct the teacher to pages where the concept is introduced and developed. These references may be from the Student Book for the previous year, the current year or the next year.

The Teacher Resource support pages provide additional learning activities for students who need remediation or extension activities. The Blackline Masters provide activities to support students of various learning abilities.

- Cartoons**

Cartoons are used to motivate and instruct.

- Extra support pages**

Decimals, multiplication tables, factors and multiples, extended multiplication, estimation, patterns and problem solving are supported in the Extra support pages.

Australian Signpost Maths icons

Signpost icons are used throughout the book as cues to the essential nature of exercises and activities, and as a guide to ways of engaging with them. These icons often indicate alternative or more concrete approaches to dealing with concepts.



This icon highlights **important rules and concepts** occurring throughout the book. It often appears with worked examples.



Investigations allow students to **explore and discover** maths concepts.



Activities provide **applications and enrichment**. These activities usually involve the use of concrete materials and partner or group work.



These activities involve the use of computers or other technology.



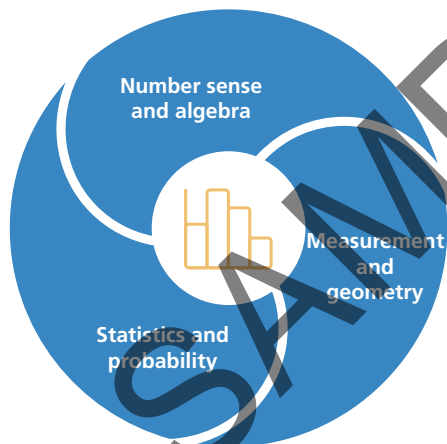
These enjoyable activities are used to **motivate and involve** students in mathematical pursuits. They usually involve games and puzzles.

I'm on the top of each page.



Structure of the Australian Curriculum, F–6 (v9)

Numeracy elements



Curriculum content is organised under 6 interrelated strands: Number, Algebra, Measurement, Space, Statistics and Probability.

The Curriculum strives to develop in students proficiency in Mathematics, highlighting Understanding, Fluency, Reasoning and Problem solving.

Sub-elements for Number sense and algebra

Number and place value

Counting processes

Additive strategies

Multiplicative strategies

Interpreting fractions

Number patterns and algebraic thinking

Understanding money

Sub-elements for Measurement and geometry

Understanding units of measurement

Understanding geometric properties

Positioning and locating

Measuring time

Sub-elements for Statistics and probability

Understanding chance

Interpreting and representing data

Mathematics content of the Australian Curriculum

- It is important that you download the **GENERAL CAPABILITIES** document from 'Downloads' in the top navigation bar of the website homepage. It contains the tables that list the progression level expectations for each Year, F to 10. It also provides the content of all progression levels.
- The **LEARNING AREAS** download gives a summary of Content descriptions and Elaborations. **CROSS-CURRICULUM PRIORITIES** can also be found there.

5 Content and curriculum overview

Content cross-referencexii
 Dictionaryxiv
 Chapter 1 Number and algebra. 1
 Chapter 2 Operations and algebra 27
 Chapter 3 Measurement 87
 Chapter 4 Space 113
 Chapter 5 Statistics and probability. 136
 Extra support 159
 Answers 174



Number and algebra			Content	Counting, number	Place value	Rounding	Fractions	Decimals	Percentages	Suggested program	
Page	Unit	Title									
1	1:01	Numbers using millions	Term 1	●	●					Week 3	
2	1:02	Large numbers		●	●						Week 3
3	1:03	Using large numbers		●	●	●					Week 3
4	1:04	Fractions					●				Week 4
5	1:05	The order of unit fractions					●				Week 4
6	1:06	Mixed Numbers					●				Week 4
7	1:07	Tenths and hundredths					●		●		Week 5
8	1:08	Percentages					●		●	●	Week 5
9	1:09	Using percentags					●		●	●	Week 5
10	1:10	Fractions					●		●	●	Week 6
11	1:11	Improper fractions, mixed numbers					●				Week 6
12	1:12	Addition of fractions					●				Week 7
13	1:13	Subtraction of fractions					●				Week 7
14	1:14	Place value to thousandths			●				●		Week 8
15	1:15	Place value and decimals							●		Week 8
16	1:16	Addition and subtraction of fractions	Term 3				●			Week 21	
17	1:17	Equivalent fractions					●				Week 21
18	1:18	Equivalent fractions					●				Week 22
19	1:19	Equivalent fractions					●				Week 22
20	1:20	Comparing decimals		●	●			●		Week 23	
21	1:21	Comparing decimals		●				●		Week 23	
22	1:22	Subtraction from whole numbers	Term 4				●			Week 31	
23	1:23	Using fractions					●				Week 31
24	1:24	Solving problems with fractions					●				Week 32
25	1:25	Using decimals			●	●			●		Week 32
26	1:26	Patterns and percentages					●	●	●		Week 33

- The teacher will decide when testing occurs. The Progress Tests and Re-tests are found in the online Teacher Resource.
- Suggested program: The first two units of the Mentals Book review the previous year and could be completed in Weeks 1 and 2.

Operations and algebra

Page	Unit	Title
27	2:01	Numbers fact, X 6, X 7, X 8, X 9
28	2:02	Learning your multiplication tables
29	2:03	Division facts
30	2:04	Rounding
31	2:05	Strategies, + and –
32	2:06	Addition to 999
33	2:07	Addition to 999
34	2:08	Using the addition algorithm
35	2:09	Subtraction with trading
36	2:10	Subtraction to 999
37	2:11	Multiples
38	2:12	Factors
39	2:13	Factors and multiples
40	2:14	Addition of money
41	2:15	Subtraction of money
42	2:16	Shopping
43	2:17	Division with remainders
44	2:18	Division of 2-digit numbers
45	2:19	Using division facts
46	2:20	Subtraction to 999
47	2:21	Subtraction from hundreds
48	2:22	Addition to 9999
49	2:23	Addition to 9999
50	2:24	Subtraction to 9999
51	2:25	Subtraction from 1 000s
52	2:26	Subtraction from 1 000s strategy
53	2:27	Dividing 2-digit numbers
54	2:28	Dividing 2-digit numbers
55	2:29	Dividing 2-digit numbers
56	2:30	Dividing 3-digit numbers
57	2:31	Multiplying tens
58	2:32	Multiplying tens or hundreds
59	2:33	Dividing 3-digit numbers by 10
60	2:34	Dividing with zero in the answer
61	2:35	Divisibility
62	2:36	Factors and multiples
63	2:37	Using factors in multiplication
64	2:38	Averages
65	2:39	Mental strategies for multiplication
66	2:40	Algebraic thinking
67	2:41	Algebraic thinking
68	2:42	Algebraic thinking
69	2:43	Multiplying 2-digit numbers
70	2:44	The extended form of multiplication
71	2:45	The extended form of multiplication

Content	Suggested program								Week	Term
	Addition	Subtraction	Multiplication	Division	Multiples, factors, divisibility	Mental strategies	Algebraic thinking	Problem solving		
			●		●				Week 3	Term 1
			●		●				Week 4	
				●			●		Week 9	
	●	●	●	●		●			Week 10	
	●					●		●	Week 11	Term 2
		●				●			Week 12	
			●		●			●	Week 13	
	●				●				Week 14	
				●				●	Week 15	
	●	●				●		●	Week 16	
								●	Week 17	
		●				●			Week 18	
				●					Week 19	
				●				●	Week 20	
				●		●	●	●	Week 24	Term 3
				●				●	Week 25	
	●			●				●	Week 26	
			●			●			Week 27	
			●			●		●	Week 27	

• The teacher will decide when testing occurs. The Progress Tests and Re-tests are found in the online Teacher Resource.

Operations and algebra

Page	Unit	Title
72	2:46	The contracted form of multiplication
73	2:47	The contracted form of multiplication
74	2:48	Problems involving change of units
75	2:49	Estimating by rounding
76	2:50	Estimating by rounding
77	2:51	Using your income
78	2:52	Making a budget
79	2:53	Using operations to solve problems
80	2:54	Estimating products
81	2:55	Strategies for multiplication
82	2:56	Multiplication by 2-digit numbers
83	2:57	Multiplication by 2-digit numbers
84	2:58	Multiplication by 2-digit numbers
85	2:59	Multiplication by 2-digit numbers
86	2:60	Finding the missing numbers

Content	Addition	Subtraction	Multiplication	Division	Multiples, factors, divisibility	Mental strategies	Algebraic thinking	Problem solving	Suggested program	
			●						This weekly program aligns with the Mentals Book, e.g. Mentals Book, Unit 9 covers work taught in Weeks 7 and 8 of this book.	
			●							Term 4
			●							Week 28
	●	●	●	●				●		
		●								Week 29
	●	●	●	●		●		●		
	●	●						●		Week 32
	●		●	●				●		
			●			●				Week 33
			●			●		●		
			●			●		●		Week 34
			●			●		●		
			●			●		●		Week 35
	●	●	●	●			●			Week 37

• The teacher will decide when testing occurs. The Progress Tests and Re-tests are found in the online Teacher Resource.

SAMPLE PAGES

Measurement		
Page	Unit	Title
87	3:01	Kilometres
88	3:02	Kilometres and metres
89	3:03	Perimeter
90	3:04	Perimeter
91	3:05	Calculating area
92	3:06	Square metres
93	3:07	Area
94	3:08	Problem solving
95	3:09	Time units
96	3:10	24-hour time
97	3:11	Using 12- and 24-hour time
98	3:12	24-hour time problems
99	3:13	Using measurement scales
100	3:14	Millimetres
101	3:15	Converting length measurements
102	3:16	24-hour time
103	3:17	Problems involving time
104	3:18	Grams and kilograms
105	3:19	Measuring mass
106	3:20	Perimeter
107	3:21	Exploring perimeter and area
108	3:22	Measuring volume in mL
109	3:23	Capacity and volume
110	3:24	Measuring capacity
111	3:25	Hectares
112	3:26	Square kilometers

Content	Length	Area	Capacity and volume	Mass	Temperature	Time/Duration	Problem solving	Suggested program	
								Week	Term
	●							Week 5	Term 1
	●							Week 6	
	●						●	Week 7	
		●					●	Week 8	
	●	●	●		●	●	●	Week 9	
						●	●	Week 11	Term 2
	●		●	●	●		●	Week 22	Term 3
	●					●		Week 23	
				●		●	●	Week 24	
	●			●			●	Week 25	
	●	●					●	Week 31	Term 4
			●					Week 33	

- The teacher will decide when testing occurs. The Progress Tests and Re-tests are found in the online Teacher Resource.

SAMPLE PAGES

Space			Content	2D space	Angles, lines	Symmetry, turning	3D objects	Position, directions	Suggested program This weekly program aligns with the Mentals Book, e.g. Mentals Book, Unit 9 covers work taught in the Weeks 7 and 8 of this book.	
Page	Unit	Title								
113	4:01	3D space					●		Week 12	Term 2
114	4:02	Prisms and pyramids					●		Week 12	
115	4:03	Reflection, translation, rotation				●			Week 13	
116	4:04	Flip, slide, turn	●			●			Week 13	
117	4:05	Nets					●		Week 14	
118	4:06	Describing position	●					●	Week 14	
119	4:07	Using a protractor			●				Week 15	
120	4:08	Angle types in degrees			●				Week 15	
121	4:09	Using a protractor			●				Week 16	
122	4:10	Classifying angles			●				Week 16	
123	4:11	Compass directions						●	Week 17	
124	4:12	Reading a map						●	Week 17	
125	4:13	Rotational symmetry	●			●			Week 18	
126	4:14	Measuring angles of rotation			●	●			Week 18	
127	4:15	Rotational symmetry			●	●			Week 18	
128	4:16	Views and nets of 3D objects					●		Week 21	Term 3
129	4:17	Coordinates on the number plane	●				●	●	Week 21	
130	4:18	Using coordinates						●	Week 21	
131	4:19	Drawing angles			●				Week 31	Term 4
132	4:20	Angles greater than 180°			●				Week 31	
133	4:21	Mapping Australia						●	Week 34	
134	4:22	Using transformations				●		●	Week 34	
135	4:23	Using angles			●				Week 35	

The teacher will decide when testing occurs. The Progress Tests are found in the online Teacher Resource.

SAMPLE PAGES



Statistics and probability			Content	Collecting / recording data	Analysing data displays	Chance / language	Chance experiments	Suggested program	
Page	Unit	Title						Week	Term
136	5:01	Reading graphs			●			Week 7	Term 1
137	5:02	Drawing graphs	●	●				Week 8	
138	5:03	Drawing picture graphs	●					Week 9	
139	5:04	Surveys	●	●				Week 16	Term 2
140	5:05	Choosing at random			●	●		Week 19	
141	5:06	Fair or unfair?			●	●			
142	5:07	Comparing the chances	●		●	●			
143	5:08	Dot plots	●	●				Week 23	Term 3
144	5:09	More line graphs		●				Week 25	
145	5:10	Reading line graphs		●				Week 27	
146	5:11	Drawing line graphs	●	●					
147	5:12	Matching graphs with stories		●				Week 29	
148	5:13	Chance, as a fraction			●				
149	5:14	Chance			●			Week 30	
150	5:15	Collecting chance data	●		●	●			
151	5:16	Collecting data	●	●	●	●		Week 34	Term 4
152	5:17	Data collected over time	●	●					
153	5:18	Data investigation	●	●				Week 36	
154	5:19	Using spreadsheets	●	●					
155	5:20	Bar and sector graphs		●				Week 37	
156	5:21	Reasoning with graphs		●					
157	5:22	Selecting a graph to use	●					Week 37	
158	5:23	Comparing types of graphs	●	●					

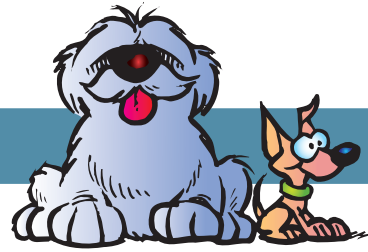
Extra Support pages						
159	1	Decimals	2	Place value in decimals	3	Reading and writing decimals
162	4	+ and – of fractions	5	Place value to thousandths	6	Comparing decimals
165	7	x 2, x 3, x 4, x 5, x 10 tables	8	x 6, x 7, x 8, x 9 tables	9	Factors and multiples
168	10	Extended multiplication	11	Estimating products	12	Number patterns
171	13	Problem solving with algorithms	14	Problem-solving strategies	15	Problem-solving strategies
174	16	Problem solving	17	Averages	18	Finding missing numbers
177	19	Extension: enlargements	20	Extension: enlargements	21	Decimals!

- The teacher will decide when testing occurs. The Progress Tests and Re-tests are found in the on line Teacher Resource.

Suggested Program	Term 1	Term 2	Term 3	Term 4
Number and algebra	1:01 - 1:15	-	1:16 - 1:21	1:22 - 1:26
Operations and algebra	2:01 - 2:08	2:09 - 2:32	2:33 - 2:50	2:51 - 2:60
Measurement	3:01 - 3:10	3:11 - 3:12	3:13 - 3:21	3:22 - 3:26
Space	-	4:01 - 4:15	4:16 - 4:18	4:19 - 4:23
Statistics and probability	5:01 - 5:03	5:04 - 5:07	5:08 - 5:16	5:17 - 5:23
Total number of pages:	36	45	45	32

- See the Teacher Resource for a more detailed suggested program.
- The suggested program aligns with the Mentals book, Progress Tests and Re-tests.
Learn more at pearson.com.au/asm

Contents cross-reference



Number and algebra

1	Whole numbers	Pages
	Counting, ordering numbers	1, 2, 3, 25, 169, 170, 177
	Place value	1, 2, 3, 7, 14, 15, 20, 21, 25, 161, 163, 164
	Fractions	4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 16, 17, 18, 19, 22, 23, 24, 159, 160, 162, 163, 177
	Decimals	6, 7, 8, 9, 10, 14, 15, 20, 21, 25, 26, 159, 160, 161, 163, 173
	Percentages	8, 9, 10, 25, 26, 161
	Rounding numbers, estimates	3, 20, 30, 32, 33, 36, 60, 721, 75, 76, 80, 169
2	Addition and subtraction	Pages
	Addition	31, 32, 33, 34, 40, 42, 48, 49, 64, 75, 77, 78, 79, 171
	Subtraction / difference	31, 35, 36, 41, 42, 46, 47, 50, 51, 52, 75, 77, 171
	Mental strategies (+ and –)	31, 33, 34, 36, 46, 47, 52, 75
	Algorithm strategy (+ and –)	31, 32, 34, 35, 36, 40, 41, 42, 46, 47, 48, 49, 50, 51, 171
	Problem solving (+ and –)	34, 40, 41, 42, 47, 49, 50, 51, 64, 74, 77, 78, 79, 171, 172, 144, 170, 172
	Money	40, 41, 42, 47, 48, 49, 77, 78
3	Multiplication and division	Pages
	Multiplication	27, 28, 57, 58, 63, 65, 69, 70, 71, 72, 73, 79, 80, 81, 82, 83, 84, 85, 165, 166, 168, 169
	Division (sharing and grouping)	29, 43, 44, 45, 53, 54, 55, 56, 59, 60, 64, 79, 175
	Multiplication and division facts	27, 28, 29, 165, 166
	Multiples, factors and divisibility	27, 28, 37, 38, 39, 61, 62, 65, 63, 82, 83, 85, 165, 167
	Strategies (\times and \div), multiplication families	57, 58, 59, 63, 65, 70, 71, 81, 168, 172
	Problem solving (\times and \div)	38, 43, 44, 45, 54, 55, 56, 59, 60, 64, 71, 74, 76, 79, 82, 83, 84, 85, 144, 172, 175
4	Algebra	Pages
	Multiplication and division (inverse operations)	29, 44, 45, 86, 176
	Finding unknown values in numerical equations	29, 59, 86, 176
	Algebraic thinking / problem solving	28, 65, 66, 67, 136, 172, 173

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Measurement and space

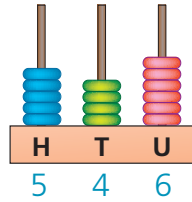
1	Measurement	Pages
	Length	25, 74, 85, 87, 88, 89, 90, 94, 99, 100, 101, 100, 107
	Area	91, 92, 93, 94, 107, 111, 112, 152
	Capacity and volume	25, 74, 94, 99, 108, 109, 110
	Mass (weight)	25, 74, 99, 104, 105
	Temperature	94, 99, 152, 153
	Time (duration)	74, 94, 95, 96, 97, 98, 102, 103
	Clocks	96, 97, 102
	Problem solving with measurement	74, 90, 91, 92, 94, 95, 98, 99, 103, 105, 107, 112
2	Space	Pages
	2D shapes	xxiv, 113, 114, 116, 117, 118, 125, 127, 128
	Angles, parallel and perpendicular lines	119, 120, 121, 122, 126, 131, 132, 135
	Symmetry, flip, slide, turn, tessellations	115, 116, 125, 126, 127, 134, 177, 178
	3D objects	xxiv, 113, 114, 117, 128
	Position, coordinates, maps	118, 123, 124, 129, 130, 133, 134

Statistics and probability

1	Data	Pages
	Collecting data and recording data	137, 139, 152, 153, 154
	Analysing data displays	136, 137, 138, 139, 143, 144, 145, 146, 147, 152, 154, 155, 156, 157, 158
	Chance and the language of chance	140, 141, 142, 148, 149
	Chance experiments	143, 150, 151

abacus

An instrument used for counting and calculating.

**am** (ante meridiem)

Any time between midnight and midday.

- The time is 25 past 7 in the morning. It is 7:25 am.

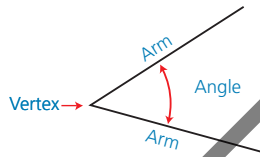
analog time

The time shown on a clock face.

- 13 minutes to 6 is the time on this analog clock.

**angle**

The amount of turning between two arms about a common point.

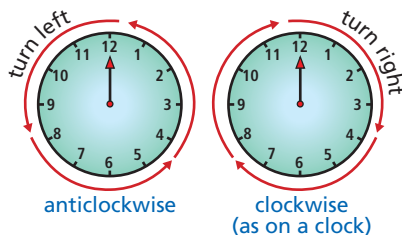


acute	right	obtuse
between 0° and 90°	90°	between 90° and 180°

straight	reflex	revolution (full turn)
180°	between 180° and 360°	360°

anticlockwise and clockwise

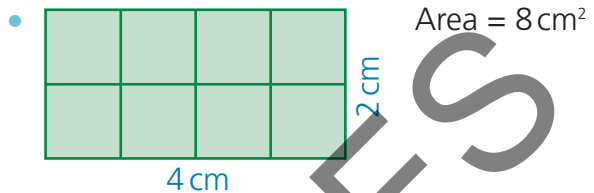
The direction of a turn.

**area**

The size of a surface.

Area is measured in square units.

- square centimetres: cm^2
- square metres: m^2

**ascending order**

Arranged in order from least value to greatest value.

- \$1.65 (least) \$2.30 \$4.75 \$5.96 (most)

average

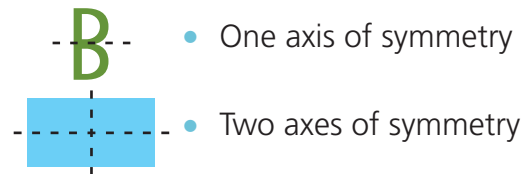
A fair share.

Average = (sum of scores) ÷ (number of scores)

axis of symmetry

See *line of symmetry*.

A line that divides a picture in half so that each half is the mirror image of the other part.



The plural of *axis* is *axes*.

billion

A thousand millions.

- 1 000 000 000

capacity


The amount that a container can hold.

- The capacity of this juice bottle is 250 mL.



centimetre (cm)

A unit of length equal to one hundredth of a metre.

- $100\text{ cm} = 1\text{ m}$, $1\text{ cm} = 10\text{ mm}$ 

chance

The chance (or probability) of something happening is its likelihood of happening.

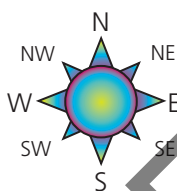
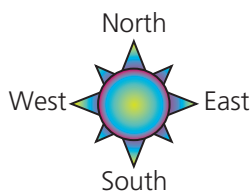
- If you toss a coin, there is an even chance of tossing a head.



See *probability*.

compass directions

The needle of a compass points north (N).



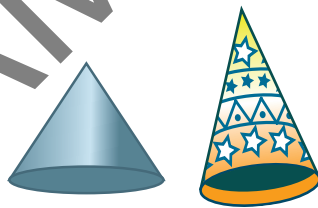
composite number

A number that has more than two factors.

- 9 is composite because it has three factors: 1, 3 and 9.

cone

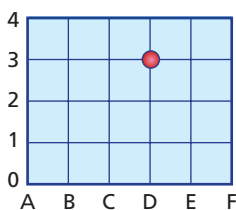
A three-dimensional object with a circular base that tapers to a point.



coordinates

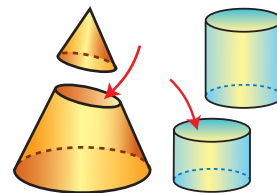
Pairs of letters or numbers used to show position on a grid.

- This position is D3 or (D, 3).



cross-section

A face that is exposed when a 3D object is cut through.



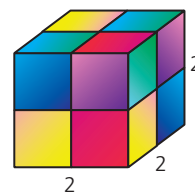
cube

A three-dimensional object that has six equal square faces, eight vertices and twelve equal edges.



cube number

- $2\text{ cubed} = 2^3$ ← Index
 $= 2 \times 2 \times 2$
 $= 4 \times 2$
 $= 8$



cubic centimetre (cm³)

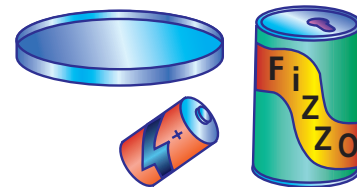
A unit of volume equal to the volume of a cube of side length 1 cm.

cubic metre (m³)

A unit of volume equal to the volume of a cube of side length 1 m.

cylinder

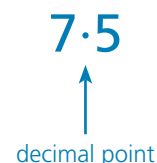
A three-dimensional object with two equal circular faces and one curved surface.



decimal notation

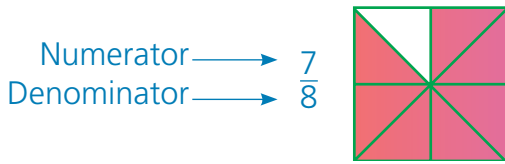
The decimal point separates the whole number from the fraction part.

- 0.7 means 7 tenths.
- 6.5 means 6 ones and 5 tenths.
- 3.07 means 3 ones and 7 hundredths.



denominator

The bottom number of a fraction. It tells the number of equal parts there are in the whole.



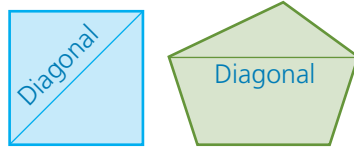
descending order

Arranged in order from greatest value to least value.

- \$5.96
(most)
- \$4.75
- \$2.30
- \$1.65
(least)

diagonal

A line that joins any two non-adjacent corners of a polygon.



digital time

Time expressed using digits.

- This digital clock shows 24 minutes past 10.



digits

Symbols used to write a number.

- 6 Six is a 1-digit number.
- 47 Forty-seven is a 2-digit number.

divisible

To have no remainder when divided.

- 30 is divisible by 3.

division (\div)

Breaking up groups into equal parts.

- $10 \div 2$

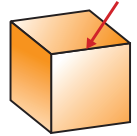


a How much will each receive if you share between 2.

b How many groups of 2 can be made?

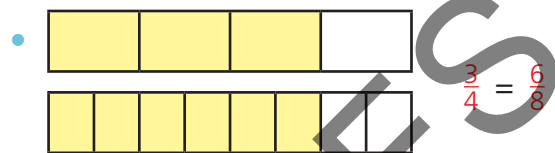
edge

Two faces of a 3D object meet at an edge.



equivalent fractions

These are equal. They refer to the same part of the whole.



estimate (estimation)

A good guess.

even number

Any number that is a multiple of two and can be grouped in twos. They end in 0, 2, 4, 6 or 8.

- 16, 300, 4394

The other counting numbers are **odd**.

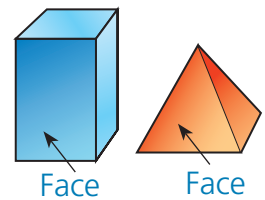
expanded notation

A way of writing numerals to show the place value of each digit.

- $137 = (1 \times 100) + (3 \times 10) + 7$

face

A flat surface of a three-dimensional object that is bounded by only straight sides.



factor

A factor of a number divides the number exactly, leaving no remainder.

- The factors of 12 are 1, 12, 2, 6, 3 and 4.

flip (reflection)

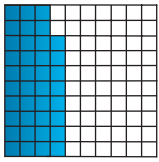
To turn over.

- A mirror image is made.



fraction

A part of a whole or group.



Numerator
 $\frac{38}{100}$
Denominator

Equivalent fraction

Fractions of equal size.

- $\frac{1}{2} = \frac{5}{10} = \frac{7}{14} = \dots$

Improper fraction

A fraction which has a numerator that is bigger than the denominator.

- $\frac{9}{8}$

Mixed numeral

A numeral that has a whole number part and a fraction part.

- $1\frac{2}{3}$

gram (g)

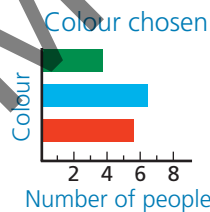
A unit of mass.

- 1 kilogram = 1000 grams, 1 kg = 1000g

graphs

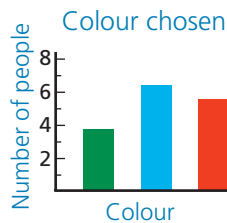
Bar graph

A graph which uses horizontal bars to compare the size of groups.



Column graph

Groups are compared using the heights of columns (or bars).



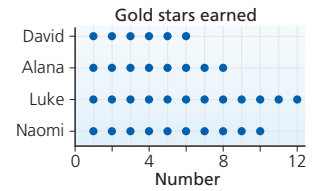
Divided bar graph

A bar is divided to show the make-up of the data.



Dot plot

A graph which uses dots to compare the size of groups.



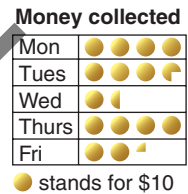
Line graph

A continuous line shows the connection between variables.



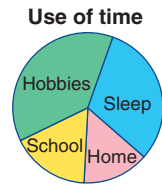
Picture graph

A picture is used as a unit to show how many.



Sector graph

A circle is cut into sectors to show the parts of a whole.



greater than (>)

A way of showing that a number is larger than another number.

- $7 > 3$ means 7 is greater than 3.

See also *less than* (<).

hectare (ha)

A unit of area equal to a square with sides of 100 m.

- 1 ha = 10 000 m²

horizontal

- Parallel to the horizon.
- Level or flat.
- Any direction at right angles to the vertical.

inverse operations

Adding 8 is the opposite (the inverse) of subtracting 8.

- $100 + 8 - 8 = 100$

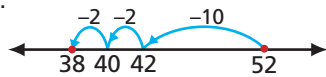
Multiplying by 2 is the opposite (the inverse) of dividing by 2.

- $4 \times 2 \div 2 = 4$

jump strategy

Adding or subtracting numbers, jumping by hundreds, tens and ones.

- $52 - 14 = 38$



kilo (k)

Kilo means 1000.

kilogram (kg)

The basic unit of mass, equal to 1 000 grams.

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

kilometre (km)

A unit of length equal to one thousand metres.

- $1 \text{ km} = 1\,000 \text{ m}$

less than (<)

A way of showing that a number is smaller than another number.

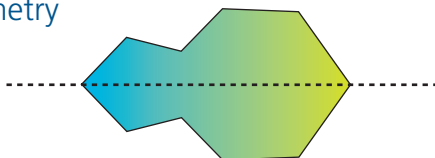
- $3 < 7$ means 3 is less than 7.

See also *greater than* (>).

line of symmetry

A line that divides something in half so that each half is a mirror image of the other part.

Line of symmetry



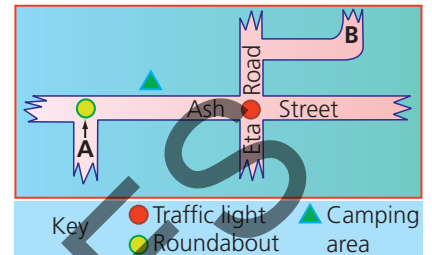
litre (L)

A unit of capacity (or volume) used for the measurement of liquids.

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

map or plan

A picture of an area viewed from above.



mass

The amount of matter in an object, a measure of how heavy something is.



mean

The arithmetic average.

- $\text{mean} = \frac{\text{sum of scores}}{\text{number of scores}}$

See also *average*.

metre (m)

The basic unit of length, equal to 100 centimetres.

- $1 \text{ m} = 100 \text{ cm}$

millilitre (mL)

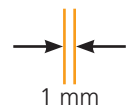
A unit of capacity (or volume) equal to one thousandth of a litre.

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

millimetre (mm)

A unit of length equal to one tenth of a centimetre, or one thousandth of a metre.

- $10 \text{ mm} = 1 \text{ cm}$
- $1\,000 \text{ mm} = 1 \text{ m}$



million

A thousand thousands

- $1\,000\,000$

mixed numeral

A numeral that has a whole number part and a fraction part.

- $4\frac{1}{8}$

mode

The number that occurs the most often in a set of numbers.

- 2, 3, 3, 3, 4, 4, 5, 7

The mode is 3.

multiple

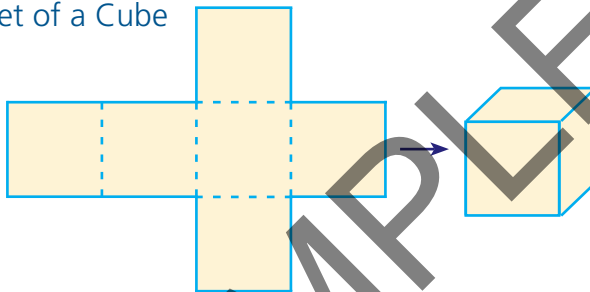
The result of multiplying a counting number by another counting number.

- The multiples of 5 are 5, 10, 15, 20, ...

net

A flat shape that can be folded to make a three-dimensional object.

Net of a Cube



object

The term used to describe a three-dimensional shape.



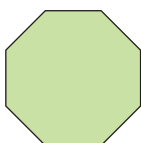
Hexagonal prism



Cone

octagon

A polygon with eight sides.



Regular octagon

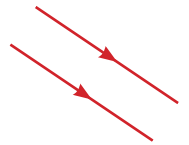


Irregular octagon

See also *polygon*.

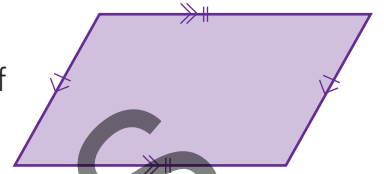
parallel lines

Straight lines on the same flat surface that do not meet.



parallelogram

A shape with 4 sides such that the pairs of opposite sides are parallel and equal.



pentagon

A polygon with five sides.



Regular pentagon



Irregular pentagon

See also *polygon*.

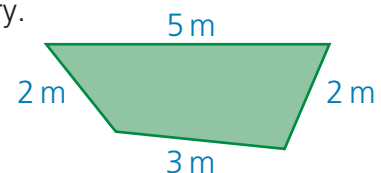
per cent (%)

Out of one hundred.

- $\frac{37}{100} = 0.37 = 37\%$ or 37 per cent

perimeter

The distance around the outside of a shape; the boundary.



- Perimeter = $2\text{ m} + 3\text{ m} + 2\text{ m} + 5\text{ m}$
 $= 12\text{ m}$

perpendicular lines

Lines that meet at right angles.



place value

The column value of a digit.

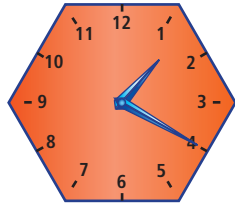
- $396 =$

	Hundreds	Tens	Ones
	3	9	6

pm (post meridiem)

Any time between midday and midnight.

- The time is 20 past 1 in the afternoon. It is 1:20 pm.



Afternoon

polygon

A two-dimensional shape with three or more straight sides, such as a triangle, quadrilateral, pentagon etc.



prism

A three-dimensional object with a uniform cross-section. The ends are identical shapes and all other faces are rectangles. Prisms are named by the shape of their ends.



Triangular prism

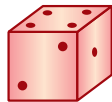


Hexagonal prism

probability

The probability (or chance) of something happening is its likelihood of happening.

- The probability of rolling an even number on a dice is 50%.



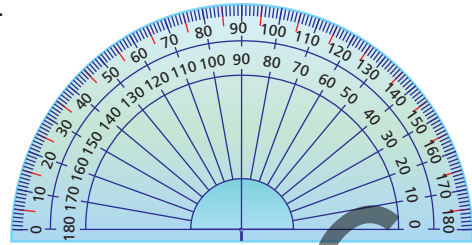
product

The answer to a multiplication question.

- The product of 8 and 9 is 72.

protractor

An instrument used for measuring and drawing angles.

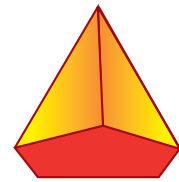


pyramid

A three-dimensional object that has a polygon for a base and triangles for all other faces. Pyramids are named by the shape of their base.



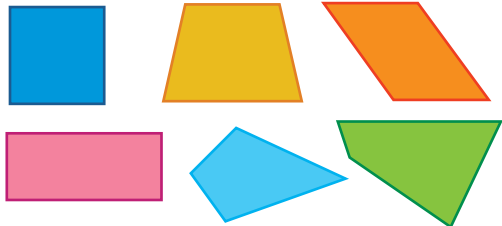
Square pyramid



Pentagonal pyramid

quadrilateral

A two-dimensional shape with four straight sides.



quotient

The answer when one number is divided by another.

random selection

Choosing without looking.

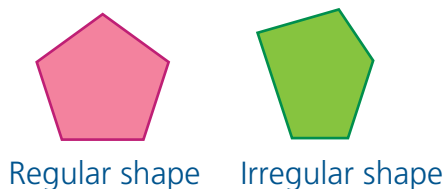
Each item has an equal chance of being chosen.

reflection

See *flip*.

regular and irregular shapes

Regular shapes have all sides and all angles equal. Irregular shapes do not.



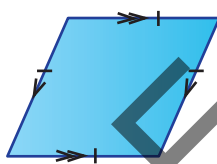
remainder

The number that is left over after sharing or dividing.

- 22 cups shared among 5 people gives 4 cups each, remainder 2.

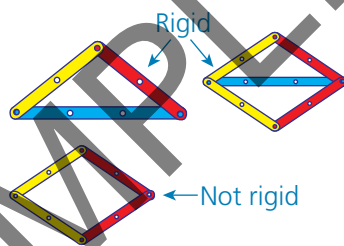
rhombus

A shape with 4 sides, opposite sides parallel, all sides equal.



rigid shape

A model that cannot be pushed out of shape because triangles have been used in its construction.



Roman numerals

A number system devised by the ancient Romans.

Roman numerals use letters for numbers:

I	V	X	L	C	D	M
1	5	10	50	100	500	1000

- XXVIII = 28

rounding

Writing a number to the nearest 5, 10, 1000, ...

- 3786 rounded to the nearest 100 is 3800.
- 35 000 rounded to the nearest ten-thousand is 40 000.

skip counting

Counting on, adding the same number each time.

- 5, 10, 15, 20, 25, ... is skip counting by 5.

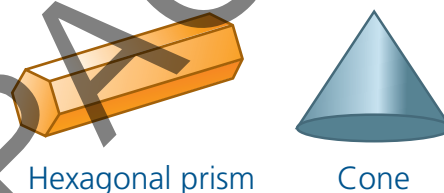
slide (translation)

To move a shape in any direction without changing its orientation.



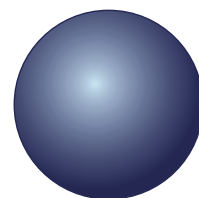
solid

A term used to describe a three-dimensional object.



sphere

A three-dimensional object that is ball-shaped and round. All points on the surface of a sphere are the same distance from its centre.



split strategy

Adding numbers by splitting them into their parts.

- $36 + 52 = 30 + 6 + 50 + 2$
 $= (30 + 50) + (6 + 2)$
 $= 80 + 8$
 $= 88$

Spreadsheet

A table produced by a computer program used for organising data, allowing rapid calculations and the production of graphs.

square centimetre (cm²)

A unit of area equal to a square with sides of 1 cm.

square kilometre (km²)

A unit of area equal to a square with sides of 1 km.

- $1 \text{ km}^2 = 1\,000\,000 \text{ m}^2$, $1 \text{ km}^2 = 100 \text{ ha}$
-

square metre (m²)

A unit of area equal to a square with sides of 1 m.

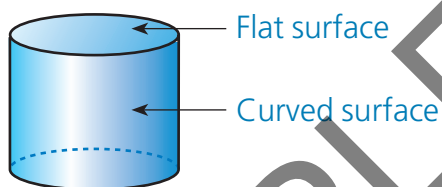
- $10\,000 \text{ m}^2 = 1 \text{ ha}$
-

sum

The answer when you add numbers.

surface

The outside layer of a three-dimensional object. A surface can be flat or curved.



See also *face*.

survey or questionnaire

A list of questions used to discover information.

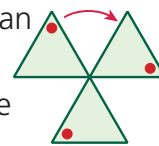
symmetry

A balanced arrangement.

- **Line symmetry**
A property of a figure where one half is the mirror image of the other.
 - **Line (or Axis) of symmetry**
A line that divides a figure into two parts that are mirror images of each other.
-

- **Rotational symmetry**

A property of a figure where it can be spun about a point so that it repeats its shape more than once in a full turn.



tally

To keep count by making a mark for each item. To make counting easy, the marks are drawn in groups of five with each fifth mark crossed over the other four marks.

-  = 18
-

tangram

A traditional Chinese puzzle. A square is cut into seven pieces that can be rearranged to make different pictures.



temperature

A measure of how hot or cold something is. Temperature is usually measured in degrees Celsius (°C).

- Water freezes at 0°C.
 - Water boils at 100°C.
-

tessellation

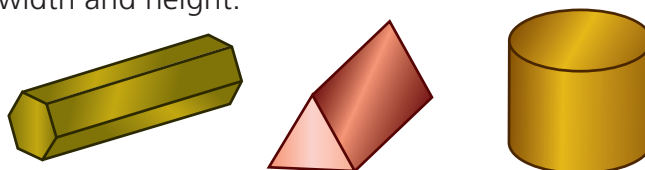
A pattern of identical shapes that fit together without gaps or overlaps.

thermometer

An instrument used for measuring temperature.

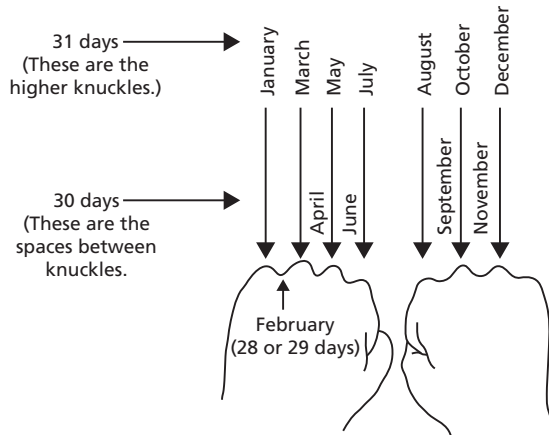
three-dimensional (3D) object

Objects are three-dimensional. They have length, width and height.



Time (months of the year)

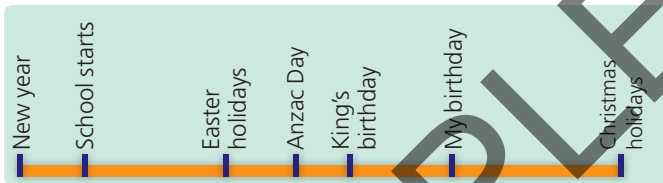
- The number of days in each month:



30 days has September, April, June and November. All the rest have 31, except February alone, which has 28 days clear and 29 days each leap year.

timeline

Shows a sequence of events in time.

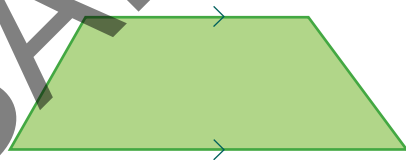


translation

See slide.

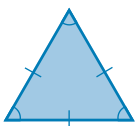
trapezium

A quadrilateral with one pair of parallel sides.

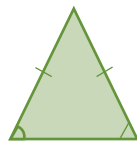


triangle

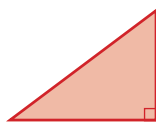
A two-dimensional shape with three straight sides and three angles.



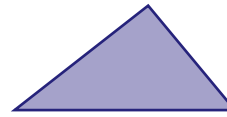
Equilateral



Isosceles



Right-angled



Scalene



Scalene

Scalene triangles have no sides equal.

See also *polygon*.

turn (rotation)

To rotate a shape about a given point.

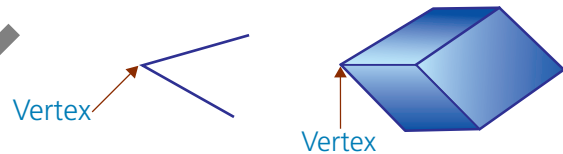
twenty-four hour time

Time shown as a 4-digit number, the first two digits indicating the hour and the second two digits indicating minutes.

- 13:20 is 20 past 1 in the afternoon, or 1:20 pm.

vertex

A point at which two or more lines meet to form a corner on a 2D shape or 3D object.



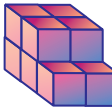
The plural of *vertex* is *vertices*.

vertical

- At right angles to the horizontal.
- Straight up and down.
- The direction in which an object falls under gravity.

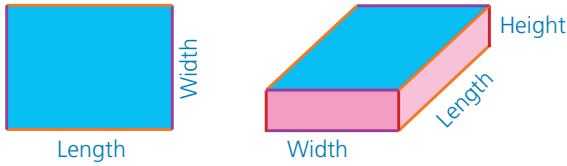
volume

The amount of space occupied by a 3D object.

-  Volume = 10 cubic units
1 cubic centimetre = 1 mL

width or breadth (dimensions)

The distance from side to side.



year

There are 365 days in a year and 366 days in a leap year (which is every 4th year).

There are 12 months in a year.

2D (two-dimensional) shapes

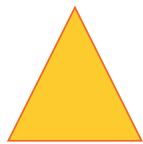
Flat shapes are two-dimensional.

They have length and width.



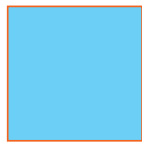
circle

1 curved side



triangle

3 sides
3 corners



square

4 equal sides
4 right angles



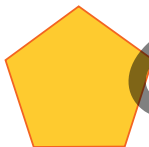
rectangle

2 equal long sides and 2 equal short sides, like a stretched square



oval

1 curved side, like a squashed circle



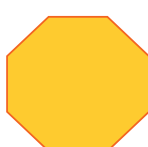
pentagon

5 sides
5 corners



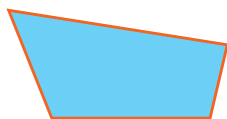
hexagon

6 sides
6 corners



octagon

8 sides
8 corners



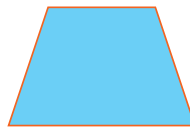
quadrilaterals

4 sides and 4 corners.



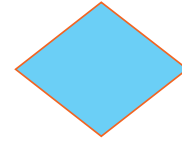
parallelogram

two sets of parallel lines
opposite sides equal



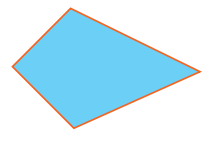
trapezium

one set of parallel lines



rhombus

all sides equal (a diamond)



kite

two pairs of equal sides

All of the blue shapes are quadrilaterals.

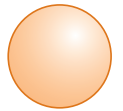
3D (three-dimensional) objects

Solid objects are three-dimensional.

They have length, width and height.

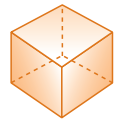
sphere

A sphere is curved and round.



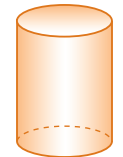
cube

A cube has 6 square faces, 8 vertices and 12 straight edges.



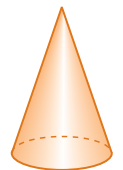
cylinder

A cylinder has 2 circular flat surfaces and 1 curved surface.



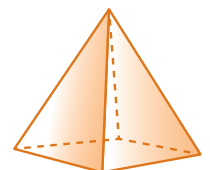
cone

A cone has 1 circular flat surface and 1 curved surface.



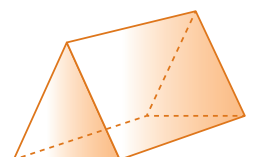
pyramid

A pyramid has triangular faces joined around a base.



prism

A prism has rectangular faces joining two identical bases.





Zero is a place holder.

One million is 1000 thousands.

- The population of the United Kingdom in 2023 was 68 878 820

68 million			878 thousand			820		
100 000 000	10 000 000	1 000 000	100 000	10 000	1 000	100	10	1
6	8		8	7	8	8	2	0



- The population of the United States of America in 2023 was 336 406 770.

1 Read these numbers and then write them in the place-value chart.

- A eight hundred and sixty-nine thousand
- B four million, eight hundred and one thousand, six hundred and forty-nine
- C thirty-six million, three hundred and forty-one thousand, five hundred and seventy-five
- D fifteen million, six hundred and fifty thousand

500K is sometimes used for 500 000.

	ten millions	millions	hundred thousands	ten thousands	thousands	hundreds	tens	ones
A								
B								
C								
D								

a Order the numbers, in **A**, **B**, **C** and **D** of this table, from smallest to largest.

b Write the numeral that is three million more than **D**.

c Write the numeral that is one million five hundred thousand more than **C**.

2 Write the numeral for:

a $6\,000\,000 + 300\,000 + 70\,000 + 2\,000 + 800 + 40$

b 7 million 500 thousand

c 18 million 120 thousand 452

d $(3 \times 10\,000\,000) + (6 \times 1\,000\,000) + (7 \times 100\,000) + (5 \times 10\,000) + (2 \times 1\,000)$

e the 2023 population of Queensland (5 million 360 thousand)

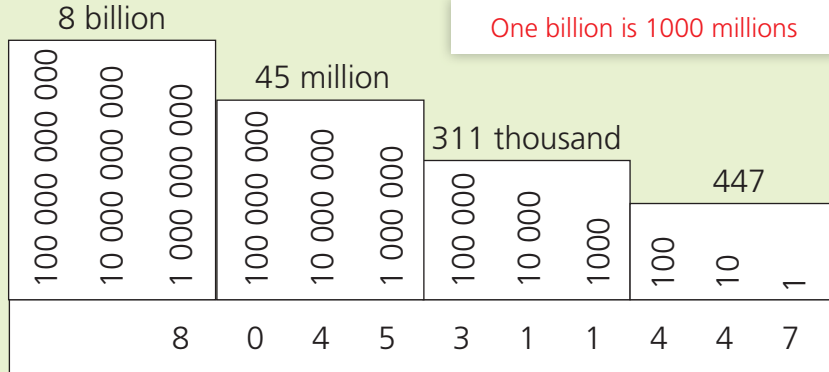
f the 2023 population of Victoria (6 million 829 thousand)

One million has 6 zeros.





The population of the World in 2023 was over 8 billion people.



That's 8 045 311 447 people.



1 Read these numbers and then write them in the place-value chart.

- A five hundred and sixty-four thousand and twenty-seven
- B ten million, two hundred and fifteen thousand, nine hundred and eighty-two
- C two hundred and fifty million, nine hundred and forty thousand
- D thirty-six billion eight hundred and fourteen million
- E twelve billion six hundred and fifty-five million, seven hundred thousand

Empty columns are filled with zeros.



	billions			millions			thousands			ones		
	H	T	O	H	T	O	H	T	O	H	T	O
A												
B												
C												
D												
E												

1 million has 6 zeros.

1 billion has 9 zeros

There are 2 trillion bees worldwide.

Order the numbers in this table from smallest to largest.

2 Write the numeral for:

- a 860 million
- b 70 million
- c 14 billion
- d 2 billion
- e 308 million
- f 100 billion



2 000 000 000 000

- g the distance to the Sun, 150 million 238 thousand km
- h the population of India in 2023, 1 billion 417 million 792 thousand 656
- i the distance to the star, Proxima Centauri, 40 billion 208 million km
- j The distance light travels in one hour, 1 billion 71 million 360 thousand km

See Extra Support 21 (Decimals! - What does a million look like?)





CONCEPT



● **Rounding to the nearest million**

When rounding, look at the next figure.

If it is 5 or more, round up.

71 542 800 rounds to 72 000 000

13 499 000 rounds to 13 000 000.

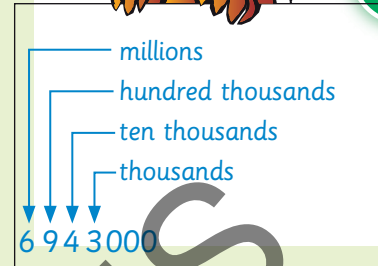
● Write 3 475 040 in expanded notation.

3 000 000 + 400 000 + 70 000 + 5 000 + 40

● Complete: $167\,000 = 150\,000 +$

167 000 = 150 000 + 17 000

Three million has 6 zeros.



1 Write the numeral for:

a $6\,000\,000 + 900\,000 + 40\,000 + 9\,000 + 200 + 70 + 1$

b $10\,000\,000 + 7\,000\,000 + 300\,000 + 2\,000 + 600 + 80 + 9$

c $80\,000\,000 + 900\,000 + 5\,000 + 700 + 80 + 4$

d $90\,000\,000 + 9\,000\,000 + 900\,000 + 90\,000 + 9\,000$

2 Write the following in expanded notation.

a 3 475 600

b 847 231

c 26 809 050

d 80 520 300

3 Round each to the nearest million.

a 76 397 495

b 32 681 340

c 96 476 80

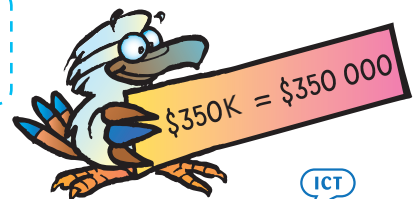
d 89 504 215

4 Complete:

a $157\,350 = 150\,000 +$

b $266\,423 = 250\,000 +$

This is called partitioning.



5 Use partitioning and doubling to answer these.

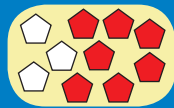
a $157\,350 + 150\,000 =$

b $250\,000 + 266\,423 =$

Find examples of large numbers on the internet.
Investigate the size of large cities.

ICT





$\frac{7}{10}$ of this group is red.



$\frac{7}{10}$ of the bar is red.

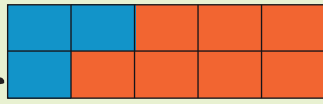


CONCEPT

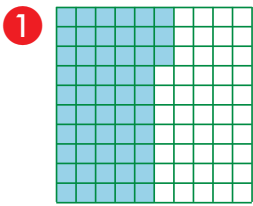
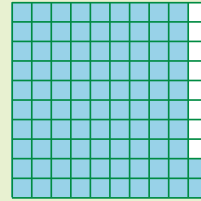


If $\frac{7}{10}$ is red, $\frac{3}{10}$ is not red,

If $\frac{92}{100}$ is blue, $\frac{8}{100}$ is not blue.



$\frac{7}{10}$ ← numerator
 $\frac{7}{10}$ ← denominator



a What is the denominator of $\frac{43}{100}$?

b What is the numerator of $\frac{43}{100}$?

c What fraction is not coloured?



d What is the numerator of $\frac{7}{10}$?

e What is the denominator of $\frac{7}{10}$?

2 Complete.

a $\frac{1}{2}$ and $\frac{1}{2}$ makes whole.

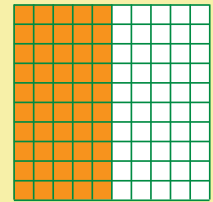
b $\frac{1}{4}$ and makes 1 whole.

c and $\frac{2}{3}$ makes 1 whole.

d $\frac{2}{5}$ and $\frac{3}{5}$ makes whole.

e $\frac{3}{8}$ and makes 1 whole.

f and $\frac{4}{10}$ makes 1 whole.



$$\frac{50}{100} + \frac{50}{100} = 1$$

3 a If $\frac{3}{4}$ of our class come to school by bus, what fraction does not come by bus?

b If $\frac{7}{10}$ of the class is present, what fraction is absent?

c If a water tank is $\frac{5}{8}$ full, what fraction of the water tank is empty?

d $\frac{3}{5}$ of a pizza is left. What fraction has been eaten?

e $\frac{9}{10}$ of my pavers have arrived. What fraction still needs to arrive?

f If $\frac{3}{8}$ of a cake has been eaten, what fraction is left?



4 a Colour $\frac{1}{4}$ of this bar. What is $\frac{1}{4}$ of 12.

b Colour $\frac{1}{3}$ of this bar. What is $\frac{1}{3}$ of 12.

c Which fraction is larger, $\frac{1}{4}$ or $\frac{1}{3}$?

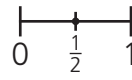
d Colour $\frac{3}{10}$ of this bar red. Colour $\frac{5}{10}$ of this bar blue.



The larger the denominator, the smaller the fraction.

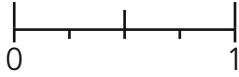


1 Use dots to show the fractions on the number line.
Use < or > to complete the sentence.



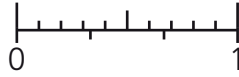
Unit fractions have 1 as the numerator.

a $\frac{1}{2}$ and $\frac{1}{4}$



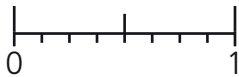
$\frac{1}{2}$ $\frac{1}{4}$

b $\frac{1}{10}$ and $\frac{1}{3}$



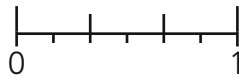
$\frac{1}{10}$ $\frac{1}{3}$

c $\frac{1}{2}$ and $\frac{1}{8}$



$\frac{1}{2}$ $\frac{1}{8}$

d $\frac{1}{6}$ and $\frac{1}{3}$

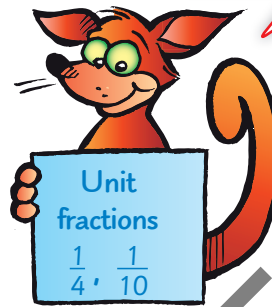


$\frac{1}{6}$ $\frac{1}{3}$

e $\frac{1}{10}$ and $\frac{1}{5}$

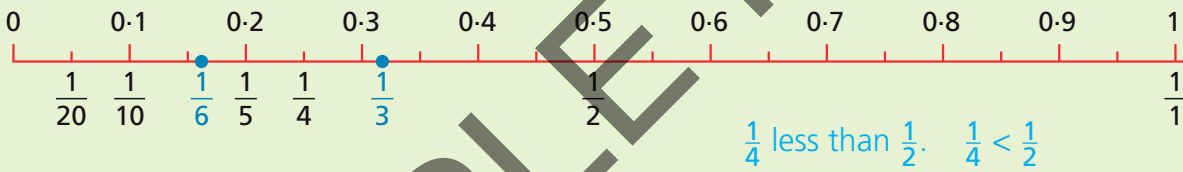


$\frac{1}{10}$ $\frac{1}{5}$



< means is less than.
> means is greater than.
 $2 < 7$ $9 > 4$

The order of unit fractions



2 Put each group of fractions in order, from smallest to largest.

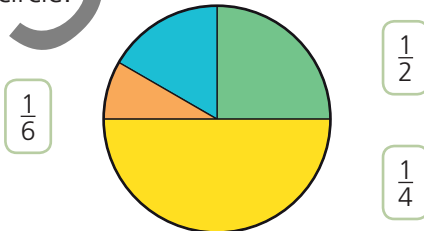
a $\frac{1}{2}, \frac{1}{5}, \frac{1}{4}$

b $\frac{1}{100}, \frac{1}{10}, \frac{1}{20}$

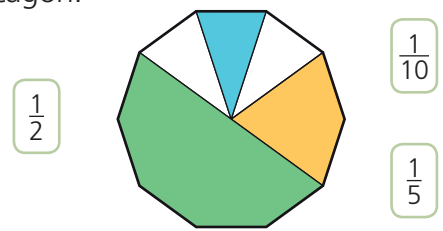
c $\frac{1}{3}, \frac{1}{8}, \frac{1}{2}$

d $\frac{1}{4}, \frac{1}{8}, \frac{1}{2}, \frac{1}{12}$

3 Match each fraction with a part of the circle.



4 Match each fraction with a part of the decagon.



5 For unit fractions, the greater the denominator, the the fraction.

6 $\frac{1}{4} + \frac{1}{4} + \frac{1}{4} =$



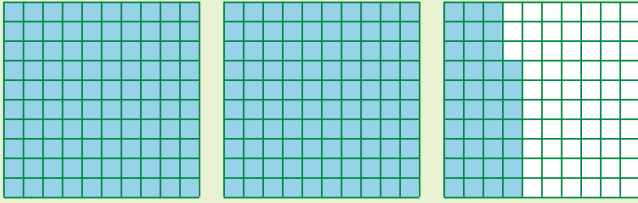


CONCEPT



Fraction

$$\frac{237}{100}$$



2 Wholes and $\frac{37}{100}$

Mixed number

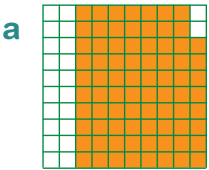
$$2 \frac{37}{100}$$

or 2.37

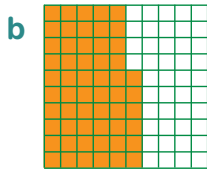


That's 2 ones, 3 tenths and 7 hundredths.

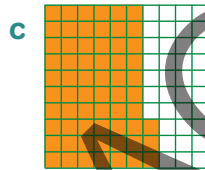
1 Write the fraction and the decimal shown in each hundred square.



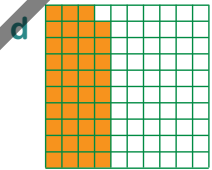
or



or

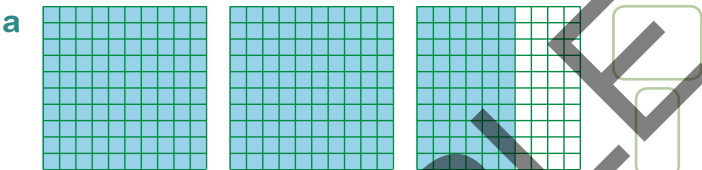


or

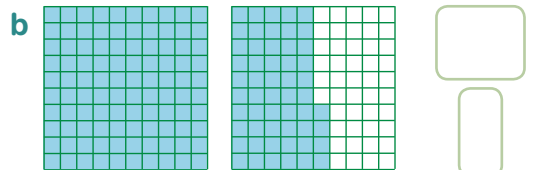


or

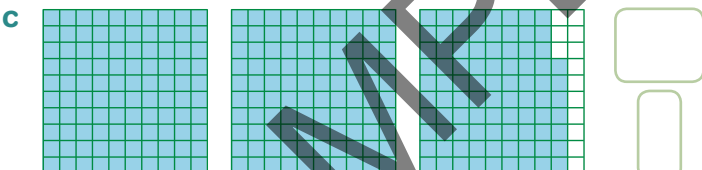
2 Write the mixed number and the decimal for each part.



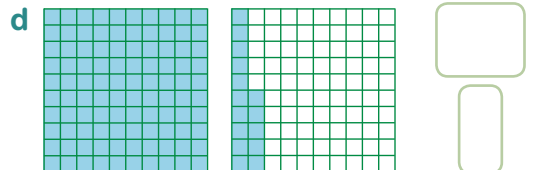
or



or



or



or

3 Write each mixed number as a decimal.

a $2 \frac{37}{100}$

b $1 \frac{76}{100}$

c $6 \frac{8}{100}$

d $9 \frac{95}{100}$

e $7 \frac{81}{100}$

f $5 \frac{3}{100}$

4 Write each decimal as a mixed number.

a 6.25

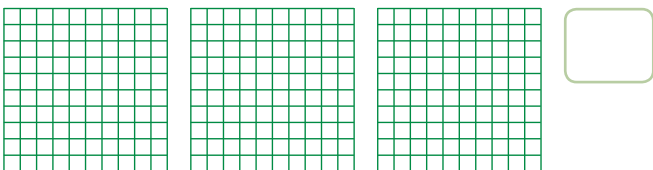
b 3.04

c 9.42

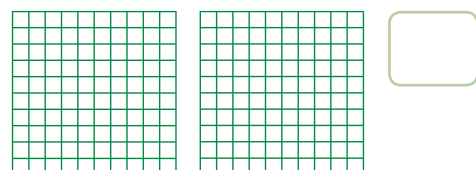
Use a zero as a place holder.



5 Colour 2.75 of these. Write the mixed number.



6 Colour 1.05 of these. Write the fraction.



0.7	
0.5	



Tick the larger decimal.



$\frac{7}{10}$

This is the same as 0.7.

ones	tenths
0	7

ones	tenths	hundredths
1	7	4

$1\frac{74}{100}$

This is the same as 1.74.

CONCEPT

- 1 Use decimals to write:
- a 8 tenths b 3 tenths c 9 tenths d 4 tenths
- e zero point eight f zero point three g one point zero
- h 1 and 6 tenths i 2 and 5 tenths j 7 and 9 tenths

2 Match each fraction with the correct decimal.

a

$\frac{5}{10}$	0.5
$\frac{8}{100}$	0.2
$\frac{2}{10}$	0.08

b

$2\frac{3}{10}$	2.03
$2\frac{93}{100}$	2.93
$2\frac{3}{100}$	2.3

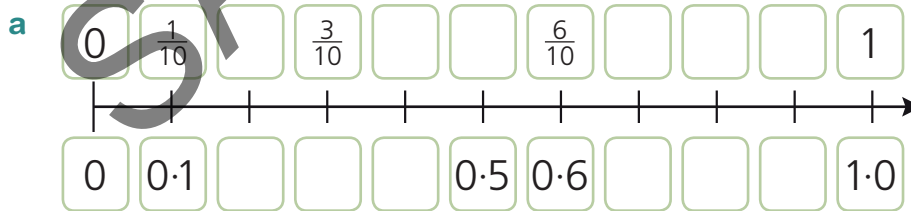
c

$4\frac{6}{10}$	4.5
$4\frac{5}{100}$	4.6
$4\frac{5}{10}$	4.05

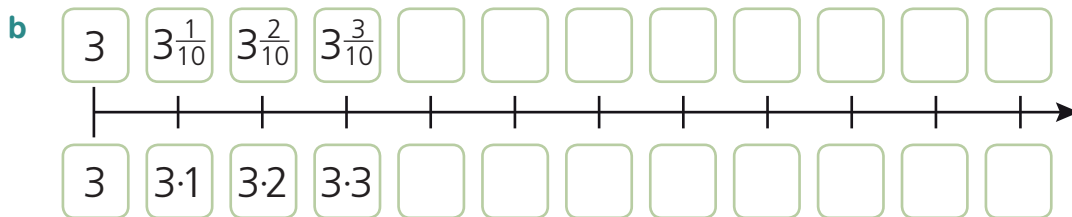
3 Write the decimal for:

a $\frac{9}{10}$ <input type="text"/>	b $\frac{5}{10}$ <input type="text"/>	c $\frac{12}{100}$ <input type="text"/>	d $\frac{34}{100}$ <input type="text"/>
e $\frac{4}{10}$ <input type="text"/>	f $1\frac{6}{10}$ <input type="text"/>	g $2\frac{8}{10}$ <input type="text"/>	h $1\frac{12}{100}$ <input type="text"/>
i $2\frac{8}{10}$ <input type="text"/>	j $3\frac{2}{100}$ <input type="text"/>	k $6\frac{9}{10}$ <input type="text"/>	l $2\frac{87}{100}$ <input type="text"/>

4 Complete the number lines.



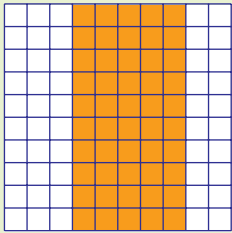
0.1 and $\frac{1}{10}$ occupy the same position on the number line.



See Extra Support 2 (Place value in decimals).





50 out of 100
 50 hundredths
 50%




0.50
 $\frac{50}{100}$

50% says 50 per cent.

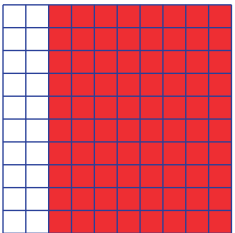
64% 

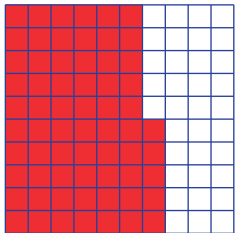
CONCEPT 

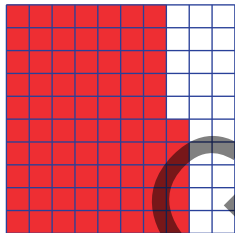
Phones use percentages to show charge remaining.

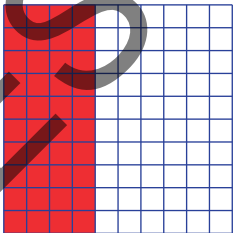


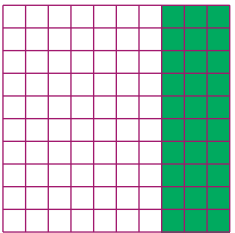
1 What percentage of each square is coloured?

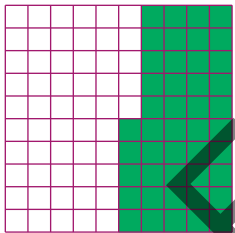
a 

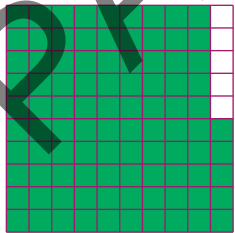
b 

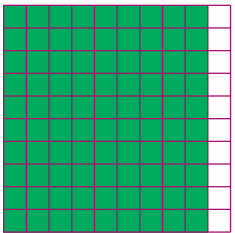
c 

d 

e 

f 

g 

h 

2 What percentage of each square in Question 1 is not coloured?

a b c d e f g h

3 Complete these equivalents:

a	0.25	$\frac{\quad}{100}$	%
b	0.65		
c	0.45		
d	0.80		
e	0.50		
f	0.20		
g	0.60		
h	0.35		
i	0.75		
j	0.55		
k	0.95		
l	0.40		



Percentages in the environment

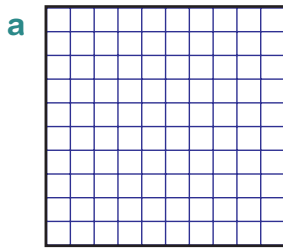
- Collect examples of percentages from newspapers and food packages.
- Discuss different ways in which percentages are used.



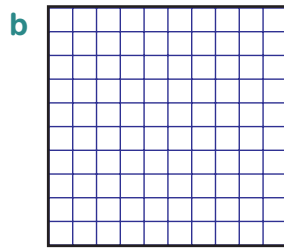
See Extra Support 2 (Place value in decimals).



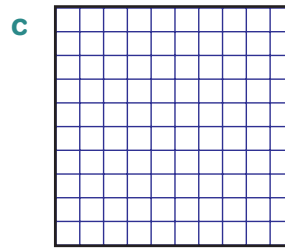
1 For each square, colour the percentage shown.



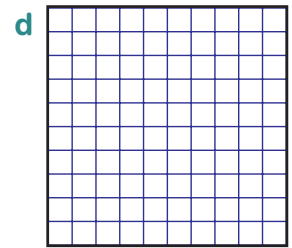
10%



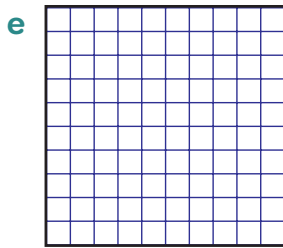
25%



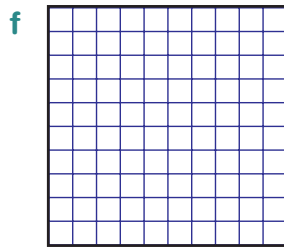
20%



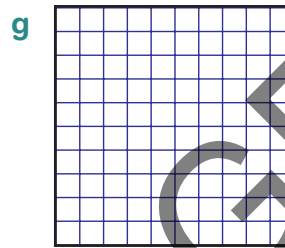
75%



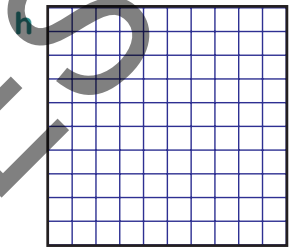
50%



15%



60%



90%

2 What percentage of each square in Question 1 should be not coloured?

a b c d e f g h

3 Complete the following.

a

$\frac{17}{100}$	0.	%
------------------	----	---

b

$\frac{76}{100}$	0.	%
------------------	----	---

c

$\frac{27}{100}$	0.	%
------------------	----	---

d

$\frac{49}{100}$	0.	%
------------------	----	---

e

$\frac{98}{100}$	0.	%
------------------	----	---

f

$\frac{81}{100}$	0.	%
------------------	----	---

g

$\frac{31}{100}$	0.	%
------------------	----	---

h

$\frac{12}{100}$	0.	%
------------------	----	---

i

$\frac{34}{100}$	0.	%
------------------	----	---

j

$\frac{28}{100}$	0.	%
------------------	----	---

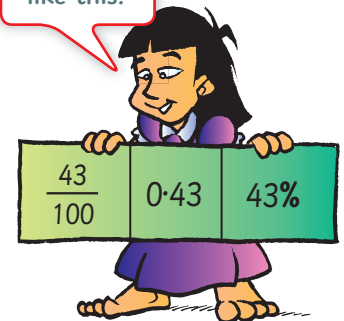
k

$\frac{63}{100}$	0.	%
------------------	----	---

l

$\frac{94}{100}$	0.	%
------------------	----	---

Do them like this.



Converting fractions to decimals

4 Use a calculator to divide the denominator into the numerator.

e.g. $\frac{35}{100}$ ← numerator is 3 5 ÷ 1 0 0 = 0.35 ← denominator

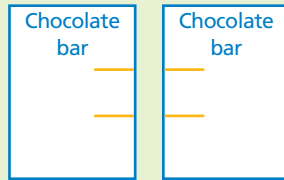
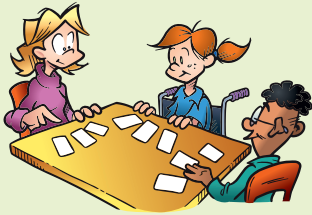
Now calculate:

a $\frac{65}{100}$ <input type="text"/>	b $\frac{15}{100}$ <input type="text"/>	c $\frac{95}{100}$ <input type="text"/>	d $\frac{45}{100}$ <input type="text"/>	e $\frac{75}{100}$ <input type="text"/>
f $\frac{25}{100}$ <input type="text"/>	g $\frac{5}{100}$ <input type="text"/>	h $\frac{60}{100}$ <input type="text"/>	i $\frac{80}{100}$ <input type="text"/>	j $\frac{40}{100}$ <input type="text"/>
k $\frac{10}{100}$ <input type="text"/>	l $\frac{37}{100}$ <input type="text"/>	m $\frac{91}{100}$ <input type="text"/>	n $\frac{20}{100}$ <input type="text"/>	o $\frac{100}{100}$ <input type="text"/>





Diane, Lyn and Alan shared two chocolate bars fairly as they played cards. What fraction of a whole chocolate bar did Alan eat?


Question:

 What is $2 \div 3$?

Alan ate one third of each bar, so he ate two thirds of a bar.

$$2 \div 3 = \frac{2}{3}$$

A fraction can be used as a division statement.



1 Students shared two chocolate bars fairly. How much chocolate would each eat if there were:

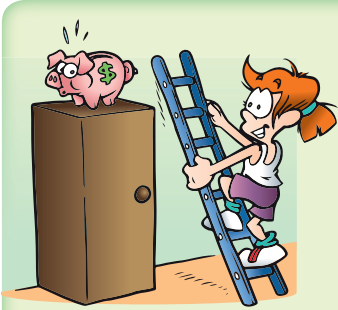
- a 6 students? b 4 students? c 2 students? d 8 students?

2 Write each of these division questions as a fraction.

- a $3 \div 4$ b $5 \div 8$ c $1 \div 2$ d $4 \div 5$

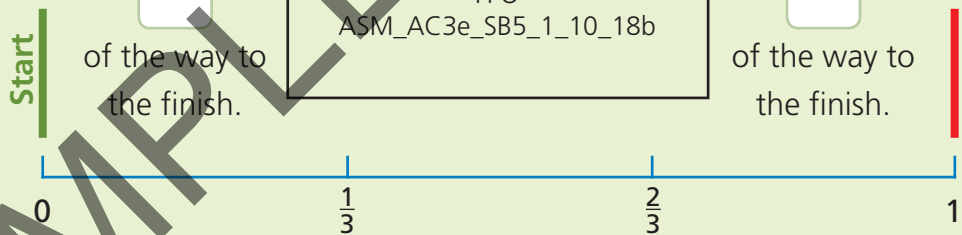
3 Write each fraction as a division.

- a $\frac{1}{2}$ b $\frac{3}{4}$ c $\frac{2}{5}$ d $\frac{7}{8}$



• Alfie is of the way to the finish.

• Rona is of the way to the finish.

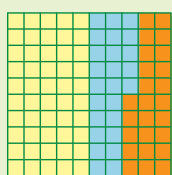


• Niki is about of the way up the ladder.

A fraction can be used to show part of a distance.

4 a What fraction of the race does Rona still have to travel?

b What fraction of the race does Alfie still have to travel?



$$\frac{50}{100} = \frac{1}{2} = 0.50, 0.5 \text{ or } 50\%$$

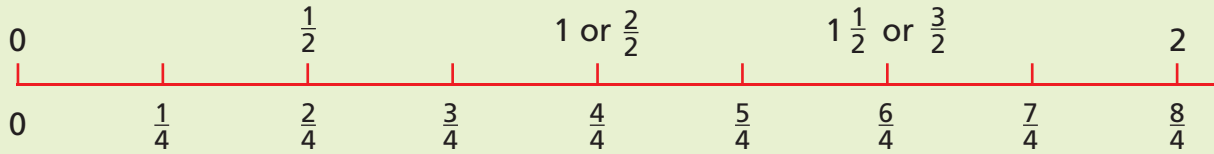
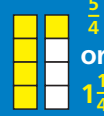
$$\frac{25}{100} = \frac{1}{4} = 0.25 \text{ or } 25\%$$

$$\frac{75}{100} = \frac{3}{4} = 0.75 \text{ or } 75\%$$

$$\frac{1}{3} = 33\frac{1}{3}\%$$

5 Heather ate $\frac{1}{4}$ of a cake and Tome ate $\frac{1}{2}$ of another cake. Heather said she ate more cake than Tom. How can this be so?





FPO
ASM_AC3e_SB4_2_24_01

$\frac{5}{4}$ means 5 quarters and is the same as $1\frac{1}{4}$.

$\frac{3}{2}$ means 3 halves and is the same as $1\frac{1}{2}$.

When the number has a whole number part and a fraction part, it is a **mixed number**. $3\frac{1}{2}$

When the numerator is larger than the denominator, it is an **improper fraction**. $\frac{7}{2}$

- To change a mixed number into an improper fraction, multiply the whole number by the denominator of the fraction part, then add the fractions.

$$3\frac{1}{4} = \frac{3 \times 4}{4} + \frac{1}{4} = \frac{13}{4}$$

$$2\frac{3}{10} = \frac{2 \times 10}{10} + \frac{3}{10} = \frac{23}{10}$$



- Change the mixed number into an improper fraction.

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

b $1\frac{1}{4}$

c $2\frac{1}{2}$

d $3\frac{2}{5}$

e $1\frac{4}{5}$

f $2\frac{3}{4}$

g $2\frac{2}{4}$

h $2\frac{2}{3}$

i $1\frac{7}{10}$

j $3\frac{2}{10}$

k $2\frac{5}{10}$

l $4\frac{8}{10}$

Multiply then add.

- To change an improper fraction into a mixed number, divide the bottom into the top.

$$\frac{9}{5} = 9 \div 5 = 1\frac{4}{5}$$

$$\frac{9}{4} = 9 \div 4 = 2\frac{1}{4}$$

$$\frac{9}{2} = 9 \div 2 = 4\frac{1}{2}$$

Four and a half pies!

- Change the improper fraction into a mixed number.

a $\frac{9}{4}$

b $\frac{7}{3}$

c $\frac{5}{2}$

d $\frac{7}{4}$

e $\frac{11}{3}$

f $\frac{10}{4}$

g $\frac{14}{5}$

h $\frac{17}{2}$

i $\frac{17}{10}$

j $\frac{41}{10}$

k $\frac{36}{10}$

l $\frac{55}{10}$

FPO
ASM_AC3e_SB5_1_11_19a

Divide bottom into top.

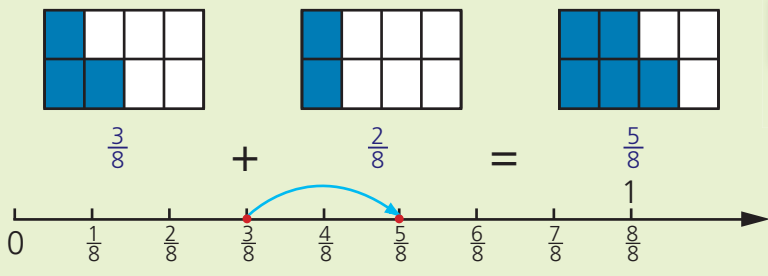
When we add or subtract, the denominators must be the same.



CONCEPT



$$\frac{3}{8} + \frac{2}{8} = \frac{5}{8}$$



1 Add these fractions. Colour part of the last grid to match your answer.

a + =

b + =

c + =

d + =

2 Use the fraction card to find the answers. (Remember: $\frac{4}{10} + \frac{6}{10} = \frac{6}{10} + \frac{4}{10}$)

a $\frac{1}{10} + \frac{5}{10} =$

b $\frac{3}{10} + \frac{4}{10} =$

c $\frac{2}{10} + \frac{7}{10} =$

d $\frac{6}{10} + \frac{3}{10} =$

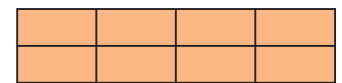
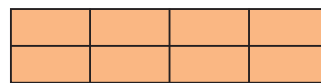
e $\frac{5}{10} + \frac{2}{10} =$

f $\frac{4}{10} + \frac{5}{10} =$

g $\frac{7}{10} + \frac{1}{10} =$

h $\frac{1}{10} + \frac{8}{10} =$

3 Use the fraction cards to find the answers.



a $\frac{2}{8} + \frac{6}{8} =$

b $\frac{7}{8} + \frac{4}{8} =$

c $\frac{5}{8} + \frac{5}{8} =$

d $\frac{3}{8} + \frac{6}{8} =$

For $<$ and $>$, the arrow points to the smaller number, $10 < 30$ and $100 > 40$. $<$ looks like an L so it means *Less than*.

4 Answer true or false.

a $\frac{6}{8} > \frac{3}{8}$

b $\frac{7}{8} < \frac{6}{8}$

c $\frac{8}{8} < \frac{5}{8}$

d $\frac{5}{8} > \frac{9}{8}$

e $\frac{9}{10} > \frac{6}{10}$

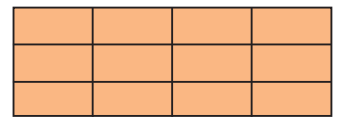
f $\frac{5}{10} < \frac{9}{10}$

g $\frac{13}{10} > \frac{11}{10}$

h $\frac{8}{10} > \frac{12}{10}$

5 a Sharen ate $\frac{3}{12}$ of a block of chocolate and Francis ate $\frac{5}{12}$ of the same block.

How much of the block did they eat?



b Ron used $\frac{4}{10}$ of the paper. Eva used $\frac{5}{10}$. How much is left?



CONCEPT



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

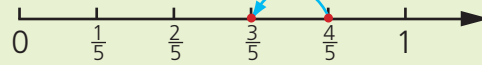
We must use fractions of the same whole.


 $\frac{4}{5}$

-


 $\frac{1}{5}$

=


 $\frac{3}{5}$


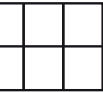
1 Subtract these fractions. Colour part of the grid to match your answer.


 $\frac{5}{8}$

-

 $\frac{1}{8}$

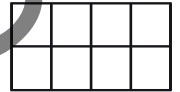
=


 $\frac{7}{8}$

-

 $\frac{2}{8}$

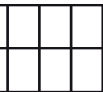
=


 $\frac{6}{10}$

-

 $\frac{3}{10}$

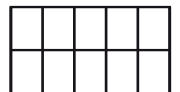
=


 $\frac{9}{10}$

-

 $\frac{4}{10}$

=


 $\frac{5}{6}$

-

 $\frac{2}{6}$

=


 $\frac{4}{6}$

-

 $\frac{1}{6}$

=



2 Use the fraction card  to find the answers.

a $\frac{3}{10} - \frac{1}{10} =$

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

c $\frac{7}{10} - \frac{2}{10} =$

d $\frac{9}{10} - \frac{5}{10} =$

e $\frac{8}{10} - \frac{7}{10} =$

f $\frac{6}{10} - \frac{1}{10} =$

g $\frac{4}{10} - \frac{3}{10} =$

h $\frac{7}{10} - \frac{4}{10} =$

3 Use the fraction card  to find the answers.

a $\frac{7}{8} - \frac{3}{8} =$

b $\frac{5}{8} - \frac{3}{8} =$

c $\frac{6}{8} - \frac{2}{8} =$

d $\frac{4}{8} - \frac{1}{8} =$

e Tim ate $\frac{1}{8}$ of a block of chocolate. How much was left?

f Mum gave me $\frac{3}{5}$ of her money. What fraction did she keep?

4 Answer true or false.

a $\frac{2}{8} < \frac{5}{8}$

b $\frac{6}{8} < \frac{5}{8}$

c $\frac{1}{8} < \frac{3}{8}$

d $\frac{7}{8} > \frac{4}{8}$

See Extra Support 4 (+ and - of fractions)

0.1 is 1 tenth
 0.10 is 10 hundredths
 0.100 is 100 thousandths

These are the same.



This abacus shows 3.846.

U · Tth Hth Thth

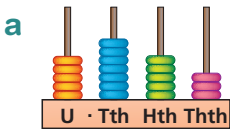
Decimal point

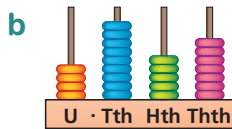
There are 3 units, 8 tenths, 4 hundredths and 6 thousandths.

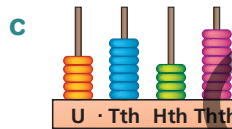
1 = 10 tenths or 100 hundredths or 1000 thousandths.

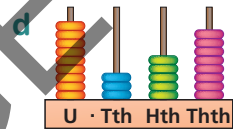
CONCEPT

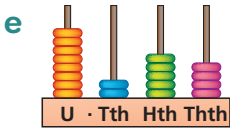
1 Write the numeral for the number shown on each abacus.

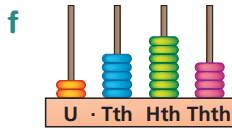












ones	tenths	hundredths	thousandths
0	.	0	1
10 thousandths = 1 hundredth			
0	.	1	0
10 hundreds = 1 tenth			
1	.	0	
10 tenths = 1 whole			

2 Write each number on the place-value chart.

- a three point one nine seven
- b five point six three eight
- c nine point two four nine
- d six point five four eight
- e eight point three five two
- f two point seven one nine

Units	.	10ths	100ths	1000ths

CONCEPT

ten 1000ths = one 100th	$\frac{10}{1000} = \frac{1}{100}$
ten 100ths = one 10th	$\frac{10}{100} = \frac{1}{10}$
ten 10ths = one unit	$\frac{10}{10} = 1$

Ten of one column gives one in the column on the left.

FUN SPOT

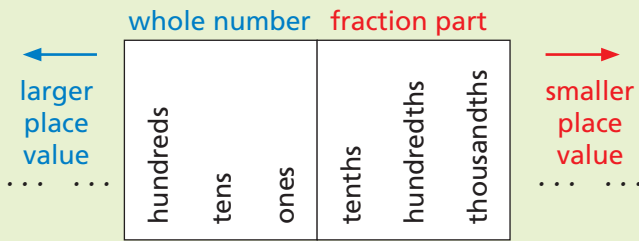
Make the largest number

- Each player, in turn, rolls the dice and records the number in the column of their choice in the place-value card.
- The player rolls three more dice to fill the place-value card.
- The player with the largest 4-digit number wins the game.

$6.421 = 6 \frac{421}{1000}$

Units	.	Tenths	Hundredths	Thousandths
6	.	4	2	1

See Extra Support 5 (Place value to thousandths)



				0	•	3			
				2	•	7			
				0	•	9	4		
				0	•	0	8	5	
		8	0	8	•	6			
			6	8	•	3	7	5	
		1	7	8	•	8	4		
				\$7	•	9	5		

FPO ASM_AC3e_SB6_Header_06 FPO ASM_AC3e_SB6_Header_02

Meaning

- 3 tenths
- 2 and 7 tenths
- 94 hundredths
- 85 thousandths
- 808 and 6 tenths
- 68 and 375 thousandths
- 178 and 84 hundredths
- 70 dollars and 95 cents

● 68.375 is read sixty-eight point three seven five.
 decimal point

● The decimal point separates the whole number part from the fraction part.



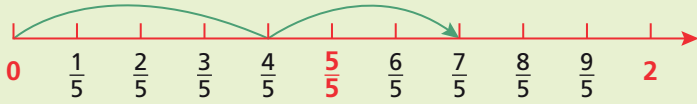
1 Write the decimal for:

- | | | | | | |
|---------------------------|----------------------|---------------------------|----------------------|------------------|----------------------|
| a 8 tenths | <input type="text"/> | b 1 tenth | <input type="text"/> | c 5 tenths | <input type="text"/> |
| d 7 and 5 tenths | <input type="text"/> | e 4 and 1 tenth | <input type="text"/> | f 9 and 3 tenths | <input type="text"/> |
| g 64 hundredths | <input type="text"/> | h 33 hundredths | <input type="text"/> | i 25 hundredths | <input type="text"/> |
| j 805 thousandths | <input type="text"/> | k 65 thousandths | <input type="text"/> | | <input type="text"/> |
| l 215 and 5 tenths | <input type="text"/> | m 90 and 8 tenths | <input type="text"/> | | <input type="text"/> |
| n 11 and 125 thousandths | <input type="text"/> | o 33 and 333 thousandths | <input type="text"/> | | <input type="text"/> |
| p 296 and 48 hundredths | <input type="text"/> | q 507 and 5 hundredths | <input type="text"/> | | <input type="text"/> |
| r 90 dollars and 15 cents | <input type="text"/> | s 971 dollars and 6 cents | <input type="text"/> | | <input type="text"/> |

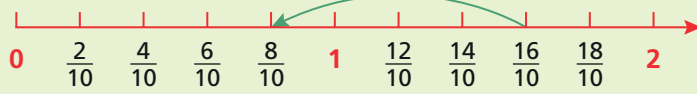
- 2
- Put blue dots on the number line, to show the positions of 5.6, 5.8, 5.9, 5.3, 5.1, 5.4.
 - Circle the decimals in Part a that are closer to 6 than to 5.
 - Put red dots on the number line, to show the positions of 5.24, 5.27, 5.29, 5.21, 5.26.
 - Circle the decimals in Part c that are closer to 5.2 than to 5.3.



CONCEPT



$$\frac{4}{5} + \frac{3}{5} = \frac{7}{5}$$



$$\frac{16}{10} - \frac{8}{10} = \frac{8}{10}$$

1 Write the improper fraction for the mixed numbers:

a $1\frac{2}{8} = \square$

b $1\frac{4}{5} = \square$

c $1\frac{3}{4} = \square$

d $3\frac{1}{2} = \square$

e $2\frac{3}{5} = \square$

f $1\frac{9}{10} = \square$

These are the same.

2 Write the mixed number for the improper fractions:

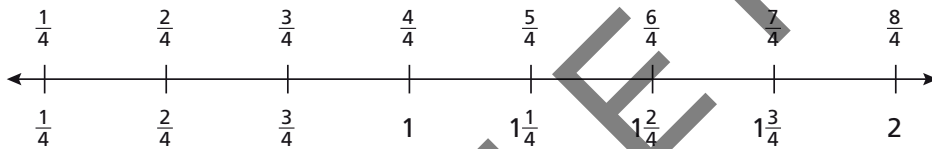
a $\frac{8}{5} = \square$

b $\frac{4}{3} = \square$

 Note: $\frac{6}{4} = 1\frac{2}{4}$, $\frac{7}{4} = 1\frac{3}{4}$

c $\frac{9}{4} = \square$

d $\frac{9}{8} = \square$


 Improper fraction: $\frac{11}{8}$

 Mixed number: $1\frac{3}{8}$

3 Add these fractions.

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

b $\frac{1}{4} + \frac{2}{4} = \square$

c $\frac{2}{10} + \frac{7}{10} = \square$

d $\frac{1}{5} + \frac{3}{5} = \square$

e $\frac{3}{5} + \frac{3}{5} = \square$

f $\frac{4}{5} + \frac{4}{5} = \square$

g $\frac{2}{5} + \frac{4}{5} = \square$

h $\frac{5}{5} + \frac{4}{5} = \square$

i $\frac{4}{10} + \frac{6}{10} = \square$

j $\frac{8}{10} + \frac{8}{10} = \square$

k $\frac{6}{10} + \frac{4}{10} = \square$

l $\frac{8}{10} + \frac{5}{10} = \square$

m $\frac{3}{8} + \frac{1}{8} + \frac{2}{8} = \square$

n $\frac{1}{5} + \frac{1}{5} + \frac{2}{5} = \square$

o $\frac{1}{10} + \frac{2}{10} + \frac{2}{10} = \square$

p $\frac{3}{10} + \frac{2}{10} + \frac{4}{10} = \square$

4 Subtract these fractions.

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

b $\frac{4}{5} - \frac{2}{5} = \square$

c $\frac{5}{10} - \frac{2}{10} = \square$

d $\frac{5}{8} - \frac{3}{8} = \square$

e $\frac{3}{5} - \frac{1}{5} = \square$

f $\frac{9}{8} - \frac{3}{8} = \square$

g $\frac{4}{3} - \frac{2}{3} = \square$

h $\frac{7}{4} - \frac{6}{4} = \square$

i $\frac{11}{10} - \frac{6}{10} = \square$

j $\frac{12}{10} - \frac{3}{10} = \square$

k $\frac{14}{10} - \frac{9}{10} = \square$

l $\frac{13}{10} - \frac{7}{10} = \square$

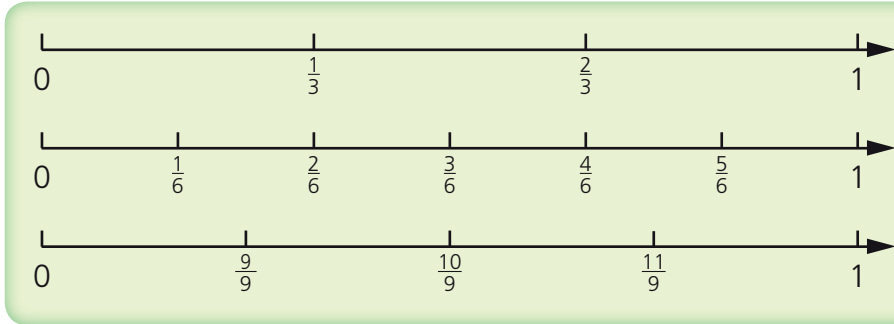
$$\frac{1}{3} = \frac{3}{9}$$



These two fractions are at the same point on the number line.



The number lines show equivalent fractions.



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

$$\frac{1}{3} = \frac{3}{9}$$



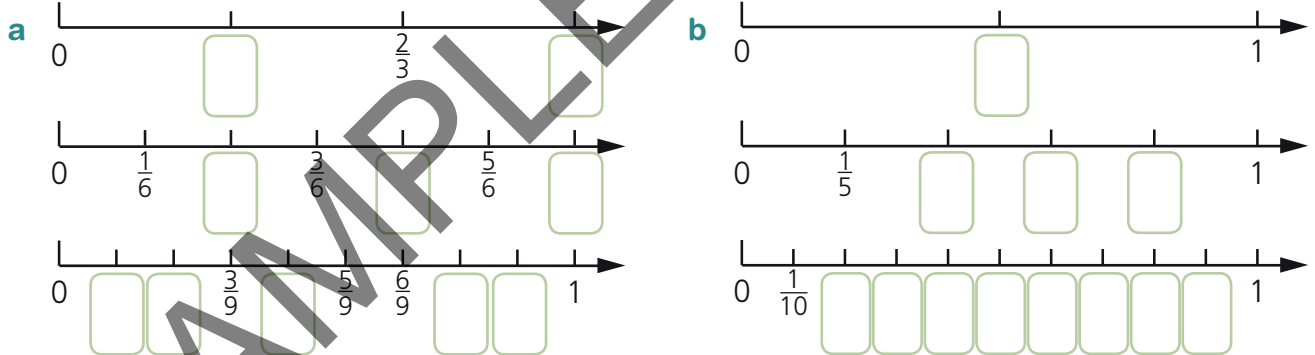
1 Use the number lines to show an equivalent fraction for:

- | | | | |
|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| a $\frac{1}{3}$ <input type="text"/> | b $\frac{9}{9}$ <input type="text"/> | c $\frac{3}{9}$ <input type="text"/> | d $\frac{2}{3}$ <input type="text"/> |
| e $\frac{2}{6}$ <input type="text"/> | f $\frac{4}{6}$ <input type="text"/> | g $\frac{6}{6}$ <input type="text"/> | h $\frac{6}{9}$ <input type="text"/> |

2 Use the number lines above to answer true or false.

- | | | | |
|--|--|--|--|
| a $\frac{1}{6} = \frac{2}{9}$ <input type="text"/> | b $\frac{2}{3} = \frac{6}{9}$ <input type="text"/> | c $\frac{2}{3} = \frac{4}{6}$ <input type="text"/> | d $\frac{6}{9} = \frac{4}{6}$ <input type="text"/> |
| e $\frac{3}{3} = \frac{9}{9}$ <input type="text"/> | f $\frac{3}{6} = \frac{5}{9}$ <input type="text"/> | g $\frac{1}{3} = \frac{3}{9}$ <input type="text"/> | h $\frac{5}{6} = \frac{2}{3}$ <input type="text"/> |

3 Complete the number lines.



4 Use the number lines above to answer true or false.

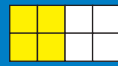
- | | | | |
|---|--|---|---|
| a $\frac{1}{5} = \frac{2}{10}$ <input type="text"/> | b $\frac{6}{9} = \frac{4}{6}$ <input type="text"/> | c $\frac{1}{3} = \frac{1}{6}$ <input type="text"/> | d $\frac{2}{5} = \frac{4}{10}$ <input type="text"/> |
| e $\frac{2}{3} = \frac{4}{6}$ <input type="text"/> | f $\frac{3}{6} = \frac{6}{9}$ <input type="text"/> | g $\frac{4}{5} = \frac{9}{10}$ <input type="text"/> | h $\frac{3}{5} = \frac{8}{10}$ <input type="text"/> |
| i $\frac{1}{5} = \frac{1}{10}$ <input type="text"/> | j $\frac{2}{3} = \frac{6}{9}$ <input type="text"/> | k $\frac{1}{2} = \frac{5}{10}$ <input type="text"/> | l $\frac{5}{6} = \frac{8}{9}$ <input type="text"/> |

5 Use the number lines above to write an equivalent fraction for:

- | | | | |
|---------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| a $\frac{1}{3}$ <input type="text"/> | b $\frac{4}{6}$ <input type="text"/> | c $\frac{1}{2}$ <input type="text"/> | d $\frac{6}{9}$ <input type="text"/> |
| e $\frac{8}{10}$ <input type="text"/> | f $\frac{3}{9}$ <input type="text"/> | g $\frac{2}{3}$ <input type="text"/> | h $\frac{1}{5}$ <input type="text"/> |

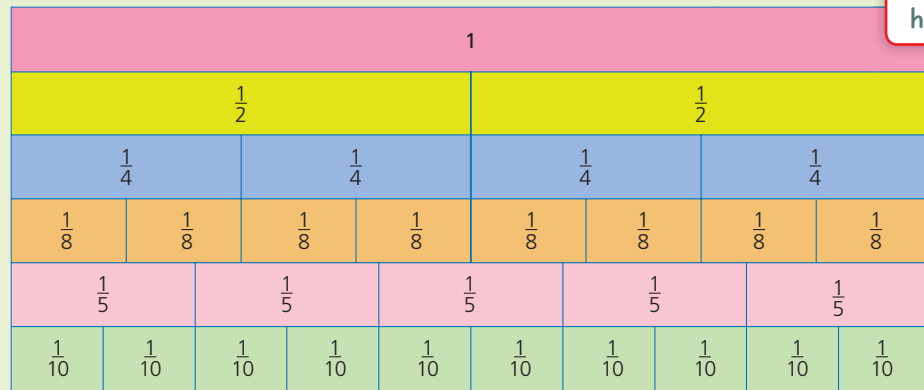


$$\frac{1}{2} = \frac{2}{4} = \frac{4}{8}$$



Equivalent fractions have the same value.

CONCEPT



$$\frac{1}{2} = \frac{5}{10}$$

$$\frac{1}{2} \begin{matrix} (\times 5) \\ (\times 5) \end{matrix} = \frac{5}{10}$$

We can make equivalent fractions by multiplying the numerator and denominator by the same number.

1 Complete these to make equivalent fractions.

a $\frac{1}{4} = \frac{\square}{8}$

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

c $\frac{3}{4} = \frac{\square}{8}$

d $\frac{1}{5} = \frac{\square}{10}$

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

f $\frac{3}{5} = \frac{\square}{10}$

g $\frac{2}{4} = \frac{\square}{8}$

h $\frac{4}{5} = \frac{\square}{10}$

i $\frac{1}{2} = \frac{\square}{8}$

j $1 = \frac{\square}{10}$

2 Complete these to make equivalent fractions.

a $\frac{1}{4} \begin{matrix} (\times 2) \\ (\times 2) \end{matrix} = \frac{\square}{\square}$

b $\frac{1}{2} \begin{matrix} (\times 4) \\ (\times 4) \end{matrix} = \frac{\square}{\square}$

c $\frac{1}{5} \begin{matrix} (\times 2) \\ (\times 2) \end{matrix} = \frac{\square}{\square}$

d $\frac{3}{5} \begin{matrix} (\times 2) \\ (\times 2) \end{matrix} = \frac{\square}{\square}$

e $\frac{3}{4} \begin{matrix} (\times 2) \\ (\times 2) \end{matrix} = \frac{\square}{\square}$

f $\frac{4}{5} \begin{matrix} (\times 2) \\ (\times 2) \end{matrix} = \frac{\square}{\square}$

g $\frac{1}{2} \begin{matrix} (\times 2) \\ (\times 2) \end{matrix} = \frac{\square}{\square}$

h $\frac{2}{5} \begin{matrix} (\times 2) \\ (\times 2) \end{matrix} = \frac{\square}{\square}$

i $\frac{1}{3} \begin{matrix} (\times 2) \\ (\times 2) \end{matrix} = \frac{\square}{\square}$

j $\frac{1}{6} \begin{matrix} (\times 2) \\ (\times 2) \end{matrix} = \frac{\square}{\square}$

k $\frac{2}{3} \begin{matrix} (\times 4) \\ (\times 4) \end{matrix} = \frac{\square}{\square}$

l $\frac{4}{6} \begin{matrix} (\times 2) \\ (\times 2) \end{matrix} = \frac{\square}{\square}$

3 Complete these to make equivalent fractions.

a $\frac{1}{3} \begin{matrix} (\times \square) \\ (\times \square) \end{matrix} = \frac{4}{\square}$

b $\frac{3}{6} \begin{matrix} (\times \square) \\ (\times \square) \end{matrix} = \frac{6}{\square}$

c $\frac{2}{3} \begin{matrix} (\times \square) \\ (\times \square) \end{matrix} = \frac{8}{\square}$

d $\frac{2}{6} \begin{matrix} (\times \square) \\ (\times \square) \end{matrix} = \frac{4}{\square}$

e $\frac{4}{10} \begin{matrix} (\times \square) \\ (\times \square) \end{matrix} = \frac{8}{\square}$

f $\frac{3}{5} \begin{matrix} (\times \square) \\ (\times \square) \end{matrix} = \frac{9}{\square}$

g $\frac{3}{5} \begin{matrix} (\times \square) \\ (\times \square) \end{matrix} = \frac{6}{\square}$

h $\frac{1}{4} \begin{matrix} (\times \square) \\ (\times \square) \end{matrix} = \frac{5}{\square}$

i $\frac{2}{7} \begin{matrix} (\times \square) \\ (\times \square) \end{matrix} = \frac{6}{\square}$

j $\frac{7}{5} \begin{matrix} (\times \square) \\ (\times \square) \end{matrix} = \frac{\square}{10}$

k $\frac{11}{3} \begin{matrix} (\times \square) \\ (\times \square) \end{matrix} = \frac{\square}{9}$

l $\frac{5}{2} \begin{matrix} (\times \square) \\ (\times \square) \end{matrix} = \frac{\square}{8}$



Multiply the numerator and denominator by the same number.



$$\frac{1}{2} \begin{matrix} (\times 5) \\ (\times 5) \end{matrix} = \frac{5}{10}$$



Multiplying by $\frac{5}{5}$ is the same as multiplying by 1.



1 Write an equivalent fraction for each of these.

a $\frac{1}{3} \begin{matrix} (\times 2) \\ (\times 2) \end{matrix} = \frac{\square}{\square}$

b $\frac{1}{4} \begin{matrix} (\times 3) \\ (\times 3) \end{matrix} = \frac{\square}{\square}$

c $\frac{1}{2} \begin{matrix} (\times 5) \\ (\times 5) \end{matrix} = \frac{\square}{\square}$

d $\frac{1}{5} \begin{matrix} (\times 3) \\ (\times 3) \end{matrix} = \frac{\square}{\square}$

e $\frac{2}{5} \begin{matrix} (\times 3) \\ (\times 3) \end{matrix} = \frac{\square}{\square}$

f $\frac{2}{3} \begin{matrix} (\times 4) \\ (\times 4) \end{matrix} = \frac{\square}{\square}$

g $\frac{3}{4} \begin{matrix} (\times 2) \\ (\times 2) \end{matrix} = \frac{\square}{\square}$

h $\frac{3}{5} \begin{matrix} (\times 3) \\ (\times 3) \end{matrix} = \frac{\square}{\square}$

2 Complete these.

a $\frac{1}{2} \begin{matrix} (\times 4) \\ (\times 4) \end{matrix} = \frac{\square}{\square}$

b $\frac{1}{5} \begin{matrix} (\times 2) \\ (\times 2) \end{matrix} = \frac{\square}{\square}$

c $\frac{1}{3} \begin{matrix} (\times 3) \\ (\times 3) \end{matrix} = \frac{\square}{\square}$

d $\frac{1}{6} \begin{matrix} (\times 2) \\ (\times 2) \end{matrix} = \frac{\square}{\square}$

e $\frac{2}{3} \begin{matrix} (\times 2) \\ (\times 2) \end{matrix} = \frac{\square}{\square}$

f $\frac{1}{2} \begin{matrix} (\times 3) \\ (\times 3) \end{matrix} = \frac{\square}{\square}$

g $\frac{1}{5} \begin{matrix} (\times 4) \\ (\times 4) \end{matrix} = \frac{\square}{\square}$

h $\frac{1}{3} \begin{matrix} (\times 4) \\ (\times 4) \end{matrix} = \frac{\square}{\square}$

3 Multiply both the numerator and the denominator by 2.

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

b $\frac{1}{6} = \frac{\square}{\square}$

c $\frac{1}{2} = \frac{\square}{\square}$

d $\frac{1}{5} = \frac{\square}{\square}$

e $\frac{1}{3} = \frac{\square}{\square}$

4 Multiply both the numerator and the denominator by 3.

a $\frac{1}{6} = \frac{\square}{\square}$

b $\frac{2}{3} = \frac{\square}{\square}$

c $\frac{1}{3} = \frac{\square}{\square}$

d $\frac{3}{4} = \frac{\square}{\square}$

e $\frac{4}{5} = \frac{\square}{\square}$

5 Multiply both the numerator and the denominator by 4.

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

b $\frac{1}{5} = \frac{\square}{\square}$

c $\frac{1}{3} = \frac{\square}{\square}$

d $\frac{3}{4} = \frac{\square}{\square}$

e $\frac{2}{3} = \frac{\square}{\square}$

6 What number has been used to multiply the numerator and denominator in each pair of equivalent fractions below?

a $\frac{1}{2} = \frac{4}{8}$

b $\frac{1}{4} = \frac{3}{12}$

c $\frac{1}{3} = \frac{3}{9}$

d $\frac{1}{6} = \frac{2}{12}$

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

f $\frac{3}{4} = \frac{6}{8}$

g $\frac{1}{5} = \frac{2}{10}$

h $\frac{3}{5} = \frac{6}{10}$

i $\frac{1}{2} = \frac{5}{10}$

j $\frac{1}{3} = \frac{4}{12}$

7 Complete these equivalent fractions.

a $\frac{1}{2} = \frac{\square}{4} = \frac{\square}{6} = \frac{\square}{8} = \frac{\square}{10} = \frac{\square}{12}$

b $\frac{1}{3} = \frac{\square}{6} = \frac{\square}{9} = \frac{\square}{12} = \frac{\square}{15} = \frac{\square}{18}$



hundreds	tens	ones	•	tenths	hundredths	thousandths
		0	•	1	2	5
		0	•	4		
		0	•	3	5	
		0	•	0	7	9
9	9	•	9			
7	4	•	3	7	5	
1	0	•	0	4		
8	0	•	7	2	5	

1 Order these from smallest to largest:

a $0\cdot125, 0\cdot4, 0\cdot35, 0\cdot079$ (Use the diagram.)

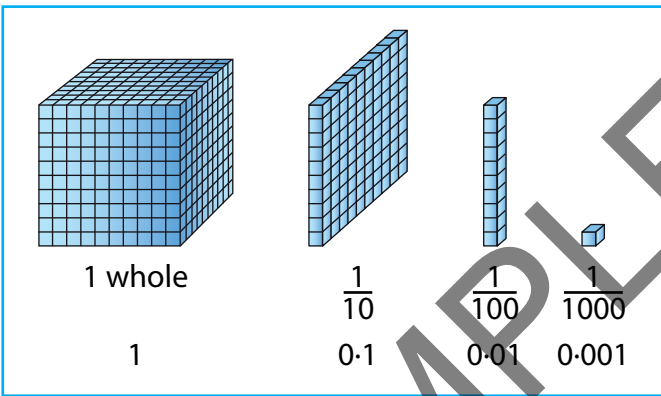
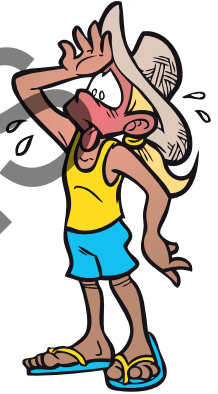
b $99\cdot9, 74\cdot375, 100\cdot04, 80\cdot725$ (Use the diagram.)

c $3\cdot5, 3\cdot49, 3\cdot52, 3\cdot095, 4, 4\cdot2$

d $0\cdot066, 0\cdot139, 0\cdot3, 0\cdot51, 1, 0\cdot1$

e $12\cdot12, 1\cdot212, 121\cdot2, 1212, 0\cdot1212$

For c, d and e, list the decimals, as in the diagram.



2 True (T) or false (F)?

a $10 \times 0\cdot001 = 0\cdot01$

b $10 \times 0\cdot01 = 0\cdot1$

c $10 \times 0\cdot1 = 1$

d $1000 \times 0\cdot001 = 1$

e $100 \times 0\cdot01 = 1$

f $0\cdot2 = 10 \times 0\cdot02$

To round off a decimal to a given decimal place we look at the next digit. If it is 5 or more we round up. If it is less than 5, we round down.

$3\cdot128$ rounds to $3\cdot1$ to 1 decimal place.

3 Round each decimal to 1 decimal place, (that is, to the nearest tenth).

a $4\cdot62$

b $14\cdot25$

c $0\cdot447$

$0\cdot35$ rounds to $0\cdot4$ to 1 decimal place.

d $60\cdot177$

e $154\cdot07$

f $33\cdot333$

$3\cdot128$ rounds to $3\cdot13$ to 2 decimal places.

4 Round each decimal to 2 decimal places, (to the nearest hundredth).

a $9\cdot627$

b $14\cdot253$

c $0\cdot145$

$0\cdot014$ rounds to $0\cdot01$ to 2 decimal places.

d $35\cdot288$

e $65\cdot043$

f $0\cdot415$

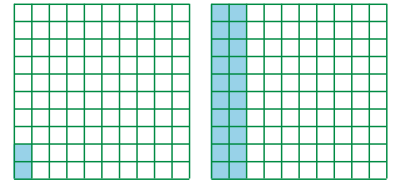
$60 \div 10 = 6$
 $0.60 \div 10 = 0.06$
 so $0.6 \div 10 = 0.06$



100 10 1 • $\frac{1}{10}$ $\frac{1}{100}$ $\frac{1}{1000}$

hundreds	tens	ones	•	tenths	hundredths	thousandths

- Hundredths are 10 times smaller than tenths. $10 \times 0.02 = 0.2$
- Thousandths are 10 times smaller than hundredths. $10 \times 0.002 = 0.02$



		0	•	1	0	0
		0	•	0	1	0
		0	•	0	0	1
			•			
			•			
			•			
			•			
			•			
			•			
			•			

$0.1 = 100$ thousandths
$0.01 = 10$ thousandths
$0.001 < 0.01 < 0.1$
length of koala in cm
length of platypus in cm
length of lizard in cm
length of echidna in cm



length = 60 cm



length = 42.15 cm



length = 82.125 cm



length = 29.4 cm

- a** Write the length of each animal on the table above.

b Write the length of each animal to the nearest centimetre.

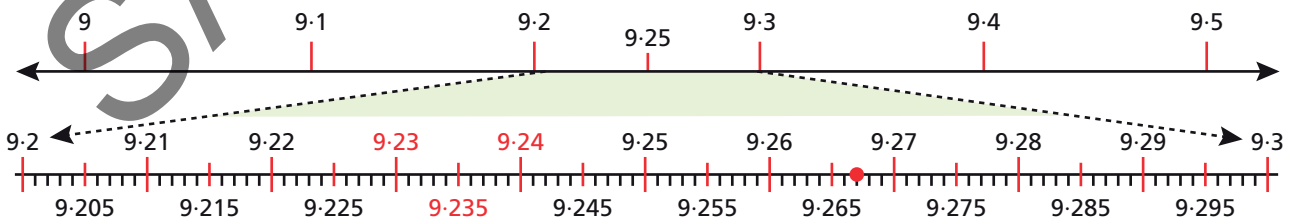
koala platypus lizard echidna

c Write the length of each animal in centimetres correct to 1 decimal place.

koala platypus lizard echidna

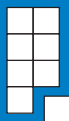
d Order the numbers 60, 42.15, 82.125 and 29.4, from smallest to largest.

- A small part of the number line has been magnified.



- A dot has been drawn at 9.267. Draw dots at; 9.277, 9.24, 9.212, 9.4, 9 and 9.206.
- Write the number that is halfway between:

9.1 and 9.2 9.21 and 9.22 9.286 and 9.287



$$\begin{array}{r} 8 \\ 8 \\ 1 \end{array} - \frac{1}{8}$$

$$1 - \frac{1}{8}$$



CONCEPT



1 whole is $\frac{3}{3}$.

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

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

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

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

1 Complete, writing the answers as whole numbers or mixed numerals.

a $\frac{7}{8} + \frac{1}{8} = \square$ b $\frac{4}{6} + \frac{2}{6} = \square$ c $\frac{2}{3} + \frac{1}{3} = \square$ d $\frac{3}{4} + \frac{1}{4} = \square$

e $1\frac{1}{6} + \frac{5}{6} = \square$ f $2\frac{5}{8} + \frac{3}{8} = \square$ g $1\frac{7}{10} + \frac{3}{10} = \square$ h $2\frac{3}{5} + \frac{2}{5} = \square$

i $1\frac{3}{5} - \frac{3}{5} = \square$ j $2\frac{7}{10} - \frac{4}{10} = \square$ k $3\frac{3}{5} - \frac{1}{5} = \square$ l $2\frac{7}{12} - \frac{3}{12} = \square$

2 Complete:

a $1 - \frac{1}{6} = \square$ b $1 - \frac{1}{10} = \square$ c $1 - \frac{1}{8} = \square$ d $1 - \frac{1}{12} = \square$

e $1 - \frac{1}{5} = \square$ f $1 - \frac{3}{4} = \square$ g $1 - \frac{7}{10} = \square$ h $1 - \frac{2}{5} = \square$

i $1 - \frac{2}{3} = \square$ j $1 - \frac{5}{6} = \square$ k $1 - \frac{3}{8} = \square$ l $1 - \frac{5}{12} = \square$

3 Complete:

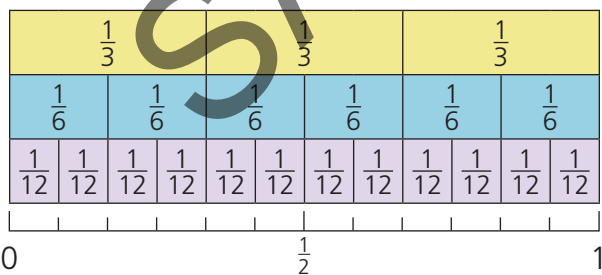
a $3 - \frac{1}{2} = \square$ b $2 - \frac{1}{3} = \square$ c $2 - \frac{1}{6} = \square$

d $3 - \frac{1}{5} = \square$ e $4 - \frac{1}{10} = \square$ f $4 - \frac{1}{12} = \square$

g $3 - \frac{1}{8} = \square$ h $4 - \frac{1}{4} = \square$ i $2 - \frac{3}{4} = \square$

Two wholes and three quarters left.

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



4 Use the diagram to show an equivalent fraction for:

a $\frac{2}{12} = \square$ b $\frac{10}{12} = \square$ c $\frac{4}{6} = \square$

d $\frac{2}{3} = \square$ e $\frac{8}{12} = \square$ f $\frac{3}{6} = \square$

5 Use the diagram in Question 4 to answer true or false.

a $\frac{1}{3} = \frac{4}{12}$ b $\frac{8}{12} = \frac{4}{6}$ c $\frac{2}{3} = \frac{6}{12}$ d $\frac{10}{12} = \frac{5}{6}$

6 Using the diagram, explain your answers to Questions 4 and 5 to a friend.



- To order fractions, use equivalent fractions to give them the same denominator.

Order $\frac{3}{8}$, $\frac{3}{4}$, $\frac{1}{2}$ and $1\frac{1}{8}$ smallest first.

$$\frac{3}{8} \quad \frac{3 \times 2}{4 \times 2} = \frac{6}{8} \quad \frac{1 \times 4}{2 \times 4} = \frac{4}{8} \quad \frac{9}{8}$$

The order is: $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$ and $1\frac{1}{8}$.



- To add or subtract fractions, give them the same denominator.

$$\begin{aligned} \frac{3}{8} + \frac{1}{4} &= \frac{3}{8} + \frac{1 \times 2}{4 \times 2} \\ &= \frac{3}{8} + \frac{2}{8} \\ &= \frac{5}{8} \end{aligned}$$



In both, we changed the denominators to eighths.

- 1 Order these numbers from smallest to largest.

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

b $\frac{3}{4}$, $1\frac{1}{4}$, $\frac{5}{8}$, $\frac{1}{2}$

c $\frac{1}{4}$, 1, $\frac{9}{8}$, $\frac{1}{8}$

d $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, $\frac{1}{8}$

e $\frac{7}{10}$, $1\frac{1}{10}$, $\frac{1}{5}$, $\frac{1}{2}$

f $\frac{6}{10}$, $\frac{1}{5}$, $\frac{3}{2}$, $\frac{1}{10}$

- 2 Make the denominators the same before adding.

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

b $\frac{1}{8} + \frac{1}{2} = \frac{1}{8} + \frac{\square}{8} = \square$

c $\frac{1}{2} + \frac{1}{4} = \square$

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

e $\frac{3}{4} + \frac{1}{8} = \square$

f $\frac{1}{10} + \frac{1}{5} = \square$

g $\frac{1}{8} + \frac{1}{4} = \square$

h $\frac{3}{5} + \frac{3}{10} = \square$

i $\frac{1}{4} + \frac{7}{8} = \square$

j $\frac{3}{5} + \frac{1}{10} = \square$

k $\frac{3}{10} + \frac{2}{5} = \square$

k $\frac{4}{5} + \frac{7}{10} = \square$



$\frac{7}{10} + \frac{7}{10} = \frac{14}{10}$ or $1\frac{4}{10}$

- 3 Make the denominators the same before subtracting.

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

b $\frac{5}{8} - \frac{1}{4} = \frac{5}{8} - \frac{\square}{8} = \square$

c $\frac{7}{8} - \frac{1}{2} = \frac{7}{8} - \frac{\square}{8} = \square$

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

e $\frac{9}{10} - \frac{1}{2} = \square$

f $\frac{7}{10} - \frac{2}{5} = \square$

g $\frac{3}{8} - \frac{1}{4} = \square$

h $\frac{7}{10} - \frac{1}{2} = \square$

i $\frac{6}{8} - \frac{1}{2} = \square$

j $\frac{9}{8} - \frac{3}{4} = \square$

k $\frac{9}{10} - \frac{1}{5} = \square$

l $\frac{3}{4} - \frac{3}{8} = \square$

m $\frac{7}{8} - \frac{3}{4} = \square$

n $\frac{4}{5} - \frac{6}{10} = \square$

o $\frac{3}{5} - \frac{1}{10} = \square$

p $\frac{11}{10} - \frac{1}{2} = \square$

q $\frac{9}{8} - \frac{1}{2} = \square$

r $\frac{3}{2} - \frac{7}{10} = \square$

s $\frac{7}{5} - \frac{7}{10} = \square$



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



1 Half of a hexagonal garden has been used to plant seeds. Another sixth of the garden has mature plants. The rest has not been used. What fraction of the garden has not been used? of the garden

2 Our water tank was full yesterday, but my son left the tap running and one-quarter of the water was wasted. How much of our water was left? of the tank

3 Three groups were allocated a section of the stage. We would all perform at the same time. Our group was allocated one-sixth of the stage. How much was left for the other groups to use? of the stage

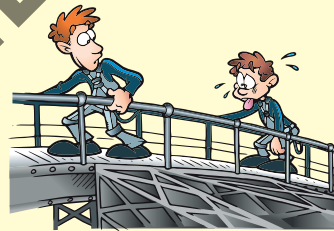
4 We had three strips of blue paper, each 12 cm long and 2 cm wide. Felicity used three-quarters of a strip. I used five-eighths of a strip. How much of the paper did we use? strips



5 Peter and his brother Tom, climbed to the top of the Sydney Harbour Bridge. When Tom was halfway up, Peter was only three-tenths of the way up. At that time, how much further up was Tom than Peter? of the way up

6 **Working**

Jessica, Felicity and *Lachlan* entered the cross-country race. Yellow cones had been placed at the 1 km, 2 km and 3 km marks.



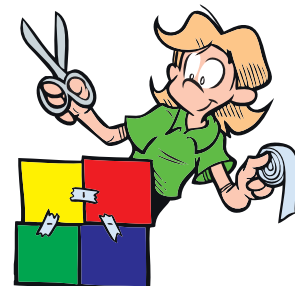
a How far from the start is *Lachlan*, when he is two-thirds of the way between the second and third cones? km

b When Felicity had run three-quarters of a kilometre, Jessica had run one and a half kilometres. How far apart were they? km

7 Rhonda bought 2 metres of tape. She used half a metre to make a one square-metre unit for measuring, and seven tenths of a metre to repair some books.

a How much tape did she use? m

b How much tape was not used? m





We can use decimals to write large numbers in millions or billions.

- To write 64 500 000 as millions, put a decimal point after the 4 in the millions column.
64.5 million We don't need the zeros at the end of the decimals.
 This is **sixty-four point five million**.
- To write 16 230 000 000 as billions, put a decimal point after the 6 in the billions column.
16.23 billion We don't need the zeros at the end of the decimals.
 This is **sixteen point two three billion**.



Put the decimal point here for billions.

Put the point here for millions.

	billions	millions	thousands	the rest
A		5	6 0 0	0 0 0
B	2	5	6 5 0	0 0 0
C	1	2	5 6 0	0 0 0
D		6	8 4 0	0 0 0
E	3	9	0 0	0 0 0 0
F	7	1	8 0	0 0 0 0
G	6	2	4 4	0 0 0 0
H	1	3	7 0	0 0 0 0

1 Write as millions using a decimal.

a **A** millions

b **B** millions

c **C** millions

d **D** millions

2 Write as billions using a decimal.

a **E** billions

b **F** billions

c **G** billions

d **H** billions

$1\text{ m} = 1000\text{ mm}$

$1\text{ L} = 1000\text{ mL}$

$1\text{ kg} = 1000\text{ g}$

$1\text{ km} = 1000\text{ m}$

$4.29\text{ m} = 4290\text{ mm}$

$2.4\text{ L} = 2400\text{ mL}$

$9.22\text{ kg} = 9220\text{ g}$

$1.75\text{ km} = 1750\text{ m}$

$3750\text{ mm} = 3.75\text{ m}$

$3600\text{ mL} = 3.6\text{ L}$

$12\,300\text{ g} = 12.3\text{ kg}$

$7700\text{ m} = 7.7\text{ km}$



3 Complete these conversions.

a $3.9\text{ m} = \text{ } \text{mm}$

b $12.7\text{ kg} = \text{ } \text{g}$

c $45.6\text{ km} = \text{ } \text{m}$

d $8.2\text{ L} = \text{ } \text{mL}$

e $10.2\text{ km} = \text{ } \text{m}$

f $11.48\text{ L} = \text{ } \text{mL}$

g $5300\text{ mm} = \text{ } \text{m}$

h $1850\text{ g} = \text{ } \text{kg}$

i $6640\text{ m} = \text{ } \text{km}$

j $5800\text{ m} = \text{ } \text{km}$

k $4300\text{ mL} = \text{ } \text{L}$

l $2675\text{ g} = \text{ } \text{kg}$

m $0.145 = \text{ } \%$

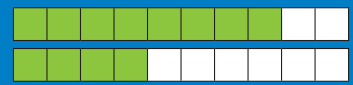
n $0.125 = \text{ } \%$

o $0.3333 = \text{ } \%$

See Extra Support 15 (Decimals! - What does a million look like?).



80% is twice 40%



100% is one whole.
200% is two wholes.

70% means 70 out of every 100.

70% of 100 = 70
70% of 200 = 140



1 Complete each pattern and write the rule.

a 120%, 100%, 80%, , ,

The rule is:

b $\frac{7}{10}$, $\frac{9}{10}$, $\frac{11}{10}$, , , ,

The rule is:

c 4, $3\frac{8}{10}$, $3\frac{6}{10}$, , , ,

The rule is:

d 0.85, 0.87, 0.89, , ,

The rule is:

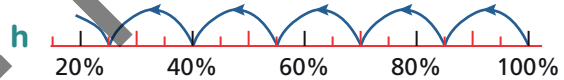
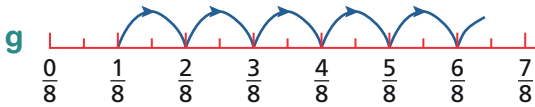
e 1.6, 1.5, 1.4, , ,

The rule is:

f , ...

The rule is:

0.3, , , , , ,



$\frac{1}{8}$, , , , , ,

100%, , , , , ...

The rule is:

The rule is:

i , ...

j , ...

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

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

The rule is:

The rule is:

2 Create your own percentage number pattern using jumps on the number line.



, , , , , ,

The rule is:



See Extra Support 12 (Number patterns).